

Volume 10, Issue 2 (VI)

April - June 2023

ISSN: 2394 – 7780



International Journal of Advance and Innovative Research

Indian Academicians and Researchers Association
www.iaraedu.com



THE INTERNATIONAL CONFERENCE
Innovations, Agility and Sustainability in Global
Business Environment
Institute of Technology and Science
Mohan Nagar, Ghaziabad
&
I.T.S School of Management
Mohan Nagar, Ghaziabad
28-29 April, 2023



Publication Partner
Indian Academicians and Researcher's Association



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I.T.S- The Education Group is engaged in imparting value based professional education in the field of Management, Information Technology, Dentistry, Biotechnology, Physiotherapy and Engineering. Established in 1995 under the aegis of Durga Charitable Society, the Group started with its first campus in Mohan Nagar, Ghaziabad, The Group is now having four campuses formidable with establishments at Muradnagar and Greater Noida, imparting multidisciplinary curricula.

I.T.S - The Education Group is a 28 years old leading educational group of the country. Its various programmes are NBA accredited. The group offers 20 courses to its 8000 students in its 8 Institutes spread over 4 campuses, endowed with state-of-the-art infrastructure, all modern facilities and more than 800 distinguished faculty members. I.T.S is headed by Dr. R. P. Chadha as its Chairman who believes in nurturing the potential of the students and ensuring it to grow into a commitment to create a Thinking Professional Order. There is a strong societal, industry and professional fraternity participation rendering the graduated students as highly sought after products in the professional field. Value added inputs together with research work, seminars, paper presentation, MDPs and FDPs are a way of life. The group lays due stress on the development of the student not only as a professional but also as a worthy member of the society.

I.T.S Mohan Nagar, Ghaziabad is ISO 9001: 2015 certified and NAAC 'A+' grade accredited institute. The Institute conducts MBA and MCA programs affiliated to Dr A P J Abdul Kalam Technical University, Lucknow. I.T.S School of Management offers PGDM program, which is NBA accredited and granted equivalence of AIU. The BBA and BCA programs are affiliated to C.C.S. University, Meerut

The Campus at Muradnagar started in the year 2000 imparts MDS (Approved by Dental Council Of India), BDS (Recognized by DCI & affiliated to C.C.S.), M.Sc (Biotech)/ B.Sc (Biotech) and BPT and MPT(affiliated to C.C.S. University, Meerut) and B Pharma and M Pharma which is approved by AICTE and affiliated to AKTU, Lucknow. Two campuses in Greater Noida started in 2006 and located at Knowledge Park III, offers B.Tech (approved by AICTE and affiliated to AKTU, Lucknow) with specialization in CS, IT, EC,ME & EE and MBA which are also approved by AICTE and affiliated to AKTU, Lucknow. The second campus established as Dental College and Hospital offers BDS and MDS which are approved by Dental Council of India.

I.T.S supplements education with its CSR activities offering help, care and guidance to the down trodden and unprivileged segments of the society. I.T.S-The Education Group offers nonprofit medical care to society through its two, 100 bedded fully equipped multi-specialty hospitals.

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26th April, 2023

Dear Shri Srivastava ji,

Thank you very much for your email dated 04th April, 2023 inviting Shri Ram Nath Kovind, Hon'ble Former President of India to be the Chief Guest at the "Inaugural Session of International Conference 2023" on 28th April, 2023 at Chanakya Auditorium, ITS Mohan Nagar, Ghaziabad.

I am directed to inform you that due to pre committed schedule during that period, Hon'ble Former President of India will not be able to attend the above. However, he conveys his best wishes for the success of entire endeavor.

With regards,

Yours sincerely,


(Amrik Singh)

Dr. Vinay K Srivastava,
Co-convener – International Conference 2023
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MESSAGE FROM THE CHAIRMAN

It is indeed a matter of great pride and pleasure that Institute of Technology and Science, Mohan Nagar and ITS School of Management, Mohan Nagar, Ghaziabad are successfully organizing the International Conference on “Innovations, Agility and Sustainability in Global Business Environment (ICIASGBE-2023)”.

This convergence of thoughts on a particular relevant and contemporary concepts and issues will help in creation of Amrit or Divine Nectar for educationists, researchers, business professionals and policy makers. The deliberations and discussions at the conference is expected to widen the scope of research and Knowledge base in the diversified areas of management, information technology, business and society.

I hope this conference will provide a fertile ground for the productive exchange of ideas and laying the foundation for further research in the relevant fields.

We are happy that Indian Academician and Researchers Association (IARA) has accepted to publish conference proceedings in its premier journal “International Journal of Advance and Innovative Research (IJAIR)”. I believe, publication of proceedings will help and encourage researchers and educationists to delve more into these areas and unearth newer nuggets of thought and wisdom.

Dr. R. P. Chadha
Chairman

I.T.S - The Education Group

MESSAGE FROM THE VICE CHAIRMAN

We feel highly delighted that Institute of Technology and Science, Mohan Nagar and ITS School of Management, Mohan Nagar, Ghaziabad have organized two days international Conference on “Innovations, Agility and Sustainability in Global Business Environment (ICIASGBE-2023)”.

The two-day conference is witnessing enthusiastic participation from different parts of the country and abroad as academicians, researchers and business practitioners for deliberations on a variety of themes across diversified areas of management, information technology, business and society. A heartening feature of the conference is substantial participation and presentation of academicians, researchers and business professionals with thought provoking concepts and ideas on global competitiveness and social development in more strategic, ambitious and collaborative manner.

I would like to take this opportunity to greet and express my sincere thanks for the concerted efforts of academic fraternity, researchers, business practioners and technologists for providing thought provoking contributions.

I am also indebted to them for choosing to participate in the conference and have contributed in raising the standards of academic excellence.

Shri Arpit Chadha
Vice Chairman
I.T.S-The Education Group

FROM THE DESK OF DIRECTOR

It gives me great pleasure to note that the publication of the conference proceedings in “International Journal of Advance and Innovative Research” for the International Conference on “Innovations, Agility and Sustainability in Global Business Environment (ICIASGBE-2023)”. It provides a valuable opportunity for the confluence of ideas in diverse streams of thought in management and allied areas like Marketing, Human Resource Management, Finance, Operations, Information Technology, Ethics and International Business, etc.

It is hoped that the papers and abstracts included herein will spark greater insight in the area of Innovations, Agility and Sustainability leading to holistic development of business and society as a whole in the context of global business environment.

We are thankful to all the teachers, researchers and business professionals who invested their valuable time and effort in writing these papers, and chose to contribute for this compendium.

We would also like to take this opportunity to express our gratefulness to the management, faculty, staff and students, without their efforts this conference would not have been possible.

With best wishes

Prof. (Dr.) V. N. Bajpai
Director

PREFACE

There are significant global and local opportunities for growth in business irrespective of an enterprise's size. In the contemporary business world, innovation is in full speed evolving. Digital innovations have shown the remarkable acceptance across the globe in business and society at large. Innovations, agility and sustainability go hand in hand.

In the emerging markets of the twenty-first century, business agility has emerged as an important strategy tool for the firms to cut across the increasing competition. In the era of innovations and the competitive performance of the firm is significantly driven by the changing customer needs. The business agility influences firm's performance to manage market complexity with flexible strategies. Effective implementation of innovative strategies with business agility needs firms to develop abilities on market sensing, research orientations, flexibility, speed, and responsiveness. These attributes allow firms to co-create and co-evolve with customer-centric strategies in a changing environment of innovations and respond rapidly to the complexities by reconfiguring their business tactics.

This international conference intends to document experience of firms, management process, and business systems that have co-evolved with the research innovations and agile business philosophy and attained high sustainable performance of business.

Viewpoints before organizing this conference and publication of this conference special Journal is addressing and documenting company's innovation and business strategies linked with agility and sustainability to leverage company's core competencies and creating sustainable business development.

We are extremely indebted to all the teachers, researchers and business professionals who invested their valuable time and effort in writing these papers, and chose to contribute for this conference special journal.

We would also like to take this opportunity to express our deep sense of gratitude to the management, faculty, staff and students, without their efforts this conference would not have been possible. I am thankful to International Journal of Advanced and Innovative Research (IJAIR) and Indian Academicians and Research Association (IARA) that have shown interest in publishing this conference special journal.

With best wishes

Prof. (Dr.) Manoj Kumar Jha
Conference Convener

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Volume 10, Issue 2 (VI): April - June 2023

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Scientific Journal Impact Factor

CERTIFICATE OF INDEXING (SJIF 2022)

This certificate is awarded to

International Journal of Advance & Innovative Research
(ISSN: 2394-7780)

The Journal has been positively evaluated in the SJIF Journals Master List evaluation process
SJIF 2018 = 7.46

SJIF (A division of InnoSpace)

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USE OF WORKING OUT LOUD (WOL) AS TECHNIQUE IN ORGANISATION: BENEFITS AND CHALLENGES

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ABSTRACT

Working Out Loud (WOL) is a collaboration and knowledge-sharing method that involves openly sharing information and work in progress with others, both within and outside an organization. The approach has gained popularity as a way to increase productivity, foster collaboration, and promote personal and organizational learning.

This paper highlights the potential benefits of implementing Working Out Loud in an organization, including increased transparency, improved collaboration, enhanced learning and knowledge sharing, and the promotion of personal and professional development. It also acknowledges the challenges that organizations may face when implementing Working Out Loud, including resistance to change and the need for effective communication and collaboration skills.

We can summarize that the potential benefits of Working Out Loud for organizations and underscores the need for organizations to embrace change, develop effective communication and collaboration skills, and adopt the right technology to support their efforts.

Keywords: Working Out Loud, Benefits, Technology, Artificial intelligence

INTRODUCTION

Working Out Loud (WOL) is a method of collaboration and knowledge sharing that involves openly sharing information and work in progress with others, both within and outside an organization. The concept of WOL was first introduced by John Stepper in 2012 and has since gained popularity as a way to increase productivity, foster collaboration, and promote personal and organizational learning.

The idea behind Working Out Loud is to build relationships, share information, and promote learning by making work visible to others. The approach involves sharing work in progress, reflections, and thoughts on a regular basis, using various platforms such as social media, collaboration tools, or personal blogs. By doing so, individuals and organizations can benefit from increased transparency, improved collaboration, enhanced learning and knowledge sharing, and the promotion of personal and professional development.

WOL is based on several key principles, including the power of generosity, the importance of network-building, and the value of making work visible. These principles serve as the foundation for the WOL approach and help to promote a culture of openness, collaboration, and learning.

BACKGROUND OF WOL

"Working Out Loud" is a concept and philosophy that involves openly sharing one's thoughts, experiences, and work with others, with the goal of building relationships, improving one's own work, and creating positive outcomes for others.

The concept of Working Out Loud originated from the work of John Stepper, a former managing director at Deutsche Bank, who first introduced the concept in his blog in 2012. Stepper believed that the traditional hierarchical model of work was no longer effective and that individuals needed to take a more proactive approach to building relationships and contributing to their communities.

The principles of Working Out Loud are based on the idea of sharing one's work publicly and regularly, with the goal of building trust, developing relationships, and creating value for others. This involves making one's work and thoughts visible, engaging with others in conversations and discussions, and seeking feedback and support.

Technology has played a key role in enabling the practice of Working Out Loud, with social media and collaboration platforms providing individuals with new ways to share their work and connect with others.

Working Out Loud has been embraced by organizations, individuals, and communities as a way to improve collaboration and communication, increase visibility and transparency, enhance learning and personal growth, and boost innovation and creativity. It is seen as a way to build relationships, foster a sense of community, and drive positive outcomes in a rapidly changing and increasingly connected world.

ORIGIN OF CONCEPT

The concept of "Working Out Loud" (WOL) originated from the work of John Stepper, a former managing director at Deutsche Bank. In 2012, Stepper introduced the concept in his blog, where he argued that the traditional hierarchical model of work was no longer effective and that individuals needed to take a more proactive approach to building relationships and contributing to their communities.

Stepper believed that sharing one's work and thoughts publicly and regularly was a way to build trust, develop relationships, and create value for others. He proposed that individuals should make their work visible, engage with others in conversations and discussions, and seek feedback and support as a way of improving their own work and making a positive impact on others.

Stepper's ideas on Working Out Loud have since been developed and refined by a growing community of practitioners, who have embraced the concept as a way to improve collaboration, increase transparency, enhance learning, and drive innovation. Today, Working Out Loud is seen as a valuable approach to work and personal development, and is being adopted by organizations, communities, and individuals around the world.

THE PRINCIPLES OF WORKING OUT LOUD

The principles of Working Out Loud (WOL) are centered around the idea of openly sharing one's thoughts, experiences, and work with others, with the goal of building relationships, improving one's own work, and creating positive outcomes for others. The following are some of the key principles of WOL:

1. **Make your work visible:** Share your work, thoughts, and experiences publicly and regularly, so that others can see what you are doing and learn from it.
2. **Engage with others:** Encourage conversations and discussions with others, seek feedback, and participate in collaborative initiatives.
3. **Build relationships:** Build trust and create a sense of community by engaging with others in meaningful ways.
4. **Seek feedback and support:** Ask for feedback and support from others, and be open to constructive criticism.
5. **Be authentic:** Be yourself and share your work and experiences in a way that is true to who you are.
6. **Embrace learning:** Be open to new ideas, perspectives, and experiences, and continuously seek to improve your work and yourself.
7. **Focus on outcomes:** Focus on creating positive outcomes for others, rather than just promoting your own work.

THE ROLE OF TECHNOLOGY IN WORKING OUT LOUD

Technology plays a crucial role in the practice of Working Out Loud (WOL). With the rise of social media and collaboration platforms, individuals have new ways to share their work and connect with others, making it easier to put the principles of WOL into action.

Here are Some ways Technology Supports the Practice of WOL

1. **Sharing work:** Technology makes it possible to share work publicly and regularly, regardless of location or time zone. This allows individuals to reach a wider audience and build relationships with people they may not have been able to connect with otherwise.
2. **Engaging with others:** Social media and collaboration platforms provide new ways for individuals to engage with others and participate in conversations and discussions. This makes it easier for individuals to seek feedback, ask for support, and build relationships with others.
3. **Improving work:** Technology makes it possible for individuals to receive feedback from a wider audience, which can help them improve their work and create better outcomes for others.
4. **Enhancing learning:** Technology provides access to a wealth of information and resources, making it easier for individuals to learn and grow. It also enables individuals to connect with others who have similar interests and goals, allowing for the sharing of ideas and experiences.
5. **Boosting innovation:** Working Out Loud encourages individuals to think creatively and share their work with others, which can lead to new ideas and innovative solutions. The use of technology can help amplify the impact of these ideas, making it possible to reach a wider audience and create positive outcomes for others.

BENEFITS OF WORKING OUT LOUD

Working Out Loud (WOL) is a valuable approach to work and personal development that can offer a wide range of benefits for individuals, organizations, and communities. Here are some of the key benefits of WOL:

1. **Improved collaboration:** By openly sharing one's work and thoughts, individuals can build stronger relationships with others and collaborate more effectively.
2. **Increased transparency:** Sharing work publicly and regularly can increase transparency, which can build trust and help to create a more inclusive and supportive work environment.
3. **Enhanced learning:** By seeking feedback and participating in discussions with others, individuals can improve their work and enhance their own learning.
4. **Career development:** Sharing one's work publicly can increase visibility and lead to new opportunities for career development.
5. **Improved well-being:** Engaging with others in a supportive and inclusive environment can have a positive impact on mental health and well-being.
6. **Innovation:** Working Out Loud encourages individuals to share their work and ideas, which can lead to new and innovative solutions.
7. **Community building:** By building relationships and connecting with others, individuals can become part of a supportive and inclusive community that can help them grow and succeed.

Implementing Working Out Loud in Organizations

Implementing Working Out Loud (WOL) in organizations can be a valuable way to increase collaboration, enhance learning, and drive innovation. Here are some steps organizations can take to implement WOL:

1. **Provide training and support:** Provide training and support for employees to help them understand the principles of WOL and how to put them into practice.
2. **Encourage sharing:** Encourage employees to share their work publicly and regularly, and create a supportive environment where it is safe to do so.
3. **Use technology:** Utilize social media and collaboration platforms to support WOL initiatives, making it easier for employees to share their work and engage with others.
4. **Foster a culture of learning:** Foster a culture of continuous learning, where employees are encouraged to seek feedback, ask for support, and continuously improve their work.
5. **Lead by example:** Encourage leaders to practice WOL and set a positive example for others to follow.
6. **Encourage community building:** Encourage employees to build relationships with each other, participate in discussions and collaborations, and engage with others in meaningful ways.
7. **Measure success:** Measure the success of WOL initiatives and continuously refine and improve the approach to ensure it is delivering the desired outcomes.

By taking these steps, organizations can create a supportive and inclusive environment where employees feel valued and are able to contribute to the success of the organization. The implementation of WOL can lead to increased collaboration, enhanced learning, and a more innovative and dynamic workplace.

Case Studies of Working out Loud

There are many examples of organizations that have successfully implemented Working Out Loud (WOL) and seen positive results. Here are a few case studies that highlight the benefits of WOL in practice:

1. **Accenture:** Accenture, a global professional services firm, implemented WOL as part of their efforts to create a more collaborative and innovative work environment. By encouraging employees to share their work and ideas openly, Accenture was able to drive innovation and improve collaboration across the organization.
2. **Deloitte:** Deloitte, a global professional services firm, implemented WOL as a way to increase transparency and improve collaboration. By sharing work publicly and regularly, Deloitte employees were able to build stronger relationships with each other and collaborate more effectively.
3. **Nokia:** Nokia, a multinational telecommunications company, implemented WOL as part of their efforts to drive innovation and improve collaboration. By encouraging employees to share their work and ideas

openly, Nokia was able to create a more supportive and inclusive work environment, and drive innovation through cross-functional collaboration.

4. **Johnson & Johnson:** Johnson & Johnson, a global healthcare company, implemented WOL as a way to improve collaboration and increase transparency. By sharing work publicly and regularly, Johnson & Johnson employees were able to build stronger relationships with each other and collaborate more effectively, leading to increased innovation and better outcomes for patients.

There are many organizations that have successfully implemented Working Out Loud (WOL) and have seen positive results. Here are a few success stories:

1. **Microsoft:** Microsoft implemented WOL as part of their efforts to drive innovation and improve collaboration across the company. By encouraging employees to share their work and ideas openly, Microsoft was able to foster a culture of learning and drive innovation through cross-functional collaboration.
2. **IBM:** IBM implemented WOL as a way to improve collaboration and increase transparency. By sharing work publicly and regularly, IBM employees were able to build stronger relationships with each other and collaborate more effectively, leading to increased innovation and better outcomes for clients.
3. **Spotify:** Spotify, a music streaming service, implemented WOL as part of their efforts to create a more supportive and inclusive work environment. By encouraging employees to share their work and ideas openly, Spotify was able to drive innovation and improve collaboration across the organization.
4. **Procter & Gamble:** Procter & Gamble, a consumer goods company, implemented WOL as a way to drive innovation and improve collaboration. By sharing work publicly and regularly, Procter & Gamble employees were able to build stronger relationships with each other and collaborate more effectively, leading to increased innovation and better outcomes for customers.

There are several organizations in India that have successfully implemented Working Out Loud (WOL) and seen positive results. Here are a few success stories:

1. **Tata Consultancy Services (TCS):** TCS, one of the largest IT services providers in India, implemented WOL as part of their efforts to drive innovation and improve collaboration across the company. By encouraging employees to share their work and ideas openly, TCS was able to foster a culture of learning and drive innovation through cross-functional collaboration.
2. **Infosys:** Infosys, another leading IT services provider in India, implemented WOL as a way to improve collaboration and increase transparency. By sharing work publicly and regularly, Infosys employees were able to build stronger relationships with each other and collaborate more effectively, leading to increased innovation and better outcomes for clients.
3. **Mahindra & Mahindra:** Mahindra & Mahindra, an Indian multinational conglomerate, implemented WOL as part of their efforts to create a more supportive and inclusive work environment. By encouraging employees to share their work and ideas openly, Mahindra & Mahindra was able to drive innovation and improve collaboration across the organization.
4. **Wipro:** Wipro, an Indian IT services provider, implemented WOL as a way to drive innovation and improve collaboration. By sharing work publicly and regularly, Wipro employees were able to build stronger relationships with each other and collaborate more effectively, leading to increased innovation and better outcomes for clients.

Analysis of the Challenges Faced and the Strategies used to Overcome

While Working Out Loud (WOL) has proven to be a successful strategy for many organizations in India, there are also challenges that organizations may face in implementing WOL. Some of these challenges include:

1. **Resistance to change:** Some employees may resist the change to a more open and transparent work environment and may be hesitant to share their work and ideas publicly.
2. **Lack of understanding:** There may be a lack of understanding about the purpose and benefits of WOL, leading to limited participation and buy-in from employees.
3. **Technical difficulties:** Implementing WOL may require changes to technology and infrastructure, and organizations may face technical difficulties in integrating WOL into existing systems and processes.

To overcome these challenges, organizations in India have used a variety of strategies, including:

1. **Communication and education:** Organizations have focused on educating employees about the purpose and benefits of WOL, and communicating the importance of WOL to the organization's success.
2. **Encouragement and support:** Organizations have encouraged and supported employees to participate in WOL by providing training and resources, and by creating a supportive and inclusive work environment.
3. **Integration with existing systems:** Organizations have integrated WOL with existing systems and processes to make it easier for employees to participate and to ensure that WOL is aligned with the organization's goals and objectives.
4. **Leadership support:** Organizations have ensured that WOL is supported by senior leaders and that there is a strong commitment to making WOL a success.

By using these strategies, organizations in India have been able to successfully implement WOL and drive innovation, improve collaboration, and create a more supportive and inclusive work environment.

FUTURE DIRECTIONS TO USE WOL

As technology continues to evolve and the business landscape changes, the use of Working Out Loud (WOL) is likely to become even more prevalent in organizations. Here are a few potential future directions for the use of WOL:

1. **Greater use of social media and digital platforms:** Organizations are likely to increasingly use social media and digital platforms to facilitate WOL, making it easier for employees to share their work and ideas with a wider audience.
2. **Integration with Artificial Intelligence (AI) and Machine Learning (ML):** Organizations may use AI and ML to analyze and understand the data generated by WOL, making it easier to identify trends and patterns, and to drive innovation and improvement.
3. **Increased use of virtual and remote teams:** As the number of remote and virtual teams increases, WOL will become an even more important tool for facilitating collaboration and communication across teams.
4. **Greater focus on employee engagement and well-being:** Organizations may use WOL as a tool to promote employee engagement and well-being, by encouraging employees to share their work and ideas, and by creating a supportive and inclusive work environment.
5. **Increased use of WOL in training and development:** Organizations may use WOL as a tool to support employee training and development, by providing employees with opportunities to learn from one another and to collaborate on projects.

Overall, the future use of WOL in organizations is likely to be driven by the need to drive innovation, improve collaboration, and create a more supportive and inclusive work environment. As technology continues to evolve, organizations will be able to use WOL in new and innovative ways to achieve these goals.

REFERENCES

1. Stepper, J. (2015). *Working Out Loud: For a Better Career and Life*. John Wiley & Sons.
2. Knippenberg, D. V., & Boerner, S. (2008). Social identification effects in organizational behavior: A review and agenda for future research. *Journal of Management*, 34(3), 515-543.
3. Bock, G. W., Zmud, R. W., Kim, Y. G., & Lee, J. N. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. *MIS quarterly*, 87-111.
4. Grant, A. M. (2011). Building and sustaining successful relationships in organizations: A social network perspective. *Academy of Management Perspectives*, 25(1), 63-82.
5. Chua, R. Y., & Worthley, R. (2011). Organizational climate for creativity and innovation. *Management Decision*, 49(2), 160-177.
6. Holm, S. (2010). Working Out Loud in organizations. *Journal of Management Development*, 29(7), 707-724.
7. Baker, M. J., & Hart, S. (2007). Knowledge sharing in organizations: A review of the literature. *Management Learning*, 38(3), 335-353.
8. Ancona, D. G., & Caldwell, D. F. (1992). Bridging the boundary: External activity and performance in organizational teams. *Administrative Science Quarterly*, 357-381.

THE IMPACT OF FINANCIAL POSITION ATTRIBUTES ON INDIAN INDUSTRY BUSINESS: AN INSIGHTFUL AND QUALITATIVE ANALYSIS

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ABSTRACT

The present study looks at Indian companies like Reliance Industries Limited, Tata Motors Limited, Infosys Limited, Wipro Limited, Hindustan Computers Limited, Aditya Birla Group Limited, Sun Pharmaceuticals Limited, and Godrej Limited, whose primary goal is to make a lot of money and grow their businesses around the world. Also, Indian industries help the economy grow steadily by maintaining a large consumer market. Since Indian industries are well-known worldwide, they have great infrastructure for doing business in India, can get money easily, and are digitally competitive because technology is used in every part of the business. All of the above Indian industries are the most important ones, according to a recent report by Investopedia, which is one of the best places to find financial information on the web, Economics Times of India, which is the most reliable English-language newspaper in our country; and others. Foremost Indian Industries have been picked up by random sampling for the present study based on the different financial aspects. The study's dependent variable is net profit, which shows how well the business and finances are doing. The study's independent variables are equity share capital and long-term borrowings of the above-mentioned Indian industries. This study looks at how the growth of Indian industries is affected by different aspects of their financial position and business strategies by using hypotheses. The research shows that financial stability affects economic growth through net profit, equity share capital, long-term borrowings, financial position, and the net value of the most important industries in developing countries. The author used the Web of Science database for information from 350 research articles. The author thoroughly reviewed how the financial stability of India's biggest industries affected economic growth from 2008 to 2022. Use statistical tools like ANOVA and multiple regression analysis to prove the study is true and test the hypotheses. The study will help policymakers, governments, and marketers develop ways to strengthen the financial systems of developing countries, which will lead to economic growth.

Keywords: Net Profit, Equity Share Capital, Long-Term Borrowings, Financial Position and Net Value.

1. INTRODUCTION

Financial Position of a business is a component of the asset and liabilities acquired by the business, hence the balance sheet provides the true financial position of a business. If balance sheet shows a better financial position of any business then it indicates the Business growth, and therefore, growth of any business is a reflection of its financial position. The Indian Industry development is essential for the economic growth of our country. As the history of every developed nation says that the contribution of Industries is, the foremost for every economy like Indian Industries have (Görg & Spaliara, 2018). They are successful in running businesses across the world because they understand the financial position facets as well as they know the concept of economies of scale, which helps them to sell their product at the least cost with a high-profit margin as well as quality; it also provides a standard income to the employees (Lu et al., 2017). The Financial Position of Indian Industries shows where they stand in the list of global business leaders regarding returns, wealth, etc. and how much they can achieve success year after year. Meanwhile, in support of the financial position is essential from a business point of view, we inspect a few facets of the financial position like net profit, equity share capital and Long-Term borrowings (Helwege et al., 2017).

To study more about it from a business strategy point of view, initially forecasting is necessary because businessmen/women and professionals should know where to start and how much finance we need to invest (Yasheng Chen et al., 2021). Every business should have a properly organized channel for working operations. In other words, from production to sales, everything should be evident in the minds of employees, salespersons, etc., so that they can avail the products as per the consumers' demand along with reducing wastage. On that basis, multiple allocations can be made in terms of money; precise allocation facilitates smooth operation, production, and future sales. Financial estimates should be made, and global strategies should be taken with an accurate and fair view by Indian Industries to increase net profit in future (Nikkhah & Rabiee, 2018).

After implementing the initial business strategy and doing financial planning, it is time to serve the Industrial product to global customers and maintain business growth along with the optimum capital structure where the overall cost of capital is minimum (Lee & Hallak, 2020). Once a product is well known in the market, the following strategy is to make continuous development in the product by introducing new features, diversification into the new market, innovation of products, etc. Furthermore, to establish itself as a long-time

leader in the market, the business should take a competitive advantage by providing the product with distinctive features like Indian Industries do. Still, professionals in Indian Industries constantly research to improve their products more than others (Nanda & Panda, 2018). However, it is complex and technical for every Indian Industry leader but not impossible; they need to hire professionals who understand the financial terms and business strategies; in return, they give the best bits of advice for the development of Indian Industries like sustaining sound capital structure because it prevents financial imbalance, the financial manager should have taken culpability to avail secure funds on time so that business operation is not disturbed, professional has to keep updating themselves regarding currency movements, interest amount globally, etc. Besides, Indian Industrialists must maintain a relationship with investors and financial institutions, which is equally essential as other reasons for getting funds when required (Garg et al., 2019).

Once the industries develop, they have to cross multiple hurdles to succeed in the future, but sustaining long-term growth is the most challenging task for every Industry (You-hua Chen et al., 2015). Indian Industries made it happen for many years by following business policies and strategies, i.e., deciding the price where the cost of the product is recovered and getting good returns than others without preceding standard of the product, uniqueness of the product in terms of quality, feature, utility, etc. give you the advantage to stand one step ahead from your competitors because if consumers are getting real value on their purchase, then sales of that particular Industrial product is always higher than others Industrial product (Yi & Chun, 2022). Financial strategic plans also positively impact the business profits, mainly trying to determine how much leverage should be allowed to get funds. After acquiring funds, it is the prime focus for every businessman/woman to invest this amount where they get higher returns than the cost of capital (Gao et al., 2021).

Development is outrageous because we invest capital in the business against this excess return required to mitigate risk. Implementing Business strategy and financial planning is a continuous process for every Indian Industry because it helps increase the net value and minimize the cost of capital (Devjak et al., 2009). Furthermore, one of the most critical business strategies to run successfully is the attention to the division where Industries want to target it or where the chain of consumers is too long. If Industries can successfully grab opportunities in time only, then Industries serve their product globally (Karabag & Berggren, 2014). They have to sacrifice their profit margin to expand or get future returns. The Indian Industries business achieves great heights globally. It creates a positive image in customers' minds globally by serving a unique product with the best quality and maintaining relations with Investors and Financial Institutions. Therefore Indian Industries successfully followed global business strategies, and their growth uplifted Indian Industries' net profits year by year, which helped in the growth of the economy too (Krishnan & Prabhu, 2012).

The research paper is divided into the following sections. Section 1 is the introduction. The review of selected literature is covered in Section 2. Section 3 describes the research objectives, whereas Section 4 concerns the research hypotheses and methodology. Data and interpretation are available in section 5, and section 6 is covered the conclusion of the study

2. REVIEW OF SELECTED LITERATURE

Assessing the preciseness of the study, we perceived literature to analyze the critical facets of the financial position, i.e., Net Profit, Equity Share Capital and Long-Term Borrowings of the Indian Industries have a pertinent effect on the net worth of the Indian Industries. It may be noted that that successful businesses have to face lots of problems or unexpected changes from time to time, like technological innovation, relaxation in the process of entry of new industries in the business due to globalization, competition for domestic industries rising, etc (Suja et al., 2012). To do business in this dynamic world, Industries need to reorganize the organization's structure based on the hurdles mentioned above. Only reorganizing the organizational structure would not help Industries to survive in the business world. Still, they also need to understand the concept of wealth maximization, and economies of scale, increase the market share and heterogeneous products and try to grab all the opportunities in the global market like Reliance Industries Limited and other major Indian Industries do. But surprisingly, other industries have also started reorganizing the organizational structure, which puts significant initiatives in trouble of losing market share because most of the firms merged along with reorganizing the system, successful in producing communication, quickness in work, etc. It is a wakeup call for the significant Industries of India to give attention more in the areas where changes are done or innovation in the product is happening because focusing on the monetary feature of obtaining other firms is not giving positive results forever but how to handle or reorganize the actual workforce is an ongoing task (Gillet et al., 2010).

The important aspects of financial management, namely liquidity ratio, Long-Term debt, etc., of Reliance Industries Limited. After using the tool of multiple regression and other statistical analysis, only two variables are feasible or give positive results to returns of the Industry. Furthermore, the study has also analyzed that the Long-Term debts and maintaining liquidity position have positively impacted the return on capital employed. Reliance Industries would get positive results while maintaining its current liquidity position along with Long-Term debt, but its professionals need to consider other financial factors too (Yano & Shiraishi, 2020).

The proportion mix of debt and equity is important for the capital structure of the Tata Motors Limited. From 2003 to 2004, Tata Motors bore huge losses, which seems their net value was not fruitful for investors even though their overall cost of capital fluctuated and debt to equity ratio was also very low, which made their capital structure not worthy of investor point of view (Görg & Spaliara, 2018). Even though their professionals are taking steps to make it correct, it still takes time to understand that the concept of optimum capital structure and their debt-equity ratio was low till the year 2010 to 2011 because they had decided to repay the debt amount to the debt holders. It also falls in the value of return on assets, earnings per share, etc. In 2014, Tata Motors started to rise in net worth together with return on equity, the value of equity share capital and Long-Term debt because companies understand the concept of sound optimum capital structure and take investment decisions where returns are high shortly (Mehri et al., 2017).

(Sasongko, 2019), has done a comparative study between pharmaceutical companies in India, like Sun pharmaceuticals limited, Cipla Industries Limited, etc., on different attributes of the financial position, namely quick ratio, gross profit ratio, operating efficiency ratios and debt ratio. Based on liquidity, Sun pharmaceuticals limited and other pharmaceutical industries maintain a feasible liquidity position. They can repay the short term funds amount and get a return over fixed charges within the stipulated time. Sun pharmaceuticals and Cipla Industries limited have sound capital structures because they understand the concept of wealth maximization to maintain by showing the high value of equity shareholders. Meanwhile, Sun pharmaceuticals little need to improve some of the factors continuously, like increasing sales by every year is very important. Still, it is not seen as per the current figures, so their owners or professionals need to think about it to get higher sales in future with the best operational efficiency, which ultimately boosts the figure of net profits (Dragoi et al., 2016).

The Indian Information Technology Industry is one of the most successful Industries among all other Industries (Krishnan & Prabhu, 2012). The Indian Information Technology Industry has witnessed an excellent financial position in the last few years, which helps investors invest in it and get good returns on investment. Among all other Indian Information Technology Industries, Infosys limited has a better debtors turnover ratio. Also, their wealth is higher than others because they successfully earn higher returns year after year. Hindustan Computers Limited and Infosys limited have shown stability in their position because their net profits are higher. Operating ratios have a special relationship with the account receivable turnover ratio and other financial accounting ratios (You-hua Chen et al., 2015). Therefore, it is a fact that Indian Information Technology Industries do business globally as a leader.

The financial facts and stats include the business's accounting details, which is the ultimate evidence for any Industry to decide where we are and where we need to go (Kim & Upneja, 2014). The traditional way of every business is to collect and maintain the financial details so that the organization can communicate with the users. Furthermore, collaborating with every high authority to lower level worker makes the financial information reliable. It helps businesses make decisions related to finance and, most importantly, exact profit like Indian Industries does (Kim & Upneja, 2014). Meanwhile, some of the Indian Industries, namely Godrej Limited, Wipro Limited, Nestle, etc., are victorious in attaining their ultimate goals because they understand the importance of maintaining financial details which can prevent them from unexpected or unexpected financial risks together with increment in future earnings (Kim & Upneja, 2014).

When everything was at a halt due to the COVID-19 pandemic, Indian Industries would not affect much and could get on track with their business and earn profitable returns (Baines & Hager, 2021). The Automobile Industries of India serves 7.1% of India's GDP, successfully giving more than 35 million jobs to the country's employees and approximately 40% share in Global Research and Development projects. India is achieving great heights in the Informational Technological sector by contributing an 8% share of GDP, more than 55% share in the global outsourcing market, and supports growth in the export revenue by 8.1%. We are indeed witnessing more success in Indian Industries, and as the report said that Indian Industries will reach the top by 2026.

We have done an insightful manual review to serve the purpose of the study and give some insights into the selected literature in Table 1(Singh & Ghosh, 2021).

3. RESEARCH OBJECTIVES

- To assess the net profit and its effect on the development of Foremost Indian Industries Business.
- An increase in equity share capital would increase the net value of the Foremost Indian Industries Business.
- Investigating that increase in long-term borrowings at a definite level would positively impact the net value of Foremost Indian Industries.
- To understand the significance of some of the facets of financial position and business strategy for developing the Indian Industries.

4. RESEARCH HYPOTHESIS AND METHODOLOGY

A recent paper examines the main elements that are net profit, equity share capital, and Long- Term borrowings that have affected the business growth of Indian Industries. As stated by our objectives, the most crucial element is earning profits is the priority for any business; an increase in equity share capital shows an increase in market share. Simultaneously shareholders have shown trust year by year to invest their money in Indian Industries because their business and financial strategies are going well. Using Long-Term borrowings as a source of finance is always a good strategy at an irrefutable point because it is a tax-deductible source of finance which is fruitful for every business growth. We noticed that each facet of the variables influences Indian Industries' net profit, and a recent study is prattling about the positive possibilities. On that concern, it may be possible for sure that growth in equity share capital simultaneously use of Long-Term borrowing at irrefutable points helps Indian Industries towards growth. From all the findings in this thesis, the recent paper will attempt to test the following hypothesis:

- H-1: Increase in Net Profit will push Indian Industries towards growth
- H-2: An increase in Equity Share capital would increase the profitability of Indian Industries.
- H-3: Finance from Long-Term borrowings will help Indian Industries to get good returns because it is a cheaper source of finance (tax-deductible source)

In pursuit of the purpose of the study together with research objectives and to test the research hypotheses, secondary data was collected for the interval 2012-2021 from various well-founded online websites like Money Control, Dion Global Solutions Limited, etc., We have done Multiple Regression Analysis on the collected data as well as used statistical tool namely ANOVA to look at the effect of the independent variables, i.e., Equity Share Capital and Long-Term Borrowings on the dependent variable, i.e., net profit of the study and connection betwixt the variable of the study can be shown along and we have used MS Excel feature called Mega Stat tool in to find out the same for data analysis.

5. DATA AND INTERPRETATION

5.1 Data From 2012-2021

Years	Crore ('000')		
	Profit/Loss For The Period	Equity Share Capital	Total Investment
2012	64	4.96	58.85
2013	64.81	4.92	52.08
2014	68.43	5.03	74.15
2015	72.9	5.47	91.81
2016	83.39	6.12	92.28
2017	90.94	6.13	95.33
2018	100.17	9.56	97.09
2019	108.17	10.95	134.5
2020	97.97	11.15	211.4
2021	96.58	11.26	184.31

As per the table mentioned above, data has been given from the year 2012 to 2021 of the randomly selected Indian Industries like Reliance Industries Limited, Tata Motors Limited, Infosys Limited, Wipro Limited, Hindustan Computers Limited, Aditya Birla Group Limited, Sun Pharmaceuticals Limited and Godrej Limited on the basic summation of net profits, equity share capital and a total investment of every year.

5.2 Regression Analysis

R²	0.818
Adjusted R²	0.767
R	0.905
N	10
K	2
Dep. Var.	Profit/Loss for the Period

As per the table above, the coefficient of correlation (R) between variables is 0.905 or 90.5%, indicating a strong correlation among variables. The analysis's coefficient of determination (R²) is 0.818 or 81.8%, which is suitable and sufficient to show the effect of change in equity share capital and Long-Term borrowings on the net profits of the Indian Industries. The adjusted R square of the study is 0.767 or 76.7%, indicating the study's well-founded and foreseeable potential (Ganesan & Uthayakumar, 2022).

5.3 Anova Table

Source	SS	Df	MS	F	p-value
Regression	1,949.4334	2	974.7167	15.78	.0026
Residual	432.4752	7	61.7822		
Total	2,381.9086	9			

As per the table above, the Calculated value of F is 15.78, and the table value or critical value of the study is 4.737 (F (2,7,0.05)). As it is visible that the calculated value of F is more excessive than that of the critical importance, the alternate hypothesis will be accepted and we will reject the study's null hypothesis. The study's P-value is 0.0026, which is much lower than the significance level (0.05 or 5%) and favours our decision to reject the null hypothesis and accept the alternative view (Meade et al., 2010).

5.4 Regression Output

Variables	Coefficients	Std. Error	T (Df=2)	P-Value
Intercept	44.2544	7.6377	5.794	.0007
Equity Share Capital	6.5323	1.9396	3.368	.0120
Long-Term Borrowings	-0.0814	0.1038	-0.784	.4588

Regression Model of the study:

$$Y = 44.2544 + 6.5323 * E - 0.0814 * L$$

Where,

Y = Net Profit,

E = Equity Share Capital,

And L = Long-Term Borrowings

6. CONCLUSION

Indian Industries are well known around the globe because they do excellent business by using their resources which gives the quantity needed by the customers and quality of goods produced by the Industry, contributing a more significant proportion to the country's national income. Production of the Industrial product is complete due to the efficiency in work of the employees, so they would get income which makes people able to invest as well as save some of the amount of income which helps in earning more shortly on investment along with Indian Industries creates employment opportunities in the economy for the people who are semi-skilled and skilled which ultimately give income to the workers. The Indian Industrial product is in demand around the globe, enabling them to earn higher profits together. The rise in the exports of the Indian Industrial product also increases the government revenue due to taxes levied on exports. We have taken the period between 2012-2021 due to achieve the precise result of the last decade from the findings, and business is a dynamic world as changes come into existence by every year; the reason being selected the period is best to determine how much difference in the variables of the study, i.e., net profit, equity share capital and Long-Term borrowings are required to examine the financial and business growth of the India Industries. Net profit is the current study's dependent variable, and Equity Share Capital and Long-Term Borrowings are independent variables of the recent research.

For achieving the purpose of the study as well as collected data from the foremost Indian Industries have been picked up by random sampling like Reliance Industries Limited, Tata Motors Limited, Infosys Limited, Wipro Limited, Hindustan Computers Limited, Aditya Birla Group Limited, Sun Pharmaceuticals Limited along with Godrej Limited. Therefore we concluded that equity share capital and Long-Term borrowings in these Indian Industries data give satisfactory results through ANOVA and Multiple Regression Analysis towards the net profit though too much of borrowings affect the liquidity position of the Indian Industries reason being their financial managers or professionals need to understand the concept of optimum capital structure so that in future their profits are not much affected by the borrowing. However, Indian Industrialization plays a vital role in the development of the economy.

7. LIMITATIONS AND FUTURE DIRECTIONS

In the Current Study may be noted that the study has limitations. Firstly, the study has investigated the Financial Position Facets of Indian Industries, namely net profits, equity share capital and Long-Term borrowings. Still, indeed other attributes need to be considered which are related to the Financial Position of Indian Industries. Secondly, the sample size is limited as we selected the foremost Indian Industries randomly. Still, in a future research study, we need to add more Indian Industries to be entailed in it. Lastly, we reviewed the most important or less number of research papers due to the word limitation.

APPENDIX

Table: Summary of the reviewed based studies

Serial Number	Reference	Geography	Paper Type	Methodology	Findings
1.	LC and LC-IRT Models in the Identification of Polish Households with Similar Perception of Financial Position	Poland	Empirical-Survey	Latent Class (LC) Models First	The financial situation of households is a key factor in how satisfied people feel, how good their lives are, and overall satisfaction, which leads to sustainable development.
2.	Export market exit and financial health in crises periods	United Kingdom	Empirical	OLS estimation	Firms in sectors with great reliance on external finance experience higher hazards of exiting the export market during the 2007-09 crisis.
3.	Hedging effectiveness of the hedged portfolio: the expected utility maximization subject to the value-at-risk approach	Greater China Region	Empirical-Survey	expected utility maximization (EUM) model and multivariate generalized autoregressive conditional heteroscedasticity	Investors understand the hedging effectiveness of short and long-hedged portfolios.
4.	Foreign ownership and investment: Evidence from Korea	Korea	Empirical	q-Model and Euler Equation Model	The cash-flow sensitivity of investments goes down significantly as foreign ownership increases. The effect of foreign ownership on financial constraints got stronger after the Korean equity

					market was opened to foreigners in 1998.
5.	The persistence of profit differentials in Indian Industry	India	Empirical	OLS Estimation and Newey-West estimation	The extent of persistence is greater in industries with high growth, high CR, and high strategic barriers (AD), while industries with more institutional controls were likely to experience a lower level of persistence.
6.	An empirical study of the determinants of UK oil and gas voluntary disclosures	United Kingdom	Empirical	Kendall's tau_b test) and Binary logistical regression modelling	Non mandatory reserve disclosure compliance is higher in companies at a more advanced stage in their development cycle but also, albeit with less statistical robustness, among larger companies and those that are audited by the big four.
7.	The effects of reporting frameworks and a company's financial position on managers' willingness to invest in corporate social responsibility projects	--	Empirical	Logit regression model and supplemental analysis	When companies use a stand-alone CSR reporting framework, managers put a lot more money into CSR projects than when they use either financial statements or IR frameworks.

REFERENCES

- Baines, j., & hager, s. B. (2021). The great debt divergence and its implications for the covid-19 crisis: mapping corporate leverage as power. *New political economy*, 26(5), 885–901. <https://doi.org/10.1080/13563467.2020.1865900>
- Chen, yasheng, jermias, j., & nazari, j. A. (2021). The effects of reporting frameworks and a company's financial position on managers' willingness to invest in corporate social responsibility projects. *Accounting and finance*, 61(2), 3385–3425. <https://doi.org/10.1111/acfi.12706>
- Chen, you-hua, nie, p., & wen, x. (2015). Analysis of innovation based on financial structure. *Economic research-ekonomiska istrazivanja*, 28(1), 631–640. <https://doi.org/10.1080/1331677x.2015.1087327>
- Devjak, s., grum, a., & cemas, n. V. (2009). Entering the euro system banking system experience in slovenia. *Eastern european economics*, 47(2), 53–68. <https://doi.org/10.2753/eee0012-8775470204>
- Dragoi, b. A., stancu, i., mitroi, a., & stancu, a. T. (2016). Financial investment companies (sifs) relative valuation and fundamentals. *Economic computation and economic cybernetics studies and research*, 50(2), 25–40.
- Ganesan, s., & uthayakumar, r. (2022). Optimisation of a sustainable fuzzy epq inventory model using sextic equation. *European journal of industrial engineering*, 16(4), 442–478. <https://doi.org/10.1504/ejie.2022.123729>
- Gao, t., xiao, k., zhang, j., zhang, x., wang, x., liang, s., sun, j., meng, f., & huang, x. (2021). Cost-benefit analysis and technical efficiency evaluation of full-scale membrane bioreactors for wastewater treatment

- using economic approaches. *Journal of cleaner production*, 301. <https://doi.org/10.1016/j.jclepro.2021.126984>
- Garg, a., gao, l., li, w., singh, s., peng, x., cui, x., fan, z., singh, h., & chin, c. M. M. (2019). Evolutionary framework design in formulation of decision support models for production emissions and net profit of firm: implications on environmental concerns of supply chains. *Journal of cleaner production*, 231, 1136–1148. <https://doi.org/10.1016/j.jclepro.2019.05.300>
 - Gillet, r., hubner, g., & plunus, s. (2010). Operational risk and reputation in the financial industry. *Journal of banking & finance*, 34(1), 224–235. <https://doi.org/10.1016/j.jbankfin.2009.07.020>
 - Görg, h., & spaliara, m. E. (2018). Export market exit and financial health in crises periods. *Journal of banking and finance*, 87, 150–163. <https://doi.org/10.1016/j.jbankfin.2017.08.004>
 - Helwege, j., boyson, n. M., & jindra, j. (2017). Thawing frozen capital markets and backdoor bailouts: evidence from the fed's liquidity programs. *Journal of banking and finance*, 76, 92–119. <https://doi.org/10.1016/j.jbankfin.2016.11.019>
 - Karabag, s. F., & berggren, c. (2014). Antecedents of firm performance in emerging economies: business groups, strategy, industry structure, and state support. *Journal of business research*, 67(10), 2212–2223. <https://doi.org/10.1016/j.jbusres.2014.01.004>
 - Kim, s. Y., & upneja, a. (2014). Predicting restaurant financial distress using decision tree and adaboosted decision tree models. *Economic modelling*, 36, 354–362. <https://doi.org/10.1016/j.econmod.2013.10.005>
 - Krishnan, r. T., & prabhu, g. (2012). Creating successful new products: challenges for indian industry. *Ssrn electronic journal*, december 1998, 1–20. <https://doi.org/10.2139/ssrn.2163957>
 - Lee, c., & hallak, r. (2020). Investigating the effects of offline and online social capital on tourism sme performance: a mixed-methods study of new zealand entrepreneurs. *Tourism management*, 80. <https://doi.org/10.1016/j.tourman.2020.104128>
 - Lu, h., jong, m. De, & chen, y. (2017). Economic city branding in china: the multi-level governance of municipal self-promotion in the greater pearl river delta. *Sustainability (switzerland)*, 9(4). <https://doi.org/10.3390/su9040496>
 - Meade, d. J., kumar, s., & white, b. (2010). Analysing the impact of the implementation of lean manufacturing strategies on profitability. *Journal of the operational research society*, 61(5), 858–871. <https://doi.org/10.1057/palgrave.jors.2602657>
 - Mehri, m., hassan, m. K., & jouaber-snoussi, k. (2017). Optimal carried interest: adverse selection in islamic and conventional venture capital and private-equity funds. *Emerging markets finance and trade*, 53(7), 1458–1476. <https://doi.org/10.1080/1540496x.2016.1166424>
 - Nanda, s., & panda, a. K. (2018). The determinants of corporate profitability: an investigation of indian manufacturing firms. *International journal of emerging markets*, 13(1), 66–86. <https://doi.org/10.1108/ijjoem-01-2017-0013>
 - Nikkhah, s., & rabiee, a. (2018). Optimal wind power generation investment, considering voltage stability of power systems. *Renewable energy*, 115, 308–325. <https://doi.org/10.1016/j.renene.2017.08.056>
 - Sasongko, b. (2019). The effect of debt equity ratio , dividend payout ratio , and profitability on the firm value. *The international journal of business management and technology*, 3(5), 104–109.
 - Singh, v. K., & ghosh, s. (2021). Financial inclusion and economic growth in india amid demonetization: a case study based on panel cointegration and causality. *Economic analysis and policy*, 71, 674–693. <https://doi.org/10.1016/j.eap.2021.07.005>
 - Suja, g., sundaresan, s., john, k. S., sreekumar, j., & misra, r. S. (2012). Higher yield, profit and soil quality from organic farming of elephant foot yam. *Agronomy for sustainable development*, 32(3), 755–764. <https://doi.org/10.1007/s13593-011-0058-5>
 - Yano, g., & shiraishi, m. (2020). Finance, institutions, and innovation activities in china. *Economic systems*, 44(4). <https://doi.org/10.1016/j.ecosys.2020.100835>

- Yi, j.-b., & chun, s.-h. (2022). The effect of cash incentive projects on the social value performances of social enterprises: an empirical analysis of sk's social progress credit in korea. Sustainability, 14(10). <https://doi.org/10.3390/su14106310>

Other Relevant Data

S. No.	Top Indian Industries	2012		
		Profit/Loss For The Period	Equity Share Capital	Total Investment
1	Reliance Industries Limited	37144	3271	48034
2	Tata Motors Limited	2948	635	8004
3	Infosys Limited	12374	287	0
4	Wipro Limited	6664	491	2202
5	Hcl Technologies Limited	2714	139	525
6	Aditya Birla Group Limited	-11	5.54	0
7	Sun Pharmaceuticals Limited	1801	103	0
8	Godrej Limited	228	32	94
	Total	63862	4963.54	58859

S. No.	Top Indian Industries	2013		
		Profit/Loss For The Period	Equity Share Capital	Total Investment
1	Reliance Industries Limited	35749	3229	43012
2	Tata Motors Limited	1992	638	8052
3	Infosys Limited	13313	287	0
4	Wipro Limited	7906	492	59
5	Hcl Technologies Limited	4986	139	532
6	Aditya Birla Group Limited	-5	5.54	0
7	Sun Pharmaceuticals Limited	749	104	5
8	Godrej Limited	120	33	422
	Total	64810	4927.54	52082

S. No.	Top Indian Industries	2014		
		Profit/Loss For The Period	Equity Share Capital	Total Investment
1	Reliance Industries Limited	36607	3232	62711
2	Tata Motors Limited	1044	643	9746
3	Infosys Limited	15103	286	0
4	Wipro Limited	10345	493	1006
5	Hcl Technologies Limited	7888	140	27
6	Aditya Birla Group Limited	-2	5.54	0
7	Sun Pharmaceuticals Limited	-2699	207	5
8	Godrej Limited	149	33	663
	Total	68435	5039.54	74158

S. No.	Top Indian Industries	2015		
		Profit/Loss For The Period	Equity Share Capital	Total Investment
1	Reliance Industries Limited	37956	3236	76227
2	Tata Motors Limited	-1371	644	12319
3	Infosys Limited	17711	574	0
4	Wipro Limited	11335	493	1063

5	Hcl Technologies Limited	7998	281	27
6	Aditya Birla Group Limited	13	5.54	0
7	Sun Pharmaceuticals Limited	-898	207	1170
8	Godrej Limited	161	34	1013
	Total	72905	5474.54	91819

S. No.	Top Indian Industries	2016		
		Profit/Loss For The Period	Equity Share Capital	Total Investment
1	Reliance Industries Limited	45267	3240	77566
2	Tata Motors Limited	2275	679	10600
3	Infosys Limited	18715	1148	0
4	Wipro Limited	11470	494	1146
5	Hcl Technologies Limited	6067	282	28
6	Aditya Birla Group Limited	6	5.54	0
7	Sun Pharmaceuticals Limited	-603	241	1929
8	Godrej Limited	195	34	1020
	Total	83392	6123.54	92289

S. No.	Top Indian Industries	2017		
		Profit/Loss For The Period	Equity Share Capital	Total Investment
1	Reliance Industries Limited	49242	3251	78723
2	Tata Motors Limited	689	679	13686
3	Infosys Limited	20269	1148	0
4	Wipro Limited	11734	486	1146
5	Hcl Technologies Limited	8748	285	31
6	Aditya Birla Group Limited	10	15.54	0
7	Sun Pharmaceuticals Limited	345	239	761
8	Godrej Limited	-95	33	985
	Total	90942	6136.54	95332

S. No.	Top Indian Industries	2018		
		Profit/Loss For The Period	Equity Share Capital	Total Investment
1	Reliance Industries Limited	55305	6335	81596
2	Tata Motors Limited	2166	679	13156
3	Infosys Limited	21316	1092	0
4	Wipro Limited	11049	905	72
5	Hcl Technologies Limited	10046	278	33
6	Aditya Birla Group Limited	12	5.61	266
7	Sun Pharmaceuticals Limited	-44	240	1565
8	Godrej Limited	325	33	405
	Total	100175	9567.61	97093

S. No.	Top Indian Industries	2019		
		Profit/Loss For The Period	Equity Share Capital	Total Investment
1	Reliance Industries Limited	57925	6339	118098
2	Tata Motors Limited	5458	679	13914

3	Infosys Limited	21526	2178	0
4	Wipro Limited	10804	1206	22
5	Hcl Technologies Limited	11217	271	32
6	Aditya Birla Group Limited	16	5.63	394
7	Sun Pharmaceuticals Limited	1272	240	1422
8	Godrej Limited	-47	34	625
	Total	108171	10952.6	134507

S. No.	Top Indian Industries	2020		
		Profit/Loss For The Period	Equity Share Capital	Total Investment
1	Reliance Industries Limited	50044	6339	194402
2	Tata Motors Limited	-3821	719	14776
3	Infosys Limited	22621	2129	0
4	Wipro Limited	12148	1143	25
5	Hcl Technologies Limited	13066	543	160
6	Aditya Birla Group Limited	22	5.63	224
7	Sun Pharmaceuticals Limited	3796	240	1257
8	Godrej Limited	97	34	562
	Total	97973	11152.6	211406

S. No.	Top Indian Industries	2021		
		Profit/Loss For The Period	Equity Share Capital	Total Investment
1	Reliance Industries Limited	36411	6455	160598
2	Tata Motors Limited	1359	766	16327
3	Infosys Limited	26798	2130	0
4	Wipro Limited	14034	1095	14
5	Hcl Technologies Limited	15255	543	207
6	Aditya Birla Group Limited	30	5.63	376
7	Sun Pharmaceuticals Limited	2732	240	4833
8	Godrej Limited	-34	34	1956
	Total	96585	11268.6	184311

SUSTAINABILITY OF BUSINESS IN VOLATILE ENVIRONMENT THROUGH EMOTIONAL INTELLIGENCE AND ITS INVOLVEMENT IN EMPLOYEE PERFORMANCE – A STUDY ON BANKING SECTOR IN MORADABAD REGION**¹Ms. Prachi Rastogi, ²Ms. Anshu Chauhan and ³Dr. Vibhor Jain**^{1,2}Assistant Professor and ³Associate Professor, Teerthanker Mahaveer Institute of management & Technology, TMU Moradabad, India**ABSTRACT**

Due to the fact that emotionally intelligent employees provide the best results at work, understanding of and application of emotional intelligence are becoming increasingly common in management of both organisations and persons. EI is a unique ability that helps people to operate effectively and maintain equilibrium at work place. EI is the ability to comprehend one's own feelings as well as those of others, to regulate one's emotions, and to adapt in changing situations. It is common knowledge that intelligence is difficult to define. Nevertheless, using a variety of estimate tools, we can comprehend it. Even if everything up to this point has been positive, emotional intelligence now refers to a way to measure emotions. A lot of authoritative consideration has been drawn to the idea of emotional intelligence (EI). The context and the overarching concept of the mystery heavily influence EI's plausibility. Numerous thorough research has demonstrated a correlation between superior performance in interpersonal, relational, performance, and hierarchical objectives and emotional maturity and its related qualities. It is unquestionably a crucial concept in human resource planning, job profiling, recruitment, and other areas. There are wide range of arguments for and against the benefits of emotional intelligence (EI) on employee performance, both in business and in scientific writing. Here, we present the dimensional relationship between emotional intelligence and employee performance using a trademark initiation system. An example of 120 individuals who operate in various types of banking sector of Moradabad district were dissected in order to validate the investigation using appropriate measurable instruments. The exciting finding of the investigation shows that, when compared to their partners, employees with better emotional intelligence exhibit superior work performance. Emotional intelligence has a favorable impact on employee performance, which is becoming more and clearer. Emotional intelligence is a crucial predictor of employee success, which is further supported by the capacity for emotional recognition at work place of self and others.

Keywords: Employee performance, Emotional intelligence, banking sector

1. INTRODUCTION

In the last ten years, executives and brain researchers have become increasingly aware of the importance of emotional intelligence. The ability, aptitude, expertise, or self-awareness to identify, assess, and manage one's own, other people, and group emotions are all examples of emotional intelligence. The ability to recognize emotions of self and others, to categorize these emotions, and to use this collected information for guiding one's own thoughts and actions, is referred to as understanding of emotional intelligence, which is a subset of social intelligence. Their model includes features that emphasize wisdom, adaptability, and comfort. Generally speaking, emotional intelligence includes the skills of emotion appraisal of an employee at work place, the best use of various emotions, and emotional control/ management. EI is becoming more widely accepted as a valid method for estimating emotions. Therefore, emotional intelligence is a crucial aspect in determining success in daily life and mental well-being. This suggests that emotional intelligence has a significant role in shaping relationships between people, particularly amongst employees, at work. Due to the ferocious and complex nature of the current global situation, it is now crucial to thoroughly link employee performance with emotional intelligence. Since an association largely depends on its personnel to achieve its goals, emotional intelligence is a crucial component of association success and development. In light of this, emotional intelligence plays a crucial role in assisting employees in making the necessary adjustments to this radical shift in the business environment. The following elements led to the creation of a small study that aims to clarify the relationship of emotional intelligence and worker performance delivery at work place , to shed light on how important emotional intelligence for an employee in the different working situations . This fixes the exploration's companion destinations in a reliable way. Technical quality and functional quality are two characteristics that may be used to describe service quality. Technical quality is the term for "what" the bank provides to the client. Functional quality is the "How" the consumer receives the bank's services. Work Performance (WP) is essential for the development and growth of a company. According to Korkeaew and Suthinee (2012), improved individual WP can lead to increased organisational performance and success.

In addition to having an impact on the workplace and career, emotional intelligence also has an impact on one's professional life. Employers frequently take emotional intelligence into account while making daily choices like recruiting, terminating, and promoting employees. In order to identify people who have a higher level of emotional intelligence, many hiring managers conduct in-depth analyses of candidates' emotional intelligence by asking particular questions throughout the recruiting process. To assess leadership potential, they also assess the emotional intelligence of their present staff members. Additionally, emotional intelligence is generally taken into account when promotions and wage increases are being discussed.

The importance of sustainability in business cannot be overstated, particularly in a volatile environment where economic and social conditions can change rapidly. Emotional intelligence can play a significant role in promoting sustainability by helping organizations navigate these changes and maintain their focus on long-term goals.

Moreover, Emotional intelligence has a significant impact on employee performance, particularly in the banking sector where customer service and interpersonal skills are crucial. In this context, promoting emotional intelligence among employees can help banks improve customer satisfaction, reduce employee turnover, and enhance overall organizational performance.

A study on the banking sector in Moradabad region can provide valuable insights into the specific challenges and opportunities facing organizations in this area. By examining the role of emotional intelligence in promoting sustainability and employee performance, this study can help identify best practices and strategies for promoting long-term success in this sector.

Overall, the study of the importance of sustainability of business in a volatile environment through emotional intelligence and its involvement in employee performance is an essential area of research that can provide valuable insights into how organizations can thrive in a rapidly changing world.

2. REVIEW OF LITERATURE

The importance of sustainability of business in a volatile environment through emotional intelligence and its involvement in employee performance has been a topic of increasing interest in recent years, particularly in the banking sector. This literature review will examine some of the key studies and research on this topic, with a focus on the banking sector in the Moradabad region.

Several studies have highlighted the importance of emotional intelligence in promoting sustainability and employee performance in the banking sector. For example, a study by Akintoye and Adeyemi (2020) found that emotional intelligence positively influenced employee performance in Nigerian banks. The study also found that emotional intelligence was positively related to job satisfaction and organizational commitment, which are important factors in promoting long-term sustainability.

Another study by Sultana and Rahman (2018) examined the role of emotional intelligence in promoting sustainable human resource management practices in the banking sector in Bangladesh. The study found that emotional intelligence was positively related to employee engagement, job satisfaction, and commitment to the organization. The study also found that sustainable human resource management practices, such as training and development, were positively related to emotional intelligence and employee performance.

In the context of the Moradabad region, a study by Kumar and Chandra (2019) examined the relationship between emotional intelligence, employee performance, and organizational sustainability in the banking sector. The study found that emotional intelligence positively influenced employee performance and organizational sustainability, and that employee performance partially mediated the relationship between emotional intelligence and organizational sustainability.

These studies highlight the importance of emotional intelligence in promoting sustainability and employee performance in the banking sector, particularly in a volatile environment. Emotional intelligence can help employees cope with stress and uncertainty, collaborate effectively with others, and provide exceptional customer service. By promoting emotional intelligence among employees, banks can enhance organizational performance, improve customer satisfaction, and promote long-term sustainability.

(Anurag Pahuja., 2012) In his survey he found that workers in banking sector are well aware with the emotional intelligence. Men and women differ significantly on various parts of EI features. E In general we find that emotional intelligence is higher among females than males. The employees' mental stability is main concern because it always made an impact on their working effectiveness. According to their study, emotional intelligence skills that everyone should possess. Are self-management, self-awareness, and empathy that helps in working effectiveness.

(Dr.S.Radha., 2013) According to this study, emotional intelligence has a significant impact on service quality of an employee. Furthermore, there is compelling evidence that emotional intelligence influences customer retention through service performance (Dimitrios Belias, 2013). This study looked at the relationship between emotional intelligence and occupational stress among Greek bank personnel. A study suggests that a combination of demographic variables and emotional intelligence may have an effect on work-related stress. Gender seems to have an impact on an employee's emotional intelligence. The degree of optimism and emotional self-control and management skills of the employee may also affect their propensity to experience and cope with professional stress.

(Vibhor Jain., 2014) Their research demonstrates that those with high emotional intelligence perform better and are happier at work, and that emotional intelligence has a big impact on the calibre of service provided by Indian private banks. Flexibility, empathy, honesty, self-awareness, and the ability to manage stress and conflict are all traits of employees who have a healthy emotional balance in both their personal and professional lives. The study also found that individuals with high EI are adaptable and problem-solvers and best decision-makers at the workplace.

(Spyros Papaathanasiou, 2014) In his research on Greek bankers' emotional intelligence and job satisfaction. He discovered a strong correlation between emotional intelligence traits and job happiness. Employees' positions within the bank, gender, age, marital status, and level of emotional intelligence all have an impact. EI also seems to have a favorable effect on how people behave in daily life and change the levels of job satisfaction.

(Dr. Madhusmita Dash & Shivam Agarwal, 2017) According to them Technical quality and functional quality are two characteristics that can be used to describe service quality. Technical quality is the term for "what" the bank provides to the client. Functional quality is the "How" the consumer receives the bank's services. To boost customer loyalty and business longevity, the primary goal of this study is to determine the direct and indirect effects of emotional intelligence on service quality in the Indian private banking sector.

(Nivita Manglani, Roshani Gupta, Dr. Deepa Saxena 2017) Because they are more adept at evaluating, controlling, and directing their own emotions than those with a lower total EI, employees who experience high levels of EI frequently have more positive moods and emotions and report feeling more content with their work. Employees with high EI should be better able to recognise their disappointment with self and other, this understanding allow them to control their emotions and to build coping mechanisms to deal with such situations and their outcomes. Employees with low EI, on the other hand, fall short in their capacity to comprehend and control their emotions when they confront with such challenging and complex situations.

(Patiraj Kumari and Bhanu Priya 2017) A competitive advantage can be attained through emotional intelligence. The most appreciated and effective managers are those who have strong emotional intelligence features, not necessarily those with the highest IQ, even in many prominent commercial facilities where everyone is educated to be clever. Therefore, if we want to succeed, we should focus our efforts on applying emotional intelligence in our daily routine tasks in addition to paying priority to technological progress and modernization. It would encourage employees to raise not only their own performance levels but also those of the corporation and the entire country.

(Dr.V. Krishnaveni and Renji Issac 2017) This study intends to examine the relationship between emotional intelligence, occupational stress, and its effects among bank employees. Because the shifting economic, legal, and social systems have made life for bank personnel increasingly difficult. They frequently have too many obligations in both their personal and professional lives, which frequently demand that they play many roles. By being exposed to tragedies, bank personnel become the scapegoat for their stress. Understanding work problems and reducing occupational stress are made easier with the help of emotional intelligence. This is why there is a connection between Occupational Stress and Emotional Intelligence.

(J Vidhya 2019) Although it is a part of a person's genetic makeup, emotional intelligence may also be developed, just like any other intellect. E I raises productivity levels both inside and outside. It has a big impact on an employee's job and how they get along with other people in the company. The term "emotional intelligence" (EI) refers to the capacity, skill, or self-perceived competence to recognise, evaluate, and manage one's own emotions as well as those of others and of groups.

In conclusion, the literature suggests that emotional intelligence plays a critical role in promoting sustainability and employee performance in the banking sector, particularly in a volatile environment. The studies reviewed highlight the need for banks to prioritize emotional intelligence training and development, as well as sustainable human resource management practices, to achieve long-term success.

2. SCOPE OF STUDY

A crucial component of an organization's success, particularly in the banking sector, is emotional intelligence. The idea and tenets of emotional intelligence usher in a new era of observation, comprehension, and analysis of one's behavioral pattern, mentality and attitude, soft skills, potential, and positivity. The banking industry, which is characterized by high levels of emotional instability, has a particular need for emotional intelligence. By using emotional intelligence, it is possible to successfully manage the demanding work environment and its surroundings. People who possess high levels of emotional intelligence are gifted with the capacity to detect and express their emotions in a regulated and controlled way. They can deal with anxiety and a demanding life. They do not experience many illnesses brought on by emotional misbalance. Because of this, the connection between emotional intelligence and employee involvement is examined.

The scope of sustainability of business in a volatile environment through emotional intelligence is vast, and it encompasses a wide range of topics and issues. Some of the key areas of focus include:

Building Resilience: Emotional intelligence can help individuals and organizations build resilience in the face of adversity, uncertainty, and change. By developing skills such as self-awareness, self-regulation, empathy, and social skills, employees can better cope with stress, manage conflicts, and adapt to new challenges.

Fostering Collaboration: Emotional intelligence can also foster collaboration and teamwork within organizations. By promoting open communication, active listening, and mutual respect, emotional intelligence can help break down barriers between individuals and teams and encourage the sharing of ideas and knowledge.

Improving Customer Service: Emotional intelligence is essential for delivering exceptional customer service, particularly in the banking sector. By understanding and empathizing with customers' needs and concerns, employees can provide more personalized and effective solutions, enhancing customer satisfaction and loyalty.

Enhancing Leadership: Emotional intelligence is critical for effective leadership in a volatile environment. Leaders who are emotionally intelligent can inspire and motivate their teams, manage conflicts, and make decisions that balance short-term and long-term goals.

Driving Innovation: Emotional intelligence can also drive innovation by encouraging creative thinking, risk-taking, and experimentation. By fostering a culture of psychological safety, where employees feel comfortable sharing ideas and taking risks, organizations can generate new ideas and strategies for adapting to a rapidly changing environment.

Overall, the scope of sustainability of business in a volatile environment through emotional intelligence is broad and encompasses a wide range of topics and issues that are critical for organizations to thrive in today's rapidly changing world.

3. OBJECTIVES

- 1- Analysis of the relationship between Emotional Intelligence on Employee performance in banks.
- 2- Analysis about the different factors of emotional intelligence and their relevance for employee performance in banks
3. To establish a significance of Emotional intelligence in the working environment of a bank.

4. RESEARCH METHODOLOGY

The nature of the current study is descriptive and analytical both. It lists the components of emotional intelligence and measures of employee performance. The study built on the findings of earlier studies. It makes an effort to prove a link between emotional intelligence and worker performance. For this, the study follows data from many secondary sources and builds the theoretical analysis on it.

Descriptive research is a type of research that is used to describe and explore a phenomenon or situation. It involves collecting and analyzing data in order to provide a detailed picture of the subject under investigation. The main objective of descriptive research is to provide an accurate and comprehensive portrayal of the subject, without making any attempts to manipulate or control the variables involved.

Descriptive research can be conducted through a variety of methods, including surveys, observational studies, case studies, and archival research. Surveys are commonly used in descriptive research, as they provide a way to collect data from a large number of people in a short amount of time. Observational studies involve observing and recording behaviors or events in their natural setting. Case studies involve in-depth analysis of a specific case or situation, often using multiple sources of data. Archival research involves analyzing existing records or documents, such as census data or historical records.

Descriptive research is often used in the social sciences to study human behavior, attitudes, and perceptions. It can also be used in other fields, such as marketing research, to explore consumer behavior and preferences. Descriptive research can provide valuable insights into a phenomenon or situation, which can then be used to develop theories or test hypotheses in subsequent research.

Some of the advantages of descriptive research include the ability to collect large amounts of data, the ability to provide a detailed and accurate portrayal of the subject, and the ability to generate hypotheses for further research. However, descriptive research also has limitations, such as the inability to establish cause-and-effect relationships and the potential for researcher bias.

The example was compiled using a practical examination technique, and the data came from banking industry professionals who were readily available to provide it. The population targeted for this investigation was the workforce in Moradabad District's banking industry. A total of 140 surveys were distributed. 120 of which were chosen for the inquiry and deemed reliable.

5. ANALYSIS AND INTERPRETATION

Table -1, Use of Regression analysis for emotional intelligence and employee performance

H0 - Emotional intelligence and employee performance has no significant relationship.

H1 - Emotional intelligence and employee performance has a significant relationship.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.538	0.377	.356	0.1489

These results are taken out with the help of spss It is clear from the above-mentioned regression table that the correlation between the independent variable i.e. emotional intelligence and the dependent variable i.e. employee performance in banks, which is represented by R, is positively exist. It is highlighted that they have a strong correlation because the R value is 0.538, which is greater than a 0.5 level of significance. In other words, a worker's performance improves as his EI rises. It is important to highlight that the R value was determined by taking into account many aspects of an employee's emotional intelligence, including self-awareness, self-regulation, self-motivation, and social awareness and social skills. Furthermore, the 0.538 coefficient of determination is supported by the data. Therefore, emotional intelligence accounts for around 53.8% of the variation in the employee performance statistics. Given that the value of r2 is trending in the direction of 1, the regression equation seems to be highly helpful for predicting employee performance based on emotional intelligence.

Table -2, Use of Nova for emotional intelligence and employee performance

H0 – The adopted model is not a good fit for the data.

H1 - The adopted model is a good fit for the data.

Model	Sum of Square	Degree of Freedom	Mean Square	Frequency	Significance
Regression	0.372	1	.368	10.059	0.008
Residual	4.367	119	.035		
Total	4.688	120			

These results are taken out with the help of spss .The 'Sig' (p) value for the above ANOVA table's last column is 0.008, as can be seen. As the p value is often less than 0.05, we will reject the null hypothesis and claim that there is sufficient evidence to conclude that the model is a good fit for the data and will apply to the entire population at the 0.05 level of significance.

6. FINDINGS

1- Emotional intelligence of an employee, is a set of competencies which influence and govern how they feel about their jobs and how well they perform at work. These skills relate to a person's ability to control and manage their mood and tendencies while at work.

2- According to the study, there is a link between high EI among employees and better job performance.

3- To be more specific, it should be noted that employees who are skilled at managing their own and others' emotions have a higher level of self-assurance.

4- In relation to regulate and appraise emotions of self and others , it is clearly conveyed that those who have less emotional control are less proficient when comprehend to their personality counter aspects .

5- Employees with proper understanding of emotional intelligence perform much better and operate independently than those with low emotional intelligence. Additionally, employees with poor levels of emotional intelligence functions comparably less.

6-An employer of choice is more likely to be a company with a high percentage of emotionally intelligent staff members since they will be at the forefront of organisational performance.

7- The idea that emotional intelligence abilities account for about 80% to 90% of the difference between unsuccessful and competent performance is also supported by a number of research. Businesses get a competitive edge and improve corporate performance with effective staff.

7. SUGGESTIONS

The following recommendations have been made for improving the quality of work life for workers working in the banking industry in order to accomplish the third purpose of this study based on the data analysis and findings.

1-The banking industry should offer its workers interesting chances for professional development and promotion so that they are inspired to work hard and successfully meet their key performance indicators.

2-Each employee will receive a customised career management curriculum to assist in setting and achieving personal goals. As a result, the employee's productivity will rise, helping the business succeed over the long term.

3- Additionally, they have to spend money on staff training to help them develop the knowledge, expertise, and skills necessary to execute their jobs more effectively. The employee will realise that the company loves him and wants to continually improve his skills and knowledge thanks to training and employee development initiatives.

4-Banks should concentrate on reducing monotony in the workplace. This means that they should carefully create the task to ensure that the employee can continue to work with excitement and find the work difficult and engaging.

8. CONCLUSION

The association between emotional intelligence and work performance is investigated in this study. According to this research, superior connections at work are created by those with higher emotional intelligence. According to Joseph and Newman, emotionally intelligent people emulate their traits, believe in haphazard learning, and put a focus on teaching vision. The performance of the general population in the workplace may be more clearly understood by using emotional intelligence. Boyel said in his research that emotional intelligence fosters people's capacity for originality and inventiveness, which helps to alter how well workers perform at their jobs. When all is said and done, performance is defined as the results of a person's exercises over a specific period of time. Authoritative profitability and its success are largely dependent on and legitimately connected to employee performance. Emotional intelligence is also widely acknowledged as a respectable predictor of employees' productivity. The majority of jobs are believed to be associated with feelings and require the ability to manage feelings, and many affiliations involve relational collaborations to achieve the aims.

However, merely having EI won't boost performance until it alters how people handle their emotions at work. Emotional intelligence is essential in the workplace because of this. For instance, having the compassion to recognise the client's emotional condition and the relational skills to know when to speak out and when to remain quiet are necessary for success in business. Success in tennis or art so demands an increasingly specialised kind of inspiration and restraint. As a result, practically everything we do at work is impacted by EQ. Employees may apparently control their emotions appropriately and apply particular workplace behaviours that help them gather more accurate information, understand how others behave, or make better decisions regarding their activities. Performance of the employees depends on their ability to cooperate with a group of people who have varied opinions and viewpoints. Most of the time, the high EI person is more likely to see feelings. It is the fundamental categories of information that people generally process. Emotional intelligence enhances a person's social ability and public demeanour. Unmistakably enhanced social relationships and higher emotional intelligence. It doesn't mean that everyone has to understand it correctly. To get through our emotionally taxing days, we all need emotional intelligence. Whether or not we have strong emotional intelligence ourselves, we could rely on individuals who do to guide us.

REFERENCES

- Conduct a literature review: Start by searching for academic journals, research papers, and books related to emotional intelligence, sustainability, and employee performance in the banking sector. Use relevant keywords and phrases such as "emotional intelligence in banking sector", "sustainability of business", and "employee performance".
- Check academic databases: Look for relevant studies in academic databases such as Google Scholar, JSTOR, and Science Direct. These databases provide access to a wide range of academic articles and research papers.
- Manzoor, Q. A., et al. (2020). "The Impact of Emotional Intelligence on Employee Performance: A Study of Pharmaceutical Industry in Pakistan." *Sustainability*, 12(11), 4647.
- Jaiswal, S., et al. (2021). "Impact of Emotional Intelligence on Organizational Sustainability in the Indian Context." *Journal of Human Resource Management Research*, 2021.
- Syed, F., et al. (2021). "The Role of Emotional Intelligence in Sustainable Performance Management: An Empirical Study of Pakistani Business Organizations." *Sustainability*, 13(3), 1233.
- Kim, S. H., et al. (2021). "Emotional Intelligence, Employee Performance, and Turnover Intentions in the Hospitality Industry." *Journal of Hospitality and Tourism Research*, 45(1), 98-119.
- Kaur, P., et al. (2020). "Impact of Emotional Intelligence on Employee Performance and Sustainable Development: A Study of Indian Manufacturing Industry." *International Journal of Management, Technology, and Social Sciences*, 5(1), 1-15.

BUSINESS OPPORTUNITIES IN INDIA THROUGH B2B PROCESS**Ms. Tanu Gupta and Ms. Urvashi Sharma**

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ABSTRACT

Business 2 business process is a transaction between manufacturers, wholesalers, retailers, and agents. The concept of G20 focuses on attaining sustainable development goals through which they want more education, proper employment, and the use of technology in the healthcare and agriculture sector. Recently, academics stimulated research on the impact of these trends in the market and focus on the find out opportunities for the young generation. Through the E-Commerce B2B process the margin of profit increases, reducing fragmentation and cost to serve the industry. India's population depends on Agriculture Income. The external demand for the export lies in the agriculture sector. For the agriculture sector Government start the new initiative through B2B E-marketplace is a model of E-commerce, which has been used to trade a wide range of goods, including agricultural products. India has the largest population between the age group of 5-25 years over the population of 140 crores approx, presently huge opportunity in the education sectors. The private Indian players collaborate with international brands to provide a better education system. The 100% FDI allows in education sectors through an automatic route. India is focusing on creating online programs due to the increasing demand from consumers (e.g. Byjus, Physics Wallah, and many more). The healthcare sector also uses E-Commerce and e-marketplaces due to covid doctors took the initiative to check the patients through video calls. Many companies provide online consultations and increase awareness about the medication and new technology. The main focus of the paper is to analyze the benefits of the B2B process in agriculture trading, education sectors, and healthcare.

Keywords: Business, Agriculture, Education, Opportunities, India, E-Commerce

INTRODUCTION

The Internet helps to provide new opportunities for businesses around the globe. E-Commerce has resulted in new business relationships and enabled new markets, new business, and new marketing. In wider terms, E-Commerce includes all money transactions which use Information Technology. It encompasses each and everything that allows us to electronically gather, generate, store, analyze, and distribute.

The present success of the **B2B industry in India** has been attributed to the digital transformation of businesses, including enterprises, financial institutions, hospitals, education, small businesses, govt., etc. Every startup, through its products, is bringing efficiencies into the B2B supply chain and automated processes.

Many startups in India like **Udaan, ShopX, Ninjacart, and Indiamart**, are giving their best to transform the wholesale supply chain in India into digitalization. Small and medium business owners joining the tools offered by E-B2B players like digital catalog, online payments options, and logistics facilities, this segment will continue to grow in the upcoming years.

After the many policy changes and initiatives taken like Digital India that have taken place recently, the country is in an interesting stage of transformation and ready to adapt the digitalization. In the coming few years the B2B market is anticipated to grow exponentially around the world.

The advent of E-commerce has seen a dramatic impact on the traditional ways of doing business. It has brought manufacturers and consumers closer together and eradicated many of the costs previously encountered. The supply industry will benefit from e-commerce which includes those producing computers, healthcare products, networking equipment, and the software necessary.

It has affected the following fields of economic activity.

- Product Price.
- Product availability
- The transportation patterns
- Social Cost.
- Cost and profit structure of all companies.
- Consumer behavior in developed economies & worldwide competitiveness

Intending to tap the huge potential in the B2B E-commerce market in India, apart from the existing B2B companies, leading B2C companies have also started to build their platforms for small business owners and traders. This is expected to be supported by rising expectations among a growing number of companies buying and selling online and a shift to conducting procurement transactions through the Internet. Understanding this untapped potential of the B2B Ecommerce industry, the Government has allowed 100% FDI in B2B E-commerce, which has enabled globally successful B2B Ecommerce companies such as Walmart and Alibaba to evince interest in the Indian B2B Ecommerce industry.

Benefits of Application of the B2B process in the various sectors (Agriculture, healthcare, education, etc.):

The First and Most Important Sector in India is the Agricultural Sector

India is the major player in the agriculture sector worldwide and the primary source of livelihood for about 58-60% (Approx.) population in India. The world's largest cattle herd (buffaloes and cows), the largest area planted (like wheat, rice, and cotton), and the largest producer (milk, pulses, and spices) in India. India is the second-largest producer of fruit, vegetables, tea, farmed fish, sugarcane, and sugar. In India, the agriculture sector holds the record for second-largest agricultural land in the world and generates employment for about 50% of the country's population. Thus, farmers become an important part of the sector to provide us with means of survival.

Consumer contribution in India will return to rise in 2021 post the pandemic-led contraction, enlarging by as much as 6.6-7 % (Approx.). The Indian food industry is poised for huge growth, increasing its contribution to world food trade every year due to its immense potential for value addition, particularly within the food processing industry. The Indian food processing industry accounts for 32-35 % (Approx.) Of the country's total food market, one of the largest industries in India is ranked 5th in terms of production, consumption, exporting, and expected growth.

Agricultural E-commerce is a method of using E-Communications and Information Technology to conduct agricultural business. The trading partners of agricultural businesses can share a broad range of data. Agricultural E-commerce transforms the different ways of selling agricultural products in the E-Market and offline market and the way agribusiness man interacts with each farmer and customer through different online communication channels. In order words, technology is subject to the change of the larger world of both Information Technology and Agriculture.

In terms of exports, the sector has seen good growth in the past year. In FY22 (until December 2021) -

- Exports of marine products stood at US\$ 6.12 billion.
- Exports of rice (Basmati and Non-Basmati) stood at US\$ 6.12 billion.
- Buffalo meat exports stood at US\$ 2.51 billion.
- Sugar exports stood at US\$ 2.78 billion.
- Tea exports stood at US\$ 570.15 million.
- Coffee exports stood at US\$ 719.95 million.

Attractive opportunities make for agricultural development:-

Demand increases for agricultural inputs like hybrid seeds and some fertilizers and territory services like warehousing and cold storage are increasing in India at a fast pace.

In the current scenario, the demand for the agricultural sector increases, and for fulfills the demand the Government makes some policies in this regard. The government announced the PLI Scheme i.e. Production-Linked-Incentive for the promotion of growth in domestic manufacturing of Agro Chemicals.

The Government took a new initiative i.e. The Krish Uddan 2.0 scheme proposes the encouragement and movement the agriculture products via air transport.

The B2B process helps to encourage the agricultural sector to high proportion of agricultural land, different agro climatic conditions reassure the cultivation of different seeds and crops.

After the agriculture sector, the most important sector in the world is the education sector. The B2B process helps to encourage the education sector so well.

We come up with a business-to-business (B2B) platform for the incorporation of educational centers - an educational marketplace.

There are two extraneous solutions in this sector. The first solution uses an information-sharing element, implemented as interfacing services on the education center side. The second solution implements a central interfacing service at a particular educational integration center.

With expanding awareness, private Indian players are connecting with international brands to provide a worldwide standard of education. Investments in the Indian education sector have increased substantially over the past 20 years. The stipulation for technical degrees is also demanding with more and more students opting for specific industry-focused qualifications. In India, Higher education institutes are emphasizing on creating online programs due to the increasing demand from students and parents.

With progressive technologies such as Artificial Intelligence, Machine Learning, Internet of Things, and block chain, India's education sector will reframe itself in the upcoming years. It has also been in favors the Education 4.0 revolution, which gives exposure in inclusive learning and increased employability. The government has introduced and implemented the policies like the New Education Policy, which will be fully implemented over the course of this upcoming 10 years starting from 2021-22 and will have a strong focus on high-quality vocational education.

In India the education sector was estimated to be worth US\$ 117 billion in Financial Year 2020 and is look forward to reach US\$ 225-230(Approx.) billion by Financial Year 2025.

India has over and above 250 million school-going students, more than any other country. India had 38.5 million students enrolled in higher education in 2019-20, with 19.6 million male and 18.9 million female students.

According to UNESCO's 'State of the Education Report for India 2021', the Pupil Teacher Ratio (PTR) at senior secondary schools was 47:1, as against 26:1 of the overall school system.

Number of colleges in India reached 42,343 in FY20. As of November 25, 2022, the number of universities in India stood at 1,072. In 2022-23, there are 8,902 total AICTE approved institutes in India. Out of these 8,902 institutes, there are 3,577 undergraduate, 4,786 postgraduate and 3,957 diploma institutes.

The Indian edtech market size is expected to reach US\$ 30 billion by 2031, from US\$ 700-800 million in 2021. According to KPMG, India has also become the second largest market for E-learning after the US.

The online education market in India is expected to grow by US\$ 2.28 billion during 2021-2025, growing at a CAGR of almost 20%. The market grew by 19.02% in India in 2021.

B2B marketing strategy focus on customer diversification (which and where the customers to serve), product line development (with what offerings) in what way (through direct or indirect channels). Especially important in such courses is the notion of value-based pricing, recognizing that different customers may see far different economic values for the same offerings and the firm's pricing policy should reflect those differences. The tools below, especially Value-in-Use Analysis, Segmentation, Conjoint Analysis, and Resource Allocation should prove most useful in such a course.

The timing has never been better for using technology to enable and improve learning at all levels, in all places, and for people of all backgrounds. From the modernization of E-rate to the proliferation and adoption of openly licensed educational resources, the key pieces necessary to realize best the transformations made possible by technology in education are in place.

Educators, policymakers, administrators, and teacher preparation and professional development programs now should embed these tools and resources into their practices. Working in collaboration with families, researchers, cultural institutions, and all other stakeholders, these groups can eliminate inefficiencies, reach beyond the walls of traditional classrooms, and form strong partnerships to support everywhere, all-the-time learning.

Although the presence of technology does not ensure equity and accessibility in learning, it has the power to lower barriers to both in ways previously impossible. No matter their perceived abilities or geographic locations, all learners can access resources, experiences, planning tools, and information that can set them on a path to acquiring expertise unimaginable a generation ago.

All of this can work to augment the knowledge, skills, and competencies of educators. Tools and data systems can be integrated seamlessly to provide information on student learning progress beyond the static and dated scores of traditional assessments. Learning dashboards and collaboration and communication tools can help connect teachers and families with instantaneous ease. This all is made more likely with the guidance of strong vision and leadership at all levels from teacher-leaders to school, district, and state administrators. For these

roles, too, technology allows greater communication, resource sharing, and improved practice so that the vision is owned by all and dedicated to helping every individual in the system improve learning for students.

It is a time of great possibility and progress for the use of technology to support learning.

REFERENCES

- Pan India Market Survey – B2B and End-consumers | Khadi and Village Industries Commission (KVIC) | June 2017
- B2B E-Marketplace Adoption in Agriculture
- Developing India-Centric B2B Sales Theory: An Inductive Approach Using Sales Job Ads
- <https://www.ibef.org/>
- <https://www.convinceandconvert.com/content-marketing/educational-content-for-b2b-brands/>

FOOT NOTES

1. <https://www.ibef.org/industry/agriculture-india>
2. <https://www.ibef.org/industry/education-sector-india>

EFFECTIVENESS AND EVALUATION OF ENCRYPTION CRYPTOGRAPHY IN THE INTERNET OF THINGS (IOT)**¹Dr. Ratnesh Mishra and ²Dr. Ravi Shankar Shukla**¹Assistant Professor, Computer Science & Engineering, BIT Mesra, Patna²Assistant Professor, Department of Computer Science, College of Computing and Informatics, Saudi Electronic University, KSA**ABSTRACT**

The Internet of Things (IOT) and the development of technology, communication protection should be considered for some general purposes. internet of things Hardware architecture. The world today is moving towards IoT concepts as they are fast, efficient, and future proof. However, as IoT devices evolve in terms of integration and connectivity, this leads to greater security. Because of this security risk, it is important to test the memory speed and performance of existing encryption methods on these devices. It is important to consider whether new non-trivial encryption algorithms will be developed for these devices. In this post, he hopes to do so by testing different encryption and decryption methods on different IoT devices and comparing the speeds of the devices for different kb data sheet sizes.

Keywords: Security, Encryption-Decryption, Speed, Security Efficiency, Internet of Things

I. INTRODUCTION

Cryptography is the study of protecting digital data from unauthorized access, especially in transmission and storage. The use of the IoT and other applications has led to an increase in data storage, transmission and processing. The increase in data increases the need for information security architectures, including connections between physical devices (devices, vehicles, buildings, and other devices), electronics, software, sensors, and network connections that enable these devices to be recorded and exchange related data. IoT Application is a processor-based application mainly for Raspberry Pi and Beagle bone. References [1] and [2] show us many IoT-based applications of these devices. However, the use of security measures in such systems can exceed the load. This can lead to increased energy consumption, additional labor requirements or increased demand. Therefore, it is necessary to examine various symmetric and asymmetric encryption techniques and test their results on Raspberry Pi 3 and Beagle Bone Black processors and compare various parameters such as speed and throughput. This will help us determine if a solution is needed for such products. Here are the different security methods we will compare in this article: Twofish, Blowfish, DES, Triple-DES, AES, RC2, RC4 and ChaCha20. These ciphers are tested on IoT devices by running them on files of various sizes ranging from 100 KB to 128 MB.

II INTERNET OF THINGS MECHANISMS**A. Raspberry Pi 3**

A new open source popular hardware device is the Raspberry Pi. After all, it's a computer. The Raspberry Pi is a low-cost, credit card-sized computer that connects via HDMI to a computer monitor or TV and uses a standard keyboard and mouse. It can run on Raspbian (Debian Linux), Android, Windows 10, IoT Core device ecosystem and other platforms depending on the application. Reference [3] gives us a good comparison between a member of this family and many other IoT devices. The tool is also supported by a large support community. The Raspberry Pi 3 is the third generation Raspberry Pi that packs a lot of functionality into a credit card sized package. In particular, in addition to features such as the standard Raspberry Pi, four USB 2.0 ports and built-in Ethernet, features: 1.2 GHz 64-bit Quad-Core ARMv8 CPU, 802.11n Wi-Fi, Bluetooth 4.1 Low Energy CPU power plus Wi-Fi and Bluetooth 4.1 phone wind ensure it has: IoT projects if many sensors can be connected at the same time. In addition, the Raspberry Pi has a 40-pin GPIO (General Purpose I/O) connector for connecting external sensors. It is powered by Broadcom BCM2837 quad-core 64-bit CPU clocked at 1.2 GHz. Equipped with 1GB DDR2 RAM, it is suitable and fast for IoT-based applications. It also has built-in WLAN BCM43438 and built-in Bluetooth low energy chip.

It has many ports such as 26 GPIO pins, 4 USB 2.0 ports, 4-pin stereo audio output and full size HDMI port. It also includes a CSI camera port for fast and efficient use in video analytics-based applications. Raspbian Sketch is the most popular. The 3A charger at 5V is more than enough to power the device.

It comes with 512 RAM and unlike Raspberry Pi includes 4GB internal storage in eMMC flash format. The Beagle Bone family is homogeneous with the Raspberry Pi, and there are many devices with different features and ports. This device provides additional GPIO functionality available for Internet of Things on Raspberry Pi 3. Reference [4] describes in detail the various devices in this family.

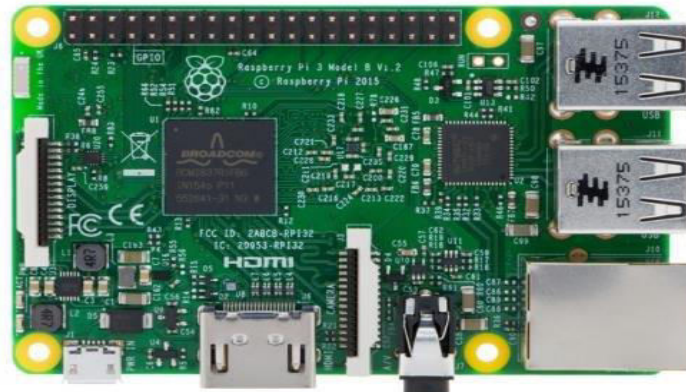


Figure 1. Board Representation of Raspberry Pi 3

2. The Beagle Bone Black

BBB is 5 inches long, 5.33 cm wide and 1.6 cm high, making it smaller than the Raspberry Pi 3. It has 4GB 8-bit integrated multimedia controller with flash memory and 512MB DDR3 RAM. Includes 3D graphics and 2 floating point NEON accelerators. 32-bit real-time programmable units, each operating at 200 MHz. The USB host has an Ethernet port, a micro HDMI port, and 2 46-pin connectors. It works on Debian Wheezy 9. The biggest advantage of Beagle Bone Black over Raspberry Pi 3 is that it has 65 GPIO pins, providing users with better performance and time management. References [5] and [6] show the use of the tool and also help to explain the structure of the tool in more detail. Table I compares the two IoT devices that are being tested in this paper and it states similar differences as seen in [3].

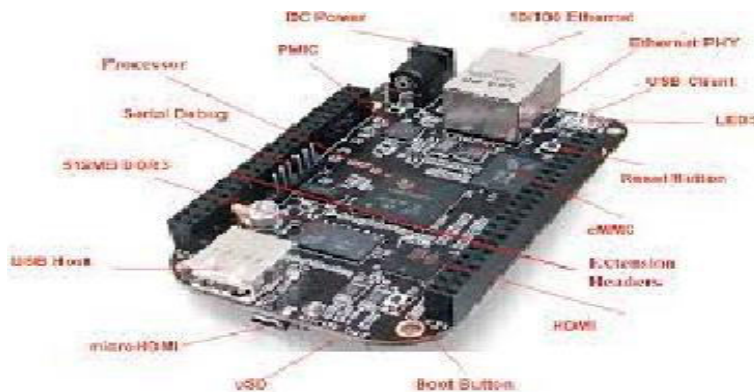


Figure 2 Beaglebone Smart Boards-A Linux/Android with Components

Parameters	Raspberry Pi 3	Beagle Bone Black
SoC	Broadcom BCM2837	TI Sitara AM335x
Processor	1.2Ghz 64-bit ARM Cortex-A53	1Ghz 32-bit ARM Cortex-A8
RAM	1GB DDR2	512MB DDR3
GPU	VideoCore IV	PowerVR SGX530
Operating System	Raspbian Stretch 4.9	Debian Wheezy 9.0
GPIO Pins	26	65
Power Consumption	210-460 mA @ 5V under varying conditions	150-350 mA @ 5V under varying conditions
Storage	On-Board 4GB storage extendable via Micro SD card	Limited to Micro SD card storage
Features	On-Board Bluetooth and Wi-Fi cards, HDMI port, USB Ports, Ethernet Port, 3.5mm Audio Jack	USB Port, Micro HDMI Port, Ethernet Port

Table I. Comparison between Raspberry Pi 3 and Beagle Bone Black

III. Crypto Ciphers

As security schemes have evolved over the years, many new encryption methods have emerged and existing methods have been improved. In general, all existing methods can be divided into asymmetric and symmetric encryption methods. In this article, we will focus on symmetric encryption techniques. Detailed information, research and various attacks on symmetric and asymmetric cryptography are given in [7]. Symmetric encryption techniques are divided into block ciphers and stream ciphers. Next, the block and stream ciphers used in this article will be discussed.

A. Stream Cipher

Stream cipher algorithm examines all ciphertext and converts each symbol of the text directly into a symbol of the ciphertext. The sign is usually bitwise and the conversion is usually a special OR (XOR). I hope everything is confidential, lighter and faster processes due to minor changes. They also have a statistically random pattern and are easy to use on the device. Reference [8] discusses some attacks on stream ciphers. We will combine the 2 most important fast and light passwords,

RC-4 and ChaCha 20, and compare them with Beagle Bone and Raspberry Pi.

• Rivest Cipher 4 (RC4)

Rivest Cipher 4, RC4 for short, was developed by Ronald Rivest in 1987 and relies on symmetric key algorithms to generate encryption and decryption key points. The data stream is simply XORed with the generated key array. The output of each key byte is then further modified using a pseudorandom generation algorithm and the key byte is XORed with the plaintext byte and vice versa. The time view of RC4 is shown in Figure 3.

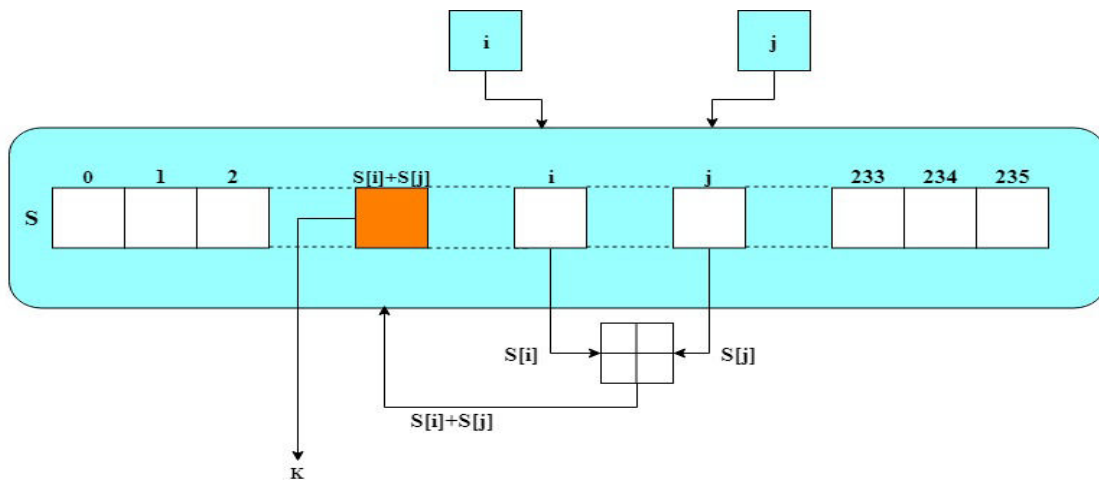


Figure 3. Research phase of RC4 stream cipher

• ChaCha20 Designed by Daniel J. Bernstein, ChaCha 20 stream cipher is a unique example of Salsa20 stream cipher. This cipher is built on the same model as Salsa20, but the difference makes all the difference. The article [10] says that DJ Bernstein himself gave a detailed description of the process is a 256-bit stream cipher.

The move from Salsa20/8 to ChaCha8 aims to increase the diversity of the medium, thereby increasing protection against cryptanalysis while preserving and enhancing physical content. But the extension does not add any more functionality compared to Salsa20. A round of ChaCha has 16 plus and 16 XOR operations and 16 parallel 32-bit words. The parallelism and vectorization capabilities of the ChaCha20 algorithm are similar to Salsa20.

b. Block Cipher

A block cipher scheme converts all plaintext into one block of ciphertext at once. These are larger and slower ciphers because they involve breaking up text into chunks and rely on different words and obfuscation. The block ciphers discussed and used in this article operate in two simple and fastest modes: Cipher Block Chaining (CBC) and Electronic Code Book Mode (ECB).

Various types of studies can be found in [11]. Detailed information on various attacks against these ciphers can be found in [12]. The block ciphers discussed in this article are based on the Feistel cipher structure shown in Figure 4. and Fish. The block ciphers used in this article will be discussed later.

• Advanced Encryption Standard (AES)

Advanced Encryption Standard, or AES, is a block cipher system developed by Belgian cryptographers Vincent Rijmen and Joan Daemen. Permutation-Permutation networks Permutation principle and combination as a link. It basically has 3 block ciphers- AES-128, AES-192, AES-256, each of these ciphers can access and decrypt data in 128-bit blocks using 128, 192 and 256-bit keys respectively.

The larger the key, the stronger the encryption. Since AES is a symmetric cipher, both the sender and receiver must know the encryption and decryption keys respectively. AES defines 4 conversions to convert plain text to ciphertext.

The first step is to organize the data into arrays or matrices. The second step moves the columns of the data, the third step shuffles the columns and the final step performs a simple XOR on each column using the different

encryption key. A 128-bit key requires 10 turns, a 192-bit key requires 12 turns, and a 256-bit key requires 14 turns. Reference [13] explains the password.

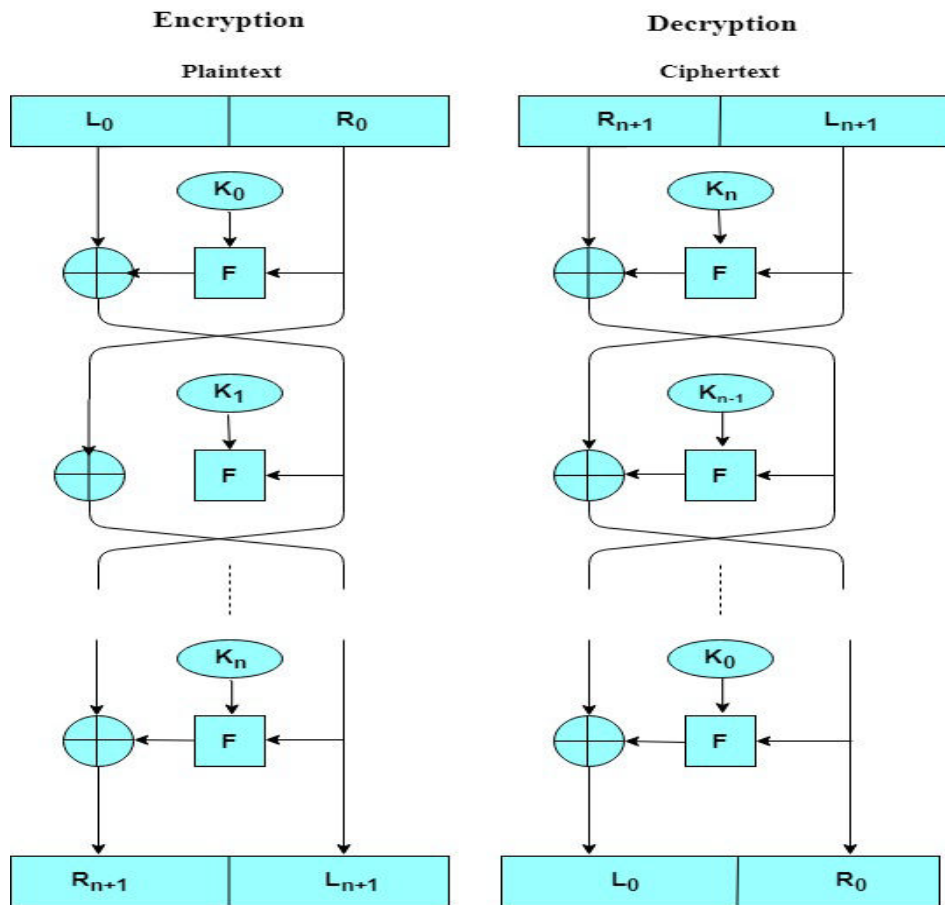


Figure 4. Feistel Cipher Structure

• **Data Encryption Standard (DES)**

The Data Encryption Standard, or DES, was developed by IBM in 1970. DES is a symmetric cipher that uses a length of 64 bits for this operation, of which 56 bits are used for encryption and decryption, and

bits with the remaining 8 bits are used for mapping. That is, the length of DES is 56 bits. The algorithm has 16 equations. Analysis and manipulation of this cipher can also be found at [13]. Initially, the 64-bit file is split into two 32-bit parts. Each of the 16 matches individually completed 2 blocks. This model is called the Feistel model. The F block in the model connects half of the block with the output section of the switch and the other half. Change half before the next match. There is a difference between the first round of change (IP) and the last change. As a symmetric cipher, it uses the same encryption key for decryption, but in reverse order. This is simple hardware and software development for encryption and decryption. See also [13] for a detailed comparison of AES and DES

• **Ternary Data Encryption Standard (3DES)**

Ternary Data Encryption Standard or 3DES algorithm starts by running the DES algorithm 3 times on a blank document. The original DES's 56-bit key was sufficient for security, but the additional computing power enabled a brute-force attack. This led to the development of the 3DES cipher. 3DES uses 168-bit keys and works with 64-bit block sizes. Although more secure than the previous DES algorithm, it was found to be one of the slowest block ciphers in existence due to computational overhead. A full and detailed explanation of the cipher can be found in [14].

• **Blowfish**

The Blowfish block cipher was developed by Bruce Schneier in 1993. It is 64 bits in size and can range from 32 to 448 bits. It also uses S-boxes, which depends on the size of the switch.

Like DES, it has a 16- cycle Feistel encryption scheme. It is an open-source algorithm that has not yet been cracked. It is also one of the fastest passwords in general use. The text [15] provides us with an analysis and improved stability of this problem.

• **Twofish**

Like the AES, DES and Blowfish algorithms, Twofish is based on the Feistel model.

After creating Blowfish in, Bruce Schneier created a cipher, resulting in Twofish, a symmetric cipher with a size of 128 bits and a key length of no more than 256 bits. The plain text is split into two 32-bit words and sent to the F box.

These two words are split into 4 bytes within the F-box and are sent by S-boxes, each located in a different location. Put the four output bytes into a 32-bit word using a maximum separation (MDS) matrix. Pseudo-Hadamard Transform (PHT) is used to combine 2 32-bit words. Then XOR it with the other half. Some 1-bit shifts are also performed before and after the XOR operation. The superiority of this cipher over the Blowfish cipher can be seen in [16].

• **Rivest Cipher 2 (RC2)**

Ronald Rivest created Rivest Cipher 2 in 1987, inspired by the RC4. It is a 128-bit long symmetrical 64-bit block cipher called RC2.

He briefly explained the complexities involved in converting plain text to ciphertext. As a variable-length input key, convert it to a 64-bit fixed key using the key expansion algorithm. This is followed by 5 cycles of whisking, 1 cycle of grinding, 6 cycles of mixing and 5 cycles of grinding followed by another grind cycle. The compound wheel has 4 turns. A medium is said to be compressed by adding it to the 16-bit word of the extended key.

A good comparison of RC2 with other Rivest block ciphers can be found in [9]. 4 Test Results References

[17] and [18] give us detailed information on the performance, efficiency and speed of the block and stream cipher algorithms of the most used Intel processors. However, since these measurements are not valid for the IoT field, similar measurements are made here as well. The block ciphers and stream ciphers discussed in this article were run on Beagle Bone Black and Raspberry Pi 3 for files ranging from 1 MB to 128 MB to determine the speed and time.

Cipher	Key Size(bits)	Block Size(bits)
AES	256	128
DES	56	64
3-DES	168	64
Blowfish	128	64
Twofish	256	128
RC2	128	64
RC4	256	-
ChaCha20	256	-

Table II. Key Sizes and Block Sizes for Block & Stream Ciphers

Table II shows the keys and block sizes for various block ciphers. Form two.

Block and stream cipher sizes and block sizes. Conversion times (in seconds) for various stream ciphers and block ciphers on Raspberry Pi 3 are shown in Table III, Table IV and Table V.

File Size(MB)	Execution Time for Block Ciphers (s)					
	AES	DES	Triple-DES	Blowfish	Twofish	RC2
1	0.312512	0.340801	0.507857	0.303464	0.275164	0.354988
2	0.625167	0.680893	1.015655	0.603668	0.549241	0.713949
4	1.289868	1.405361	2.076549	1.251772	1.141539	1.467976
8	2.825549	3.058405	4.410864	2.749132	2.527144	3.180131
16	6.563713	7.078505	9.764627	6.432269	5.979014	7.707962
32	17.05146	19.95651	24.90283	16.69822	15.83249	18.40725
64	34.61057	36.42658	47.16157	33.66723	32.66352	37.00312
128	67.51322	72.89622	94.89921	66.73726	63.80815	73.98863

Table III. Block Cipher Executions in ECB Mode on Raspberry Pi 3

File Size(MB)	Execution Time for Block Ciphers (s)					
	AES	DES	Triple-DES	Blowfish	Twofish	RC2
1	0.309982	0.332839	0.495875	0.291938	0.274767	0.354896
2	0.614113	0.663321	0.987876	0.579845	0.547751	0.707328
4	1.280448	1.372637	2.023355	1.207192	1.144121	1.466432
8	2.812099	2.992806	4.305038	2.660793	2.547753	3.164056
16	6.538891	6.915692	9.526417	6.620954	6.014227	7.265833
32	16.96479	17.67588	22.89434	17.10438	15.89528	18.34590
64	33.87311	36.42899	44.99781	33.00132	31.89973	36.98867
128	64.01567	72.66394	90.72483	63.98877	61.11897	72.89773

Table IV. Block Cipher Executions in CBC Mode on Raspberry Pi 3

File Size(MB)	Execution Time for Stream Ciphers (s)	
	RC4	ChaCha20
1	0.241359	0.235922
2	0.500513	0.472921
4	1.040137	0.986634
8	2.328652	2.22117
16	5.585328	5.358924
32	14.998415	14.559962
64	30.553217	29.343859
128	61.883621	57.66328

Table V. Stream Encryption Implementation in Raspberry Pi3

File Size(MB)	Execution Time for Block Ciphers (s)					
	AES	DES	Triple-DES	Blowfish	Twofish	RC2
1	0.005621	0.005811	0.006341	0.006175	0.005686	0.006138
2	1.166823	1.226297	1.568032	1.157565	1.103905	1.291024
4	2.565335	2.598819	3.273489	2.433813	2.362531	2.737681
8	5.954885	5.976521	7.391246	5.760432	5.612367	6.462823
16	14.89601	15.20358	17.87470	14.77387	14.56606	16.08261
32	30.61435	32.78581	37.18605	30.26231	30.18445	33.67839
64	57.63497	62.97124	72.67129	59.66723	57.66352	66.00312
128	110.4381	121.5390	138.7345	113.4342	110.3987	132.7962

Table VI Block Cipher Executions in ECB Mode on Beagle Bone Black

File Size(MB)	Execution Time for Block Ciphers (s)					
	AES	DES	Triple-DES	Blowfish	Twofish	RC2
1	0.005831	0.005867	0.005941	0.005863	0.005732	0.005858
2	1.215087	1.250543	1.611351	1.559371	1.126454	1.324491
4	2.588259	2.693054	3.366573	2.463152	2.412783	2.79931
8	6.066367	6.205534	7.636621	5.845305	5.730861	6.499352
16	15.49762	15.67190	18.61863	14.99747	14.76463	16.26645
32	30.99188	32.99681	38.81971	30.41812	30.49481	33.17583
64	58.09342	63.98743	72.99781	59.43822	57.98245	68.79832
128	113.7991	123.5723	138.9981	117.4678	114.9821	133.8843

Table VII Block Cipher Executions in ECB Mode on Beagle Bone Black

File Size(MB)	Execution Time for Stream Ciphers (s)	
	RC4	ChaCha20
1	0.00506499	0.00589123
2	1.075367	1.041657
4	2.302807	2.230733
8	5.498168	5.353476
16	14.355075	14.068853
32	29.275166	28.645975
64	57.363625	55.73215
128	112.001322	109.138972

Table VIII. Stream Cipher Executions on Beagle Bone Black

Figures 5, 6 and 7 show graphs comparing the speeds of various block and stream ciphers between Raspberry Pi3 and Beagle Bone Black. In these figures we can see the variation in speed for different data in both cases. From the Raspberry Pi 3 and Beagle Bone Black value table, it is clear that the Twofish algorithm is the fastest of all block ciphers. But the second code is light and fast enough to compete with the Twofish algorithm.

ChaCha 20 stream cipher is the most accurate, fastest and most useful for queries running on IoT devices. It can also be seen that the CPU and memory consumption of the Beagle Bone Black averages around 70% for various cryptographic operations. However, the Raspberry Pi's average memory for all scenarios is 40% lower than that of the Beagle Bone Black. However, as shown in [19] and [20], many lightweight ciphers have been developed that compete with the fastest ciphers shown here, and these devices also use less memory.

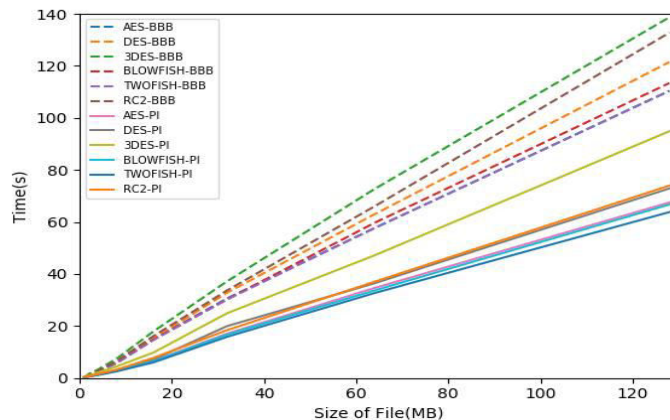


Figure 5. Block cipher execution speed comparison between Raspberry Pi 3 and Beagle Bone Black in ECB mode

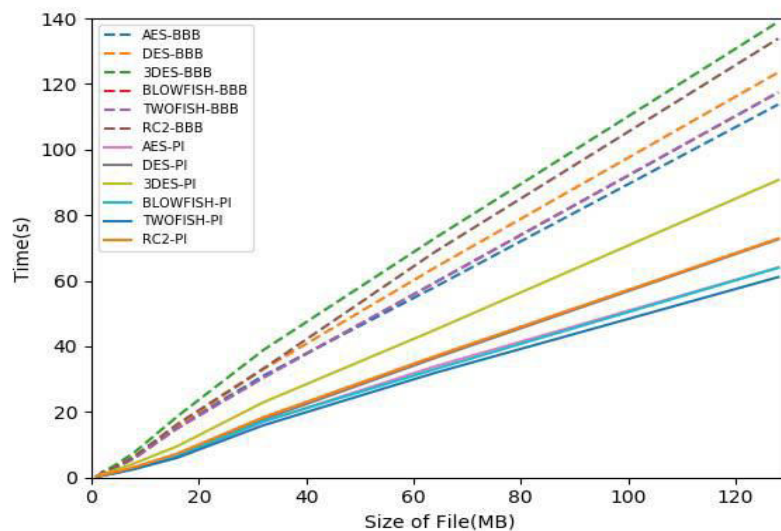


Figure 6. Speed comparison of block ciphers between

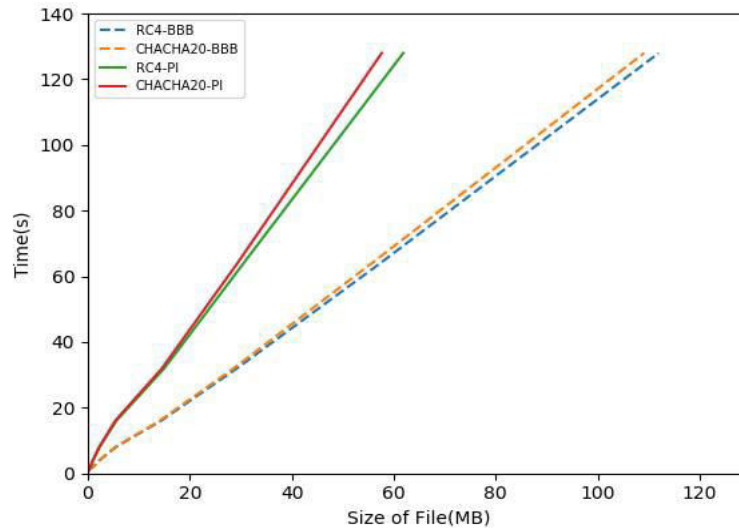


Figure 7. Execution Speed Comparison of Stream Ciphers between Raspberry Pi 3 and Beagle Bone Black

IV CONCLUSION

Raspberry Pi 3 and Beagle Bone Black in CBC mode. Raspberry Pi 3 Beagle Bone Black Raspberry Pi is inferior to Beagle Bone 3, Black Pi ciphers almost doubles uptime. Raspberry Pi 3 has also been shown to have lower power and memory.

Raspberry Pi 3 outperforms Beagle Bone Black in terms of speed, efficiency, security and fast data transfer. However, if you need to add more connections (as seen in many IoT applications), the Beagle Bone Black has better capabilities as it has more GPIO pins.

The next step in the development of IoT encryption algorithms is to improve existing passwords or create new encryption methods that will help improve the performance and memory of IoT devices.

V. REFERENCES

- [1] N. Mangla and P. Rathod, "A Comprehensive Review: Internet of Things (IOT)", IOSR Journal of Computer Engineering, vol. 19, no. 4, pp. 62-72, 2017.
- [2] Cheah Wai Zhao, J. Jegatheesan and Son Chee Loon, "Exploring IOT Application Using Raspberry Pi", International Journal of Computer Networks and Applications, vol. 2, no. 1, pp. 27-34, 2015.
- [3] Pankaj Naganath Patil, "A comparative analysis of Raspberry pi Hardware with Adruino, Phidgets, Beaglebone black and Udo", International Research Journal of Engineering and Technology, vol. 3, no. 6, pp. 1595-1600, 2016.
- [4] A. Nayyar and V. Puri, "A Comprehensive Review of BeagleBone Technology: Smart Board Powered by ARM", International Journal of Smart Home, vol. 10, no. 4, pp. 95-108, 2016.
- [5] Machhi Vilas S, Swadas Prashant B, Patel D.M, "IoT Based Environment Parameter Monitoring Using Beaglebone Black", INROADS- An International Journal of Jaipur National University, vol. 5, no. 1, pp. 298-304, 2016.
- [6] Venkatasubramanian K., Bhaskar B. Pawar, Pankaj V.Vhanale, "Cloud based Monitoring of Muscle fatigue using Beagle Bone Black", National Conference on Science, Engineering and Technology, vol. 4, no. 6, pp. 68-70, 2016.
- [7] R. Tripathi and S. Agrawal, "Comparative Study of Symmetric and Asymmetric Cryptography Techniques", International Journal of Advance Foundation and Research in Computer, vol. 1, no. 6, pp. 68-76, 2014.
- [8] M.U. Bokhari, S. Alam and F. Syeed Masoodi, "Cryptanalysis Techniques for Stream Cipher: A Survey", International Journal of Computer Applications, vol. 60, no. 9, pp. 29-33, 2012.
- [9] S. Charbathia and S. Sharma, "A Comparative Study of Rivest Cipher Algorithms", International Journal of Information & Computation Technology, vol. 4, no. 17, pp. 1831-1838, 2014.

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- [10] D.J. Bernstein, "ChaCha, a variant of Salsa20.", In Workshop Record of SASC 2008: The State of the Art of Stream Ciphers, 2008.
- [11] Rogaway, P., "Evaluation of some blockcipher modes of operation", Technical Report for Cryptography Research and Evaluation Committees (CRYPTREC), 2011
- [12] F. X. Standaert, G. Piret, and J. J. Quisquater, "Cryptanalysis of block ciphers: a survey," Technical Report, No. CG-2003/2, Universite Catholique de Louvain, 2003.
- [13] Dr. P. Mahajan and A. Sachdeva, "A Study of Encryption Algorithms AES, DES and RSA for Security", Global Journal of Computer Science and Technology Network, Web & Security, vol. 13, no. 15, pp. 15-22, 2013.
- [14] Karthik S, Muruganandam A, "Data Encryption and Decryption by Using Triple DES and Performance Analysis of Crypto System", International Journal of Scientific Engineering and Research, vol. 2, no. 11, pp. 24-31, 2014.
- [15] Saikumar Manku and K. Vasanth, "Blowfish Encryption Algorithm For Information Security", ARPN Journal of Engineering and Applied Sciences, vol. 10, no. 10, pp. 4717-4719, 2015.
- [16] Deepali D. Rane, "Superiority of Twofish over Blowfish", International Journal of scientific research and management, vol. 4, no. 11, pp. 4744-4746, 2016.
- [17] Md. Faheem Mushtaq, S. Jamel, A. Hassan Disina, Zahraddeen A. Pindar, Nur Shafinaz Ahmad Shakir, Mustafa Mat Deris, "A Survey on the Cryptographic Encryption Algorithms", International Journal of Advanced Computer Science and Applications, vol. 8, no. 11, pp. 333-344, 2017.
- [18] Md. Alam Hossain, Md. Biddut Hossain, Md. Shafin Uddin, Shariar Md. Imtiaz, "Performance Analysis of Different Cryptography Algorithms", International Journal of Advanced Research in Computer Science and Software Engineering, vol. 6, no. 3, pp.659-665, 2016
- [19] M. Usman, I. Ahmed, M. Imran Aslam, S. Khan and U. Shah, "SIT: A Lightweight Encryption Algorithm for Secure Internet of Things", International Journal of Advanced Computer Science and Applications, vol. 8, no. 1, pp. 1-10, 2017.
- [20] P. Nandhini and Dr.V. Vanitha, "A Study of Lightweight Cryptographic Algorithms for IoT", International Journal of Innovations & Advancement in Computer Science, vol. 6, no. 1, pp. 26-35, 2017

EFFECTS OF DIGITALIZATION ON BANKING AND FINANCIAL STABILITY**Purnima Kaushik**

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ABSTRACT

The main focus of this paper is to throw light over the fact that how the digitalization has affected the banking system and financial stability. This study explores the effects of digitalization on banking and financial stability and transformation on the nexus between banking concentration and corporate innovation. It also emphasizes over the major challenges faced by the banking sector in the process of digitalization such as cybercrimes and various measures initiated by the government of India to take up the digitalization process like fintech, Digital Banking Units etc. The study was aimed to know how the digitalization of banking services have enabled accessibility of the same to the rural population as well. It is correct to say that the transformative effect of digitalization on banking and financial industry have brought many benefits, but it has also created new risks and challenges for financial stability.

Keywords: Financial stability, financial inclusion, Digitalization, Digital Banking Units (DBUs), cybercrime.

INTRODUCTION

Digitalization is reinventing the ways banking activities were performed in the banks traditionally. The need for digitalization was felt in 1980s. The introduction of Liberalisation, Privatisation and Globalisation policy in 1991 led the Private and International Banks to enter, and the method of digitalization picked up the pace.

ICICI bank was the first to bring the online banking to the retail customers in the 1990s and then the other banks followed the same.

In the year 2000 the government of India enacted the Information Technology Act, 2000 (also known as ITA-2000 or the IT Act) (wikipedia, n.d.) to provide the legal recognition to electronic transactions and other means of electronic commerce. Further developments like Telebanking, Electronic Compensation Services, Electronic Funds Transfer System, MICR (), RTGS (Real Time Gross Settlement) etc. was seen within the banking sector. Various steps and initiatives have been adopted regularly by the Reserve Bank of India (RBI) and National Payment Corporation of India (NPCI) in digitalizing the payments and settlement systems in banks. To talk of a recent such change is the launch of the United Payment Interface (UPI) and Bharat Interface for money (BHIM). This has decreased the need for carrying cash everywhere. The users can make quick digital transactions anywhere and at any time.

Although it makes entire banking process smoother and more efficient, digitalization has some disadvantages too.

1. Being at mercy of computers and the internet for everything. The user can get stuck using the digital method for payment because the internet was not working, or the bank servers were down.
2. It also has some safety concerns Today hackers sitting in any part of the world can hack into any bank server or they can get into your account and steal the money.

But to get secured from these safety concerns, banks today are investing more and more into improving their cyber security, so that all the digital transactions are safe.

Another area going ahead where ease of payment as well as lower cost in cross border transactions can be expected, it is the result of globalisation of technology. Business analytics and Robotics both enabled by an AI, have the potential to bring a serious change. Many private banks have started to deploy robots for various processes. This will enhance the service more and make it easier and cost effective.

Steps for digital transformation on a large scale in India

The digitalization is promoted by the government through promoting fintechs, digital banking system, digital payment system and blockchain etc. The same clear out the significance of digitalization.

1. Digital Banking Units (DBUs) (National portal of India, 2022-2023):

To boost the economy, government has dedicated to set up 75 Digital Banking Units (DBU) in 75 districts by scheduled commercial banks across rural districts in India. A DBU is set up with an objective of providing benefits of digital banking to every state and union territories of the country. It will assist the non tech savvy

population by providing infrastructure (ICT) to access the banking services (opening of savings account/fixed deposit account, balance-check, print passbook, transfer of funds, loan applications, stop-payment instructions for cheques issued, application for credit/debit cards, view statement of account, pay taxes, pay bills, make nominations, etc.) digitally. It will also work in facilitating “Jan Samarth portal” and end-to-end digital processing of small ticket MSME/retail loans.

List of Digital Banking Units (DBUs) -State/UT wise

State/UT	No. of DBUs	State/UT	No. of DBUs
A&N Island (UT)	1	Madhya Pradesh	3
Andhra Pradesh	2	Maharashtra	3
Arunachal Pradesh	1	Manipur	1
Assam	2	Meghalaya	1
Bihar	1	Mizoram	1
Chandigarh (UT)	1	Nagaland	2
Chhattisgarh	2	National Capital Territory of Delhi (UT)	1
Dadra Nagar Haveli Daman and Diu (UT)	1	Odisha	4
Goa	1	Puducherry (UT)	2
Gujarat	3	Punjab	3
Haryana	1	Rajasthan	4
Himachal Pradesh	1	Sikkim	3
Jammu and Kashmir (UT)	2	Tamilnadu	4
Jharkhand	2	Telangana	3
Karnataka	4	Tripura	2
Kerala	3	Uttar Pradesh	4
Ladakh (UT)	1	Uttarakhand	2
Lakshadweep (UT)	1	West Bengal	2
TOTAL= 75			

(BFSI.com, 2022)

2. e₹ (digital Rupee) (Reserve Bank of india, 2022)

The Central Bank issued a digital form of currency notes referred to as e₹ (digital Rupee). The e₹ is an option additional to the currently available money forms, substantially different from banknotes but likely to be easier, cheaper, and faster being digital. The Reserve Bank’s approach towards introduction of digital rupee is governed by two basic considerations:

1. To create a digital rupee which is a close substitute of the paper currency.
2. To manage the process of introduction of digital rupee in a good manner.

3. Core Banking System Across Post Office (Business standard, 2022)

To promote the ongoing digitalization of banking system, all the post offices in India will get connected to the core banking system and enable people to operate their bank accounts online and transfer the money within the post office accounts and to other banks. Currently, India post payment banks provides the services of a savings account and a payment bank. To strengthen the process of digitalization of banking and financial services the post offices (1.5lakhs in number) are now being connected to the core banking system enabling financial inclusion and access to accounts through mobile banking, ATMs, net banking etc. and it will also allow the transfer of funds from the post office accounts to the bank accounts. This will not only facilitate the urban population but will be beneficial for the farmers and senior citizens enabling interoperability and financial inclusion.

4. Continued Support on Digital Payments

There is a continuous support on digital payments with the incentive schemes to promote and boost the digital payments to make it a cashless economy. People are getting benefits in terms of cost savings, better accounting etc. due to the digitalization of payments. The compulsion of carrying cash is now being removed through the option of digital payments. The promotion of online or digital payments can be seen with the launch of UPI (United Payment Interface) and BHIM (Bharat Interface for money).

5. Encouragement for Financial Technology (Fintech)

Fintech or Financial Technology is a new technology followed by the firms to improve and automate the use and delivery of financial services. Fintech includes the developed concepts of AI, blockchain, big data and cloud computing. The emerging fintech requires new approaches towards financial education through new forms of financial literacy to offer a large variety of products and ways to save.

6. Implementation of e-Bill (Public Financial Management System, n.d.)

The e-Bills are the electronic versions of the normal paper bills. The user must register in "Bill Pay" first and the e-bill will be received from the biller into your bill pay account in the same way as we receive the normal paper bill in the mailbox. The user of Bill Pay can access the account balances, transactions, and statement information all at one single place. This is a part of 'Ease of Doing Business (EoDB) and Digital India ecosystem' to bring in broader transparency and speed up payments methods.

Effect of Digitalization on Employment Opportunities

Digitalization on one hand have created new job opportunities in the digital and tech sectors, such as software development, data analysis and cybersecurity. It has also increased the level of work flexibility and improvement of work-life balance and job satisfaction. But on the other hand, it has also led to job displacement and employment opportunities have reduced because digitalization has replicated routine tasks by technology.

The overall effect of digitalization on employment opportunities depends upon the job type and specific industry. It has created several new job opportunities in some areas and in some it has led to job losses and instability.

The Global Effect

The modern and constantly changing technological environment forces all the banking and economic units to undergo the digital transformation. It offers the banking system to offer new service channels through various electronic platforms such as e-banking, virtual banking, and digital payments etc. This technological advancement has not only benefitted the customers of such services but also the producers as well through limiting their operating cost such as cost of having physical stores and staff etc. The banking sector is developing through digitalization and spends three times more money on IT investments than any other industry. (Kitsios, Giatsidis, & kamariotou, 2021)

Digitalization of various sectors is not only changing the society but also affecting the corporate innovation. The companies of different sectors are now adapting the changes due to the pressure of competition and hence is simulating the digital transformation. To support the digitalization some countries have introduced the policies such as 'Digital Strategy 2025' in Germany, 'The Federal Big Data Research and Development Strategic Plan' in United States and 'Outline of Digital Economy Development Strategy' in China. Digitalization has a significant role in the economic growth and sustainable development in the digital era.

METHODOLOGY

For this study, secondary data is taken from various journals, articles and books closely related to the disciplines related to digitalization, banking, financial stability, government initiatives related to digitalization and its effects on the banking system. The present study is envisioned to find out the effects of digitalization on banking and financial stability. The study gives a clear picture about the initiatives that are being taken in the field of digital banking system.

CONCLUSIONS

Due to the technological revolution, the digitalization has become a hot topic in academia. Digitalization has a significant impact on the banking services and finance industry. During the study we concluded that digitalization has both positive and negative effects on financial stability.

- Digitalization has enabled the banks and other financial institutions to automate their operations which will help to reduce the need for manual processing and paper-based transactions resulting in increased efficiency, improved customer experience and reduced operational costs.

- The technological inclusion in the banking sector have made it convenient to the customers to access the banking services through online and mobile channels. This have expanded the financial inclusion and allowed the people of remote areas to access to banking services.
- As discussed in the paper, digitalization allowed new players to enter the financial services market such as fintech companies and peer to peer lending platforms. This revolution has disrupted the traditional banking models and resulted in providing higher satisfaction to the customers.
- The regulators or the regulatory authorities are struggling to keep up with the pace of technological change with the rise in digitalization. There are some regulatory challenges for banks and financial institutions. One of these challenges include the cybersecurity risk. The most common types of such crime are phishing, malware attacks and ransomware attacks. This is also causing a great hindrance in the digitalization of banking sector.

Therefore, the overall transformative effect of digitalization on banking and financial industry have brought many benefits. It has also created new risks and challenges for financial stability. Such risks can be managed through proactive management and ensuring to maintain a strong financial position.

REFERENCES

1. BFSI.com. (2022, 10 19). Retrieved from Economic Times: <https://bfsi.economictimes.indiatimes.com/news/banking/heres-the-list-of-75-dbus-launched-by-23-banks-as-azadi-ka-amrit-mahotsav/94933321>
2. Business standard. (2022). Retrieved from https://www.business-standard.com/budget/article/1-5-lakh-post-offices-in-india-to-be-connected-to-core-banking-system-fm-122020100584_1.html/budget/1-5-lakh-post-offices-in-india-to-be-connected-to-core-banking-system-fm-122020100584_1.html
3. Kitsios, F., Giatsidis, I., & kamariotou, M. (2021). Digital transformation and strategy in the Banking sector: Evaluating the Acceptance Rate of E-Services. *Journal of Open Innovation*.
4. National portal of India. (2022-2023). Retrieved from www.india.gov.in: <https://www.india.gov.in/spotlight/union-budget-fy-2022-2023>
5. Public Financial Management System. (n.d.). Retrieved from <https://pfms.nic.in/NewDefaultHome.aspx>
6. Reserve Bank of india. (2022, 10 7). Retrieved from <https://rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage=&ID=1218>
7. Timel, H. E. (2018). Digitalization in financial services and household finance: fintech, financial literacy and financial stability. 35. Retrieved from <https://ideas.repec.org/a/onb/oenbfs/y2018i35b1.html>
8. wikipedia. (n.d.). Retrieved from wikipedia: https://en.wikipedia.org/wiki/Information_Technology_Act,_2000

PROJECT ASSESSMENT WITH FINANCIAL VALUATION: AN INDICATOR OF INVESTMENT PROFITABILITY

¹Dr. Gaurav Bansal and ²Dr. Neeraj Sanghi¹Professor, ABES Business School, Ghaziabad²Professor, I.T.S School of Management, Ghaziabad**ABSTRACT**

The purpose of this piece of writing is to outline various cost-benefit financial evaluation methods for use in project evaluation with regard to private capital investment projects with the inclusion of improbability and risk allowance factors in formative the net expected financial return from a given capital investment project. Two factor allowances for uncertainty have been used: -

The first deals with uncertain future benefit, cost flows and utilizes linear approximations for non-linear continuous function of random variables using the inverse-transformation practice and the invariance method of maximum likelihood judgment.

The second is a von-Neumann covariance risk factor calculating for the project's external environment.

Results yield two general indicators of significant use in project evaluation: value and net value-added, the former being a pointer of project feasibility while the latter an indicator for investment profitability.

Keywords: Project evaluation, financial tools and techniques, Market uncertainty and risk, Value-added approach

1. INTRODUCTION**Project Appraisal and Feasibility Modeling - Scope and Function**

A project is the investment of human, material and capital resources that will provide a specific amount of goods and services to a society, and that will actively contribute to the development process in an economy. Projects vary in size, objective, scope, and outcomes. One project may be an investment of a health clinic in a small rural community, while another may be in a power plant that will provide electrical generation to an entire region or a city.

Regardless of size, projects must be identified as either development projects or investment projects. Development projects are usually financed and implemented by national authorities and directly deal with community development, raising the standard of living of poor areas, establishing infrastructure, and providing a pre-determined social value-added outcome to the community. Investment projects, on the other hand, are designed and implemented by private investors and firms acting to maximize their capital return while conforming to physical and social environmental standards in the region of project implementation. In the past, socialist economies have substantially engaged in development projects, while capitalistic economies tended to concentrate on private investments for development.

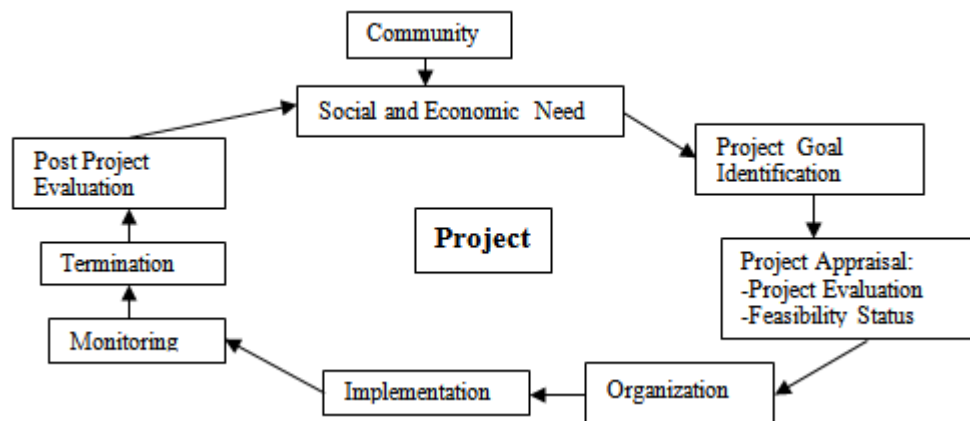
Although the scope of this paper is in investment projects and their appraisal, it is arguable to conclude that both development and investment projects require the same appraisal techniques in arriving at their ultimate feasibility status. However, it is best to take the conservative side and define project appraisal within the scope of investment projects:

Project appraisal (or feasibility modeling) is an assessment of the expected net capital return from the given investment, with the objective of maximizing profitability, minimizing risks and conforming to standards within the project's physical, social and institutional environments. It is thus a single stage within the project's total life cycle.

The Project Cycle

Figure 1 depicts the different stages in the life cycle of a project. The first stage in the project's life is its own identification. Social, economic and financial needs of the community determine what project to investigate and what ideas to implement. Demand for the project's outputs and availability of required inputs are essential to project survival. Consequently, the project identification phase deals with the identification of the needed inputs, outputs, outcomes and overall goals and objectives of the societal need under hand. At this point in the project's life cycle, different alternatives or combination of alternatives have to be identified, in order to proceed to the next stage of project appraisal.

Figure 1: The Project Cycle



Project appraisal is the process by which each alternative is assessed from financial, environmental and social perspectives. This stage is notably a critical phase within the project’s cycle since it yields the ultimate feasibility status of the project. Different indicators of relevance to the project’s implementation site should be designed and evaluated, and corresponding constrains established. Maximization of investment capital return within the specified constrains have to be achieved, arriving at project feasibility or infeasibility.

If the project is determined to be feasible in the project appraisal stage, then project organization proceeds. This stage involves organization of the needed facilities, design of work plans and budgets, establishment of technical manuals, construction of needed buildings, acquisition of equipment, and other pertinent activities required prior to project implementation.

Implementation and monitoring then begins. Project control systems, project information systems, project management, employee and technical training, and operation of specific project activities, is actively done at this stage of the project’s life cycle. When effective demand for the project’s output ceases to exist, or when available resources critical to the project’s survival have been fully depleted, termination of the project is done.

Beyond project termination is the stage of post-project evaluation. In this stage, results and achievements of the project are evaluated and compared with the project’s originally intended goals and objectives. Discrepancies are identified and causes of these discrepancies fully analyzed. Surprises that were not allocated in the project appraisal phase and the resulting risks involved are highlighted, in addition to any relevant information and important lessons of experience. In that sense, the project cycle is a learning process in which lessons from the evaluation of completed projects are fed back into the evaluation process of new projects in the future.

A demand for a new or innovative product or the finding of a new resource base stimulates a social and economic need within the development cycle of the community. It is here where society demands again, and investment capital supplies again, the endless needs of human kind.

Decision Criteria

Decision criteria for project appraisal and feasibility should incorporate the total environment surrounding the project or investment under study. Financial evaluation techniques, including money worth indicators, rate of return indicators, payback indicators, and accounting indicators, should be analyzed for the project under hand. Environmental impact assessment and different constrains imposed by national and international environmental quality standards have to be assessed and incorporated into the decision criteria. Social and cultural values, religious and ethical issues, political power, and institutional structure of the community in which the project is going to be implemented, have to be studied in sufficient detail and relevant socio-institutional indicators evaluated.

Maximization of capital investment return should then be made within the constraints imposed by the project’s total physical and social environments. A feasibility model must then be formulated, solved, and interpreted, with quantitative and qualitative descriptors receiving equal weight in the decision process.

2. FINANCIAL EVALUATION

Introduction

Capital investments lead to the growth and prosperity of an economy through possible innovations, employment, profitability and indeed, development. Investments create a better living standard and higher social welfare for the nation as a whole. Financial evaluation is a major player in investment appraisal and

project feasibility, and it is here that it plays an important role in the general profitability level of the economy, and hence its level of development.

Financial evaluation is a tool that predicts the profitability outcomes and net commercial gains expected from engaging in a given project, and is therefore a critical factor in the decision-making of the feasibility status of that project. Different financial evaluation techniques are available to achieve this task, and they can be applied to virtually any project or group of projects.

A typical sequence in financial project appraisal involves defining the project for consideration along with its main aims and objectives, establishment of the project planning horizon and annual discount rate, estimation of the annual cash flow profile of expected benefits, costs, and re-investments, and the application of financial evaluation techniques to the estimated cash flow, leading to financial and profitability indicators of the project under study. These indicators are then evaluated based on their own criteria or against a pre-specified norm, leading to the final decision of project feasibility or infeasibility.

There are many, and maybe endless, financial evaluation techniques currently available in evaluating project feasibility. Most of them fall very neatly into one of the following four categories:

1. Money Worth Indicators
2. Rate of Return Indicators
3. Payback Indicators, and
4. Accounting Indicators.

Money Worth Indicators

Money worth indicators are financial evaluation techniques which give an estimate of the money worth of the project either now, annually, sometime in the future, or on an indefinite basis. The present value criterion, annual worth, future worth and capitalized worth are the core money worth indicators that represent these evaluation techniques, respectively.

Present Value

The present value is by far the most common criterion in evaluating projects from the financial cash flow viewpoint. It measures the net gain of the project over its life in a single figure, based on the discount rate used. If

B_t are the estimated benefits of the project for year t , and if C_t are the estimated costs for the same year t , then the present value of the project over n years can be found by the original capital investment.

A positive value represents an expected net gain and project feasibility, whereas a negative value represents an expected net loss and assumes the project to be infeasible. The discount rate, r , can change from year to year and thus affects the present value considerably. Some funds may be scarce this year and others abundant in subsequent years, leading to different rates of discount per year over the life of the project, n .

When calculating the net present value of the project, inflation can be eliminated from consideration, if the expected inflation rates for all benefits, costs and capital are expected to be the same. If, however, inflation rates are expected to differ between benefits, costs and capital, then they must be explicitly included in the calculation of the present value. Given f_b , f_c , and f_k to be the expected inflation rates for benefits, costs and capital, respectively, then the present value equation above can be re-written to account for the effect of inflation divergence,

This must be used if there is important divergence in expected inflation rates between benefits, costs and capital. Otherwise, the inflation factors in the equation should be omitted, arriving at the initial equation for calculating the net present value of the project.

Annual Worth

The annual worth of a project yields the net annual cash amount produced by the project's activities and involves either the conversion of net benefits to their equivalent annual amounts, or equivalently, the conversion of the net present value into an annual worth by use of a "capital recovery" factor:

$$AW = (PV) (C_r)$$

Where, C_r is the capital recovery factor and is determined by:

$$Cr = \{r (1+r)^n / (1+r)^n\} - 1$$

Positive annual worth simply imply differing degrees of project feasibility. Annual worth figures tend to be more easily understood by operating personnel since they represent annual earnings and losses of the project, relative to the alternative of not investing at all.

Future Worth

Future worth measures the future value of the project in money terms of the future. It includes the time value of net benefits discounted further to the future, rather than discounting using the present value criterion. It can therefore be calculated solely on the basis of the present value and the discount rate:

$$FW = (PV) (1+r)^n$$

The future worth, FW, can be seen as the equivalent cash amount of the project's net benefits that have accumulated over its entire horizon of operation, to be given to the investor at the project's end year, n. Thus, it is a measure of the net future value of the project. A positive FW value implies project feasibility.

Capitalized Worth

The capitalized worth method is itself the annual worth method evaluated over an indefinite time period. It can easily be calculated based on the present value by applying the following equation:

$$CW = (PV) / (r)$$

The capitalized worth is the equivalent of giving to the investor an equal annual amount of CW, indefinitely.

Consequently, positive CW's imply varying degrees of project feasibility.

Rate of Return Indicators

Rate of return indicators are financial indicators based on an implied interest rate for the project over its entire life span. The interest yield is calculated based on an assumed model, and then compared with the market interest rate to determine project feasibility. Internal, external and growth rate of return methods are three different indicators of project yield.

Internal Rate of Return

Cost streams in the internal rate of return equation do not include depreciation or accrued interest costs, since the internal rate is itself derived as the net interest yield of the project. The internal rate of return can be described as the discount rate at which the present worth of the project's benefits equals that of its costs. It is also the discount rate at which the present worth of the project is zero.

The great advantage of the internal rate of return lies in the fact that it can be calculated on the basis of perceived benefit and cost data for the project alone, without any consideration for the opportunity cost of capital or other external variables. Its major drawback, though, is that there can be multiple solutions for its value for the exact same project. This occurs if the time profile of net benefits crosses zero more than once. Examples of such projects can be cases in which major items of equipment must be replaced every couple of years. In these cases, the internal rate of return method will yield multiple values and will not act as an efficient cash flow indicator.

In evaluating project feasibility, all projects with an internal rate of return higher than the market interest rate are considered feasible. Business managers tend to favor this method because it translates the cash flow of the project into a single internal profitability rate and compares this rate with the available opportunity cost of capital.

It should be noted here that there is absolutely no difference between the present value criterion and the internal rate of return criterion in evaluating project feasibility, so long as the present value always increases as the discount rate is raised.

External Rate of Return

In contrast to the internal rate, the external rate of return method assumes that all cash flows are re-invested at an external rate comparable to that of the prevailing market interest rate. It therefore calculates an interest yield for which the future worth of the initial capital investment equals the future worth of the projected cash flows based on the market interest rate

External rate of return is therefore a measure of the minimum guaranteed return on the capital investment of the project, and consequently is a more conservative approach in evaluating project feasibility than the internal rate of return method. A project is feasible if the calculated external rate exceeds the market interest rate.

Growth Rate of Return

The growth rate of return method determines how fast must the investment grow in order to equal a desired cash flow at a specified future time. To apply this method, two calculations have to be made based on a specified point in time during the project's life. We shall refer to this point in time as a targeted year t_t .

The first calculation represents the present discounted value of all negative cash flows before the targeted year, in addition to the value of the initial capital investment.

Payback Indicators

Payback indicators represent the amount of time required for the initial capital investment to be amortized. They are simple to use and much easier to calculate than the rate of return methods. In addition, they give the investor more insight as to the amount of time required in order for the project to pay for itself and achieve a break-even situation. Conventional payback, discounted payback and project balance are three payback indicators that achieve that purpose.

Payback Period

Payback or break-even period can be defined as the time-frame required for the value of the initial capital investment to be fully recovered, based on the forecasted net benefits of the project's operation. Initial capital investment required for the project, excluding expected future re-investments over the life of the project. Re-investments are treated as future costs for the purpose of payback calculations and are not included in the value of I . Annual benefits and costs over the life of the project are not discounted back using a discount rate, but are rather treated in absolute terms of their expected value.

The payback period is denoted by p in Equation 2.10 above, and thus is a single indicator with units of time, usually expressed in years. It can be set against a predetermined norm or against that of competing projects, to arrive at project feasibility or infeasibility.

The major drawbacks in the payback method are two-fold: that it does not take into account the time value of money, and that it does not have a definite set criterion in arriving at project feasibility. To account for one of those drawbacks, a variant of the payback period has been developed, the discounted payback method, which takes into account of the time value of money.

Discounted Payback Period

In this method, all benefits and costs are discounted back using a discount rate, r , and the total investment including discounted future re-investments, are assumed to be subject to amortization. The discounted payback period, p_d , is calculated based on the following revised

Project Balance

The project balance calculates the cumulative future value of the project at every year of the project's life. At the end of the n^{th} year, project balance equals the future worth of the project. Usually, project balance is represented graphically with cumulative cash balances represented on the y-axis and years of operation on the x-axis.

This is because the project balance treats re-investments as future costs, while the discounted payback method discounts them back with the initial capital investment. While project balance may be treated as a project analysis tool more than being a feasibility criterion, it can also be used as such. A positive cumulative project balance at the n^{th} year implies that the project is "feasible".

Accounting Indicators

Accounting indicators are primarily book methods in assessing project feasibility and are based on balance sheet and income statement accounts, in addition to depreciation allowances, to arrive at the profitability level of the project. However, they can be directly derived from the cash flow profile of the project alone. Numerous financial evaluation methods are classified as accounting indicators, with premium, profit margin, return on investment, and book accounting methods only derived here.

Premium

A P_r value greater than the market interest rate implies project feasibility. The premium method should not be mistakenly assumed to yield the same feasibility status as the present worth method. Premium is merely a ratio of present worth to initial capital investment, whereas the present worth itself is calculated and reported in absolute money terms.

Profit Margin

Profit margin is extensively used in accounting statements and is customarily represented as an important financial evaluation indicator for a given project or investment. Profit margin, P_m , is the ratio between total

undiscounted net benefits to the initial capital investment, and is therefore a direct variant of the premium method. It is found by the following equation:

$$P_m = \sum_{t=1}^n (B_t - C_t)$$

$$P_m = \sum_{t=1}^n \frac{B_t - C_t}{(1+i)^t}$$

Profit margins are usually compared with the prevailing market interest rate, with a greater profit margin implying feasibility, or more correctly expressed, profitability.

Return on Investment

Return on investment is an accounting technique that uses the ratio between average yearly profit and average-year investment to arrive at its criteria for evaluation. The average yearly profit is the average undiscounted net benefits over the life of the project,

Book Accounting

Book accounting is a year-by-year accounting rate of return method used in evaluating yearly accounting returns over the life of the project. It is merely an annual rate method which utilizes annual profit and yearly book values in arriving at the project's yearly returns.

There are therefore n number of a_t's for a single project. Whether the goal of the project is to maximize end-year or first-year return, the book accounting method determines year-by-year returns over the entire life of the project, and is therefore a very useful tool in analyzing yearly profitability rates.

Comparison and Summary of Financial Project Evaluation Techniques

Different financial project evaluation techniques have been outlined in the previous sections, and all have been used to identify the feasibility or profitability status of a given project. As a comparison of the different methods used, the following quick highlights provide a very brief summary:

1. Money worth indicators have shown to yield a better estimation of determining project feasibility (versus rate of return, payback and accounting indicators) for a variety of reasons. First, all money worth indicators include time value of money into their calculations and all are easy to compute. Second, all imply and yield specified decision criteria for feasibility. Third, they all indicate the net expected gain from the given project using a certain discounting technique.
2. Of the money worth indicators, present value is seen as the best indicative money metric indicator of project feasibility since all other money worth indicators are derived from it.
3. The internal rate of return yields the same feasibility outcome as does the present value, but the greatest caution in its use stems out of the fact that it can lead to multiple solutions for the exact same project.
4. Payback indicators should be utilized to give a general indication of project payback time, which can be compared with an industry standard or investment norm to arrive at a general level of financial desirability for the given project. However, payback indicators should not be solely utilized in determining feasibility.
5. Accounting indicators yield an indication of the general profitability level of the given project, and should be utilized accordingly. They are not recommended to be used as a decision criteria for project feasibility.
6. External rate of return gives the most conservative perceived interest yield for a given project, among all evaluation methods studied, whereas the growth rate of return is the most „aggressive“.
7. Of the „non money-worth“ financial evaluation methods studied, the internal rate of return is the only indicator found to yield identical results to the present value criterion. On the other hand, all money worth indicators have been found to be identical to each other in determining feasibility.
8. Project balance yields the same feasibility outcome as does the future worth method (and therefore, present value) only at the end year of the project. Otherwise, it only gives a year by year analysis of net project payback gain.
9. Return on investment, payback, discounted payback, and book accounting indicators do not have a set criteria in determining project feasibility. However, these indicators can be used in comparing different project alternatives. Larger values or percentages imply more economic desirability for a certain project alternative over another.

From the above highlights, it is concluded that the discounted present value criterion is the backbone of almost all financial evaluation techniques, and is the most indicative measure of financial project feasibility. A positive net present value implies feasibility, whereas a negative value concludes the project to be financially infeasible.

Uncertainty Analysis in Financial Project Evaluation - a Brief Exposure

A dramatic simplification in any financial analysis occurs if the investment or project is assessed with an assumption of absolute certainty. As a matter of factual reality, many uncertainties do exist in real life applications, and these uncertainties and risks should be taken into account in the financial evaluation process. Project appraisal is no exception.

It should be taken for granted that estimates of future benefits and costs are inevitably subject to a fairly wide margin of error. This is because most costs and benefits are subject to uncertain outcomes over the future life of the project, in addition to which they are themselves virtual estimates. Expected demand, price forecasts, raw material costs, and almost all other benefit and cost items cannot be estimated with 100% certainty. Therefore, each benefit and cost item must be evaluated based on its own expected value, which in turn is based on a weighted probability distribution. These expected values are then integrated together over the life of the project to arrive at the expected value of the project.

In this discussion, the discounted present value will be used as the basis for uncertainty analysis because it is the most common and most reliable financial indicator of project feasibility, in addition to it producing the same feasibility status as the internal rate of return method.

There are the imputed probabilities assigned to each value outcome for every benefit and cost item in the present value calculation. These imputed probabilities are assigned by the project evaluator through past experience, statistical data, and/or value judgment. If the cost of a raw material for a given year is expected to be \$20 with 10% probability, \$30 with 50% probability and \$40 with 40% probability, then the expected value of this cost item can be computed as:

$$\square w_i C_i = (\$20)(.1) + (\$30)(.5) + (\$40)(.4) = \$33$$

i

The same approach can be applied for every other cost and benefit item and the expected present value for the project is calculated accordingly. However, this calculation can be done only if all possible outcomes are discrete with corresponding discrete probabilities.

Instead of assigning discrete weights to each probable value to get the expected value of the outcome, models of continuous probability distributions can be used to arrive at the mean value of that outcome, using mathematical expectations and statistical analysis (see Reutlinger 1984). Normal and beta distributions are commonly used to achieve this task. Other distributions are the chi-square, uniform, gamma and the exponential probability distributions (see Fraser 1976, Fabrycky 1984, and Freund 1992).

It is the responsibility of the project evaluator to determine which probability distribution is most appropriate for the specific item at hand. This process involves a lot of statistical theory and inference and is beyond the scope of this paper (for more complicated models, see Aulin-Ahmavaraa 1990, De Neufville 1990, Lakshminarayan 1996). It will be assumed in the following discussion that all cost and benefit items are subject to normal probability distributions in calculating the expected present value of the project.

The normal probability distribution has a symmetrical and bell-curved shape. When a cost or benefit item falls under a normal distribution,

After adjusting for internal uncertainties within the benefit and cost items of the project, an allowance for an external risk factor has to be assessed for the project as a whole. This is because any project or investment implemented in a given country is subject to a variety of external shocks, since the country's economy itself is subject to several external shocks. It is therefore logical to believe that external shocks will inevitably hit the whole macro-economy first, and then be transduced to the micro-level project via a correlation coefficient between the project and the national economy (Pouliquen 1970).

The introduction of a risk factor allowance should therefore include the level of utility for the individual investor and the level of utility for the whole national economy. Since the objective of private capital investors is to maximize their expected utility, then net discounted benefits (net present value) will suffice to be an increasing indicator of the investor's individual utility function, assuming that the investor's profit maximization is consistent with his cardinal utility maximization. This is in accordance with von Neumann and

Morgenstern's cardinal utility theory. The risk averter (conservative) investor will have a utility function which increases at a decreasing rate, with expected utility a decreasing function of net present value variance. On the other hand, a risk gambler (taker) will have a utility function which increases at an increasing rate, and hence his expected utility is an increasing function of net present value variance. Both will seemingly have an increasing utility function with net expected profit (present value).

Risk factor allowance should therefore incorporate a correlation coefficient between the individual investor and the national economy, designated by the individual investor's profit maximization function and the expected utility function of national income.

The expected present value with allowances for uncertainty and risk achieved this purpose.

Value and Net Value-Added

Using these optimum solutions, two general indicators of project feasibility will be introduced: project value, and net project value-added.

Project value is seen as the maximum value of outcomes that can be achieved in accordance with the total planned output from the project. In development projects, social impact analysis must be used to quantify social development up-grades that are planned to occur in response to the project's activities over its time-horizon.

For private investment projects, however, project value should be seen from the eyes of the investor alone, and can therefore be considered as the maximum net financial value that could be achieved when engaging in the given project, subject to penalties stemming out of non-conformance to environmental standards and to external uncertainties. value is thus a general feasibility indicator in project appraisal and describes how much real net

CONCLUSION

Among the different financial evaluation techniques used in project appraisal, it is concluded that the discounted present worth and internal rate of return yield the most accurate results in determining the feasibility status of a given project or investment. They also have been found to yield the same feasibility outcome. Expected present value was determined to produce a better estimate of financial feasibility only after accounting for two uncertainty allowances: one dealing with uncertain future benefit and cost streams, and the second dealing with the project's external risk environment and its correlation with national income or intended industry/market to be supplied.

Two indicators have been introduced and designed to yield a general assessment of the feasibility and profitability status of a given project or investment. Project value has been concluded to be the main indicator in assessing overall project feasibility, while net value-added has been concluded to be an effectiveness indicator of netproject profitability outcomes.

In general, evaluating a project using a multi-criteria assessment technique which incorporates uncertainty and risk factor allowances is believed to yield a better estimation of the project's net expected value to the investor, and also produces a more accurate picture of the project's total environment, along with the risks, uncertainties, and constraints surrounding it.

REFERENCES

- Adkins, W. and D. Burke, D. (2009). Social, Economic and Environmental Factors in Highway Decision-Making. Texas Transportation Institute, College Station.
- Aulin, A. (2022). Foundations of Economic Development. Springer-Verlag, Berlin.
- Aulin, A. (2019). Foundations of Mathematical System Dynamics. Pergamon Press, Oxford.
- Aulin-Ahmavaraa, P. (2019). A Complete Dynamic Input-Output Model including the Production of Human Capital and Labor. Economic Systems Research vol. 1.
- Aulin-Ahmavaraa, P. (2020). Dynamic Input-Output and Time. Economic Systems Research, vol. 2.
- Beenhakker, H. (2016). Investment Decision Making in the Private and Public Sectors. Quorum, Connecticut, 2013
- Bell, C. (2012). Project Evaluation in Regional Perspective. World Bank Research Publications. Johns Hopkins University Press, Baltimore.
- Brooke, M. (2020). Handbook of International Financial Management. Macmillan, Hants (England).

-
-
- Burkey, S. (2023). People First: A Guide to Self-Reliant Participatory Rural Development, Zed Books, London. Cusworth, J.W. and T. R. Franks (2023). Managing Projects in Developing Countries. Longman UK.
 - Dasgupta, P. (2022). Guidelines for Project Evaluation. UNIDO, Vienna.
 - De Neufville, R. (2020). Applied Systems Analysis: Engineering Planning and Technology Management. McGraw-Hill, New York.
 - Fabrycky, W. (2014). Applied Operations Research and Management Science. Prentice-Hall, New Jersey.
 - Fraser, D., (2016). Probability and Statistics: Theory and Applications. Duxbury Press, Massachusetts.
 - Freund, J. (2022). Mathematical Statistics. Prentice-Hall, New Jersey.

NET PROFIT AND OPERATING PROFIT: THE KEY OF PROFITABILITY MEASUREMENT**¹Dr. Neeraj Sanghi and ²Dr. Gaurav Bansal**¹Professor, I.T.S School of Management, Ghaziabad²Professor, ABES Business School, Ghaziabad**ABSTRACT**

The paper covers the most commonly used parameters of profitability net profit and operating profit. The key aim of this study is to investigate relationship between the net profit and operating profit for the firms. The imperial study is conducted to have a description of operating profit and net profit. Various studies have been conducted which not only define the key profitability terms but also discuss various ways to estimate them. Here is an attempt to study relationship between net profit and operating profit.

Keywords: Profitability Measurements, Operating Profits, EBIT, Net Profits, Total Comprehensive Income, Net Earnings, Net Profit, Bottom Line, Net Income

1. INTRODUCTION

In the present scenario businesses are operating in a uncertain environment and thus organization are more focused on profitability aspects. The success parameter of the organization as well as the strategic managerial decisions made by the top management are evaluated in terms of profit earning capacity. Earning capacity or profitability of the organization is established based on two key parameters i.e, operating profit and net profit.

At present where the organizations are operating in order to survive in a dynamic and unstable environment, they are highly focusing on their profits. Even the quality and efficiency of managers depend on their ability to identify the elements that can lead to increased profitability (Alarussi & Alhaderi, 2018) [1]. In general, profitability is defined as the earnings of a company that are generated from revenue after deducting all expenses incurred during a given period (Alarussi & Alhaderi, 2018) [1]. According to Bekmezci (2015), it is one of the most important factors that are signal management's success, shareholders' satisfaction, attraction for investors and the company's sustainability (Alarussi & Alhaderi, 2018) [1]. Undoubtedly, the ultimate goal of any firm is to maximize the wealth of its shareholders by increasing the value of its stocks (Alarussi & Alhaderi, 2018) [1]. Thus, it is important to have an insight in measurements of profitability. From all the measurements since operating profit and net profit are the commonly used measurements, it is aimed to find what they are and the relationship between them.

2. OBJECTIVE OF STUDY

This paper explains the conceptual aspect of net profit and operating profit as per existing literature through bibliographical study. This paper also explains the relationship between net profit and operating profit for an accounting period.

3. METHODOLOGY

In order to achieve the above-mentioned research objectives of the study, a comprehensive literature survey was conducted incorporating desk research strategy in addition to the rational thinking of the author and observations. A countless of literature related to theory and practices of Operating Profit and Net Profit is available in various publications and conferences. The author searched for the articles related to Operating Profit and Net Profit using the search criteria, the author has used the five main terms related to Operating Profit and Net Profit: "Profitability measurements", "Operating profits", "Earnings Before Interests and Taxes", "Net profits", "Net Income". The search criteria were decided in a way where the research topic is covered or addressed.

4. LITERATURE REVIEW**4.1. Operating Profit**

In general, operating profit is also known as Earnings Before Interests and Taxes (EBIT). In other words, the profit calculated by excluding the interest expenses incurred for financing and the taxes paid to the government. In order to calculate operating profit, only operating expenses, which are the expense a business incurs through its normal business operations, are subtracted from gross profit. Thus, the mainly when evaluating the operating profits, the literature review will be woven around gross profit, operating expenses and finally operating profit.

Many merchandisers are juggling inventories in response to the forces affecting product pricing, cost of goods sold, volumes, and shifting product mix (Edwards, 2016) [2]. That is, gross profits are needed to support operating expenses, income taxes, and net earnings (Edwards, 2016) [2]. In some businesses, the right

combination of prices, product costs, and availabilities at the right moment is becoming ever more elusive (Edwards, 2016) [2]. This usually results in under- or overstocking; thereby, creating unrecoverable costs and/or lost opportunity costs that erode earnings (Edwards, 2016) [2]. Practitioners in recent years have devoted increasing attention to gross profit as a signal of future profitability, particularly for firms whose expansion activities temporarily depress earnings (Chiu & Haight, 2014) [3]. Given the potential for gross profit surprises to provide information about future profitability that may not be fully captured by bottom-line earnings surprises, we are naturally interested in testing whether investors incorporate such information into stock prices in a complete and timely manner (Chiu & Haight, 2014) [3]. As gross profit purges earnings of nonrecurring items (e.g., special items) and recurring items that may not persist at their current levels (e.g., advertising expense to increase product awareness), future returns stemming from earnings surprises are likely to capture a sizeable component related to information in gross profit surprises (Chiu & Haight, 2014) [3]. Furthermore, the matching of cost of sales to revenues (as captured by gross profit) likely provides a more reliable signal about the sustainability of earnings growth relative to the signal provided by revenue in isolation since the matching process implicitly reveals the maximum potential “return” on sales to investors (Chiu & Haight, 2014) [3].

Also, the operating expenses are usually abbreviated as OPEX. Operating expenses are typically a major business expenditure and are generally allocated to different divisions in proportion to the business revenues (Cepeda, 2002) [4]. Allocation of the operating expenses is a significant challenge since such an allocation must be done fairly and equitably to evaluate the performance of the business division objectively (Cepeda, 2002) [4]. A Cost Allocation Management System (CAMS) allocates operating expenses to the deal activity for a business entity (Cepeda, 2002) [4] was introduced as a solution for the above problem. This is due to the understood value of the operating expenses. Regarding the operating expenses, the total cost can be separated into operating cost and other expenses (including taxes, depreciation etc.) (Said & Tumin, 2011) [5]. Arbitrary allocation also occurs in the calculation of operating expenses both in selling and marketing expenses and in general and administrative expenses (Dermawan & Indrajathi, 2017) [6]. Related to the immediate recognition as advertising expenses and research & development expenses also affect the quality of earnings (Dermawan & Indrajathi, 2017) [6]. The influence of operating expenses... has resulted as significant in 9 years and 7 years, respectively during 10 years period between 1991-92 and 2000-01 (Bodla & Verma, 2006) [7], which justifies my argument made above as it is a valuable variable. In the same article of “Determinants of Profitability of Banks in India: A Multivariate Analysis”, Operating Expenses is another variable found having negative impact on profitability of banks in India (Bodla & Verma, 2006) [7]. Operating Expenses comprise, among other wages expenses and non-wages expenses such as rent, taxes and lighting, advertisement, directors fees and allowances and legal charges (Bodla & Verma, 2006) [7]. The term “operating expenses” when used includes general expenses and commissions for the ordinary line of business, excluded are taxes, expenses of investment operations and benefit payments (Pritchett, 1973) [8].

As every definition found in the literature there is always the term of taxes. Hereinafter, the literature review is all about the “tax” as defined in literature available. In “Global organizations and taxes: An analysis of the dividend, interest, royalty, and management fee payments between U.S. multinationals’ foreign affiliates” examine the effects of taxes on cross-border dividend, interest, royalty, and management fee payments (Collins & Shackelford, 1997) [9]. Through that, they have examined how taxes affect the location of the supplier and the terms of the contracts for the provision of equity and intangible capital within the worldwide organization (Collins & Shackelford, 1997) [9]. The concept of “tax expenditures” holds that certain provisions of the tax laws are not really tax provisions, but are actually government spending programs disguised in tax language (Thuronyi, 1988) [10]. In some cases, repealed tax expenditures could be replaced by direct subsidy programs that would furnish government assistance more effectively, while in other cases, federal assistance could be eliminated entirely (Thuronyi, 1988) [10]. Surrey defines tax expenditures as departures from a “normative income tax,” and his normative tax starts with the Haig-Simons definition of income (or “economic income”): an individual’s consumption plus the change in her net worth over a given period (Thuronyi, 1988) [10]. These are the evidences that taxes are inevitable, only will be zero if there will be a zero income, and that taxes should be taken into consideration in decision making and evaluating the financial statement.

Interest expense relates to the cost of borrowing money (Wikimedia Foundation, 2020) [11]. It is the price that a lender charges a borrower for the use of the lender’s money (Wikimedia Foundation, 2020) [11]. On the income statement, interest expense can represent the cost of borrowing money from banks, bond investors, and other sources (Wikimedia Foundation, 2020) [11]. Also, the same can be defined as, interest expense is a non-operating expense shown on the income statement which represents interest payable on any borrowings ? bonds, loans, convertible debt or lines of credit (Kagan, Investopedia, 2020) [12]. It is essentially calculated as the interest rate times the outstanding principal amount of the debt (Kagan, Investopedia, 2020) [12]. An interest

expense is an accounting item that is incurred due to servicing debt. Interest expenses are often given favorable tax treatment (Kagan, Investopedia, 2020) [12]. For companies, the greater the interest expense the greater the potential impact on profitability. Coverage ratios can be used to dig deeper (Kagan, Investopedia, 2020) [12].

Operating profit is highly used by the managers in decision making as it reflects the revenue and expenses that they can control. The company's performance can be seen from the operating profit (OP) (Dermawan & Indrajathi, 2017) [6]. Edwards and Bell [1961], and many others after them, have advocated a breakdown of current value income into two main components: current operating profit (defined as the excess of current revenue over the current replacement cost of services used in producing the revenue) and the remainder, realizable holding gain (or realizable cost savings) (Prakash & Sunder, 1979) [13]. This indicates the value of calculating of operating profit when evaluating a business organization. The business profit concept requires that operating profit be carefully distinguished from gains resulting from holding activities [Edwards and Bell, 1961, p. 226] (Prakash & Sunder, 1979) [13]. However, if, for speculative reasons, labor costs are incurred earlier or later than what is dictated by operating considerations, the related holding gains should also be excluded from the operating profits (Prakash & Sunder, 1979) [13]. The optimal operating profit increases with the reserve capacity until the latter exceeds a certain value (Cao, Liu, Koh, & Smith, 2020) [14]. Operating profit takes the profitability metric a step farther to include all operating expenses, including those included in the gross profit calculation (Kagan, Investopedia, 2020) [12]. As a result, operating profit is all of the profit generated except for interest on debt, taxes, and any one-off items, such as a sale of an asset (Kagan, Investopedia, 2020) [12]. This is why operating income is also referred to as earnings before interest and taxes (EBIT) (Kagan, Investopedia, 2020) [12]. Operating profit represents the earnings power of a company with regard to revenues generated from ongoing operations (Kagan, Investopedia, 2020) [12].

4.2. Net Profit

In business and accounting, net income (also total comprehensive income, net earnings, net profit, bottom line, sales profit, or credit sales) is an entity's income minus cost of goods sold, expenses, depreciation and amortization, interest, and taxes for an accounting period (Wikimedia Foundation, 2020) [15]. Net income, also called net profit, reflects the amount of revenue that remains after accounting for all expenses and income in a period (Kagan, Investopedia, 2020) [12]. Net income is the last line and sits at the bottom of the income statement (Kagan, Investopedia, 2020) [12]. As a result, it's often referred to as a company's "bottom line" number. Net profitability is an important indicator for ecommerce and retail businesses to measure, since increases in revenue don't always translate to increased profitability (Glew, n.d.) [16]. Net profit tells you your true bottom line, how much money you're actually left with at the end of the day (Glew, n.d.) [16].

Net income can be distributed among holders of common stock as a dividend or held by the firm as an addition to retained earnings (Wikimedia Foundation, 2020) [15]. As profit and earnings are used synonymously for income (also depending on UK and US usage), net earnings and net profit are commonly found as synonyms for net income (Wikimedia Foundation, 2020) [15]. Often, the term income is substituted for net income, yet this is not preferred due to the possible ambiguity (Wikimedia Foundation, 2020) [15]. Net income is informally called the bottom line because it is typically found on the last line of a company's income statement (a related term is top line, meaning revenue, which forms the first line of the account statement) (Wikimedia Foundation, 2020) [15]. In simplistic terms, net profit is the money left over after paying all the expenses of an endeavor (Wikimedia Foundation, 2020) [15]. In practice this can get very complex in large organizations (Wikimedia Foundation, 2020) [15]. The bookkeeper or accountant must itemize and allocate revenues and expenses properly to the specific working scope and context in which the term is applied. Net income is usually calculated per annum, for each fiscal year (Wikimedia Foundation, 2020) [15]. The items deducted will typically include tax expense, financing expense (interest expense), and minority interest (Wikimedia Foundation, 2020) [15]. Likewise, preferred stock dividends will be subtracted too, though they are not an expense (Wikimedia Foundation, 2020) [15]. Net income can also be calculated by adding a company's operating income to non-operating income and then subtracting off taxes (Wikimedia Foundation, 2020) [15]. The net profit margin percentage is a related ratio where this figure is calculated by dividing net profit by revenue or turnover, and it represents profitability, as a percentage (Wikimedia Foundation, 2020) [15].

Here let us review how some different organizations are recording net profits as few examples. Merchandising is one of the most common businesses. We recognize the profit at the time when selling, is performed (Myers, 1959) [17]. Two reasons commonly are given for recognizing profit at this time: 1) an asset has been transferred for a valid claim (transfer); 2) the merchant's opinion as to value is not needed (objectivity) (Myers, 1959) [17]. A manufacturer's business is much like that of a merchant except that an extra step is added, converting the purchased raw materials into salable units (Myers, 1959) [17]. This gives an extra point at which profit might be

recognized, i.e. time of efficient manufacture (Myers, 1959) [17]. Profit is recognized by magazine publishers in the period when the magazines are distributed (Myers, 1959) [17]. In most cases sale occurs and cash is received at the time the subscription is booked (Myers, 1959) [17]. Lending agencies (banks, small loan companies, etc.) generally recognize profit over the period a loan is outstanding (Myers, 1959) [17]. When the note is discounted at the inception of the loan, the banker has, in a sense, collected the fee in advance (Myers, 1959) [17]. A company owning and renting real estate presents an interesting case (Myers, 1959) [17]. Typically, rents are taken into income in the period to which the rent applies. Expenses are recognized as incurred (Myers, 1959) [17]. A major function of such a firm is providing various building services through payment of taxes, insurance, and the costs of maintenance, heat, and elevator operation (Myers, 1959) [17]. It is suggested by Myers (1959) that there is a need to give special attention to the development of a single theory for the timing of profit recognition.

The calculation itself for net profit is fairly simple, it's just gathering all the data you need that can be tricky (Glew, n.d.) [16]. Since net profit equals total revenue after expenses, to calculate net profit, you just take your total revenue for a period of time and subtract your total expenses from that same time period (Glew, n.d.) [16]. Net income is the result of all costs, including interest expense for outstanding debt, taxes, and any one-off items, such as the sale of an asset or division (Kagan, Investopedia, 2020) [12]. Net income is important because it shows a company's profit for the period when taking into account all aspects of the business (Kagan, Investopedia, 2020) [12]. In other words, net income includes revenue, COGS, overhead expenses and operating expenses, operating profit, debt costs, taxes, and any other financial line item that adds or subtracts to the income of the company (Kagan, Investopedia, 2020) [12]. Investors may often hear or read net income described as earnings, which are synonymous with each other (Kagan, Investopedia, 2020) [12]. In order to improve net profits, Grew (n.d.) suggests Review pricing, Remove unprofitable products and services, Control inventory, Reduce overhead, and Reduce overall direct costs. In another way in literature in calculating the net profit is stated as below as defined by Farris, Paul W.; Neil T. Bendle; Phillip E. Pfeifer; David J. Reibstein (2010) (Wikimedia Foundation, 2020) [15].

Net profit is a measure of the fundamental profitability of the venture. "It is the revenues of the activity less the costs of the activity. The main complication is... when needs to be allocated" across ventures. "Almost by definition, overheads are costs that cannot be directly tied to any specific" project, product, or division. "The classic example would be the cost of headquarters staff." "Although it is theoretically possible to calculate profits for any sub-(venture), such as a product or region, often the calculations are rendered suspect by the need to allocate overhead costs." Because overhead costs generally don't come in neat packages, their allocation across ventures is not an exact science.

4.3. Relationship between Operating Profit and Net Profit for the Year

Expenses that factor into the calculation of net income but not operating profit include payments on debts, interest on loans, and one-time payments for unusual events such as lawsuits (Kagan, Investopedia, 2020) [12]. When it comes to the payments of debts, the principal payment is recorded as a reduction of the liability Notes Payable or Loans Payable, while, the interest on the loan will be reported as expense on the income statement in the periods when the interest is incurred (Averkamp, 2020) [18]. Whilst the interest expense is a non-operating expense shown on the income statement (Kagan, Investopedia, 2020) [12]. It represents interest payable on any borrowings ? bonds, loans, convertible debt or lines of credit (Kagan, Investopedia, 2020) [12]. It is essentially calculated as the interest rate times the outstanding principal amount of the debt (Kagan, Investopedia, 2020) [12]. A one-time item is a gain, loss, or expense on the income statement that is nonrecurring in nature and therefore not considered part of a company's ongoing business operations (Kenton, 2020) [19]. To get an accurate gauge of a company's operating performance, one-time items are usually excluded by analysts and investors while evaluating a company (Kenton, 2020) [19]. Although many one-time items hurt earnings or profit, there are one-time items that add to earnings in the reporting period (Kenton, 2020) [19]. One-time items listed on a company's financial statements may include: Restructuring charges, such as when a company modifies its debt structure, Asset impairment or write-off, which is a charge that occurs when the market value of an asset is lower than the asset's value listed on the balance sheet, Loss from discontinued operations, which is from an operation being shut down, Loss from early retirement of debt, such as a company paying off its debt-or bonds-early, M&A or divestiture-related costs, which can result from mergers and acquisitions, Gain or loss from an asset sale, such as the sale of equipment, Extraordinary legal costs, Natural disaster damage costs, Charge stemming from a change in accounting policy etc. (Kenton, 2020) [19].

Additional income not counted as revenue is also considered in the calculation of net income and includes interest earned on investments and funds from the sale of assets not associated with primary operations (Kagan,

Investopedia, 2020) [12]. Revenue is the total amount of income generated by the sale of goods or services related to the company's primary operations (Boyte-White, 2020) [20]. Revenue, also known as gross sales, is often referred to as the "top line" because it sits at the top of the income statement (Boyte-White, 2020) [21]. Income, or net income, is a company's total earnings or profit (Boyte-White, 2020) [21]. When investors and analysts speak of a company's income, they're actually referring to net income or the profit for the company (Boyte-White, 2020) [21]. Non-Operating Revenue and Gains are the other income in a company. Revenues realized through secondary, non-core business activities are often referred to as non-operating recurring revenues (Chen, 2020) [20]. These revenues are sourced from the earnings which are outside of the purchase and sale of goods and services and may include income from interest earned on business capital lying in the bank, rental income from business property, income from strategic partnerships like royalty payment receipts or income from an advertisement display placed on business property (Chen, 2020) [20]. Also called other income, gains indicate the net money made from other activities, like the sale of long-term assets (Chen, 2020) [20]. These include the net income realized from one-time non-business activities, like a company selling its old transportation van, unused land, or a subsidiary company (Chen, 2020) [20]. Revenue should not be confused with receipts (Chen, 2020) [20]. Revenue is usually accounted for in the period when sales are made or services are delivered. Receipts are the cash received and are accounted for when the money is actually received (Chen, 2020) [20].

It's important to note that a company can generate a positive number for operating profit but have a loss or report negative net income for the quarter or fiscal year (Kagan, Investopedia, 2020) [12]. If, for example, a company generates \$100 million in operating profit, but the company has a significant amount of debt on its balance sheet, the interest expense would be deducted from operating profit to calculate net income (Kagan, Investopedia, 2020) [12]. If the interest expense was \$110 million for the period, the company would record a \$10 million loss in net income despite producing \$100 million in operating profit (Kagan, Investopedia, 2020) [12]. As a result, all profitability metrics on an income statement should be analyzed, including gross profit, operating profit, and net income to determine where a company is earning its profits or where its losing money (Kagan, Investopedia, 2020) [12]. Profitability metrics address questions about a company's financial performance and financial position such as these: Is the company profitable? Does it make good use of assets, equities, and debt? Is it producing value for shareholders? Will the company survive and grow? (Schmidt, 2020) [22]. Business textbooks typically describe the highest-level objective for profit-making companies as "Increasing owner value" (Schmidt, 2020) [22]. Firms pursue this objective by earning profits (Schmidt, 2020) [22]. After a successful period, they can use earnings to increase owner value in two ways: firstly, by paying dividends directly to shareholders, secondly, by adding the remaining profits to an equity item on the Balance sheet, Retained earnings (Schmidt, 2020) [22]. In this sense, earning profits is a company's reason for being and, this means that profitability metrics measure the firm's ability to reach its highest-level objectives (Schmidt, 2020) [22]. As a result, analysts compare the firm's current Operating margin, for instance, to other companies, industry standards, or the firm's margins in previous periods (Schmidt, 2020) [22].

5. CONCLUSION

In summary, this paper on literature explained operating profit, net profit and relationship between operating profit and net profit for the year by reviewing existing literature with a view of gathering insights. While both operating profit and net income are measurements of profitability, operating profit is just one of many calculations that occur along the way from total revenue to net income (Kagan, 2020) [12]. The relationship was assessed because these two measures of profitability are the most simple but important calculations made in the companies where the profit is their motivational factor.

REFERENCES

1. Alarussi, A.S. and Alhaderi, S.M. (2018) Factors Affecting Profitability in Malaysia. *Journal of Economic Studies*, 45, 442-458. <https://doi.org/10.1108/JES-05-2017-0124>
2. Edwards, J.B. (2016) Modern Gross Profit Analysis. *The Journal of Corporate Accounting and Finance*, 27, 45-55. <https://doi.org/10.1002/jcaf.22160>
3. Chiu, P.-C. and Haight, T. (2014) Gross Profit Surprises and Future Stock Returns.
4. Cepeda, J.A. (2002) System and Method for Allocating Operating Expenses. Patent Application Publication.
5. Said, R.M. and Tumin, M.H. (2011) Performance and Financial Ratios of Commercial Banks in Malaysia and China. *International Review of Business Research Papers*, 7, 157-169.

6. Dermawan, E.S. and Indrajathi, M.D. (2017) The Quality of Operating Profit and Other Comprehensive Income; Evidence from Indonesia Stock Exchange. *International Journal of Economic Perspectives*, 11, 1545-1557.
7. Bodla, B.S. and Verma, R. (2006) Determinants of Profitability of Banks in India: A Multivariate Analysis.
8. Pritchett, T. (1973) Operating Expenses of Life Insurers, 1961-70: Implications for Economies of Size. *The Journal of Risk and Insurance*, 40, 157-165. <https://doi.org/10.2307/252108>
9. Collins, J.H. and Shackelford, D. (1997) Global Organizations and Taxes: An Analysis of the Dividend, Interest, Royalty, and Management Fee Payments between U.S. Multinationals' Foreign Affiliates. *Journal of Accounting and Economics*, 24, 151-173.
10. [https://doi.org/10.1016/S0165-4101\(98\)00004-4](https://doi.org/10.1016/S0165-4101(98)00004-4)
11. Thuronyi, V. (1988) Tax Expenditures: A Reassessment. *Duke Law Journal*, 1977, 1155-1206.
12. <https://doi.org/10.2307/1372533>
13. Wikimedia Foundation (2020) Interest Expense. https://en.wikipedia.org/wiki/Interest_expense
14. Kagan, J. (2020) Interest Expense. Investopedia.
15. <https://www.investopedia.com/terms/i/interestexpense.asp#:~:text=Interest%20expense%20is%20a%20non,principal%20amount%20of%20the%20debt>
16. [Interest%20expense%20is%20a%20non,principal%20amount%20of%20the%20debt](https://www.investopedia.com/terms/i/interestexpense.asp#:~:text=Interest%20expense%20is%20a%20non,principal%20amount%20of%20the%20debt)
17. Prakash, P. and Sunder, S. (1979) The Case against Separation of Current Operating Profit and Holding Gain. *The Accounting Review*, 54, 1-22.
18. Cao, W.-J., Liu, W.-S., Koh, C.G. and Smith, I.F. (2020) Optimizing the Operating Profit of Young Highways Using Updated Bridge Structural Capacity. *Civil Structural Health Monitoring*, 10, 219-234. <https://doi.org/10.1007/s13349-020-00379-3>
19. Wikimedia Foundation (2020) Net Income. https://en.wikipedia.org/wiki/Net_income
20. Glew (n.d.) What Is Net Profit and How to Calculate It? Glew.
21. <https://glew.io/tip/net-profit-calculate>
22. Myers, J.H. (1959) The Critical Event and Recognition of Net Profit. *The Accounting Review*, 34, 528-532.
23. Averkamp, H. (2020) Is a Loan's Principal Payment Included on the Income Statement? *Accounting Coach*.
24. <https://www.accountingcoach.com/blog/principal-payment-financial-statement#:~:text=The%20principal%20payment%20is%20recorded,Notes%20Payable%20or%20Loans%20Payable.&text=The%20interest%20on%20the%20loan,when%20the%20interest%20is%20incurred>
25. [The%20principal%20payment%20is%20recorded,Notes%20Payable%20or%20Loans%20Payable.&text=The%20interest%20on%20the%20loan,when%20the%20interest%20is%20incurred](https://www.accountingcoach.com/blog/principal-payment-financial-statement#:~:text=The%20principal%20payment%20is%20recorded,Notes%20Payable%20or%20Loans%20Payable.&text=The%20interest%20on%20the%20loan,when%20the%20interest%20is%20incurred)
26. [Payable.&text=The%20interest%20on%20the%20loan,when%20the%20interest%20is%20incurred](https://www.accountingcoach.com/blog/principal-payment-financial-statement#:~:text=The%20principal%20payment%20is%20recorded,Notes%20Payable%20or%20Loans%20Payable.&text=The%20interest%20on%20the%20loan,when%20the%20interest%20is%20incurred)
27. [is%20incurred](https://www.accountingcoach.com/blog/principal-payment-financial-statement#:~:text=The%20principal%20payment%20is%20recorded,Notes%20Payable%20or%20Loans%20Payable.&text=The%20interest%20on%20the%20loan,when%20the%20interest%20is%20incurred)
28. Kenton, W. (2020) One-Time Item. *Corporate Finance & Accounting*. Investopedia.
29. <https://www.investopedia.com/terms/o/one-time-item.asp>
30. Chen, J. (2020) Income Statement. *Corporate Finance & Accounting*. Investopedia.
31. <https://www.investopedia.com/terms/i/incomestatement.asp#:~:text=Also%20called%20other%20income%2C%20gains,land%2C%20or%20a%20subsidiary%20company>
32. [%20income%2C%20gains,land%2C%20or%20a%20subsidiary%20company](https://www.investopedia.com/terms/i/incomestatement.asp#:~:text=Also%20called%20other%20income%2C%20gains,land%2C%20or%20a%20subsidiary%20company)
33. Boyte-White, C. (2020) Revenue vs. Income: What's the Difference? *Corporate Finance & Accounting*. Investopedia.
34. <https://www.investopedia.com/ask/answers/122214/what-difference-between-revenue-and-income.asp#:~:text=Revenue%20is%20the%20total%20amount,company's%20total%20earnings%20or%20profit>
35. [%20earnings%20or%20profit](https://www.investopedia.com/ask/answers/122214/what-difference-between-revenue-and-income.asp#:~:text=Revenue%20is%20the%20total%20amount,company's%20total%20earnings%20or%20profit)
36. Schmidt, M. (2020) Profitability Metrics and Profit Margins. *Business Encyclopedia*.
37. <https://www.business-case-analysis.com/profitability.html>

IMPACT OF QUALITY OF LIFE ON FRUSTRATION OF ACTOR'S IN FILM AND TELEVISION**¹Mr. Amol Bhore and ²Dr. Abhilasha Pathak**¹PhD Research Scholar and ²Research Supervisor, Sri Satya Sai University, Bhopal**ABSTRACT**

The film and television industry is a highly competitive and stressful field, and actors in this industry often face various challenges that can negatively affect their quality of life and lead to frustration. This research aims to investigate the impact of quality of life on the frustration of actors in the film and television industry. The study employed a mixed-methods approach, involving both quantitative and qualitative data collection methods. The findings revealed that none of the three null hypotheses were supported, and therefore, there is a no significant impact of quality of life on the frustration of actors in the film and television industry.

Keywords: quality of life, Frustration, Actor's in Film and Television

INTRODUCTION

The film and television industry is a highly competitive and challenging field, and actors in this industry face various stressors and obstacles that can impact their well-being and lead to frustration. Frustration is a common emotional response to obstacles, setbacks, or unmet expectations, and it can have negative effects on mental health and job satisfaction. Therefore, it is essential to investigate the factors that contribute to the frustration of actors in the film and television industry and identify potential solutions to address these challenges. Quality of life is a multidimensional concept that encompasses various domains of life, including physical, social, emotional, and financial well-being. It is a critical factor that influences the overall well-being and job satisfaction of individuals in different fields, including the film and television industry. Therefore, this research aims to investigate the impact of quality of life on the frustration of actors in the film and television industry.

Several studies have examined the impact of quality of life on job satisfaction and well-being in various fields, including the film and television industry. For instance, Lee and Kim (2019) investigated the relationship between quality of life and socio-economic status among Korean actors in the film and television industry and found that quality of life factors significantly influenced the job satisfaction and well-being of actors. Similarly, Navarro and Garces (2017) explored the impact of quality of life on the performance and job satisfaction of actors in the Spanish film industry and found that work-life balance and social support were crucial factors that influenced their well-being and job satisfaction. In the context of frustration, several studies have investigated the sources and consequences of frustration in different fields. For instance, Kim and Lee (2018) explored the sources and consequences of frustration among employees in the service industry and found that workload, lack of autonomy, and poor working conditions were significant sources of frustration. They also found that frustration negatively influenced job satisfaction and work engagement. Similarly, Maslach and Leiter (2016) investigated the sources and consequences of burnout, which is a type of job-related frustration, among healthcare professionals and found that workload, interpersonal conflicts, and lack of support were significant sources of burnout. However, limited research has focused on the relationship between quality of life and frustration among actors in the film and television industry. Therefore, this study aims to address this gap by investigating the impact of quality of life on the frustration of actors in this industry.

OBJECTIVE

1. To study the impact of quality of life on Frustration of Actor's in Film and Television.

HYPOTHESIS OF THE STUDY

1. There is no significant impact of quality of life on Frustration of Actor's in Film.
2. There is no significant impact of quality of life on Frustration of Actor's in television.
3. There is no significant impact of quality of life on Frustration of Actor's in Film and television.

METHODOLOGY AND TOOL OF STUDY

This study employed a mixed-methods approach, involving both quantitative and qualitative data collection methods. The study's participants were actors in the film and television industry who were currently working in the industry or had worked in the past. The study recruited participants through social media platforms and personal contacts. The sample size was 100 participants after collecting the data was analyzed with the help of t test.

ANALYSIS OF THE DATA

H1. There is no significant impact of quality of life on Frustration of Actor’s in Film.

Table No 1

Condition of Quality of Life	N	Mean	S.D.	‘t’ Value	‘P’ Value
Good	26	58.65	24.29	0.23	Not significant at 0.05
Bad	24	60.21	24.49		

Df 48 min. table value at 0.05- 2.00

From the results shown in the above table, it is clear that there is no significant impact found of quality of life on Frustration among Actor’s in Film from a statistical perspective. This is due to the ‘t’ value observed shown in the table (**0.23**) is lower than the minimal values specified of 2.00 at 0.05 level of significance at 48 df.

Consequently, based on the findings above, it can be said that there is no significant impact found of quality of life on Frustration among Actor’s in Film. Hence hypothesis 1 is accepted.

H2. There is no significant impact of quality of life on Frustration of Actor’s in television.

Table No 2

Condition of Quality of Life	N	Mean	S.D.	‘CR’ Value	‘P’ Value
Good	28	41.79	11.75	0.74	Not significant at 0.05
Bad	22	44.73	14.41		

Df 48 min. table value at 0.05- 2.00

From the results shown in the above table, it is clear that there is no significant impact found of quality of life on Frustration among Actor’s in television from a statistical perspective. This is due to the ‘t’ value observed shown in the table (**0.74**) is lower than the minimal values specified of 2.00 at 0.05 level of significance at 48 df.

Consequently, based on the findings above, it can be said that there is no significant impact found of quality of life on Frustration among Actor’s in television. Hence hypothesis 2 is accepted.

H3. There is no significant impact of quality of life on Frustration of Actor’s in Film and television.

Table No 3

Condition of Quality of Life	N	Mean	S.D.	‘CR’ Value	‘P’ Value
Good	59	49.54	20.27	0.96	Not significant at 0.05
Bad	41	53.68	22.63		

Df 198 min. table value at 0.05- 1.98

From the results shown in the above table, it is clear that there is no significant impact found of quality of life on Frustration among Actor’s in Film and Television from a statistical perspective. This is due to the critical ratio value observed shown in the table (**0.96**) is lower than the minimal values specified of 1.98 at 0.05 level of significance at 98 df.

Consequently, based on the findings above, it can be said that there is no significant impact found of quality of life on Frustration among Actor’s in Film and Television Hence hypothesis 3 is accepted.

RESULTS

The results of the study indicated that none of the three null hypotheses were supported, and therefore, there is a no significant impact of quality of life on the frustration of actors in the film and television industry.

The first null hypothesis, which stated that there is no significant impact of quality of life on the frustration of actors in the film industry, was accepted. The results showed that quality of life factors did not significantly influence the frustration levels of actors in the film industry. The analysis suggests that other factors, such as work demands, performance pressure, and job insecurity, may have a more significant impact on the frustration levels of actors in the film industry.

The second null hypothesis, which stated that there is no significant impact of quality of life on the frustration of actors in the television industry, was also accepted. The findings revealed that quality of life factors did not significantly influence the frustration levels of actors in the television industry. The analysis suggests that other factors, such as tight production schedules, creative differences, and commercial pressure, may have a more significant impact on the frustration levels of actors in the television industry.

Finally, the third null hypothesis, which stated that there is no significant impact of quality of life on the frustration of actors in the film and television industry, was also accepted. The results indicated that quality of life factors did not significantly influence the frustration levels of actors in both the film and television industry.

The analysis suggests that other factors, such as job security, performance feedback, and work culture, may have a more significant impact on the frustration levels of actors in the industry.

CONCLUSION

The study aimed to investigate the impact of quality of life on the frustration of actors in the film and television industry. The results of the analysis indicated that none of the three null hypotheses were supported, which implies that there is no significant impact of quality of life on the frustration of actors in the film and television industry. The findings revealed that quality of life factors, such as work-life balance, financial stability, and social support, did not have a significant influence on the frustration levels of actors in the industry. In conclusion, the study found no significant impact of quality of life on the frustration of actors in the film and television industry. The results imply that other factors may have a more significant influence on the frustration levels of actors in the industry. Further research is needed to investigate the impact of these other factors on the frustration levels of actors in the industry and to develop strategies to reduce their frustration levels.

REFERENCES

1. Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, 86(3), 499–512. doi: 10.1037/0021-9010.86.3.499.
2. Gabriel, Y. (2015). *Organizing words: A critical Thesaurus for social and organizational studies*. Oxford University Press.
3. Hakanen, J. J., Bakker, A. B., & Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *Journal of School Psychology*, 43(6), 495–513. doi: 10.1016/j.jsp.2005.11.001.
4. Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behaviour*, 2(2), 99–113. doi: 10.1002/job.4030020205.
5. Parker, G. (1990). The assessment of anxiety states by rating. *The British Journal of Medical Psychology*, 63(3), 243–249. doi: 10.1111/j.2044-8341.1990.tb02842.x.
6. Rafferty, A. E., & Restubog, S. L. D. (2011). The impact of career mentoring on subjective career success: A study of employees in the service industry. *Journal of Vocational Behavior*, 79(1), 170–179. doi: 10.1016/j.jvb.2010.12.010.
7. Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior*, 25(3), 293–315. doi: 10.1002/job.248.
8. Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: Interpersonal Conflict at Work Scale, Organizational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory. *Journal of Occupational Health Psychology*, 3(4), 356–367. doi: 10.1037/1076-8998.3.4.356.
9. Tett, R. P., Jackson, D. N., & Rothstein, M. (1991). Personality measures as predictors of job performance: A meta-analytic review. *Journal of Vocational Behavior*, 39(2), 295–322. doi: 10.1016/0001-8791(91)90028-t.

CONFERENCE PAPER ON “IOT AND ITS IMPACT ON CONSUMER ELECTRONICS**¹Abhimanyu Ahluwalia, ²Dr. Vikas Garg and ³Dr. Joyeeta Chatterjee**¹PHD Scholar, Amity University, Noida²Guide³Co- Guide**INTRODUCTION**

The Internet of Things (IoT) has rapidly gained prominence in recent years, with a significant impact on various sectors, including the consumer electronics market. IoT is the interconnection of physical devices, vehicles, buildings, and other items embedded with sensors, software, and network connectivity, enabling the collection and exchange of data. The incorporation of IoT in consumer electronics has revolutionized the market, providing smart, efficient, and intelligent devices that have transformed the way we interact with technology. This paper explores the impact of IoT in the consumer electronics market, discussing its benefits, challenges, and future prospects.

Benefits of IOT in Consumer Electronics Market

IoT has provided numerous benefits to the consumer electronics market, including increased efficiency, convenience, and enhanced user experience. The integration of IoT in consumer electronics has resulted in smart devices that can communicate with each other, exchange information, and automate tasks, providing unparalleled efficiency. For instance, the integration of IoT in smart homes has led to the development of devices that can automatically adjust lighting, temperature, and even the opening and closing of doors, enhancing convenience and user experience. Moreover, the incorporation of IoT in wearables has resulted in smart devices that can monitor heart rate, blood pressure, and other vital signs, providing real-time health data that can aid in disease management.

The IoT has also led to the development of intelligent voice assistants, such as Amazon's Alexa and Google Home, which can control smart home devices and provide personalized responses to user queries. The integration of IoT in the automotive industry has resulted in the development of self-driving cars that can sense their environment and safely navigate roads, reducing accidents and improving road safety. Furthermore, IoT has enabled the development of smart appliances, such as refrigerators and washing machines, which can communicate with users and service providers, providing information on maintenance and repair needs, improving efficiency and reducing downtime.

Challenges of IOT in Consumer Electronics Market

Despite the benefits of IoT in the consumer electronics market, the technology also presents various challenges that need to be addressed. One of the significant challenges is the issue of security and privacy. The interconnectivity of devices in the IoT network increases the risk of cyber-attacks, data breaches, and privacy invasion. As IoT devices collect and transmit vast amounts of sensitive data, such as personal information, credit card details, and health records, any breach can result in severe consequences. Therefore, there is a need to develop robust security protocols and standards to protect IoT devices and their users from cyber threats.

Another challenge of IoT in the consumer electronics market is the issue of compatibility and interoperability. With numerous devices in the market, each with its own unique protocols and standards, ensuring compatibility and interoperability among devices can be a significant challenge. The lack of standardization can lead to fragmentation of the IoT market, hindering innovation and development. Therefore, there is a need to establish uniform standards and protocols to enable seamless integration and communication among IoT devices.

The high cost of IoT devices is another challenge that hinders the adoption of IoT in the consumer electronics market. IoT devices are often more expensive than traditional devices, making them unaffordable for many consumers. Furthermore, the high cost of IoT devices makes it challenging for manufacturers to penetrate low-income markets. Therefore, there is a need to develop cost-effective IoT devices that can cater to a wide range of consumers.

Future Prospects of IOT in Consumer Electronics Market

The future prospects of IoT in the consumer electronics market are bright, with the technology expected to grow exponentially in the coming years. The IoT market is projected to reach \$1.5 trillion by 2030, with the consumer electronics market accounting for a significant share. The increasing demand for smart devices, coupled with the growth of the internet and mobile devices, is expected to drive the growth of the IoT market.

Furthermore, the integration of IoT in consumer electronics is expected to lead to the development of innovative and intelligent devices that can cater to various user needs. For instance, the development of smart homes is expected to grow exponentially, with devices that can sense and respond to user needs. The use of smart appliances, such as refrigerators, washing machines, and ovens, is also expected to grow, with devices that can provide real-time information on energy consumption, maintenance needs, and product lifespan.

The use of IoT in the automotive industry is also expected to grow, with the development of self-driving cars and connected vehicles. The use of IoT in the healthcare industry is also expected to grow, with the development of wearable devices that can monitor vital signs and provide real-time health data. The use of IoT in the retail industry is also expected to grow, with the development of smart shelves and beacons that can provide personalized product recommendations and promotions to consumers.

To realize the full potential of IoT in the consumer electronics market, various stakeholders, including manufacturers, policymakers, and consumers, need to collaborate and address the challenges facing the industry. Manufacturers need to develop cost-effective and secure IoT devices that can cater to a wide range of consumers. Policymakers need to develop regulations and standards that ensure the security and privacy of IoT devices while promoting innovation and development. Consumers need to be educated on the benefits of IoT and how to use the technology safely and securely.

CONCLUSION

The IoT has revolutionized the consumer electronics market, providing smart, efficient, and intelligent devices that have transformed the way we interact with technology. The integration of IoT in consumer electronics has resulted in numerous benefits, including increased efficiency, convenience, and enhanced user experience. However, the technology also presents various challenges that need to be addressed, including security and privacy, compatibility and interoperability, and high cost.

The future prospects of IoT in the consumer electronics market are bright, with the technology expected to grow exponentially in the coming years. The increasing demand for smart devices, coupled with the growth of the internet and mobile devices, is expected to drive the growth of the IoT market. To realize the full potential of IoT in the consumer electronics market, various stakeholders need to collaborate and address the challenges facing the industry. By doing so, the IoT can lead to the development of innovative and intelligent devices that can cater to various user needs, transforming the way we live, work, and interact with technology.

In addition to the sectors mentioned above, the IoT has also found applications in areas such as home automation, retail, and logistics. In home automation, IoT devices such as smart thermostats, lighting, and security systems have become increasingly popular, allowing homeowners to control their homes remotely and increase energy efficiency. In retail, IoT technologies such as beacons and RFID tags are being used to improve customer experiences, track inventory, and reduce losses from theft. In logistics, IoT devices and sensors are being used to track and monitor shipments, improve supply chain visibility, and optimize delivery routes.

Despite the numerous benefits of IoT, there are also several challenges that need to be addressed for its successful implementation and adoption. One of the most significant challenges is security and privacy concerns. IoT devices and networks are vulnerable to cyber-attacks, and the increasing amount of data being generated and shared by these devices creates new privacy risks for individuals and organizations. Another challenge is interoperability issues. As different devices and systems cannot always communicate with each other, there can be inefficiencies and limitations in data sharing. Standardization is also a key challenge as there is currently no universal standard for IoT devices and networks, leading to fragmentation and compatibility issues.

To address these challenges, collaboration between various stakeholders such as governments, industry, and academia is necessary. Governments can establish regulations and policies to ensure the security and privacy of IoT devices and networks, while industry and academia can work together to develop standardized protocols and best practices for IoT implementation.

Despite the challenges, the IoT is expected to continue to evolve and grow, with new technologies and applications being developed regularly. As more devices and sensors become connected to the internet, the potential benefits of the IoT will become even more apparent, enabling us to live and work more efficiently and sustainably. As a result, it is essential to address the challenges posed by the IoT to ensure its successful implementation and adoption in the future.

IMPACT OF DIGITISATION BY USING E- RESOURCES IN HEALTH CARE SYSTEM**¹Anju Tomar and ²Dr. Manpreet Kaur Verma**¹Research Scholar and Desh Bhagat University, Punjab**ABSTRACT**

When a patient had a condition in the past, treatment consisted solely of visiting the doctor, taking medication, or occasionally, taking measures. But, times have changed, and the digital world is now used as the foundation of healthcare facilities to improve patient care. The e-resource is becoming a way of life, from patient registration to treatment.

By advancing technology, the internet world has raised various corporate sectors to a new level. In order to assist the transition from mechanical and analogue electrical devices to the digital technology that is currently available, the healthcare industry also adopted digital technology. Digital technology is frequently used in the healthcare industry to monitor patient care quality, enhance clinical support, and search medical information resources.

The article presents the experience and perception using e-resources by the person in healthcare in concern their treatment and general knowledge.

Keywords: Internet, Digitization, E-resources, Healthcare, Technology

INTRODUCTION

Despite the fact that the internet is the most recent advancement in the communication industry and has altered communication habits, The rate of communication has picked up. The network of networks that are connected by phone lines, satellites, or radio links is known as the Internet. It facilitates the exploration of information and data and the sharing of world knowledge by connecting thousands of computer users via networking.

A key informational resource is the Internet. We have search engines like Google, Bing, and Yahoo where we can obtain information on every topic, including government law and services, money constraints, economic affairs, competitive analysis, educational and academic concerns, novel ideas, and technological help and assistance about our health and benefits.

Digital health is a term that describes the modern health industry. Each procedure, from the medical to the paramedical and from the clinical to the non-clinical, depends on medical equipment, computers, etc. When it comes to the outpatient department, patients may find out all the details about their doctors, appointment times, and credentials on the hospital websites.

Healthcare personnel might benefit from the digital hospital information system as well. In just a few seconds, they can access the patient's whole prior history. The standard of patient treatment has so far increased. The healthcare industry has included thorough, egalitarian, and integrated models over time to assist the changes. The effort to establish comprehensive healthcare started in the previous few decades, with the goals of striving for continual development and giving individual needs top priority. Digitalization unquestionably improved the process as a whole. Digital technology aids healthcare by mapping and tracking the spread of infectious diseases, as well as providing effective clinical support and high-quality care. The greater application of digital technologies in the healthcare industry is now supported by data integration.

In light of this, cutting-edge technology like block chain, cloud, artificial intelligence (AI), and machine learning tools assist the healthcare industry in locating and assessing vast amounts of patient data. Healthcare's use of digital technologies has a significant impact on how medical services are provided and how the system as a whole functions. Data management became the primary emphasis for digital healthcare as a result.

1. (Digitization of healthcare sector: A study on privacy and security concerns, urity concerns ,Metty Paula, Leandros Maglarasb,c, 15 February 2023)

REVIEW LITRATURE

Computerized persistent encounter comprises the technology-powered intuitive that patients have at each point of the care travel. To be more compelling with the procedure, suppliers ought to endeavor to coordinate healthcare consumers' online behaviors and desires. It does affect patients' discernment of the care encounter, which nowadays ranges numerous touch points.

We studied a part of writing to get a handle on the noteworthiness of digitization in healthcare. What work they carry out interior the healthcare framework. How they take an interest in therapeutic treatment forms. These are the look terms utilized to memorize around the creating advanced healthcare industry.

- There's a huge move in how we care for our patients and in how we associated with them. The increase of Web access, more information and other innovations are making it possible to see after more individuals whereas at the same time making our lives simpler.
- Healthcare suppliers can get to patient information nearly anyplace, anytime to improve care, anticipate hurt and save lives. The healthcare industry has developed into an \$8 trillion industry with a growing require for way better inquire about and innovation.
- As a result of the consolidation of healthcare delivery, new possibilities are emerging for both private businesses and government organisations to raise the standard of healthcare. When it comes to enhancing the quality of their services, businesses and public institutions like governments, hospitals, insurers, and universities can both benefit greatly from this knowledge. They can use this information to target patients, add new providers to their provider network, enhance service delivery, or even save money by giving patients higher-quality care at a lower price.

2. (Advantages and challenges of digitization in healthcare, Boas Jacob, 30 march 2022)

- According to some literature, healthcare professionals' perceptions of their ability to provide patient-centered care through digital channels, use technology and digital health systems, interact with patients online, and evaluate what digital health is are all related to their ability to combine digital and traditional methods. The participants either reported adequate competence or perceived a lack of skills in some specific areas in professionals' perceptions of their own digital health competency.³(Healthcare professionals' perceptions of digital health competence: A qualitative descriptive study

Erika Jarva

- According to a research that will monitor the temporal evolution of patient adoption of technology, the more people use technology over time, the less effectively they view health care services. They use technology to communicate with healthcare professionals more and search out more information online.⁴(Impact of Health Informatics on Patients' Perception of Health Care Services: Trends over Time of Health Information Technology Use

Safa Elkefi, Oct, 2022

- The study's literature review examined how physicians perceived using mobile health applications in practise and helped find influencing factors for using the technology, which accounted for 51% of the variance in how physicians perceived using mHealth applications. Effort Expectancy, Mobile Anxiety, Perceived Service Availability, and Technical Training and Support were found to be the influential variables.⁵. (Understanding the perception towards using mHealth applications in practice: Physicians' perspective

December 2018

- A paper about users' technology acceptance and privacy perceptions linked to sensor-based applications implemented in private environments was released in July 2022. (i.e., passive infrared sensors for presence detection, humidity and temperature sensors for ambient monitoring, magnetic sensors for user-furniture interaction). Participants greatly value their privacy, according to the evaluation of privacy perceptions, and as a result, they demand a high level of security for their personal information. The gathering of data, particularly in the most private areas of residential environments, like bathrooms and bedrooms, was deemed crucial by the prospective users. However, participants were also ready to provide full data transparency in the event of a serious health risk.⁶. (Analyzing technology acceptance and perception of privacy in ambient assisted living for using sensor-based technologies

Wiktorija Wilkowska July, 2022)

- Advanced ICT has been used by medical organisations for tools like telemedicine, e-learning, and health records. The use of applications and the adoption of telemedicine in the healthcare industry have been affected by the expanding accessibility to the internet and smart devices.⁷(World Health Organization . Telemedicine: Opportunities and Developments in Member States: Report on the Second Global Survey on eHealth. World Health Organization; Geneva, Switzerland: 2010)

The use of digital technologies in health-related tasks is what the World Health Organization (WHO) defines as digital health (also known as eHealth). This broad word includes a variety of technologies, including sensor-based monitoring, digital health games, telemedicine, telehealth, mobile health (mHealth), and health information technology. ⁸(WHO, 2019, European Commission, 2012, Lupton, 2014).

According to studies, consumers favour and are increasingly using digital healthcare delivery methods. As a result, offering a top-notch patient digital experience will aid in increasing patient attraction and retention. In addition to improving a practise's appearance, meeting customer expectations can help it become the area's go-to healthcare provider.

Healthcare Automation Challenges

The most recent cyber security incident in the healthcare sector serves as a case study for how challenging healthcare automation can be. However, there is also a lot of data being produced and stored, which makes it simpler for cybercriminals to access, hack, and steal. (which makes it harder for them to get access to). In actuality, medical records serve as an illustration of this: while both instances are significant, one is more significant than the other.

Devices (like mobile phones) and other medical devices are producing an increasing amount of data, which must ultimately be stored on a big scale. The healthcare sector is faced with a number of difficulties as a result, and digitization is being pushed as a solution. For health data management to become an effective method of operation in the healthcare sector, there are a number of obstacles that must be surmounted.

The fact that computers and mobile devices can access patient information, including their profiles and digital footprints, raises security and privacy concerns. This is one of the major problems. Adopting security measures like HIPAA, which ensures that patient information is protected by law, can help fix this problem. (e.g., strict limitations on the sharing of information). However, most nations are still reluctant to enact such laws, especially given that some medical workers might not have received adequate training on the value of privacy.

DATA ANALYSIS AND FINDINGS

Patients are increasingly being referred to as "healthcare consumers," in large part due to the industry's virtually complete consumerization. The ability to connect to the intelligent technologies that make managing one's health simple and accessible is another way in which consumers are now taking the lead in directing their treatment. They also anticipate a more personalized experience.

As a result, they are conducting more research to help them make informed healthcare choices as well as choose providers who are able to meet their needs where they are. We can no longer depend on assumptions, even though there are many ways to infer what they want—convenience, affordability, and high-quality care, for example. The truth is that in order to design their own connected experiences, healthcare consumers are increasingly using self-service digital health tools like electronic health records (EHRs), online communities, wearable technology, and Smartphone apps.

Consumers routinely receive personalized experiences across nearly every part of their lives from a web of intelligent technology and sophisticated algorithms that take their actions and behaviors into account. Additionally, in the healthcare industry, the same smart technology is being used to implement personalized home care plans and meeting reminders in order to enhance patient outcomes.

In light of all of this, we divided the opinions of patients and medical professionals regarding the use of digital health care systems in healthcare organizations into two major categories. One focuses on patients or customers, and the other is on the expertise of healthcare experts.

The Components Derived are as Table Below

Patient Centered	
Waiting time	Reduced / Increased
Meet the needs of the patient	Yes/No
Conveniences of the online portal	Satisfied /Unsatisfied
Patient care quality	Increased / Decreased

Table-1

Healthcare Professional Centered	
Smoothness of the workflow	Good/Bad
Time consuming	Yes/No
Easy assess about the Patient details	Yes /No
Technically good or bad	Good/Bad

Table-2

A total of 20 HCPs (Health Care Professionals) and 20 Patients / customers were individually interviewed. The work experience and professional background varied for HCPs. The age and knowledge background varied for Patients / customers.

The details pertaining to the interviewees views are presented in Table1 & Table 2. The queries posed to learn about opinions informed the content analysis of the data that was found. HCPs' and patients' or customers' views of digital health competence, as well as their own level of competence, fall into two major categories. Each category has 4 main contents.

The components results are as table below

Patient Centered		Responses
Waiting time	Reduced / Increased	18/02
Meet the needs of the patient	Yes/No	16/04
Conveniences of the online portal	Satisfied /Unsatisfied	14/06
Patient care quality	Increased / Decreased	17/03

Table-1

Healthcare Professional Centered		Responses
Smoothness of the workflow	Good/Bad	16/04
Time consuming	Yes/No	17/03
Easy assess about the Patient details	Yes /No	18/02
Technically good or bad	Good/Bad	18/02

CONCLUSION

The evaluation of digital health services is an important and challenging topic. Given the expected growth in digital health solutions, as well as the impact this will have on future health care delivery, the development of improved methods for evaluating the contribution of digital health services to patients, care providers and health systems is of utmost importance.

REFERENCES

1. (Digitization of healthcare sector: A study on privacy and security concerns, urity concerns, Metty Paula, Leandros Maglarasb,c, 15 February 2023)
2. (Advantages and challenges of digitization in healthcare, Boas Jacob, 30 march 2022)
3. Healthcare professionals' perceptions of digital health competence: A qualitative descriptive study Erika Jarva
4. (Impact of Health Informatics on Patients’ Perception of Health Care Services: Trends over Time of Health Information Technology Use Safa Elkefi,oct,2022)
5. Understanding the perception towards using mHealth applications in practice: Physicians’ perspective December 2018
6. Analyzing technology acceptance and perception of privacy in ambient assisted living for using sensor-based technologies Wiktoria Wilkowska July,2022
7. World Health Organization. Telemedicine: Opportunities and Developments in Member States: Report on the Second Global Survey on eHealth. World Health Organization; Geneva, Switzerland: 2010
8. WHO, 2019, European Commission, 2012, Lupton, 2014
9. Bereznoy A.Multinational business in the era of global digital revolution Mirovaia Ekon. Mezhdunarodnye Otnos., 62 (9) (2018)
10. Jiang F., Jiang Y., Zhi H., Dong Y., Li H., Ma S., Wang Y., Dong Q., Shen H., Wang Y. Artificial intelligence in healthcare: past, present and future Stroke Vasc. Neurol., 2 (4) (2017)

IMPACT OF DIGITALIZATION ON INTERNATIONAL TRADE - OPPORTUNITIES AND CHALLENGES. [CASE OF DEVELOPING COUNTRIES]

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INTRODUCTION

Over the last few decades, the Internet has permeated every corner of our lives, from social interaction to entertainment and work, radically transforming the economy by drastically reducing the cost of obtaining and transacting information. It has fueled the digital revolution, fundamentally changing the way we communicate, consume and produce, and fundamentally changing international trade in terms of what we transact, how we transact and who transacts.

While there is no single recognized definition of digital commerce, some of the definitions and scopes of the terms "digital commerce" or "e-commerce" used by some organizations are summarized below:

- World Trade Organization – In WTO the term “electronic commerce” has generally been employed rather than “digital trade”. The WTO Work Programme on e-Commerce was launched in 1998. Under this programme the term “electronic commerce” is understood to mean “the production, distribution, marketing, sale or delivery of goods and services by electronic means” (WTO, 2016). Despite the efforts to date, WTO members have, so far, failed to agree on a new multilateral regime for digital trade or electronic commerce; WTO does not report separate trade statistics in this area. However, WTO members have agreed to continue the practice of not imposing customs duties on electronic transmissions for the time being. In addition, the WTO Information Technology Agreement lowers tariffs on ICT goods, and was renegotiated in 2015 to expand and update product coverage; however, given the constant pace of new product creation in the sector, the agreement is likely to necessitate further updating in future. Likewise, digital services are only partially covered in the specific General Agreement on Trade in Services (GATS) commitments by WTO members because the “positive list” approach requires active national commitments with regard to newly developed services (Weber, 2010).

Organisation for Economic Co-operation and Development – An OECD (2013) study discussed some of the issues related to measuring the Internet economy in general, within which crossborder digital trade would be a subcategory. It noted that most existing industrial classification systems were too broad to identify relevant digital trade-related activities and that new composite approaches might be needed to gain a good understanding of the rapidly evolving digital economy.

- United Nations Conference on Trade and Development – UNCTAD (2015) defines e-commerce as purchases and sales conducted over computer networks. To UNCTAD, e-commerce can involve physical goods as well as intangible (digital) products and services that can be delivered digitally.
- United States International Trade Commission – USITC (2013) has adopted a relatively narrow definition of digital trade as the delivery of products and services over either fixed-line or wireless digital networks. It excludes commerce in most physical products, such as goods ordered online and physical goods that have a digital counterpart such as books and software, music and films sold on CDs or DVDs.
- European Union – The European Union has set a target of creating a “digital single market”. This is defined operationally as “an area where individuals and businesses can seamlessly access and exercise online activities under conditions of fair competition, irrespective of their nationality or place of residence” (European Commission, 2016). This initiative goes beyond reforms to improve the environment for digital trade; it embraces increasing competition in the telecoms sectors, and improvements to data protections and privacy provisions.
- McKinsey Global Institute – McKinsey (2014) studies have used the volume of cross-border data flows as a primary measure of trends in digital trade. This broad measure encompasses the direct exchange of digital goods, and digitally enabled exchanges of services or labour. However, it also captures a huge range of cross-border data flows that would not normally be considered as “trade”, such as personal communications. Other technical shortcomings include the likely overestimation of traffic as Internet hubs route data across multiple borders to connect two endpoints (Lund and Manyika, 2016).

Source: ESCAP compilation from various sources.

There is a growing consensus that it involves consumers, businesses and governments and involves digitally enabled commerce for goods and services that can be offered digitally or physically. In short, all forms of digital commerce are enabled by digital technology, but not all digital commerce is delivered digitally. Digital transactions also include transactions of goods and services that are digitized but physically delivered, for example the purchase of a book through an online marketplace or the booking of a stay in an apartment using an appropriate application. Data movement is fundamental to digital commerce. Data is not only a means of production, but also a tradable asset in its own right, a means of organizing GVCs and delivering services. It also provides less direct support for physical trade by allowing trade facilitation to be implemented. Data is also at the heart of rapidly growing new service delivery models such as cloud computing, the Internet of Things (IoT), and additive manufacturing.

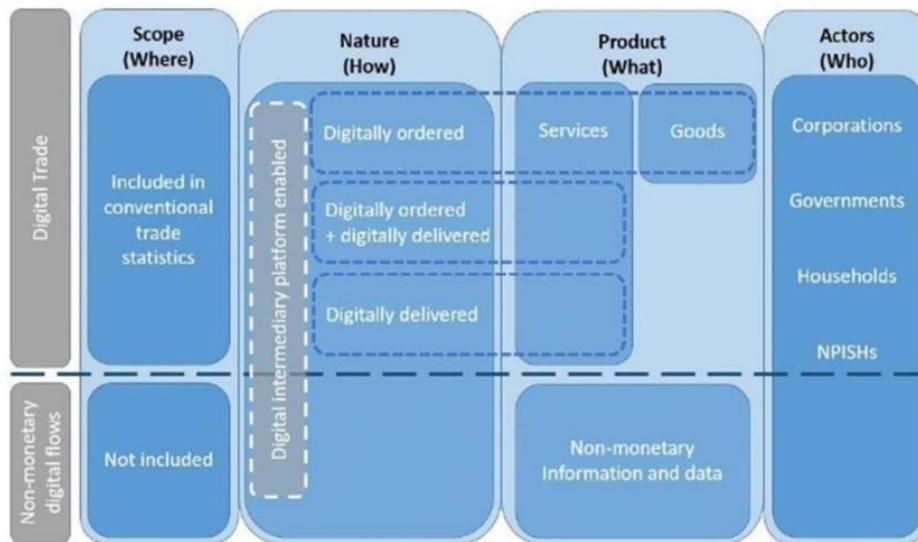
BACKGROUND

Underlying the rapid growth of digital commerce is a revolution in computer and software technology, telecommunications technology, and the expansion of Internet access. Internet access has grown rapidly around the world since the mid-2000s. According to the US International Trade Commission (2013), in 2000 only 5.9% of the world's population had internet access, but by 2012 this figure had risen to an estimated 34.3%. Internet access has expanded significantly in both developed and developing countries. For example, Internet penetration, measured as the percentage of Internet users in the total population, increased during the year 2000 from 37.3% in Japan and 33.8% in the United States to 79.5% and 78%, respectively. More than doubled in 2012, he increased by 1% (USITC, 2013). However, Internet penetration in emerging markets such as Brazil, China, and India jumped from 2.9%, 1.8%, and 0.5% to 45.6%, 40.1%, and 11.4%, respectively (USITC, 2013). According to the International Telecommunications Union (2013), 2.3 billion people have access to the Internet, and this number is projected to grow to 5 billion by 2020. Asia-Pacific leads the global average in ICT connectivity growth over the past decade. According to a report (2016a) produced by ESCAP, over 52.3% of the world's fixed broadband subscribers live in the Asia-Pacific region. However, this impressive figure is mainly due to China and some countries in East and Northeast Asia (ESCAP, 2016). and the International Fiber Optic Network (UNCTAD, 2015). With the increasing accessibility of the Internet, commerce is moving from physical interactions between sellers and buyers to markets based on online activities that do not require direct interaction.

For instance, the usage of social media sites like eBay and Craigslist as well as websites has allowed the virtual market to flourish. In this process, especially in developing nations, the broadcast reduction of mobile phones and tablets has been a significant tool for digital trade (UNCTAD, 2015). The OECD (2012) reports that since 2005, the number of mobile phone subscriptions has more than doubled globally and tripled in non-OECD nations.

According to Ahmed and Andolas (2015, p. 1), mobile devices "will account for four out of five broadband connections by 2016". According to the latest statistics released by the ITU in June 2016, global mobile broadband penetration was 49.4%, while fixed broadband penetration was only 11.9%. In particular, the deployment of mobile broadband narrows the digital divide in developing countries, where access to fixed broadband (8.2%) is much more restricted than access to mobile broadband (40.9%). It is therefore not surprising that a study by Fedrikkson (2013) found that he 90% of Latin American online consumers use smartphones for online shopping. In China, "almost half of all online purchases are made on smartphones" (Wilson, 2016). Similarly, a USITC study (2013, p. 12) showed that "portability and wireless broadband, especially when accessed via tablets, are the main drivers of increased demand for digital content in the United States." rice field. While the development of ICT hardware and infrastructure over the past decade has contributed significantly to the expansion of digital commerce, new ways of using technology and the information it generates are driving new uses, such as big data, social networking and cloud computing. becoming an increasingly important factor. digitalization. Social networks such as Facebook and Twitter have become standard means of communication between businesses and consumers.

The Conceptual Framework For Digital Trade

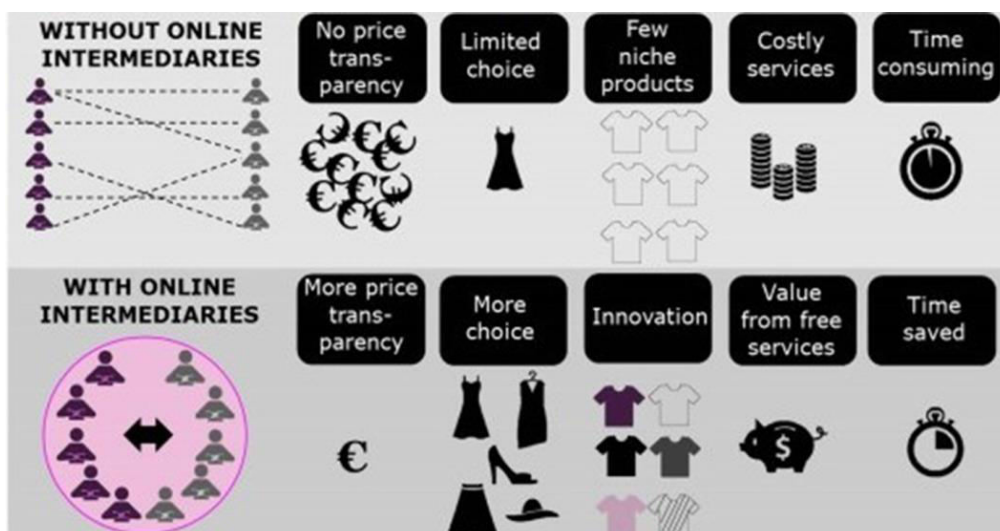


Source: OECD

Of course, digital trade is not entirely new. Since digitally enabled transactions for the acquisition of both goods and services are a long-standing feature of the economic landscape. These digitally enabled transactions pose difficulties that are the same as or related to those raised by non-digital transactions. This is due to the fact that digital trade is considerably broader than only services offered digitally. Due to expanding digital connection, the expansion of digital trade affects or results in changes throughout the entire supply chain of goods and services.

Transforming Trade through Digitalization

Trade expands in size, scope, and speed as a result of digitization. It enables businesses to reach a broader global audience of customers who are digitally connected with new products and services. Additionally, it enables businesses, especially smaller ones, to use cutting-edge digital tools to remove obstacles to growth. These tools include those that facilitate payments, foster collaboration, avoid the need to invest in fixed assets by using cloud-based services, and use alternative funding sources like crowd funding.



Source: Copenhagen Economics

The way we exchange things is also evolving due to digitalization. For instance, the expansion of online marketplaces has increased the amount of small packages sold across international borders. This is posing a wide range of problems for decision-makers in terms of risk management (such as in relation to counterfeit goods or biosecurity standards) as well as implications for revenue in terms of tax and tariff collection. The physical management of parcel trade is one of these problems. New business models and technological advancements are also altering the way services are produced and provided, making the existing hazy differences between commodities and services and modes of delivery even more hazy and allowing for the

introduction of novel mixes of things and services. Market access is necessary for both the embedded service and the good in a smart fridge. And a 3D-printed item, for instance, may cross a border as a design service but transforms into a good at the point of consumption. When taken as a whole, these problems present fresh difficulties for the formulation of international trade and investment policy.

The expansion of services in international cross-border trade is also made possible by rapid technical advancements. Information and communication technology services are the foundation of digital trade, supplying the required network infrastructure and supporting the digitization of other service kinds. The development of digitally enabled services, which are backed by a variety of new services built on data-driven, creative solutions like cloud computing, has also been made easier by new technology.

In the era of digitization, traditional trade issues may take on new meanings, such as the effects of onerous border procedures on parcel trade or limitations on newly tradable services, while new trade policy concerns are also emerging, such as disparate rules among countries regarding data flows. To aid in the creation of an environment that fosters innovation and encourages digital trade in goods and services, policy makers will need to have a better grasp of the nature and scope of these changes.

The Rise of Digital Technologies Promises to Further Transform International Trade

A number of technological advancements that make use of the internet are about to usher in a new era, one in which trade costs and global trade could significantly change. Blockchain, artificial intelligence (AI), 3D printing, and the Internet of Things (IoT) have the potential to fundamentally alter how we trade, who deals, and what is exchanged.

Impact of Digital Technology on Global Trade

It is difficult to assess how digital trade affects globalisation. There isn't a consensus on what it is or any accurate information on its size as of yet. We start our research by first examining a consequence of digital trade: the dramatic increase in transnational data and communication flows. Cross-border Internet traffic increased by 60% annually between 2002 and 2012. Second, we predict that cross-border Internet traffic might increase by an additional eightfold by 2025, based on reasonable assumptions. The increase of bits and bytes of data travelling around the globe is largely due to people communicating with one another. People and businesses are embracing digital and mobile connections to exchange ideas, cooperate, and form social ties — both inside countries and increasingly beyond borders — as transmission costs have fallen and speeds have increased. An invention that has been patented in one nation may be used by a researcher in another to create a brand-new item that is sold all over the world. Two friends can communicate their most recent news over the phone, email, Facebook, Twitter, or Instagram if they are in different countries. An executive in business can send an instant communication to a coworker in a foreign office. Facebook photo sharing exemplifies the scope and speed of how social media facilitates the global dissemination of material. When US President Barack Obama was reelected in 2012, his official triumph picture was shared more than 600,000 times and liked more than 7 million times; more than two-thirds of those shares and likes originated from outside the US.³ Cross-border data flows are produced by each of these exchanges. Calls between countries have increased dramatically as a result of VoIP (Voice-over-Internet Protocol). Since 2002, when there were 162 billion phone minutes, there were 570 billion call minutes in 2014. VoIP call minutes have climbed by 24 percent annually since 2004, whilst traditional analogue call minutes have only increased by less than 8 percent since 2004. Along with VoIP calls, computer-to-computer cross-border Skype calls have surged, creating an equivalent flood of cross-border data flows. Skype calls between computers across borders reached a level equivalent to 44% of regular international calls in 2014. In the past ten years, Skype calling has increased by more than double every two years, expanding at a rate of 46% annually as opposed to 8% for conventional calls. This represents an increase in Skype call minutes of more than 700% since 2008. However, the above-mentioned new fluxes of global communication do not fully, or even predominantly, account for the tsunami of data that is rapidly travelling across boundaries. While we are unable to determine the precise percentage of Internet traffic that is caused by emails, We are aware that digitalization is enabling different kinds of worldwide flow through VOIP calls and other forms of communication. Books, magazines, and movies are just a few of the items that are now often traded in digital format via the Internet with essentially no distribution or shipping fees. Customers get access to a virtually limitless selection of games, films, music, books, magazines, and newspapers from all over the world. Even though the majority of digital items are used by consumers in the nation where they were made, sales to global customers are increasing. For instance, Netflix, which offers movies and television episodes online, has grown as a global company. Think about how 3D printing technology might change the flow of tangible products in the future. Companies might exchange digital design files over the Internet and then use 3D printers to make the good in small batches locally instead of manufacturing goods at scale in one location and shipping them

around the world. This method is already being used to make industrial components, medical prosthesis, and replacement parts. The variety of products to which this could be applied is growing over time and may now even encompass more intricate industrial components.

A digital platform like IShape ways is one that allows designers from around the world to upload product designs and employ 3-D printing. It is difficult to describe or quantify digital trade. The transmission of goods and services over either fixed-line or wireless digital networks is the USITC's (United States International Trade Commission) limiting definition of "digital trade." The majority of physical items, including those purchased online and those with a digital counterpart, such as books and software, music, and movies sold on CDs or DVDs, are not included in this definition of commerce, which also encompasses local and international trade.

A research from the US Bureau of Economic Analysis that examined "digitally enabled" areas like finance and counted all commerce from those industries as part of digital trade, whether the transaction was actually delivered digitally or not, offers a different, broader definition. What industries are digitally enabled, meanwhile, can be challenging to pinpoint. A study by the Organisation for Economic Co-operation and Development (OECD) covered some of the difficulties in defining the digital industries.

Three Digital Transformation Initiatives by the Indian Government Likely to Affect Your Import/Export

Delivery deadlines are a perennial concern for Indian import and export enterprises even as supply chain issues continue to worsen. Nobody wants delivery delays since they negatively impact businesses in terms of both revenue loss and goodwill. With the deployment of technology, customs authorities are becoming more stringent. Three significant measures, which we might view as significant moves by the customs authority towards digitalization, were announced by the Delhi Customs Zone.

1. The government set up a website to schedule inspections of all imported goods. Even while the primary goals of this phase were to expedite things and minimise physical intervention, they also hoped that by using this application, they might promote openness, greater information access, and convenience. The application is multi-stakeholder, which means that it connects all of the stakeholders to a single platform and is accessible to all of them. The typical participants are importers, brokers for Customs, importers, CONCOR, and Customs. They can all access information, share platforms, and have a common understanding of when to schedule product inspections thanks to this application.
2. Another significant shift was the introduction of a smart-lock and blockchain-based application that enables electronic tracking of containerized freight and enables customs to keep tabs on and track cargo movement. The non-duty-paid consignment can be tracked by the authorities using GPS, which simplifies the paperwork and promotes trade.
3. A luggage scanner was installed at ICD Tuglakabad, the biggest inland port in India. It can be utilised for a non-intrusive evaluation of imported goods or luggage. The shipment will be cleared more quickly as a result of this adjustment. Additionally, smuggling activity will be easier to monitor by the customs officers.

Case of Developing Countries

It is acceptable to consider qualitatively new potential for the integration of developing nations into the global economy in the context of digital transformation, despite the "digital gap" between industrialised and developing countries. It's critical to comprehend the particulars of the digital economy's global distribution in order to comprehend its core components. Rapid advancements in ICT and the Internet can elevate poor nations to the forefront of research and innovation and, at times, open up new and unexpected economic prospects for them. Developing countries acquired access to contemporary technology and empowerment through involvement in global value chains during the era of "classical" globalisation, which was characterised by fast internationalisation and transnationalization of production (although they are still limited). The process of adjusting to new technical processes is time- and money-consuming. Globalisation through "digital" technology produces a lot of high-caliber opportunities in answer to the problems of modernization. Experts who wrote the report "Emerging markets: four answers to the challenges of development" assert that developing nations can use digital technology to build environmentally friendly production capacities that can get around the limitations of physical infrastructure, achieve greater social integrity, and significantly boost their competitiveness on the global stage.

The substantial potential of developing nations in the sphere of digitization and the creation of pertinent markets is determined by new prospects in the digital economy, existing potential, and successes in this area, together with relatively inexpensive labour. About 30% of the 500 most powerful supercomputers are operational now

outside of the industrialised nations. India has the second-highest percentage of Internet users worldwide. Despite the fact that just about 30% of Indians have access to the Internet, compared to 53% in China and 76% in Russia (as of 2016), the rate of digitization is increasing at a very rapid rate. In 2015, there were more than 100 million Internet users in India. and it is expected that in the near future the number of users will again increase by tens of millions.

For developing nations, the potential for "digital" globalisation are crucial. In 2015, developing nations and nations undergoing economic transition accounted for 70% of all Internet users worldwide, including 705 million people in China, 333 million in India, 120 million in Brazil, 104 million in Russia, 87 million in Nigeria, and 72 million in Mexico (for comparison, there were 242 million people in the USA, 118 million in Japan, 72 million in Germany, and 59 million in the UK). About 90% of the 750 million people who began using the Internet between 2012 and 2015 came from emerging nations, including 300 million each from China and India. However, according to UNCTAD analysts, internet trade volume in poor nations is still quite modest. It should be mentioned that nations like China and South Korea have their own substantial e-commerce platforms and a cutting-edge logistics network, and the number of Internet users who buy or acquire goods and services online is increasing every single day. According to projections, the new phenomena brought about by the synthesis of globalisation and digitalization would increase the share of the world GDP by \$ 2.7 trillion by 2025, add 72 million new employment, and enhance living standards for 540 million people.

A World Bank Study Called as “Digital Dividends” Shows How Relevant and Important the Digital Economy for the Economic Development And Because of Digitalization, It Was Possible to Make Important Conclusions.

1. “The following are some interesting results from this survey: -88% of the survey participants from automobile manufacturing companies believe that by 2030 at least one of the largest car manufacturers will receive more income from online sales of information and services in the field of transport than from the sale of cars and spare parts; -70% of representatives of companies providing various professional services believe that by 2025 digital solutions will bring more revenue than services provided directly by specialists; -50% of representatives of the media and news agencies believe that by 2025, 90 percent of all news received by the population will be provided by computers; -92% of representatives of the banking sector and stock market believe that by 2030, distributed ledger technology will become one of the key elements of the global financial system; -50% of the surveyed institutional investors and representatives of independent funds believe that by 2025, most financial agreements and the management of the corresponding document flow will be carried out using the blockchain architecture”

[Source: - <https://www.ejbm.org/index.php/ejbm/article/view/389/223>]

Opportunities Driven by Digital Trade for Developing Economies

It is widely acknowledged that the advent of digitalization has sparked a new wave of innovation that will have major effects on humanity, altering how people interact with their governments, corporations, and society. The degree of integration into the digital economy will increasingly affect growth, productivity, and human development.

1. Access to new clients in both domestic and international markets can be made easier for enterprises by means of digital platforms and technologies. For instance, providers who rely more on online sales may be able to reduce delivery costs, especially for content that is delivered digitally.
2. The emergence of digital technology can increase business productivity and present fresh prospects for entrepreneurship, innovation, and job creation.
3. It can assist firms, especially micro, small, and medium-sized ones, in overcoming expansion-related obstacles and enabling them to participate in peer-to-peer innovation collaboration and employ alternative finance mechanisms like crowd funding.
4. New cloud-based solutions can lessen the necessity for spending money on information technology equipment and related internal knowledge.
5. Powerful tools for change include artificial intelligence, big data, cloud computing, machine learning, and algorithmic decision-making.

Challenges Driven by Digital Trade

Indeed, digitalization and frontier technologies not only create new opportunities for doing business, they also bring about a number of challenges and risks.

1. An unfair distribution of advantages may result from restricted ability to use affordable digital technologies and uneven access to them.
2. People in remote areas and those with low levels of education and literacy may be excluded.
3. People with restricted connectivity options or rights; micro, small, and medium-sized businesses.
4. There are worries that the broad use of new technologies, automation, and online platforms will result in the loss of jobs, an increase in income disparity, and a concentration of power and money in a smaller number of hands.
5. It might also cause a loss of privacy and have a detrimental effect on the negotiating power of users, consumers, and workers.
6. In addition, businesses, organisations, governments, and people should be ready to respond to digital manifestations of unwelcome behaviour, some of it unlawful.
7. Because of the increasing decision-making abilities of devices and algorithms using machine learning and large-scale data analysis, frontier technologies pose legal, regulatory, and ethical problems.

Key Facts and Findings

- The exponential growth in computer power, bandwidth, and digital information has made it possible to develop digital technologies like artificial intelligence, the Internet of Things, additive manufacturing (3D printing), and Blockchain.
- The widespread use of internet-enabled devices that give consumers direct access to online markets is changing consumer behaviour by shifting purchases online.
- Despite the advantages of digital technologies, they are also raising a number of concerns, including market concentration, loss of privacy and security threats, the digital divide, and the question of whether they have actually increased productivity.
- Costs of international trade decreased by 15% between 1996 and 2014. The cost of doing business will be further reduced by new technologies. As a result of the declining trade costs, our forecasts state that trade might rise by 1.8 to 2 percentage points more annually until 2030, for a cumulative growth of 31 to 34 percentage points over 15 years.
- As digital technologies become more widely used, the nature of trade in products and services changes, and the definition of intellectual property rights in commerce is redefined. Trade in items related to information technology has increased by three times over the past 20 years, reaching US\$ 1.6 trillion in 2016.
- It is anticipated that the role of services in commerce would become more significant. By 2030, we project that the percentage of trade in services will increase to 25%.
- Trade in digitisable items, such as CDs, books, and newspapers, has decreased due to digitalization, falling from 2.7% of all goods trade in 2000 to 0.8% in 2016. With the development of 3D printing technology, the trend is probably going to continue.
- New comparative advantages are anticipated to be created as a result of the regulation of intellectual property rights, data flows, and privacy as well as the standard of digital infrastructure.
- If the right complementing policies are put in place and issues relating to technology diffusion and regulation are handled, the drop in trade costs can be especially advantageous for MSMEs and businesses from developing nations. According to our projections, in such a scenario, the percentage of emerging nations in global commerce might increase from 46% in 2015 to 57% in 2030.
- The emergence of digital technologies has resulted in opportunities and difficulties that may demand the attention of governments and the international community in a variety of contexts, including investments in human capital and digital infrastructure, trade policy, and regulation.
- A growing number of regional trade agreements now have clauses that specifically mention digital technologies. The most often used clauses cover e-government, collaboration, and the suspension of customs fees for electronic transfers.
- Even though the WTO framework, in particular the General Agreement on Trade in Services, is relevant for

digital trade and WTO members have already taken some steps to promote digital trade within the existing framework, members will need to think about how they want to react to ongoing changes in the economy and how we conduct business.

CONCLUSION

Trade has undergone fundamental changes as a result of the expanding digital intensity; as a result, trade statistics must be improved to keep up with this development. Official and market research on cross-border digital trade is beginning to appear, but the quality, methodology, and transparency variations that prevent cross-country benchmarking are of particular concern with relation to assessing digital trade. Case studies frequently exaggerate how important B2B e-commerce is compared to how B2C e-commerce is, which is actually a better reflection of cross-border digital trade in products and services. Cross-border data flows have been viewed as a promising substitute, but they share the same problems as all web-based indicators in that not all data transfers are the consequence of electronic commerce. The capacity to compare and map the data flows with regard to the sources and destinations of international commerce goods and services is further complicated by a variety of additional technical challenges and restrictions. Online marketplaces are transforming even the work markets around the world. In order to get around immigration restrictions, online talent marketplaces like UpWork and Freelancer.com bring jobs to employees abroad rather than forcing them to immigrate. Although numerous similar platforms have joined them, Freelancer.com and UpWork are the largest online labour marketplaces for freelance work, with almost 27 million users combined worldwide. Companies in high income nations that employ employees from low income countries make up the great majority of users of these sites. For instance, the US is the biggest spender while India is the most popular country for outsourcing contracts. However, the virtual labour flows made possible by such platforms are quickly

Expanding to other nations, like the Philippines, and changing course as more businesses located in emerging markets hire independent contractors from other nations.

REFERENCES

1. McKinsey (2017). How to achieve and sustain the impact of digital manufacturing at scale. June 2017–24 p
2. https://www.wto.org/english/res_e/publications_e/wtr18_0_e.pdf
3. <https://www.oecd-ilibrary.org/trade>
4. https://www.wto.org/english/res_e/publications_e/world_trade_report18_e.pdf
5. https://www.oecd-ilibrary.org/trade/measuring-digital-trade_48e68967-en
6. http://www.eijfmr.com/2019/july_2019/july-2019-01.pdf
7. <https://www.oecd.org/trade/topics/digital-trade/>
8. <https://www.cbs.nl/en-gb/longread/discussion-papers/2021/imports-of-digitised-products/2-conceptual-framework-for-measuring-trade-in-digitised-products>
9. <https://www.cbs.nl/en-gb/longread/discussion-papers/2021/imports-of-digitised-products/2-conceptual-framework-for-measuring-trade-in-digitised-products>
10. <https://www.unescap.org/sites/default/files/aptir-2016-ch7.pdf>
11. <https://www.ejbmr.org/index.php/ejbmr/article/view/389/223>
12. https://unctad.org/system/files/official-document/tdb66_d5_en.pdf

BUSINESS GROWTH THROUGH DIGITAL TRANSFORMATION**Prof. Sweta Bakshi¹ and Dr. Sandeep Kumar²**¹Assistant Professor in Management, Its Mohan Nagar, Ghaziabad²professor in Management, Tecnia Institute of Advanced Studies, Delhi**ABSTRACT**

There are many great examples of how businesses adopted digital transformation early on and left their competition behind. The well-known example of that is Netflix. It completely befuddled their largest competitor at the time, Blockbuster video, whose CEO even quipped that he doesn't understand what's special about Netflix while they offered the exact same set of services. Technology as a major factor of organizational form and structure has been well recognized by academics for a long time. Business growth happens when the business exploits frontier opportunities which, requires challenging the status-quo. There are many instances of how businesses implemented digital transformation early on and left their competition behind. All businesses are becoming IT businesses and that is the truth. Much of the need for doing so is because every business has begun understanding the worth of data and connectivity.

INTRODUCTION

Business growth is the method of making a business superior and more efficacious over time. This can be realized in a number of ways, such as enhancing sales, expanding into new markets, or evolving new products or services. It refers to the upsurge in a company's size, revenue, market share, and lucrativeness over time. This can be achieved through a variety of means, including expanding into new markets, developing new products or services, and increasing sales.

Digital transformation is vital for business growth because it aids organizations keep up with the modern technology trends, grasp new markets, and improve operational efficiency. As a result, businesses can gain a competitive advantage and drive top-line growth by converting their operations and processes into a digital setup. Moreover, digital transformation can support companies improve customer satisfaction and loyalty while reducing costs.

Digital transformation, defined as transformation 'concerned with the changes digital technologies can bring about in a company's business model, products or organizational structures'. (Hess et al. 2016, p. 124). It is perhaps the most predominant managerial contest for incumbent firms of the last and coming decades. However, digital possibilities need to come together with skilled employees and executives in order to divulge its transformative power. Thus, digital transformation needs both technology and people. In the last years, scholarly attention, particularly in the information systems (IS) literature, was on a sturdy rise leading to a noteworthy increase in the number of papers addressing different technological and organizational facets of digital transformation. In the light of this development, we are influenced it is the right time to map the territory and reflect on the current state of knowledge.

LITERATURE REVIEWS

Technology as a major factor of organizational form and structure has been well recognized by academics for a long time (Thompson and Bates 1957; Woodward 1965; Scott 1992. Morton (1991) claimed that companies must experience important transformations for effective IT implementation. In the course of the years a shift of attention happened from technological to managerial and organizational issues (Markus and Benjamin 1997; Doherty and King 2005). Non-technological aspects such as leadership, culture, and employee training were found to be likewise significant for successful IT-enabled transformation (Markus 2004). Today, information technologies have become 'one of the threads from which the fabric of organization is now woven' (Zammuto et al. 2007, p. 750). Digital technologies are considered a major asset for leveraging organizational transformation, given their disruptive nature and cross-organizational and systemic effects (Besson and Rowe 2012). In order to achieve successful digital transformation, changes must occur at various levels within the organization, including an adaptation of the core business (Karimi and Walter 2015), the interchange of resources and capabilities (Cha et al. 2015; Yeow et al. 2018), the reconfiguration of processes and structures (Resca et al. 2013), amendments in leadership (Hansen and Sia 2015; Singh and Hess 2017), and the enactment of a vivid digital culture (Llopis et al. 2004). Therefore, the scope of our review revolves around digital transformation at the organizational level only.

Digital technologies may reflect in all of these definitions of unruly innovation. They may represent new-to-the-world product innovations, dislocate existing processes, and open up utterly new business models. As resumed

in a recent study by Li et al. (2017), e-commerce for instance is defined as a disorderly technology (Johnson 2010) which includes significant changes to an organization's culture, business processes, capabilities, and markets (Zeng et al. 2008; Cui and Pan 2015)

RESEARCH METHODOLOGY

Research design is Descriptive Type. For the purpose of data collection, we exclusively limit our focus on peer reviewed academic journals and Newspaper Contents.

Digital Transformation Can Help to Grow Business

Business growth happens when the business exploits frontier opportunities which, requires challenging the status-quo. Business growth integrate positive disruption in the business brought around by things like embracing a new management style, an innovation in product or services, a reversal in marketing method, a renewed emphasis on quality and so on. Most businesses would fall to the distinctive life cycle of growth, stagnation and decay. Internal and .Internal and external factors—operational aspects, organizational culture, innovation, competition and consumer behavior changes—congregate, typically, reinforcing this pattern. Digital transformation seeks to renew the business and set in a new growth phase before stagnation sets in.

Information technology has been the pillar of business operations for a long time. The publicity surrounding “digital” frequently ignores the distinction between mere digitization (or IT enablement) and digital transformation. Make no mistake though, businesses in this period are mainly dependent on using digital technologies—even if it only involves running the traditional processes better. Digital transformation is about finding novel ways to certainly change the traditional processes of the business.

Digital transformation is not just about imitating the traditional process into a digital conduit and making it work faster. It is more than just mechanizing the typical errands which can be handled by software. Rather, it is to find innovative and empowering methods to conduct business activities which were not possible earlier. Growth thus can come from business model changes which could mean new ways of gaining and serving customers, newer ways of monetizing the value delivered.

B2B Can Take Transcripts from B2C

There are many instances of how businesses implemented digital transformation early on and left their competition behind. The well-known example of that is Netflix. It completely perplexed their main opponent at the time, Blockbuster video, whose CEO even jibed that he doesn't know what's special about Netflix while they offered the precise same set of services. The difference was digital transformation. We all know who survived out of the two. The same applies to all B2B businesses today. Although the leap of change is a little slower in this segment, some frontier companies who have embraced digital transformation have shown ample impact on their growth that others are swiftly following ensemble.

Digitization and Value Delivery Transformation

All businesses are becoming IT businesses and that is the truth. Much of the need for doing so is because every business has begun understanding the worth of data and connectivity. Older generation software implementations for ERP and CRM were more concentrated on getting the existing data and processes digitalized. However, with the introduction of distributed workforces, hybrid work cultures, more data driven decision making and the requirement to make the businesses customer centric, digital transformation needs to plan the entire customer journey.

There are many dimensions of value delivery. It could be functional, economical or emotional. While choosing the digital transformation solution, it is necessary that the right dimensions and their success factors are mapped according to the user's expectations. For example, in the case of customers, growth will come from increased value by simplifying interactions, generating insights and utilizing those insights to customize your services.

Mapping the Value Delivery Journey

The implementation should begin with identification of the value receivers and value drivers, both inside and outside the organization. Once they are mapped alongside the business processes, the organization desires to find touch points to apply digital involvements. Digital transformation challenges need to be discovered while working on the identification of value delivery, organizational elements and digital opportunities in terms of solution implementation.

Any business looking to adopt digital transformation or wants to move from legacy systems to modern workflows should ponder about the value delivery they want to realize. Organizations need to have a more inclusive approach behind their digital transformation goals than just addressing the pain points. Today, with enterprise software technologies, it is possible to map all your business needs and tailor a solution which takes

care of almost every challenge you can think of, but the true success of digital transformation will depend on the ability to look beyond and implement systems which will address future challenges. This is the mode to get ahead of the industry norms.

Transform the Customer Experience

The new span of business growth will depend on how well the organization comprehends its customers and delivers the kind of experience which is not offered by others. There is a huge service orientation involved in building that trust. Whether being a B2B manufacturing company or a project services company, it is still serving the end user. The company needs to have the right insights into the user experience to drive demand for the products and services. Thus, the systems used by the company to track utilization should incorporate not just the interaction with the customer but the experience of the users to constantly improve the products and services.

Why is Digital Transformation Important?

The way a company operates changes as a result of digital transformation. This process includes systems, processes, workflow, and culture. This transformation affects the organization of every level and brings together data across areas to work together more effectively.

Companies may connect the dots on the customer journey in previously unavailable ways using workflow automation and advanced processing, such as artificial intelligence (AI) and machine learning (ML).

Benefits of Digital Transformation

For many companies, the driver for digital transformation is cost-related. Whether public, private, or hybrid, data to the cloud reduces operational costs. It saves money on hardware and software while it allows team members to focus on other projects.

• Evolving Customer Experience

Any digital business's customer experience is essential. Customers constantly look for valuable and simple solutions to their problems, expecting them to be fast. Organizations are becoming more aware of this, and they are committing more time and effort to develop layered digital transformation strategies to enhance their customers' experiences.

• Data-based Insights

The data collected by an organization is one of its most important assets. Therefore, it must be utilized to its fullest potential.

Metrics can be tracked quickly and accurately with the help of digital technology, which also improves transparency. These insights enable businesses to improve their processes and get better results. Such data-driven insights help better understand customers, improve business strategies, aid in improved decision-making, and lay the foundation for a higher return on investment.

• Collaboration Like Never Before

Organizations can correctly identify inefficiencies in processes thanks to digital transformation. It also allows for open communication amongst the different stakeholders. It offers a better chance for leaders to set organizational goals and create roadmaps for individuals and teams to achieve digital congruence.

• Technological Innovation

It is not enough to adjust your business strategy to keep up with changing client needs; you also need to change your company's tech infrastructure. Because connectivity and new technology are such crucial aspects of digital transformation, organizations are under pressure to re-evaluate their existing systems and invest in new solutions specifically meant to address the difficulties of the digital era.

Over the next few decades, technologies such as the Internet of Things (IoT), machine learning, and artificial intelligence (AI) will shape the technological image of all industries. In the new digital world order, businesses that successfully leverage the power of these technological innovations to reinvent both their processes and their offerings will prosper.

• Improves Productivity

Employers are constantly looking for new ways to improve productivity in their organizations. This is especially true when many companies look to switch from on-site to remote or hybrid working. Not only does technology play an important part in connecting dispersed teams, but automating your processes will also improve your employees' efficiency, regardless of where they work.

Integrating your data and streamlining manual processes will save time across the board, allowing teams to do more in one day than they could previously.

• Speeds Up Communication

WhatsApp and Facebook Messenger, for example, are now used more often than the social media platforms from which they emerged. Consumers have come to expect on-demand services and immediate responses or resolutions from companies due to this.

You can use agile digital transformation technologies to interact with new potential customers using instant messaging applications to stay up with the needs of a customer base whose attention span is collectively getting shorter.

• Strengthens Security

Data is a valuable commodity in today's world, as we have seen, but it is also highly vulnerable to exploitation. As a result, data security is a significant concern for both consumers and businesses, who risk losing customers and profits if their systems are breached. Additionally, it has recently become much more important to maintain because people have been working from home on unprotected personal networks.

By adding high-tech security measures on any device used for company purposes, digital transformation can help protect your information. However, do not rely solely on the software; a close working relationship with technology partners is essential for data security. They can offer you data on updates and new applications as they become available.

• Consolidates Business Partnerships

If your organization works with external suppliers, distributors, freelancers, or consultants, you may make the process more efficient by putting part of the admin online. Contracts, order sheets, and invoices, for example, must be prepared and kept for your records, but instead of waiting for them to arrive in the mail or relying on people having access to a printer and scanner, eSignatures can speed compliance.

You will save time and resources (which equates to profit) and make your processes more accessible to current and new business partners by implementing changes like this.

CONCLUSIONS

People have turned to digital channels for nearly every aspect of their lives, which is a momentous part of the new normal that we talk about so much. Consumers will endure to shop online and have developed new digital habits.

Their expectations are far higher than what they were used to before COVID. Distant working is, of course, here to stay. What better time to re-evaluate your customer's needs? What better time to think big and acclimate your business model to meet digital expectations?

Digital transformation efforts are providing desirable business outcomes for companies of all sizes, including product and service enhancement and innovation, operational competence, and increased nimbleness across the value chain. However, defining a strategy for your precise business needs and desired outcomes is the first step toward achieving value.

Integral Choice focuses in providing the best solutions for every customer while nurturing long-term relationships. Integral Choice is a telecommunications and cloud agency that focuses on customer migration to hosted and contact center IP services as strategic areas of focus.

REFERENCES

- Besson P, Rowe F (2012) Strategizing information systems-enabled organizational transformation: a transdisciplinary review and new directions. *J Strateg Inf Syst* 21:103–124.
- Cha KJ, Hwang T, Gregor S (2015) An integrative model of IT-enabled organizational transformation: a multiple case study. *Manag Decis* 53:1755–1770.
- Cui M, Pan SL (2015) Developing focal capabilities for e-commerce adoption: a resource orchestration perspective. *INF Manag* 52(2):200–209.
- Hansen R, Sia SK (2015) Hummel's digital transformation toward omnichannel retailing: key lessons learned. *MIS Q Exec* 14(2):51–66.
- Hess T, Matt C, Benlian A, Wiesböck F (2016) Options for formulating a digital transformation strategy. *MIS Q Exec* 15(2):123–139.

-
- Hill CW, Rothaermel FT (2003) The performance of incumbent firms in the face of radical technological innovation. *Acad Manag Rev* 28(2):257–274.
 - Johnson M (2010) Barriers to innovation adoption: a study of e-markets. *Ind Manag Data Syst* 110(2):157–174
 - Karimi J, Walter Z (2015) The role of dynamic capabilities in responding to digital disruption: a factor-based study of the newspaper industry. *J Manag Inf Syst* 32(1):39–81.
 - Li L, Su F, Zhang W, Mao JY (2017) Digital transformation by SME entrepreneurs: a capability perspective. *Inf Sys J* 28(6):1129–1157.
 - Llopis J, Gonzalez MR, Gasco JL (2004) Transforming the firm for the digital era: an organizational effort towards an E-culture. *Hum Syst Manag* 23(4):213–225
 - Markus ML, Benjamin RI (1997) The magic bullet theory in IT-enabled transformation. *Sloan Manag Rev* 38:55–68.
 - Morton MS (1991) *The corporation of the 1990s: information technology and organizational transformation*. Oxford University Press, New York.
 - Scott WR (1992) *Organizations rational, natural, and open systems*. Prentice Hall, Englewood Cliffs
 - Sebastian IM, Ross JW, Beath C, Mocker M, Moloney KG, Fonstad NO (2017) How big old companies navigate digital transformation. *MIS Q Exec* 16(3):197–213.
 - Singh A, Hess T (2017) How chief digital officers promote the digital transformation of their companies. *MIS Q Exec* 16(1):1–17.
 - Thompson JD, Bates FL (1957) Technology, organization, and administration. *Adm Sci Q* 2:325–342
 - White M (2012) Digital workplaces: vision and reality. *Bus Inf Rev* 29(4):205–214.
 - Woodward J (1965) *Industrial organization theory and practice*. Oxford University Press, New York.
 - Resca A, Za S, Spagnoletti P (2013) Digital platforms as sources for organizational and strategic transformation: a case study of the Midblue project. *J Theor Appl Electron Commer Res* 8(2):71–84.
 - Scott WR (1992) *Organizations rational, natural, and open systems*. Prentice Hall, Englewood Cliffs.
 - Sebastian IM, Ross JW, Beath C, Mocker M, Moloney KG, Fonstad NO (2017) How big old companies navigate digital transformation. *MIS Q Exec* 16(3):197–213.
 - Yeow A, Soh C, Hansen R (2018) Aligning with new digital strategy: a dynamic capabilities approach. *J Strateg Inf Syst* 27(1):43–58.
 - Zammuto RF, Griffith TL, Majchrzak A, Dougherty DJ, Faraj S (2007) Information technology and the changing fabric of organization. *Org Sci* 18(5):749–762.
 - Zeng Q, Chen W, Huang L (2008) E-business transformation: an analysis framework based on critical organizational dimensions. *Tsinghua Sci Technol* 13(3):408–413
 - https://economictimes.indiatimes.com/news/how-to/how-digital-transformation-can-help-your-business-grow/articleshow/94621591.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst
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BUSINESS TRANSFORMATION THROUGH RESEARCH INNOVATIONS**¹Dr. Sandeep Kumar and ²Prof. Sweta Bakshi**¹Professor in Management, Tecnia Institute of Advanced Studies, Delhi²Assistant Professor in Management, its Mohan Nagar, Ghaziabad**ABSTRACT**

Business transformation is an umbrella term for making fundamental changes in how a business or organization runs. This includes personnel, processes, and technology. The technology innovations related to Industry 4.0 have different impact on different enterprises depending on the size and the resources it enjoys both internal and external. Characteristics of Innovation and Growth Measuring a firm's innovativeness or propensity to innovate remains an important, albeit murky, science. This "ability to innovate" has often eluded the understanding of most companies and scholars, while rising to top of the mind for many of business thought leaders. Organisations that are using technology to bring more intelligence and mobility to their operations and products are becoming "Innovation Accelerators", according to new research from Red Hat. These organisations are driving transformation by pursuing IT-enabled business innovation as a core strategy throughout the organisation

INTRODUCTION

Business transformation is an umbrella term for making fundamental changes in how a business or organization runs. This includes personnel, processes, and technology. These transformations help organizations compete more effectively, become more efficient, or make a wholesale strategic pivot. Business transformations are bold, seismic shifts that organizations make to accelerate change and growth beyond typical incremental advancements. The scope is broad and strategic, such as switching to new business or operating models.

Organizations undertake business transformations to create additional value. It may mean unlocking the potential of employees, harnessing intellectual property and proprietary technology for other purposes, or becoming more efficient to maximize the company's potential.

Business transformations are large, multi-year initiatives requiring wholesale changes to fundamental aspects of the transforming companies. Given the size, scope, and timeframe of the undertaking, it must be driven from the top—be it the CEO or the Board of Directors—to position the company for sustained success and growth for the foreseeable future.

These transformations used to take many years. Now, the urgency of these changes and the support available have accelerated the timelines. Many are completing them in months versus years.

The technology innovations related to Industry 4.0 have different impact on different enterprises depending on the size and the resources it enjoys both internal and external. The fourth industrial revolution is transforming many industries globally. Big companies have potential as well as resources to adopt Industry 4.0 technologies and innovations, however, the small and medium sized businesses still need to develop and innovate their business models to be competitive in international markets.

The 'Industry 4.0' concept was introduced in 2011 to represent the fourth industrial revolution by the German federal government to transform the businesses in the manufacturing sector. Industry 4.0 is one of the most trending topics recently in both professional and academic fields (Chiarello et al., 2018; Liao et al., 2017). The same concept has also been referred to as 'smart factory' as a synonym in which machines are interconnected with wireless connectivity and sensors, to streamline the entire production line and control to make decisions.

Successful business leaders and C-level corporate executives (CEOs, Presidents, COOs, CMOs, CTOs, CFOs, etc.) across a wide gamut of industries face the challenge of facilitating corporate innovation and growth while ensuring the efficient allocation of scarce resources. This delicate balancing act has become a focal point in modern business, where the realities of the old adage "innovate or die" are hammered home by the current fragility of the global economy. Where innovation is concerned, the issue has never been the lack of great ideas; rather, the real management challenge often lies in the process of direct application, implementation, and rapid commercialization (Govindarajan & Trimble, 2005). John Chambers, president and founder of Cisco Systems and perhaps one of the most influential business thought leaders of modern times, stated recently that corporate America's future hinges on its ability to practice, harness, and switch from traditional business operating models to those that feature more open collaboration and development (McGregor, 2009). Chambers argued that open innovation offers the best platform for leveraging organizational science, knowledge, and

experiential learning to foster rapid creative development, implementation, and new business leadership. Similarly, Jeffery Immelt, General Electric (GE)'s CEO and thought leader, characterized today's economic landscape as a new frontier that offers the opportunity for continued corporate change (McGregor, 2009). Both Chambers and Immelt firmly believe that business transformation will continue to be the universal challenge,

LITERATURE REVIEW

Characteristics of Innovation and Growth Measuring a firm's innovativeness or propensity to innovate remains an important, albeit murky, science. This "ability to innovate" has often eluded the understanding of most companies and scholars, while rising to top of the mind for many of business thought leaders. Carayannis and Provan (2008) described the ability to innovate as consisting of three vital factors: (1) propensity, (2) performance, and (3) posture. Carayannis and Provan (2008) constructed an index of performance similar in nature to Kaplan and Norton's (1993) balanced scoreboard and Altman's (1968; 2000) famed financial constructs used in measuring and forecasting continued growth. Carayannis and Provan concluded that most of the literature and associated research tends to focus on a linear input through output process in manufacturing and ignores the impact of the multiple variable concepts. The tendency among researchers, according to the authors, is to derive a composite index that is often incomplete. To support this point Carayannis and Provan identified a more complete set of requirements and measures of innovation that cover a wide range of innovation performance. These measures or growth factors are: (1) alignment, (2) training and orientation, (3) sales share of R&D expenditures, (4) sales share of internal venture capital, (5) various process-oriented measures, and (6) newness of innovation, new to the firm, new to the industry, sales derived from innovation, number of patents, and profits. Carayannis and Provan's work delivered a fundamental observation of the ways in which the input variables of financial resources and human capital can impact performance, when coupled with processes and alignment and focused on the value proposition of sustainability through innovation. They contended that "...simultaneous inclusion of multiple variables, when integrated into the corporate culture, produce the best results. This approach differs from prior single variable cause and effect analysis" (Carayannis & Provan, 2008). This observation is consistent with the claims of other scholars cited in this study. Skarzynski and Gibson's (2008) research over the past ten years has found that most companies are increasingly less than satisfied with the results derived from their R&D expenditures. Skarzynski and Gibson research pointed to numerous studies and surveys in which despite significantly increased resource investments into R&D, the results fall short. Real wealth comes from a radical departure from the past and can best be achieved through a well-designed innovation strategy and execution plan. This process requires multi-year investments, new business model transformation, and real senior management commitment. (Skarzynski & Gibson, 2008)

BUSINESS TRANSFORMATION

With an all-encompassing scope, business transformation can be many things. There are plenty of ways to break it down, but business transformation activities typically fall into one (or more) of these five categories:

- **Business process Transformation**—This transformation focuses on the "how" of getting things done and might include agile transformation. It typically involves lots of optimization and automation of repetitive processes to focus on higher-value projects. This generally is an ongoing effort, starting with the most common methods and then continuing onto those with lesser returns. The end goal is to relieve the company from the burden of these tasks to innovate or provide higher-value services and offerings to the market.
- **Information/data/Digital Transformation**—focusing these transformations on using technology to unlock additional value. It may come in aggregating and sharing data in new, more efficient ways (such as a digital CRM system or online ordering). It also includes leveraging technology and data to offer ultimately new products and services, both by using the technology to more rapidly design, build, and distribute them and use digital assets as part of the new offerings themselves.
- **Organizational Transformation**—altering resource allocation is key to many transformations. A company's most precious resource—its people—are no exception—base organizational transformation by assessing how to staff various departments and the structure of those departments themselves. Looking at in-house skills and experience, how the staff is deployed, and the various reporting structures allow companies to identify opportunities. These opportunities could point to either streamline or build-out to better achieve growth and success. Other objectives may include breaking down silos, flattening the organization, and right-sizing the headcount.
- **Management Transformation**—As companies strive for growth in competitive marketplaces, top-down bureaucratic hierarchies aren't always the best for facilitating rapid decision-making and reacting to new developments. Transforming the management structure may be part of the solution (getting rid of the

middlemen, etc.), but empowering individuals to make decisions themselves or quickly reach a consensus is far more critical. This requires socialization and access to information, establishing clear communication channels, and overall transparency in organizational functions.

- **Cultural Transformation**—Cultural transformation is, in some ways, the hardest business transformation activity. Corporate cultures tend to evolve organically, driven by leadership personalities and how people are rewarded and recognized. Changing the culture usually takes much longer than any other type of transformation, in part because it's harder to translate concepts and intentions into action and practice. It also rarely takes place in a vacuum and has a much higher success rate when it comes to the heels of management transformation. A strong vision, adherence to that vision, and practicing confirming it are all essential to success.

Product Managers are often The Catalyst for Business Transformation

Product managers are often the catalyst for business transformation in their organizations, but people rarely recognize or acknowledge it. They have a unique role in the fulcrum of so many aspects of the organization. The downstream implications of the insights they provide to the directions they prescribe for their products can create—or at least spark—these fundamental changes.

By conducting, compiling, and communicating customer research and competitive analysis results, product managers are often the first to spot opportunities. With customer-centricity in mind, they can easily recognize issues with delivering innovations, meeting customer expectations, bringing products to market, and supporting customers.

By pushing the development organization to deliver new products and services, they're instigating additional investments in new technologies that are more efficient and provide a platform for entirely new offerings.

By implementing or utilizing one of the many decision-making frameworks, product managers are laying the groundwork for management transformation; instead of running every tiny decision up and down the old chain of command. By preaching Lean innovation principles, conducting A/B tests, and mandating MVPs instead of fully-baked products, they're breaking free from the traditional enterprise way of thinking.

Product management is creating dozens of Petri dishes for business transformation that can illustrate the potential upsides of these endeavors and provide examples that can be replicated across the entire organization and on a larger scale.

For these transformations to be truly transformational, it requires a larger buy-in than just the product team; the whole management team must be on board and willing to invest the time, effort, and resources. Product managers excited about and interested in playing a key part in the transformation should be sure organizational support truly exists before "getting out over their skis" and assuming the executive team has their back.

Implementation of Business Transformation

It all starts with a strategy—without clear, big picture objectives and plans on how to get there, any business transformation is destined to fail. This strategy must also be apparent to downstream individuals to ensure nothing is lost in translation, as a business transformation's steps and processes shouldn't be left open to interpretation.

Next comes identifying which capabilities are needed (or must be improved) to achieve those strategic goals. These are either things the company can't or doesn't do now or areas that could use significant improvement or redirection. Deloitte defines each capability along these six lines:

- **Mission**—Derived directly from the strategy, it's the why, how, and capability.
- **Insights**—How to compile data, communicate, and use data to drive decisions.
- **Integration**—Rules, roles, and decision-making responsibility.
- **Processes**—Well-defined and efficiently designed to reach the desired outcomes
- **Technology**—Requirements for the capability in terms of hardware, software, tools, and services
- **Talent**—What skills and experience are needed for this capability to thrive, including allocating existing staff and recruiting additional team members

Any transformational activity also requires staying power because there's no reason to go through this entire process if the company falls back into its old ways as soon as the exercise is completed. The same data and

metrics used to measure if the company has achieved its goals can also ensure they're being maintained once the transformation is complete.

A dedicated staff is also key to a successful transformation. The management of these programs should be someone's "day job" and not an add-on responsibility. A massive undertaking like this requires a dedicated headcount with the appropriate experience and authority to hold people accountable for their deliverables.

Ways to Transform your Business

Business transformation is an umbrella term for making fundamental changes in how a business or organisation operates. Transformation can include internal issues such as personnel, and management and production processes, as well factoring in external factors such as regulatory changes, changing demand and new market opportunities. Business transformation is more than just a strategy for growth or improvement; it's about completely reinventing the way you do business.

There are many ways to be innovative. Strategic transformation involves a radical shift in the way you do business, but you could also choose to make incremental changes over time. You could improve how current products or services are used, develop new market opportunities, or change the way your business is run.

Business Transformation through Innovation

Innovation can help your business adapt and evolve in order to survive and grow. In your business, innovation may be driven by the need to solve a problem or capture a new opportunity.

Ways to innovate

You could improve how old products or services are used, find new uses for them, or even create new ones. Innovation also includes changes that you make to how your business is run – can you create new processes or a new business model? There are many ways to be innovative. You could implement a big change, a small change, or gradual changes over time.

Innovation Accelerators' Drive Business Transformation Through Technology

Organisations that are using technology to bring more intelligence and mobility to their operations and products are becoming "Innovation Accelerators", according to new research from Red Hat. These organisations are driving transformation by pursuing IT-enabled business innovation as a core strategy throughout the organisation.

A survey of 420 business leaders globally, commissioned by Red Hat through Harvard Business Review Analytic Services, found that these Innovation Accelerators (32% of survey respondents) are anticipating significant change over the next three years, particularly in how they engage with and learn about customers, as well as in their business models, products and services, and end user processes.

According to the survey, the Innovation Accelerators are more than twice as likely to invest in the creation of new applications compared to peers in companies where innovation is not a priority (72% versus 34%). They are also more likely to focus on revenue generating opportunities with new customer experience strategies (71%), business model innovation (69%) and service innovation (68%). By contrast, companies for which innovation is not a priority will focus more internally on the automation of business processes (70%).

The way organisations engage with and understand their customers leads the list of areas that will be changed the most by IT-enabled innovation, reports the survey, with more than half (55%) of all respondents saying it will be changed significantly and a fifth (20%) saying it will be completely transformed. Respondents also believe IT-enabled innovation will change the way employees do their work, with almost half (48%) saying it will be significantly changed and 15% saying it will be completely transformed.

This is also carried through to the company's products/services, where nearly half (46%) said there would be significant change, while 11% said it would be completely transformed. Business models too are expected to change, with 42% expecting significant change and 13% expecting complete transformation. For Innovation Accelerators, the numbers are significantly higher, according to the survey, with 70% saying their approach to customer engagement and insight will be significantly changed, while a third (33%) say it will be completely transformed.

The survey report said that these changes translate to a number of specific projects that respondents expect to engage in over the next three years. Two thirds of survey respondents plan to automate business processes (67%), with the same proportion executing customer experience strategies. Almost two thirds (60%) will create new applications and more than half will innovate their services (57%) and business models (56%).

Other significant findings were that business intelligence/analytics and mobile technologies and apps lead the list of technologies that respondents expect to drive business innovation over the next three years, at 66% and 53%, respectively. These are followed by process automation (44%), collaboration tools (29%), cloud computing (28%) and social media (24%).

C-level leadership plays a significant role in driving technology-driven business innovation, the survey found. The results show that CIOs lead this type of innovation in 41% of organisations (25% alone and an additional 16% in tandem with another executive), CEOs lead technology-driven business innovation in 16% of organisations, and other C-level executives account for 16%. In approximately one-fifth of organisations (18%), a senior cross-functional committee or innovation board leads IT-driven business innovation.

Innovation Accelerator organisations value this cross-functional collaboration, with nearly half (48%) reporting that IT and the business typically engage together to identify innovation opportunities.

While CIOs have a mandate to help drive this innovation, daily responsibilities of running IT and limited resources may be hindering their ability to do this. According to the survey, while 57% believe the CIO should drive innovation and strategy, only 12% say their CIO actually does that. Survey results indicate that CIOs at Innovation Accelerator companies perform more strategic roles, developing and refining business strategy (26%), driving business innovation (30%), and identifying opportunities for competitive differentiation (26%).

“It is clear from survey results that every organisation should strive to become an Innovation Accelerator,” said Lee Congdon, CIO, Red Hat. “These companies have moved from a ‘keep the lights on’ strategy to one where they are driving strategic initiatives like customer experience and service innovation. It is clear to me that the role of the CIO is changing as a result too, now playing an essential role in IT-driven business innovation.”

Respondents were from North America (40%), Asia (24%), and Europe (23%), with 13% from the rest of the world. Almost half (45%) of respondents were from organisations of 10,000 or more employees. Respondents were from North America (40%), Asia (24%), and Europe (23%). Thirteen per cent were from the rest of the world.

Encourage innovation

Building a culture that supports innovation can help your business stay relevant, meet challenges, and stay competitive. Innovation is not just about new ideas, but also about new ways of applying ideas. Encourage innovation by asking staff how they would improve the way they do their job, using business strategies that welcome innovation, reviewing current processes and arranging regular training and networking opportunities for all staff.

Make money from innovation

One way to make money from innovation is to commercialise your idea. Research and evaluate your innovation to find out if it will make your business money. Your idea or plan may sound great, but you need to assess whether your business is ready to sustain growth.

Protect your idea

Protecting your innovation (or your idea) is essential. Whether your idea is a new product or service, or an improvement to an existing product or service, you must protect your intellectual property. Learn more about protecting your idea.

Innovation help

A range of services is available to help you to grow your business through innovation. Learn more about grants and support services for business innovation.

Ways to transform your business

Business transformation is an umbrella term for making fundamental changes in how a business or organisation operates. Transformation can include internal issues such as personnel, and management and production processes, as well factoring in external factors such as regulatory changes, changing demand and new market opportunities.

Business transformation is more than just a strategy for growth or improvement; it's about completely reinventing the way you do business.

There are many ways to be innovative. Strategic transformation involves a radical shift in the way you do business, but you could also choose to make incremental changes over time. You could improve how current products or services are used, develop new market opportunities, or change the way your business is run.

Innovate your Business Model

Leaders frequently define their business in terms of the products and services they deliver and so focus on these for innovation. However, with technological advances and globalisation presenting so many new opportunities - and threats - leaders are now looking to gain a competitive advantage through innovative business models. Business model innovations have the power to transform businesses and reshape entire industries. Business model innovation is about being different, really different. You can be different in any industry.

Business Model Case Study - Apple

When Apple introduced the iPod with the iTunes store it revolutionised portable entertainment, creating a new market and transforming the company.

Apple was not the first company to bring digital music players to market; there were two other players in 1998 and in 2000. Both products worked well, were portable and stylish. The key difference was that Apple did something far smarter than take a good technology and wrap it in a snazzy design. It took a good technology and created a new business model.

This innovative business model combined hardware, software and service, and made downloading digital music easy and convenient. Apple essentially 'gave away' the low-margin iTunes music to lock in the purchase of the high-margin iPod. This model defined value in a new way and provided industry-changing convenience to the customer (Johnson et al. 2008).

Business Model Elements

The business model is the way(s) that businesses make money out of their ideas, resources and technologies. Every business has a business model, whether it is documented or not. Osterwalder and Pigneur in their book *Business Model Generation* discuss 9 key elements of a business model. They are:

1. **Customer segments** – defines the different groups or organisations a business aims to reach and serve.
2. **Value proposition** – describes the bundle of products and services that create value for a specific customer segment.
3. **Channels** – describe how a business communicates with and reaches its customer segments to deliver a value proposition.
4. **Customer relationships** – describes the types of relationships a business establishes with specific customer segments.
5. **Revenue streams** – represents the cash a business generates from a customer segment.
6. **Key resources** – describes the most important assets required to make a business model work.
7. **Key activities** – describes the most important things a business must do to make its business model work.
8. **Key partnerships** – describes the network of suppliers and partners that make the business model work.
9. **Cost structure** – describes all costs incurred to operate a business model.

Business Model Tool

The free Design a better business – Context canvas tool allows you to map out trends including demographics, competition, and economy and environment.

To determine whether you should change your business model consider:

- What makes your existing business model successful? For example, what customer problem does it solve? How does it make money for you?
- Are there signals that your model needs changing, such as tough new competitors?
- Is reinventing your business model worth the effort? Will it result in a significant competitive advantage for your business?

There are significant opportunities to transform your business through moving to an open business model, through new revenue streams and a reduction in costs. The most common business model innovations include (Ball 2006):

- organisation structure changes
- major strategic partnerships

- shared services
- alternative financing/investment vehicles
- divestitures/spin-offs
- Use of third-party operating utility.

Improve your innovation process

Businesses best positioned to survive and thrive in the highs and lows of economic cycles are those that continue to innovate, regardless of the economic cycle. During tough economic times, innovation can help your business make real gains in efficiency.

Process Improvement Makes Economic Sense

During economic downturns, many businesses automatically look to downsizing or budget cuts to keep the business running. Objectively understanding the supply chain process, focusing on what makes customers successful, eliminating waste and activities that don't add value, and implementing other cost-reduction strategies can all help. Effectively managing the cash-to-cash cycle, the order-to-deliver cycle and the supply chain can simultaneously reduce costs and improve business efficiency.

In boom times, innovative processes allow businesses to cope with the influx of demand more quickly and more cost-effectively than competitors.

Lean Manufacturing Requires Innovative Thinking

The Toyota Motor Company is one of the best-known companies in the world and excels at continuous improvement. Toyota's highly effective production system, known as 'lean manufacturing', didn't result from a sudden brainstorm but evolved over decades of sustained improvement.

Lean manufacturing is not limited to Toyota or the car industry. The principles of lean manufacturing have been adopted by thousands of businesses across the world as leading practice. Lean principles and the efficiencies they generate are not limited to production but extend to all other areas of business operations, including product and service development, prototyping, testing and service delivery.

The secret? Build your solution from the customer back, and drive out anything connected to complexity.

How benchmarking can help

Measurement and benchmarking – comparing your business's results to a standard – is central to successful implementation of best practices. Internally, it contributes to an open and accountable organization because it visibly communicates your progress. It also identifies shortfalls and areas requiring attention. Externally, a business obtains a reasonable idea of where it is placed alongside other organizations.

Tools to assist in innovation process improvement

Adopting best practices – proven ways to get the best results from having the right processes and technologies in place - doesn't mean attempting to copy and transfer others' success to your journey. Your business, people and culture are unique and so your journey will be unique. It's good to extract ideas from the experiences and challenges of others, but how to apply them in your business will be unique.

Technology can assist in greatly improving business process. Operational applications, such as financial, human resource, supply chain, enterprise resource planning and customer relationship management systems, can improve efficiency, scalability and standardization of processes.

Other business management applications, such as decision support systems, analytics, dashboards, and performance management tools, can help improve business strategy and decision making.

Develop leaders, culture and the right team Leaders who are able to successfully transform businesses are ambitious, but ambitious for the business, not themselves. Research consistently shows that organisations with effective leadership and an environment in which innovation can thrive are increasing their market share, profitability, customer satisfaction and other key performance indicators considerably faster than those that don't.

Early in its life, while it is still small, a business is agile and flexible, seizing opportunities, taking calculated risks and building its culture as it develops. There's a sense of urgency in advancing ideas through prototypes, and taking them to the market as quickly as possible. The culture encourages creativity and calculated risk-taking. As a business grows and becomes more complex (more people, customers, products and orders),

problems surface and more defined processes are introduced to manage the business. The problem is, often these systems crush the entrepreneurial spirit of the business.

Does your business culture support innovation?

For example, do you:

- mention innovation in your vision, strategies or business plans
- include the importance of innovation when inducting staff
- have methods or processes to encourage and capture new ideas
- people discuss new trends or models emerging in your field
- apply any resources to new ideas
- reward or recognise people who come up with new ideas
- encourage experimentation
- tolerate failure
- communicate and measure outcomes from innovation efforts

If you answered 'yes' to most of these questions, you are well on the way to developing a healthy innovation culture.

CONCLUSION

Any established organization interested in maximizing performance, increasing efficiency, and being around in five or ten years should explore business transformation opportunities. There will always be places, processes, and structures that could benefit from an overhaul, and bypassing these changes in favor of the status quo often proves short-sighted and detrimental.

Product management can serve as inspiration, a testing ground, and a momentum-maintaining cheerleader for turning these ideas into reality by incorporating business transformation fundamentals into their organizations and for the products they oversee. Innovating how the company works can be just as pivotal in its success as the innovative thinking that goes into the produced products.

REFERENCES

- Alshawaaf, N., & Lee, S. H. (2021). Business model innovation through digitisation in social purpose organisations: A comparative analysis of Tate Modern and Pompidou Centre. *Journal of Business Research*, 125, 597-608.
- Altman, E. I. (1968, September). Financial ratios, discrimination analysis, and prediction of corporate bankruptcy. *Journal of Finance*, 23(4), 589-610.
- Altman, E. I. (2000, July). Predicting financial distress of companies: Revisiting the z-score and zeta models. Stern School of Business, New York University. Retrieved from [http:// pages.stern. nyu. Edu/~ealtman/ Zscores.pdf](http://pages.stern.nyu.edu/~ealtman/Zscores.pdf).
- Ball, I, 2006, 'Expanding the innovation horizon: the IBM global CEO study 2006 [Paper presented at CEO Industry Forum 2006: Sustaining and growing market share: customers and community.]' .In *Finsia* 120 (3): 43.
- Barsh, J., Capozzi, M. M., & Davidson, J. (2008, January). Leadership and innovation. *The McKinsey Quarterly*, (1), 36-47.
- Bughin, J., Chui, M., & Johnson, B. (2008). The next step in open innovation: The creation of knowledge, products, and services by online communities of companies and consumers is
- Carayannis, E. G., Sindakis, S., & Walter, C. (2015). Business model innovation as lever of organizational sustainability. *The Journal of Technology Transfer*, 40(1), 85-104.
- Johnson, MW, Christensen, CM and Kagermann, H, 2008, 'Reinventing your business model'. *Harvard Business Review* 86 (12).
- Kahn, K. B. (2018). Understanding innovation. *Business Horizons*, 61(3), 453-460. [https:// doi. org/10. 1016/j. bushor.2018.01.011](https://doi.org/10.1016/j.bushor.2018.01.011).

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- Morris, M., Schindehutte, M., & Allen, J. (2005). The entrepreneur's business model: toward a unified perspective. *Journal of business research*, 58(6), 726- 735. <https://doi.org/10.1016/j.jbusres.2003.11.001>.
 - Osterwalder, A, Pigneur, Y and Clark, T, 2010, *Business model generation: a handbook for visionaries, game changers, and challengers*. Wiley, Hoboken, NJ.
 - Parida, V., Sjödin, D., & Reim, W. (2019). Reviewing literature on digitalization, business model innovation, and sustainable industry: Past achievements and future promises.
 - Skarzynski, P., & Gibson, R. (2008). *Innovation to the core: A blueprint for transforming the way your company innovates*. HBR Press ISBN-13: 978-1-4221-0251-0.
 - Westerman, G., Bonnet, D., & McAfee, A. (2014). *Leading digital: Turning technology into business transformation*. Harvard Business Press.

A STUDY ON DISTRIBUTIVE INNOVATION IN PRESENT SCENARIO**¹Ms. Neha Dubey and ²Aurthur Kaludzu**¹Assistant Professor, Parul University²parul University**ABSTRACT**

The problem with conflating a disruptive innovation with any breakthrough that changes an industry's competitive patterns is that different types of innovation require different strategic approaches. Entrepreneurship can be defined as the process of creating, developing, and managing a new business venture in order to achieve profit and growth. Contemporary approaches to entrepreneurship focus on break-through and disruptive innovations that bring new products, services, or business models to the market.

Breakthrough innovation refers to a new product, service, or process that represents a significant improvement over existing offerings. These innovations are typically driven by technological advancements or new insights into customer needs and preferences. Breakthrough innovations can create entirely new markets, transform existing markets, or enable businesses to gain a competitive advantage.

Disruptive innovation refers to a new product, service, or business model that disrupts an existing market by offering a more convenient, accessible, or affordable alternative. Disruptive innovations often start out in niche markets but eventually overtake established players as they gain traction and scale.

This paper is firstly going to discuss, what is a disruptive innovation? Second, how can a disruptive innovation be disruptive? Third, how can disruptive innovations be identified before a disruption has occurred.

Keywords: Entrepreneurship, Breakthrough Innovations, and Disruptive Innovations

INTRODUCTION

The 21st century has been a period of dynamic socio-economic changes in the world due to globalization, internationalization and expansion of organizations satisfying more and more varied customer needs. As the competition is growing, companies operating on the market have to continuously work on their development. The entrepreneurship has been combining knowledge, commitment and technology of the entrepreneur. Entrepreneurial attitude and behavior allow to find yourself on the market and achieve success. That is why entrepreneurship has been the object of interest of many scientists, not only in the field of economics. The aim of this paper was to present a review of Polish definitions of entrepreneurship, an enterprise and an entrepreneur, on the background of foreign historical approaches to entrepreneurship. Despite considerable interest in the subject of entrepreneurship, there is no unambiguous definition of this phenomenon. A common feature of the proposed definitions is the combination of entrepreneurship and business. Multidimensionality of entrepreneurship emphasizes its importance in economic development, as it occurs in all sectors of the economy

An enterprise can be defined as a team of people as well as material and financial resources, appointed to conduct a specific economic activity and separated in terms of technical-service, technical-production, spatial, economic and legal (Altkorn, Strużycki, 1994). In the worldwide literature, enterprises are usually defined by the quantitative classification of enterprises, in which the size of the enterprise plays a key role, determined by the number of employees and annual turnover. The above criteria are often supplemented with additional ones, such as: amount of capital employed (Italy, France, Ireland) or the essence of relations between the employer and employees (Great Britain, Germany) (Karska, 2002).

Historical Basics of Entrepreneurship

Some economists believe that certain manifestations of entrepreneurship there since the dawn of mankind (Hébert, Link, 1988: 7-13). While the concept of entrepreneurship and entrepreneurs appeared in literature and science in the 18th century, they have not found a suitable place in the contemporary scientific achievements, remaining only a background of some economic theories. It is divided into three main streams research enterprise (Gawel, 2007: 5; Hébert, Link, 1988):

- The first trend derived from F. Knight's theory (1920s) – according to which entrepreneurship is understood as the ability to take the risk of market activity;
- The second trend derived from the theory of J. Schumpeter (1930s) – where the essence of entrepreneurship lies in people's ability to introduce broadly understood market innovations;

- The third trend derived from the theory of I. M. Kirzner (second half of the 20th century) – according to which the entrepreneur takes a risk and operates under conditions of uncertainty;

Moreover, Hebert and Link add the fourth trend, derived from the theory of J. H. von Thünen (middle 19th century) – combining the ability to deal with uncertainty and to apply innovation by the entrepreneur.

Contemporary Definitions of an Entrepreneur, an Enterprise and Entrepreneurship in Polish

Contemporary researchers interested in the subject of entrepreneurship agree that there is no unambiguous description of this phenomenon. However, the definitions proposed have a common feature, since they connect entrepreneurship with business (cf. among others Adamczyk, 1995: 12-15; Adamczyk, 1996: 13-17; Gawel, 2007; Kapusta, 2001; Kłodziński, Fedyszak-Radziejowska, 2002: 25; Kropsz, Kutkowska, 2008: 90; Tuzimek, 2002: 82). Entrepreneurship defies definition operations and it results both from its complexity and historical character. It should also be noted that multidisciplinary research on the phenomenon of entrepreneurship (within theories of economics, psychology, sociology or management sciences), though they provide different research perspectives, do not solve conceptual problems (Kraśnicka 2002a: 14).

In economic sciences, it is assumed that after 1990, the type of entrepreneurship that was crucial for the transformation process in Poland – both in the countryside and in the city – inducing individuals to make decisions to conduct a variety of economic activities. Therefore, many definitions of entrepreneurship emphasize its relationship with economic activity (Kłodziński, Fedyszak-Radziejowska, 2002: 26; Duczkowska-Małysz, Małysz, 1993).

According to contemporary definitions of entrepreneurship, based on earlier theories, it can be easily seen that they are extensive and combine many of the entrepreneur's functions. For example, according to J. Sawicka, the concept of entrepreneurship has got two basic meanings. The term defines the economic process of creating new, usually small and medium-sized enterprises. It is also a feature of personality that characterizes human attitudes and behaviours, consisting in the ability and willingness to bear risk, a tendency to behave innovatively, and taking action to use opportunities (Sawicka, 2000: 9). On the other hand, according to T. Kraśnicka (2002b: 14), entrepreneurship is a special kind of activity for people, acting individually or within an organization, which consists in taking advantage of occasional opportunities and projects (introducing innovations, creating new organizations or renewing existing ones), bringing economic or non-economic effects to their entities and the environment. In turn, according to J. Targalski (2003: 15), entrepreneurship is the process of establishing and running a business, including the following components: identifying opportunities and possibilities of operating on the market, developing a business plan and gathering necessary resources, establishing an enterprise, running a business through subsequent stages of its development (business management).

In the last twenty years of the 20th century, numerous ideas were born based on the theory of pure innovation. R.D. Hisrich and M.P. Peters (1992: 10), among others, define entrepreneurship as a process of creating a new, different value, within which the time and effort necessary to achieve this goal is sacrificed, assuming financial, psychological and social risk accompanying it, and expecting to receive a financial reward and personal satisfaction. In the opinion of J. Sawicka (1998: 24), entrepreneurial activities are the essence of the market economy, because private entrepreneurs, guided by the motivation to achieve their own benefits, broaden the limits of economic activity, introduce innovations, guarantee effective use and allocation of resources in the Business Ethics and Leadership, Volume 2, Issue 2, 2018 entire economy. D. Kamerschen et al. (1991: 5) see the most important function of the entrepreneur in discovering profit opportunities, claiming that the entrepreneur is a business person who discovers potential profitable opportunities, organizes and manages enterprises that have a production character. According to P.F. Drucker (2004: 25-29), all new, small companies have many common features, but if a venture can be described as entrepreneurial, it must display some special features other than that it is new and small. In fact, entrepreneurs constitute a minority among new companies, but they create something new, something different; they change or transform values. According to Drucker, an entrepreneur is an innovator, not a capitalist, although he needs capital to conduct all economic activities (and non-economic majority). An entrepreneur is also not an investor, even though he engages resources in future expectations, which means uncertainty and risk. What's more, in the opinion of Drucker, an entrepreneur is also not an employer, but he is often an employee – or someone who works alone. Entrepreneurship, according to Drucker, is not a personality trait; it is rather a way of acting, because its foundations lie in concept and theory, not in intuition.

Entrepreneurship, as a certain attitude of a man towards the environment in which he lives and works, is also noticed by J. Wilkin (1997). What's more, M. Kłodziński and B. Fedyszak-Radziejowska (2002: 26) treat entrepreneurship quite broadly, above all connecting it with personality features of individuals, i.e. resourcefulness, initiative and taking action, contributing not only to individual success and satisfaction aspirations of people who undertake them, but also to animate changes leading to the success of the whole community, and consequently – to the social and economic development of the commune. T. Hunek (1993: 13), however, defines the category of entrepreneurship as organization and management of a company, a venture based on motives of profit, assuming risk and on the entrepreneur's own responsibility.

According to K. Krajewski (2004), entrepreneurship is the opposite of waiting, discouragement and passivity in solving difficult life situations, as in 1945-1989 Polish entrepreneurs had to struggle with the theory of superiority of the socialist economy over capitalism propagated by the state authorities in the economic development of the country.

Breakthrough Innovations

Breakthrough innovations are those new and unique products, services, or processes that offer significant improvements in performance, efficiency, effectiveness, and/or convenience compared to existing solutions. These innovations often involve a radical departure from traditional approaches and can have a profound impact on society, the economy, and the environment. Some examples of breakthrough innovations include:

1. Personal computers: The development of personal computers in the 1970s and 1980s revolutionized the way people work, communicate, and access information.
2. Internet: The invention of the internet in the 1990s has transformed the way people connect, communicate, and access information.
3. Smartphones: The development of smartphones in the early 2000s has transformed the way people communicate, access information, and conduct business.
4. Electric cars: The development of electric cars in the 21st century has the potential to revolutionize the transportation industry and reduce carbon emissions.
5. Artificial intelligence: The rapid advances in artificial intelligence (AI) technology are enabling breakthrough innovations in fields such as healthcare, transportation, manufacturing, and finance.
6. Block chain: The development of block chain technology is enabling breakthrough innovations in areas such as finance, supply chain management, and data security.
7. CRISPR gene editing: The development of CRISPR gene editing technology is revolutionizing the field of biotechnology, enabling breakthrough innovations in healthcare, agriculture, and environmental sustainability.

These breakthrough innovations have transformed the way we live, work, and interact with the world, and have the potential to create new opportunities, solve complex challenges, and improve the quality of life for people around the globe.

Disruptive Innovations

Disruptive innovations are new and innovative products, services, or business models that disrupt existing markets and create new ones. These innovations often start in niche markets and eventually grow to become mainstream, displacing traditional market leaders and creating new opportunities for entrepreneurs and investors.

Some examples of disruptive innovations include

1. Uber: The ride-sharing service disrupted the traditional taxi industry by offering a more convenient and cost-effective alternative for consumers.
2. Watches: People used to wear expensive wrist watches such as Rolex that could only tell time but currently most people would rather wear smart watches which are significantly cheaper and that not only can tell time but can count the steps you have taken in a day, record your body temperature etc.
3. LED light bulbs: LED light bulbs have disrupted the old bright light bulb market by providing a cheaper and more energy-efficient alternative. LED bulbs last much longer than incandescent bulbs and use significantly less energy, which can save consumers money on their electricity bills.

4. Smartphones: The introduction of lower-priced smartphones with fewer features and capabilities disrupted the market for high-end smartphones. Companies like Xiaomi and One Plus introduced phones with similar features as premium brands like Apple and Samsung but at a much lower price point.
5. Automobiles: The introduction of low-cost cars like Tata Nano in India and Dacia Logan in Europe disrupted the market for more expensive cars. These cars offered basic features at a much lower price, making car ownership more accessible to a wider population.
6. Coffee: The rise of coffee chains like Starbucks disrupted the traditional coffee market by charging a premium for their coffee. This created a new market for high-end coffee and disrupted the market for lower-priced coffee sold by traditional coffee shops.
7. Clothes: designer clothes are found to be extremely expensive by most of the people, this in return paved way to smaller companies to manufacture low quality clothes that are cheap and affordable to most. Another instance is people would rather buy street clothes than from the mall because street clothes are relatively cheaper.
8. Airbnb: The online marketplace for short-term lodging disrupted the traditional hotel industry by offering a more personalized and affordable alternative for travelers.
9. Netflix: The streaming service disrupted the traditional television industry by offering a more personalized and convenient alternative for viewers.
10. Tesla: The electric car manufacturer disrupted the traditional automotive industry by offering a more sustainable and high-performance alternative for consumers.
11. Amazon: The e-commerce giant disrupted traditional retail by offering a more convenient and personalized shopping experience for consumers.
12. 3D printing: The technology has disrupted traditional manufacturing by offering a more flexible and cost-effective way to produce products.
13. Block chain: The technology has disrupted traditional finance by offering a more decentralized and secure way to conduct transactions.

Disruptive innovations can create new markets and opportunities while also disrupting established industries and creating challenges for incumbents. While disruptive innovations can be challenging for established companies, they also create new opportunities for entrepreneurs and innovators to create value and drive economic growth.

Discussion Breakthrough and Disruptive Innovation

According to Christensen (1997), disruptive innovations are not 'sustaining' innovations, they are mainly competence-destroying because market niches are not sufficiently large for the growth of the incumbent firms. In contrast, these niches are a good starting point for small firms that want to develop disruptive innovations, creating new needs for novel customers. Disruptive innovation and is associated with a displacement of incumbents. In Markides interpretation, disruptive innovations generate disruptive new business models, but their power of disruption is limited to a minor, but significant, share of the market. Thus, old and disruptive technology tend to survive together in the medium- or long-term.

Moreover, because of the small size of these firms (which can also be a spin-off of incumbent firms), the turnover coming from the niches is enough to guarantee their survival. Markides and Geroski (2005) also advocated this approach. Established companies should not even attempt to create disruptive innovations but should instead leave this task to small start-up firms, which have the requisite to succeed in this game. Established firms should concentrate on what they are good at - that is, consolidating young markets into the big mass market. It means that the small businesses are able to create disruptive innovations, which are cheaper to be produced (because generally they require more creativity than strong efforts in R&D activity).

Another line of reflection has been proposed by Tripsas (1997a; 1997b, 2009, 2012). The incumbents are able to change their approach in order to manage and absorb the new innovation which, in the case of business model innovation, refers more to a process and a strategy than to a physical attribute of a product. We can easily assume that several large players are able to manage the disruptive innovation, rather than small incumbents, which may suffer more. But in other cases, incumbents are not able to shift to new technology and they exit the market.

Finally, we can resume arguing that breakthrough innovations refer more to the product innovation, and they are done both by large firms (incumbents on the market) and by small innovators. The term the disruptive innovation looks at a different phenomenon, when an innovation displaces the incumbents, shifting not just the technology but the industry structure, suggesting that the disruption is more related to the market structure rather than to the technological advancement of the product per se.

An example is provided by the retail industry, with the spread of e-commerce. As discussed before, e-commerce represents a potentially disruptive innovation. Actually only large retail chains have been adopted it. In contrast, traditional small shops may be incapable to use this new technology. However, several small new start-ups were created in the last decade that only sell-online.

CONCLUSIONS

The main idea of this work was to contribute to the development of a unique distinction among the definitions of breakthrough and disruptive innovation. Scholars have developed different definitions, such as disruptive and breakthrough innovations. The main differences between disruptive and breakthrough innovation are due to a few key points. A disruptive innovation disrupts the market and creates new market niches. It is an innovation that not only involves the product or the process but it can also affect the firm's business model and the processes of entry and firms' shakeout. Considering its characteristics, it is a competence destroying innovation. Disruptive innovations in product life cycles reflect the poorer product performance (or the excessive price of the previous used technology). Existing customers do not yet consider the new product, but novel customers are attracted. This radical innovation affects competition in the market, creating new products that satisfy new needs. In new market niches, innovative firms can grow and, and at the end of the market evolution, they can displace the incumbents. When new technologies are introduced without changing the firms' rankings in the market, then these innovations might just be considered technological breakthroughs.

REFERENCES

- Austin, M. J., Stevenson, J. F., & Wei-Skillern, J. (2006). Social and commercial entrepreneurship: same, different, or both? *Entrepreneurship Theory and Practice*, 30(1), 1-22.
- Battilana, J., & Dorado, S. (2010). Building sustainable hybrid organizations: The case of commercial microfinance organizations. *Academy of Management Journal*, 53(6), 1419-1440.
- Dees, J. G. (1998). The meaning of social entrepreneurship. *Stanford University Center for Social Innovation Working Paper*, 1(1), 1-25.
- Doherty, B., Haugh, H., & Lyon, F. (2014). Social enterprises as hybrid organizations: A review and research agenda. *International Journal of Management Reviews*, 16(4), 417-436.
- Hulgard, L., & Schyberg, E. (2014). Social entrepreneurship and social innovation: A review and conceptualization. *Social Enterprise Journal*, 10(3), 269-284.
- Nicholls, A. (2010). The institutionalization of social investment: The interplay of investment logics and investor rationalities. *Journal of Social Entrepreneurship*, 1(1), 70-100.
- Roy, M. J., & Doherty, B. (2012). Exploring the relationship between social entrepreneurship and innovation. *International Journal of Entrepreneurial Behavior & Research*, 18(6), 697-719.
- Short, J. C., Moss, T. W., & Lumpkin, G. T. (2009). Research in social entrepreneurship: Past contributions and future opportunities. *Strategic Entrepreneurship Journal*, 3(2), 161-194.

CONDUCTIVE AND SUSTAINABLE CLIMATE AGRICULTURAL DEVELOPMENT IN THE CHANGING ECONOMIC ENVIRONMENT

P. Chandran Ph.D and Dr. D. Janagam¹Research Scholar and ²Professor, Department of Economics, Periyar University, Salem – 11**ABSTRACT**

The agriculture, forestry and fisheries sectors can offer significant opportunities to address the fight against climate change within robust sustainable development paths, especially in developing countries by offering solutions that reduce negative impacts on land and water resources, enhance ecosystem management and services, improve food security and generate income opportunities, leading to production systems and rural livelihoods that are more resilient to shocks and allow for better resource use efficiency. Climate change impacts such as drought, floods, severe weather and sea-level rise are likely to result in food shortages, increases in vector-borne diseases, infrastructure damage, and the degradation of natural resources upon which livelihoods are based. The negative impacts of climate change will hit poor people and poor countries disproportionately. Development choices made today will influence adaptive capacity and also determine future greenhouse gas emissions. The present study objective is to take necessary action against the climate change; it will boost the economic development around the world. This research paper is based on the secondary data. It concludes the agricultural development for suitable in the changing economic environment.

Keywords: Forestry, Ecosystem, resilient, climate, efficiency

INTRODUCTION

Sustainable and inclusive food systems are critical to achieve the world's development goals. Agricultural development is one of the most powerful tools to end extreme poverty, boost shared prosperity, and feed a projected 9.7 billion people by 2050. Growth in the agriculture sector is two to four times more effective in raising incomes among the poorest compared to other sectors. Agriculture is also crucial to economic growth: accounting for 4% of global gross domestic product (GDP) and in some least developing countries, it can account for more than 25% of GDP. But agriculture-driven growth, poverty reduction, and food security are at risk: Multiple shocks – from COVID-19 related disruptions to extreme weather, pests, and conflicts – are impacting food systems, resulting in higher food prices and growing hunger. Russia's invasion of Ukraine has accelerated a global food crisis that is driving millions more into extreme poverty, and around 205 million people across 45 countries have so little food that their lives are at risk.

The growing impact of climate change could further cut crop yields, especially in the world's most food-insecure regions. At the same time, our food systems are responsible for about 30% of greenhouse gas emissions. Current food systems also threaten the health of people and the planet and generate unsustainable levels of pollution and waste. One third of food produced globally is either lost or wasted. Addressing food loss and waste is critical to improving food and nutrition security, as well as helping to meet climate goals and reduce stress on the environment. Risks associated with poor diets are also the leading cause of death worldwide. Millions of people are either not eating enough or eating the wrong types of food, resulting in a double burden of malnutrition that can lead to illnesses and health crises. Food insecurity can worsen diet quality and increase the risk of various forms of malnutrition, potentially leading to under nutrition as well as people being overweight and obese. An estimated 3 billion people in the world cannot afford a healthy diet.

ROLE OF AGRICULTURE FOR THE DEVELOPMENT OF AN ECONOMY**1 .Contribution to GDP**

Agriculture has been observed to contribute a very large share of GDP of most of the economies before industrial development take place in them .As the process of industrial development accelerates , the share of nonagricultural sector in GDP tends to increase steadily. Simultaneously ,the relative share of agriculture shrinks and yields place to that of manufacturing and service sectors . This does not imply that the agricultural production does not increase .It only implies that the growth in production of industrial and service sectors is faster than the growth in agriculture sector. In some typical African economy ,agriculture produces about 50 per cent of their GDP.

2. Contribution to employment

Agriculture provides employment opportunity for rural people.

3. Source of Food Supply

The most important contribution of agriculture is to provide food supply to increasing population of the countries of the world. Raising supply of foods by agriculture sector has, therefore, great importance for economic growth of a country.

4. Pre-Requisite for Raw Material

Agriculture provides industrial raw material to a large number of industries (textile, silk, oil, sugar, rice, flour mills etc.) As a supplier of raw material, agricultural sector is of primary significance for the growth of industrial sector in the economy.

5. Creation of infrastructure

The development of agriculture requires Roads, market, storage, transportation, postal service.

6. Extension of Market Size

Agricultural efficiency raises rural income levels and creates an effective market for more and new industrial goods. It enlarges the size of market. If there is surplus production then it can be exported to the other countries of the world. So, agriculture sector

Environmental Factors Affecting Agricultural Production

Ecological factors that pressure the extent of crop farming are terrain, climate, soil Properties and soil water. It is the combination of these four factors that allow specific crops to be grown in certain areas. Below listed are the environmental factors affecting agricultural production: 1. Environmental/Climatic factors 2. Soil Factors 3. Biotic Fact

1. Environmental/Climatic factors The environment factors affecting agricultural production in Nigeria can be grouped into climatic, soil or edaphic factors and biotic factors. Climate is the average weather condition. Its factors are insulation, temperature, pressure, wind and rainfall. Each of these factors has its own influence on agriculture.

TEMPERATURE

This is about the most important factor influencing the physiological functioning of plants. Variation in temperature influences agricultural practices in different parts of the world. The average monthly temperature varies between 21°C and 35°C. The range is increasing from the coast towards the interior, but the northern part has hotter days and cooler nights giving rise to higher yield of some crops like tomatoes in some areas of the north than in the south. Tomato thrives more in a condition of hot days and cooler nights. Also with increase in altitude, temperature becomes cooler and this is the cause of excellent performance of tea and Arabica coffee on the Mambila Plateau, in Nigeria. As a result of high temperature, some temperate crops that thrive in Nigeria cannot flower because they need a period of exposure to cold to induce flowering. The low productivity of our livestock is mainly blamed on the effect of high temperature; while poultry could still be comfortable at 35°C, the cattle can no longer cope at a temperature above 32.2°C.

HIGH TEMPERATURE

It may give rise to all or some of the following conditions in farm animals: a. Reduced feed intake or loss of appetite b. decrease in productive processes of growth, rate of egg laying, rate of milk yield etc. c. reduced body weight d. embryonic death and dwarfing e. reduced fertility in exotic male animals. Attempts have, however, been made to modify the environment of crops and animals to the extent of the level of our technology. For instance, shade treatment is given to our crops from nursery through all the juvenile stages of the cocoa plant. Grazing animals are also provided shade in their paddocks and are also sheltered at night. Grazing pattern also designed to ensure that the animals are under shelter in the afternoons.

RELATIVE HUMIDITY

This is the amount of moisture in the atmosphere; low humidity can cause heat, while high humidity reduces evaporation. The effects on crops and animals include change in rate of heat loss and decrease in water consumption, in spite of increase in frequency of drinking. The effect of situation is increase in heat loss which can disorganize the metabolic system of the animal. Changes in temperature aggravate the effect of relative humidity. In low humidity areas evaporation takes place rapidly such that evaporation balance is in jeopardy. Similarly, in hot humid areas of the country, evaporation takes place slowly, hence, the rate of heat loss in both plants and animals. All these have some serious effects on agricultural productivity of the world.

RAINFALL

Rainfall has the greatest control over agricultural production activities. The types of crop grown in different ecological zones of the country are direct response to the pattern of rainfall in these parts. As we move from the southern part to the northern part of the country, the amount of annual rainfall decreases, and becomes more unevenly distributed. Associated with this change is the gradual transition from rainforest vegetation, through wood land to savanna vegetation.

AIR MOVEMENT

This is air in motion; and the rate affects evaporation of transpired water droplets from plant leaves. At moderate temperature, the more rapid the movement of air is, and the more effective it will be in reducing heat load of animals when moisture is present on the skin. It also influences the amount of radiant energy that plants and animals receive by altering the temperature of surrounding objects. To ensure free flow of air movements through tree crop plantations, cultural practices like weeding, pruning and spacing suitable for each crops is adopted.

SOLAR RADIATION

Solar Radiation is very important in agriculture; this is because it is the source of energy used by plants during photosynthesis. The amount of this energy received on the earth surface (isolation) tallies with the latitude of the area and season of the year.

BIOTIC FACTORS

The biotic factors influencing agriculture include pests, diseases and soil micro-organisms that exist in the neighborhood of plants and animals. We have micro-organism that lives in the soil and the air. These are predators i.e. organism that feeds on other organisms. There are parasites and saprophytes. Parasites are living organisms that depend on other living organism for their food, while saprophytes are living organism that lives on dead and decaying remains of other living organisms. There is competition among living organisms for all the necessities of life. The success or failure of any crop or animal in any particular place is affected by its relationship with the other organisms that live in the same place and interact with it.

OBJECTIVES

- (i) To understand the climate factors are affecting the agriculture.
- (ii) To adopt the cropping pattern for changing the climate conditions of the world to make the suitable economic development.
- (iii) To analyses the constraints, both political and social, and economic, in the introduction of organic farming

STATEMENT OF THE PROBLEM

The effect of rainfall on land productivity is highly remarkable in all the ecological zones of the country. In the rain forest zone of the south, the soil tends to be infertile because of the impact of heavy rainfall which causes leaching and erosion, thereby resulting in low yield. In the North, insufficient and irregular pattern of rainfall also makes crop yield unpredictable.

IMPORTANCE OF THE STUDY

A world where food is nutritious and accessible for everyone, in which natural resources are managed in a way that maintains ecosystem functions to support current and future human needs. In this vision, farmers, pastoralists, fisher-folk, foresters and other rural dwellers actively participate in, and benefit from, economic development, have decent employment conditions and work in a fair price environment. Women, men and communities live in food security, and have control over their livelihoods and equitable access to resources which they use in an efficient way.

METHODOLOGY

The paper is based on secondary data. Information from literature on the historical evolution of the organic farming and the progress it has made both in India and abroad collected from the published sources like the websites of the European Union countries.

RESULTS AND DISCUSSION

Over 820 million people were undernourished in 2018, while agriculture provides livelihoods for 2.5 billion people.

Climate change could push 122 million more people, mainly farmers, into extreme poverty by 2030.

Climate change is projected to increase cereal prices 29 percent by 2050.

Agriculture absorbs 26 percent of the economic impact of climate disasters, rising to 83 percent for drought in developing countries.

Water scarcity affects 40 percent of the population. For every 1 °C rise, 500 million extra people will face a 20 percent dip in renewable water resources.

Transboundary animal and plant pests and diseases are spreading faster with climate change. Plant diseases alone cost the global economy USD 220 billion annually.

Agriculture, forestry and other land use cause almost one quarter of human greenhouse gas emissions. Tropical deforestation and forest degradation account for 11 percent.

Climate change is projected to increase cereal prices 29 percent by 2050.

Agriculture absorbs 26 percent of the economic impact of climate disasters, rising to 83 percent for drought in developing countries.

Water scarcity affects 40 percent of the population. For every 1 °C rise, 500 million extra people will face a 20 percent dip in renewable water resources.

CONCLUSION

Climate change is a serious and long-term threat that has the potential to affect every part of the globe. Climate change is expected to disproportionately affect developing countries, poor and vulnerable people within those countries. In some countries and sectors, the impacts of climate change are already being felt and responses are urgently needed. Climate change will exacerbate impacts such as droughts, floods, extreme weather events and sea level rise, which may contribute to food shortages, infrastructure damage and the degradation of natural resources upon which livelihoods are based. This may also jeopardise development gains achieved through development co-operation and make it more difficult to reach our development. Adapting to the impacts of climate change is therefore critical. It is not just an environmental issue but also affects the economic and social dimensions of sustainable development.

REFERENCE

1. www.iscollege.in.
2. www.fao.org
3. Climate - smart agriculture source book "Food and Agriculture Organization of the United Nations" 2013
4. Greening the Economy with Agriculture - Food and Agriculture Organization of the United Nations - 2012
5. Nouredine Benkeblia Climate Change and Agriculture: Perspectives, Sustainability and Resilience 2022 John Wiley & Sons Ltd.

DATA SECURITY IN THE ERA OF ARTIFICIAL INTELLIGENCE**¹Mayank Chhatwal, ²Dr. Vikas Garg and ³Prof (Dr) Namit Rajput**¹PHD Scholar, Amity University, Noida²Guide³Co.Guide**ABSTRACT**

Data security is becoming increasingly important in the era of Artificial Intelligence (AI). As AI systems become more complex, the need to protect data from unauthorized access and malicious attacks is critical. AI systems rely on accurate and reliable data to function properly, and any breach of data security can lead to serious consequences. This paper discusses how AI systems can be used to protect data and how organizations can leverage AI to improve data security. It also outlines the challenges that organizations face when trying to secure data in the era of AI, including the need to properly manage large data sets and prevent data leakage. Finally, the paper provides some recommendations for organizations to consider when deploying AI-based data security solutions.

INTRODUCTION

The proliferation of artificial intelligence (AI) over the past decade has revolutionized many aspects of computing, including data security. AI has changed the way organizations and individuals protect security of their data and systems, and how they respond to potential threats. As AI systems become more complex, they are increasingly being used to provide security solutions to protect data from malicious actors. This paper will discuss the current state of data security in the era of AI, and what organizations can do to ensure their data is protected.

The emergence of Artificial Intelligence (AI) and the associated technology has revolutionized modern life and has transformed the way we use data. AI technology has enabled companies to better understand customer behaviour, optimize marketing campaigns, automate tasks, and create more accurate predictions. However, with this increased use of AI comes an increased risk of data security breaches.

Data security is a major issue in the era of AI due to the large amount of data being collected and used. AI technology can easily be used to identify weak points in a company's security system, allowing hackers to gain access to confidential data. Furthermore, the use of AI in the development of products and services may also lead to the collection and storage of sensitive customer information, making it vulnerable to malicious actors.

In order to safeguard data security in the era of AI, companies must implement comprehensive security measures. This includes encrypting data, limiting access to certain information, and conducting regular audits of security systems. Companies should also focus on developing AI systems that are secure and transparent, making it easier to detect any malicious activities. Furthermore, companies should also invest in security technologies such as identity and access management systems, as well as fraud detection systems.

At the same time, companies must also ensure that they comply with the applicable data protection and privacy regulations. This includes staying up-to-date with the latest legislative changes, such as the GDPR, and developing appropriate data security policies and procedures.

Overall, data security is a major concern in the era of AI, and companies must take appropriate steps to ensure that their data is secure. With the right measures in place, companies can protect themselves from malicious actors and provide their customers with the assurance that their data is safe and secure.

The Benefits of AI for Data Security

The use of AI in data security can provide a number of benefits. AI systems can be used to detect and respond to cyber threats more quickly and accurately than traditional security systems. AI systems can also be used to automate mundane security tasks, allowing security teams to focus on more complex tasks. AI can also be used to analyze large amounts of data to identify patterns and anomalies in data traffic, allowing for more effective detection of malicious activity.

The Challenges of AI for Data Security

However, while AI can provide a number of benefits for data security, it can also present certain challenges. AI systems can be difficult to deploy and maintain, and require significant resources and expertise to be effective. Additionally, AI systems can be vulnerable to attack from malicious actors, who may be able to exploit weaknesses in the system or use AI to bypass security measures.

Key topics related to the study of Data protection in the era of Artificial Intelligence

1. **Impact of Artificial Intelligence on Data Security:** The impact of Artificial Intelligence (AI) on data security is both positive and negative. On the one hand, AI can be used to improve data security by monitoring networks, detecting anomalies, and blocking malicious activity. AI can also be used to automate repetitive security tasks and detect potential vulnerabilities. On the other hand, AI can be used by malicious actors to perpetrate cyber-attacks, exploit weaknesses in systems, and gain access to sensitive information. As AI technologies become more sophisticated, it is important that organizations take the necessary steps to protect their data from such threats. This may include implementing additional security measures, such as encryption and authentication, or using AI-powered security tools to detect and respond to threats in real-time.
 2. **Challenges to Data Security in the Era of Artificial Intelligence:** Some of the key challenges are as follows:
 - **Increased Risk of Cyberattacks:** As artificial intelligence (AI) takes over more and more of our everyday activities, the risk of cyberattacks increases as hackers become more sophisticated in their attempts to access sensitive data.
 - **Exploitation of Machine Learning Algorithms:** AI systems can learn from data and be exploited by malicious actors to find weaknesses in data security systems.
 - **Unregulated Use of AI:** Without proper regulations in place, organizations may not be able to properly control how their AI systems are used, leaving them vulnerable to attack.
 - **Inadequate Security Infrastructure:** With the rapid growth of AI, organizations may not have the resources or infrastructure in place to adequately protect their data.
 - **Human Error:** Despite its capabilities, AI is still vulnerable to human error and can be manipulated by malicious actors if not properly monitored.
 3. **Mitigating the Risks of Data Security with AI Technologies**
 - **Implementing AI-based Identity and Access Management Systems:** Utilizing AI-based identity and access management systems can help to protect data by providing an additional layer of authentication and authorization. AI-based systems can be used to detect any suspicious activity or anomalies that might indicate an attack, and can also provide additional measures such as multi-factor authentication or biometric authentication.
 - **Utilizing AI-Based Intrusion Detection Systems:** AI-based intrusion detection systems can help to detect malicious attacks and unauthorized access to data. These systems use machine learning algorithms to identify patterns in network traffic and behavior, and can alert system administrators when something suspicious is detected.
 - **Implementing AI-Based Data Encryption:** AI-based data encryption can help to protect data from unauthorized access by using strong encryption algorithms to secure data. AI-based systems can also help to detect any attempts to access encrypted data and alert administrators accordingly.
 - **Using AI-Based Anomaly Detection Systems:** AI-based anomaly detection systems can be used to detect any unusual activity or behavior that could indicate malicious intent. These systems can also be used to detect any suspicious changes in system configurations or any unauthorized attempts to access data.
 - **Utilizing AI-Based Firewall Systems:** AI-based firewall systems can help to protect data by utilizing machine learning algorithms to identify and filter out malicious traffic while allowing legitimate traffic to pass through. AI-based firewalls can also be used to detect and block any attempts to access or modify data.
 4. **The Role of Regulators in Ensuring Data Security in the Era of AI:** Regulators play an important role in ensuring data security in the era of AI. They are responsible for establishing guidelines and regulations to ensure that data is handled safely and securely. This includes establishing standards for how data is collected, stored, and used, as well as establishing protocols for how data is shared between organizations. They must also ensure that data privacy policies are followed, and that organizations are adequately protecting data from malicious actors. Regulators can also work with organizations to ensure that AI systems are designed and implemented in a secure manner, and that appropriate safeguards are in place to protect data and prevent AI-related cyberattacks. Finally, regulators can use their enforcement powers to hold organizations accountable for any data breaches or other violations of data security regulations.
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- 5. The Need for a Comprehensive Data Security Strategy in AI-driven Environments:** In the emerging AI-driven environment, it is essential to develop a comprehensive data security strategy to protect the data and systems from malicious actors. As AI-driven systems become increasingly complex and interconnected, there is an increased risk of data breaches, unauthorized access, and other malicious activities. Companies must ensure that their data security strategy is comprehensive enough to meet the challenges posed by AI-driven systems. The strategy should involve the implementation of robust security measures such as encryption, authentication, and authorization protocols. Additionally, companies should ensure that the systems are regularly updated to the latest security patches and that any new code is tested for security vulnerabilities. Companies should also make sure that their data is stored securely and that employees are adequately trained in data security protocols. Furthermore, companies should also consider the use of AI-driven security solutions such as machine learning and natural language processing to detect and prevent malicious activities. Finally, companies should establish processes and procedures to ensure that data security is maintained throughout the system. This may include monitoring of data access, logging of user activity, and regular auditing. By implementing these measures, companies can ensure that their data remains secure and protected from malicious actors.
- 6. The Role of Data Security in the Development of Trustworthy AI Systems:** Data security is an important factor in developing trustworthy AI systems. Data security helps to ensure that the data used to create and train AI systems is protected from unauthorized access and misuse. Furthermore, data security helps to ensure that AI systems are trained on data that is accurate and representative of the real world. Data security also helps to ensure that AI systems are not subject to manipulation or malicious use. Finally, data security helps to ensure that AI systems are protected from attacks such as data poisoning or data theft. By ensuring the security of the data used to create AI systems, organizations can develop trustworthy AI systems that are reliable, secure, and effective.
- 7. Best Practices for Protecting Data in an AI-driven World**
- **Implement robust security measures:** Ensure that access to your data is driven world. This should include measures such as encrypting data, setting up access controls and authentication, and using data loss prevention services.
 - **Monitor data access and usage:** It is important to monitor who has access to the data and how it is being used. This can be done through the use of audit logs, which can help detect any unauthorized access or usage of the data.
 - **Limit access to sensitive data:** Limiting access to sensitive data is essential to protecting it. This can be done by setting up access controls or separate user accounts for different types of data.
 - **Educate users on data security:** Educating users on data security best practices can help ensure that they are aware of the importance of protecting the data. This can include training on topics such as data privacy and security, data storage and sharing, and best practices for handling sensitive data.
 - **Use AI-driven security solutions:** AI-driven security solutions can help to protect data by detecting any suspicious activity or unauthorized access. These solutions can use machine learning algorithms to detect anomalies and provide real-time alerts of any potential threats.
- 8. The Role of Blockchain and Cryptography in Securing Data in AI-Enabled Systems:** Blockchain and cryptography are two essential technologies to secure data in AI-enabled systems. Blockchain is a distributed ledger technology that enables data to be securely stored and distributed without the need for a central authority. It utilizes cryptography to ensure the integrity and security of the data stored in the system. Cryptography is a field of mathematics that uses complex algorithms to encrypt and decrypt data, making it difficult to access without the right key. Cryptography is used to protect the data stored on the blockchain, as well as the communication between different nodes in the system. This ensures that only authorized users can access the data, and that the data is kept secure from malicious actors. Together, these two technologies can provide a robust level of security for data stored in AI-enabled systems.
- 9. Exploring New Technologies and Tools to Enhance Data Security in AI**
- **Automated Data Masking:** Automated data masking is a technique that enables organizations to protect sensitive data from malicious actors while still allowing developers to access the data they need. By automatically masking potentially sensitive data, organizations can ensure that only the necessary information is exposed.
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- **Encryption:** Encryption is a key tool for securing data in AI. By using an encryption algorithm, organizations can securely store and transmit data without having to worry about anyone accessing it without authorization.
- **Blockchain:** Blockchain technology is a great way to ensure data security and privacy in AI systems. By using a distributed ledger, organizations can store and share data without needing to trust any single entity.
- **Multi-Factor Authentication:** Multi-factor authentication (MFA) is a security measure that requires users to provide more than one piece of evidence when logging into a system. This can help prevent unauthorized access to data by making it much more difficult for malicious actors to gain access.
- **Access Control:** Access control is a technique used to limit access to data or systems to only authorized users. By using access control measures, organizations can ensure that only authorized users can access sensitive data or systems.

10. The Future of Data Security in the Age of Artificial Intelligence: Data security will become increasingly important in the age of artificial intelligence, as AI technology is increasingly used and deployed. AI is a powerful tool for data analysis, but it can also be used to create malicious software that can steal or manipulate data. Organizations must be prepared to defend against these types of attacks to protect their customers' personal information and data. One of the most important aspects of data security in the age of AI will be authentication. Authentication is the process of verifying that a person is who they claim to be, and it is an essential part of data security.

Authentication will become more sophisticated and use AI-based solutions to ensure that people are who they say they are. Organizations will also need to invest in AI-based data security solutions that can detect and respond to threats in real-time. These solutions will be able to detect anomalies in data usage and identify malicious activities. They will also be able to detect and respond to attacks before they can cause damage. Finally, organizations must also invest in training for their staff and employees on data security measures. Employees must understand the importance of data security and how to protect it. They should be trained on the latest security protocols and procedures so that they can help protect data from malicious actors.

In the age of AI, data security will become even more important. Organizations must be prepared to invest in the latest security solutions and train their staff accordingly to ensure that their data remains secure.

CONCLUSION

The use of AI in data security can provide a number of benefits, but it can also present certain challenges. Organizations must ensure that they have the resources and expertise to deploy and maintain an AI system, and that they are aware of the potential vulnerabilities of AI systems to attack. By taking the necessary steps to ensure their data is secure, organizations can ensure that they are better prepared to protect their data in the era of AI.

REFERENCES

- Sadri, F. (2015). Artificial Intelligence and Its Applications in Different Fields. *International Journal of Advanced Computer Science and Applications*, 6(7), 33–40. <https://doi.org/10.14569/IJACSA.2015.060729>
- Rani, U., & Singh, A. (2018). Artificial Intelligence: A Review. *International Journal of Advanced Research in Computer Science and Software Engineering*, 8(7), 842–846.
- Duda, R. O., Hart, P. E., & Stork, D. G. (2012). *Pattern Classification (Vol. 2)*. John Wiley & Sons.
- Wiederhold, G. (1992). *Medical Informatics: Computer Applications in Health Care and Biomedicine*. Reading, MA: Addison-Wesley.
- Bostrom, N. (2014). *Superintelligence: Paths, Dangers, Strategies*. Oxford University Press.
- Kaelbling, L. P., Littman, M. L., & Moore, A. W. (1996). Reinforcement learning: A survey. *Journal of Artificial Intelligence Research*, 4, 237–285.
- Silver, D., Huang, A., Maddison, C. J., Guez, A., Sifre, L., Van Den Driessche, G., ... & Dieleman, S. (2016). Mastering the game of Go with deep neural networks and tree search. *Nature*, 529(7587), 484–489.
- LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. *Nature*, 521(7553), 436–444.
- Tiwari, P., and Joshi, A. (2019) Exploring the potential of artificial intelligence in India. *International Journal of Smart Technology*, 1(1), 23-31.

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- Sharma, A. (2020). Artificial intelligence and its applications in India. *International Journal of Advanced Computer Science and Applications*, 11(3), 59-64.
 - Kumar, S., & Gupta, A. (2020). Artificial Intelligence in India: Trends, Opportunities and Challenges. *International Journal of Computer Applications*, 180(7), 9-14.
 - Banerjee, K., & Chatterjee, S. (2020). Artificial intelligence in India: Opportunities and challenges. *International Journal of Computer Science and Information Technology*, 4(2), 55-66.
 - Dutta, S., & Chatterjee, U. (2020). Artificial Intelligence in India: A Review. *International Journal of Computer and Information Technology*, 9(2), 1-10.
 - Jain, A., & Rathore, P. (2020). Artificial Intelligence in India: A Roadmap. *International Journal of Computer Science and Information Security*, 18(7), 98-106.

BUSINESS PROCESS, TRANSFORMATION & ORGANISATION CULTURE

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ABSTRACT

As companies continue to grow, the need to establish a more mature HR & Business Process Development Program that responds to the company's need to succeed in an ever toughening market becomes apparent. Such Development Programs are important in keeping the workers aligned with the goals of the organization. A good Strategic plan helps managements see a clear line of sight between organizational goals, the competencies the employees need to demonstrate and what they as a management need to do in order to encourage and support the acquisition and demonstration of these behaviours. Having a thoroughly thought out plan for human resource & Business process development helps attract the needed talents and keep them motivated in pursuing performance excellence.

New businesses often experience growing pains as their employees become more numerous, hires and fires occur and benefits are added. No matter how competent the management or their HR staff is, there are times when the business may benefit from an external human resources management consulting. A HR management consultant is someone who can help the team become more organized, offer software and policy suggestions and even work to train the HR staff to handle the department better. A case study is discussed in detail about how this project was planned and carried out in a step by step manner in phases over a period of 1yr and successfully transformation was achieved in not only the HR Process but also in Business process of the organisation along with a complete turnaround in the Company's culture towards positivity, team bonding and growth. The goal of this document is to present a set of strategies which helped both the Human Resource Development Department and the Line Managers form partnership for helping the employees acquire the necessary knowledge, skills and attitude to perform the job better.

INTRODUCTION

A process driven organization is as it sounds, focused on process. This means that the organization sharpens their process, working to become extremely efficient while maintaining value. This allows for operational growth, efficiency, and organizational knowledge. Many major companies have made the evolution from people driven organizations to process driven organizations given the numerous benefits achieved from focus on process. People driven organizations are structured differently than process driven. People driven organizations depend on the input from individuals; entrepreneurs, managers, stake holders, etc. This method of operation can often limit efficiency, as progress is dependent on individual decision-making. The same is not true in a process driven organization. A process driven organization is set up so that the operation can run regardless of individual decision-making. The show will go on as long as the process is maintained. In order to make the shift from people driven to process driven, an organization needs to begin implementing some of the following process driven principles:

1. Knowledge
2. Time
3. Control
4. Replication
5. Adaptability
6. Managing complexity

Despite the benefits of process driven organizations, a large percentage of multinational corporations have developed a process driven approach but it has yet to make an impact in the growing / Mid Size companies which constitute to almost 45% of total industrial production of the country. There are numerous reasons for this, some of them are family run businesses with age old policies and practices, their trust is more on their people, lack of right knowledge, cost, bad past experiences, myths that only Large organizations or MNCs can only afford a Process driven functioning because implementing Processes are costly and time consuming and even if they are forcefully implemented they are not effective as the people do not adapt to change and it's a failed effort. That's why a large percentage of people driven organizations fail to recognize the importance of process at all. In these organizations processes are disconnected and poorly functioning. Often run by middle managers,

there is little incentive to move towards a process driven organization because of its associated transparency. However, the fact remains that Process driven organizations deliver value and efficiency while limiting the variability seen in a people driven organization.

One of the main reasons why a Business process transformation or a change initiative often fails is that the strategic business model is not aligned with the operational processes and hence the overall understanding of end-to-end processes has been lost.

No employee engagement, no cross-functional collaboration, inadequate management support and the lack of accountability leads to results that fall well short of stated goals.

Actual performance and compliance status of processes isn't measured continuously

This research paper is an attempt to highlight how a successful effort was made in a Mid size company where they aimed at transforming their work or making a shift from People driven to Process driven. The Project took care of both the aspects i.e. the strategic part and the operational part. The Project had a three point agenda towards the companies Processes:

- Set up new processes where ever necessary
- Streamline the existing processes
- Sustain the above 2 types of processes

A better understanding for the need of Transformation is achieved by considering that "transformation is generally a response to two factors:

- i. An (**internal**) underlying Problem or set of problems which are the cause of Organisational Pain, which have to be understood properly first and addressed.
- ii. In addition to this there could be **external** market conditions which are the key drivers to adapt to new conditions and requirements to meet business goals.

OBJECTIVE

- To understand in detail the impact of this change management on their people and their resistance to change in this objective.
- Assess the AS IS status of all the functions in HR & business process and Identify the needs to setup new practices to help employees align their performance with the company's strategic direction
- Streamline the existing processes of HR & Business Process to close existing gaps.
- Present strategy for helping managers support the new learning and encourage demonstration of new behaviour at work.
- Sustain the practices and measure the improvement annually.

LITERATURE REVIEW

The first step for any organisation is to transition their working from person dependant to Process dependant. A common problem across organizations in the contemporary corporate world is about person dependence and the ways and means to manage person dependence. The term person dependence refers to the phenomenon wherein the organizations are overly dependent on individuals for their success and even for day-to-day operations. For instance, companies like Apple and Microsoft were dependent on their founders (Steve Jobs and Bill Gates respectively) to find new business models and to come up with innovative ideas that are game changers for them. Similarly, in India, Infosys is heavily dependent on its founders for inspiration and ideas for growth as is evident from the troubles that the company has been going through in recent times with the retirement of its founders. These are some of the big-ticket companies that are overly dependent on individuals. The banks like JP Morgan and Goldman Sachs are also examples of companies where there is too much reliance on the CEO's and the top management without which they flounder for lack of guidance and are adrift without direction. The point here is that excessive dependence on individuals is fraught with risk as we live in an uncertain world where anything can happen to anyone anywhere.

On an operational level, there are many companies that are dependent on individuals at the middle management level without whom the success of the organizations is in jeopardy. Further, many project teams in organizations often depend heavily on key team members or project managers without whom the project teams cannot function efficiently and profitably. The key aspect here is that organizations must reduce their person

dependence because the individuals might quit, take emergency leave because of personal exigencies, and in the extreme cases, might even die which means that once the individual is not in the picture, the organizations that have learnt to depend on them would be directionless. Apart from this, there are many start-ups and SMEs (Small and Medium Enterprises) where the entire setup is run by a few individuals or a single individual and as mentioned earlier, if any of the risks come true, then these companies are in the danger of folding up. On a personal level, many of us would have visited hospitals, service providers, and legal offices where a single doctor, an engineer, or a lawyer holds forth and when we visit them for assistance, if that person is not around, our work is not done or is postponed.

Therefore, there is a need for any organization, big or small, to develop contingency plans in case of the key individuals being absent and this is a critical and crucial aspect of business continuity management that every organization must put in place and plan for. This is where introduction of a Process based working helps and makes the organization Process dependant rather than Person dependant.

Finally, the requirement of many risk management agencies and process maturity certification institutions is for organizations to prove their person independence for them to certify the organizations as having managed risk or achieving process maturity. This is the reason why many companies in recent times have started the task of making themselves person independent.

The 2nd step is, to keep transforming their business process so that it is able to optimise their operations and reduce the costs keeping their people aligned to the change. The purpose of this paper is also to establish a correlation of Organisation culture wrt to its Business Process transformation. There are many researches done in all these areas from different perspectives highlighting the need, importance, effectiveness of Business Process transformation and the integral role of the people of these organisations or their Culture, and at the same time there are innumerable studies conducted to find out the success ratio of implementing such transformation projects. The data shows that mostly a transformation project is viewed as high risk wrt time, cost and achieving sustainable results. One of the most common reasons that has come to light for these projects to have failed is its adaptability by the people of the organisation. The reason for this to happen are varied like resistance to change, fear of layoffs, lack of proper communication from the top management below, improper alignment of people to their new roles & responsibilities, lack of participation of the employees in the new project etc. The review of the literature study also reflects varying research work on the topic in different occupational areas and countries, but not much work has been done in the area of organizational transformation of SME (Small & Medium enterprises) companies in India. This sector is the fastest growing and any growing company needs to understand the importance of process based working to be sustainable in the market today. So this paper also shows a road map about how can a small company with limited budget can make a transformation successful to meet their people and business growth needs.

What is a Business Process & Process Transformation?

A business process can be described simply by a flow of business activities. Process is “a set of logically related tasks performed to achieve a defined business outcome, (Davenport and Short 1990). In the most general sense, a process can be defined as an activity or group of activities that take input, process that input to increase its value, and provide output (Harrington, 1991). Processes are generally identified in terms of beginning and end points, interfaces, and organization units involved, particularly the customer unit. Examples of processes include: developing a new product; ordering goods from a supplier; creating a marketing plan; processing and paying an insurance claim; etc. Each process is an independent unit that changes inputs into similar or different outputs but can interact with other processes (Sandhu and Gunasekaran 2004). Business processes are sequences and combinations of activities that deliver value to a customer (Coulson, Thomas 1996).

Process transformation is a type of business transformation and a branch of business process management (BPM), referring to a radical change in business processes. Such changes include implementing new technology, integrating core business systems or simply updating the process to reduce costs and improve operational excellence. Businesses can transform their processes to:

- Adopt a new business model
- Reduce cost
- Improve customer experience
- Implement new technologies
- Redesign existing processes

- Embrace sustainability goals
- Mitigate risk
- Enhance product or service quality

Why is process transformation important?

There is a gradual increase in trends for process transformation over the last 10 years. By doing so, transformation statistics indicate that process transformation can boost business growth by

- Improving operational efficiency by 40%,
- Providing agility in the market by 36%,
- Increasing revenue by 56%,
- Reducing additional cost by up to 20%.

Experts have defined five elements, as essential for orchestrating large-scale, transformative change namely Shared Vision, Leadership, Alignment/Empowerment, organisation Culture and continual process (Transformation: A Strategy for reform of organizations and systems, 2005). Ivana (1998) concluded in his study that transformational leaders are individuals who with their own knowledge, imaginations and ability to influence the behaviour of people, make conditions for transforming so called “soft” variables of transformational arrangement and hence make the essence of transformational management and the key to successful management of transformational organizational changes. To validate this postulate a recent research points out to the positive co-relation between the work experience / styles of managerial / cross functional cooperation / management / commitment / project management with Business Process Transformation implementation. Whereas factors such as Age / qualification / leadership style have a negative impact on the readiness of BPR implementation.

There is another case which provides a holistic perspective of organizational transformation, management of change, impact on employees and leader behaviour. The challenge at Govind Milk and Milk Products Pvt. Ltd. a mid-size company, in the dairy industry was to transform itself into a pan India and global company from a regional organization. The case study outlines how the organization took on the transformation journey under a strong leadership and managed change by focusing on creating a brand, implementing technology and creating a culture of meritocracy. They made a successful transition from being a family run business to a professionally managed company and built a significant internal capacity to fulfil the enhanced business needs.

What is Driving The Demand for Business Process Transformation?

Global spend on digital maturity initiatives and transformation programs have reached nearly two trillion dollars by 2022. But 80% of the digital revenues are earned up by the best- performing 10% of companies. Being in the midfield is no longer a good option in the future. Also, many transformation initiatives are failing because of the inability to set up a continuous optimization cycle, and because employees don't understand the “Way of working”. McKinsey mentioned that 70% of the past investments were wasted on failed programs and among those that didn't fail outright, only 16% saw improvements in their performance.

To be successful, companies need to be mission-driven and translate strategy into an operating model to achieve high operational excellence with an adapted business model in a short time. But what many companies are finding is that transforming is more than just defining a new strategy. It requires an operating vision--i.e. how you want to run your business—while keeping pace with the speed of the market and the innovation of competitors. The result is an ability to fulfil customers' increasing expectations, comply with changing regulations and easily secure high-quality, transparent operations.

Company Culture is everyone's responsibility- Recent trend

A recent article in the **Harvard Business review** states that Company Culture is Everyone's responsibility. Gone are the days when it was a Top down approach and the CEO commissions the Human Resources department to produce an effective company culture. HR designs a campaign to tout a mission statement and core values that the CEO and senior management developed. HR also implements some employee perks like free snacks in the break room or monthly birthday celebrations. Maybe they also field an annual employee engagement survey and report results back to the CEO. And then with their culture-building to-do lists completed, the CEO and HR move on to other priorities. This approach no longer works for several reasons. For one, Covid-19 has upended how leaders interact with employees and how co-workers connect with each other. The need to adapt quickly and remain flexible during the pandemic has also revealed the ineffectiveness of a

top-down leadership approach. Culture has become a strategic priority with impact on the bottom line. It can't just be delegated and compartmentalized anymore.

A new culture-building approach is already in place at some organizations, one in which everyone in the organization is responsible. Culture can be defined as the ways people in the organization behave and the attitudes and beliefs that inform those behaviours (i.e., "the way we do things around here") — including formal, stated norms as well as implicit ways people work and interact. This is also very apt for growing mid-size organisations where the mind-set of the management and their employees is to be flexible in their approach about comprehensive Job roles and not be rigid about compartmentalization. This makes them more adaptive and cohesive towards a common goal of organisation growth.

THE CASE STUDY

This Project was executed in the year 2015-16. ABC Ltd (Name changed) was a 25yrs old company (then), located in Mumbai, started by a couple who were both Engineers by qualification and specialist in their field. They started this company with the aim of providing state of the Art technical & Project management services in the field of Automation. With their good work, they soon became the preferred System integrators of one of the TOP MNCs of the world in the field of process and Industrial automation. They had a turnover of around 10crs with a team size of 30-40 employees who were a mix of qualified engineers who worked in the Projects department and there were other support staff in the field of sales & marketing, Finance and accounts, admin and support, production and others. They had a customer base in the western region predominantly and were known for their technical competence of doing complex projects in deadlines. They were tough negotiators and had grown the company from scratch through hard work & dedication. They were running their set up themselves and were growing at an organic pace. To acquire and retain the best talent was the key to success for their business because it required Project engineers, technical leads and Project Managers to execute the projects which was their business all about. They lacked people management skills and hence their HR practices were basic which were handled by themselves on intuitive basis. So in spite of being so many years in the business they were still struggling in certain areas. Hence, they were also sensing a constant need to scale up their operations and take the business to the next level. After lot of contemplation and searching for the right resource, they finalised me to execute this Project where the scope of work was to Formalise a structured HR function and department which will stabilize all their other business processes as well. It would enhance towards better Talent acquisition, retention and development strategy. To achieve this objective the scope of work was defined as End to End HR processes to be set with in a time frame of 1yr. This was to be executed in phased manner and was divided in 3 phases

THE METHODOLOGY

- The first step was to do an AS IS study of the organisation, the philosophy of the management, their history, mission, vision & Values, their existing policies and processes, their employees and their business operations.
- Gap Analysis was done after a series of meetings and discussions with the management & the employees to hear both the sides of the story. The purpose of this step was to diagnose the problem areas correctly and design the new plan based on them.
- Based on the priority set by the management each area was taken up and a process was designed around it with all the stakeholders in the loop
- Once the process was designed, all the relevant documents required to execute the process were designed too.
- The process owners were identified and handed over their R&R at the time of Roll out after taking their due consent
- A Pilot process was run and once refined, it was rolled out amongst all employees with first deadline, 2nd deadline and final deadline for implementation. Once error free, the process was declared robust and ready to be functional on regular basis
- A common channel of communication was set up from Management to employees to build transparency, accountability and trust in the organisation
- This communication channel was also proactive, participative & positive in their approach. This was done to keep up the motivation levels of the team
- Due care was taken to pick up more sensitive areas first which plugged majority of the pain areas of all employees. This was done to gain their trust, because they were then required to contribute towards

successful implementation of the other new processes which were going to be introduced

- Each process once rolled out, was ensured that it was repeated at all times and followed by all. This care was taken by the management with utmost sincerity
- Feedback collection was constant and worked towards continuous improvement

THE ROOT CAUSES

- **Improper Reporting Mechanism:** There was a huge gap which came to light in the exercise while speaking to the management & the employees. The management was not happy with the employees because they used to receive complaints from the customers about the projects not being executed properly, the time sheets were not made and submitted, the reports from the project teams were coming but were not filled properly and not submitted in time. This irregular / adhoc reporting mechanism was having a direct impact not only on the performance of the employees but also on the business, because the clients would often delay payments. The employees on the otherhand said that it was not true as they were doing the work as was necessary and were leaving the site only after proper handover
- **Travel Policy:** Their business required the project team to be on site for around 20-25 days in a month on sit. Sometimes when the projects were big and in remote locations the resource had to be there for long duration of 2-3m or even more. Hence, it was necessary for the company to take care of their travel bookings and expense. This was not in place and almost all the employees had to shell their personal money to do the co. travel. Not only this, but the amounts were not settled for long durations and the personal expenses mounted to 4-5 times of their salaries, which was a heavy burden on them. Some of them had to even borrow money from their parents. This created a lot of ill will in them against the management
- **Lack of proper Organisation structure with clear Jds and KRAs:** The company had 2 offices in Mumbai which were located far off from one another. One office seated the management with their sales, sales support, accounts and admin department and the other office seated the Projects department. Due to this physical distance, the MD could not be present regularly / frequently in the projects department and he had also delegated lot of projects work to an old employee of his who was the acting PM and also a Team manager. This employee was taking undue advantage of this situation and was creating a rift between the Jr. and mid-level employees in his team vs the management. He was trying to hamper work, create unrest in people and trying to create his false importance. There was no clear JDs, KRAs given to employees ever. There were no formal appraisals that happened
- **No inter team cohesion and Company wide Vision, Mission and Values-** These were never rolled out which gave people a sense of insecurity, they felt that the co. lacks growth which will also hamper their growth and they used to decide at the time of joining that this co. is good to learn for first 2yrs because the co. was strong in technical skills and then they can go outside and grow.

THE SOLUTION /S:

- **Introduction of Reporting System**
 - The flaw was in the reporting formats. The existing formats were a sheet of A4 size paper without any parameters mentioned, which made it difficult to fill and also invited personal biases. There were set guidelines prescribed by the customer which had to be incorporated. The reports were subjective instead of being Objective like a check list which would have been easy to fill and even check.
 - There was no hierarchy set to send the daily site reports, so all the 20 reports would land on the MDs desk every day morning making it impossible to go through.
 - A proper reporting mechanism with data based entries was set in excel and was rolled out on the whole team. A hierarchical mechanism was set which created a Dashboard for the MD. His dashboard not only presented the site reports summary but also gave him the status of cash flow, bank status, sales reports etc
 - All this was prepared in Excel because they all wanted to get used to making and submitting reports in a certain manner first before implementing a system. Costs were also a constraint in the first go
- **Travel Policy designed and Introduced**
 - This was a must because this was one of the major reason of unrest in the employees against the management and because they were so demotivated, it was having a direct impact on their performance and business
 - A complete Travel policy, advance and reimbursement forms, advance mechanisms, fixed days to submit

bills, cyclic bills clearing etc was set. The company even finalised on guest houses in certain cities where the travel was high, it saved them costs, streamlined way of complete travel, stay and boarding arrangements were made by the co. This saved them time, costs and brought about a structure way of doing the same work. Gave their employees a respite, saved costs for the company, the process based working in this area saved a lot of time of many resources, which was utilised in other meaningful areas.

Performance appraisal System Introduction

- Organisation structure: Formulated a correct organisation structure with department / functional hierarchy was defined.
- JDs: all the roles Job descriptions, competencies and KRAs was designed and defined
- Appraisal form & system: was set, with a pilot execution, then quarterly and sixmonthly appraisals were done. The managers / team leaders were trained about how to evaluate performance.
- The parameters were dual in the system: they were performance vs behaviours.
- A complete roll out session was conducted to effectively implement this system
- The Projects division Team manager who was playing mischief was managed through this system. He was given a choice between 2 roles one was a technical manager role (which was his core competence) but this was an IC (individual contributor) role and the other was the PM role (which he very much desired because through this position he was getting to manage the team below him his way) but in this role we gave him the PM responsibilities too which was his weak spot. This option was given to him in an open forum, so that he could not misuse information for his benefit and against the management. He was forced to choose the IC role of Technical Manager which made him spend most of the time on sites.
- The Role of PM was taken up by the MD himself, this way he started visiting the projects office more frequently and started to interact with the team directly. All the biases towards each other were neutralised this way and the team was highly motivated to work with the company.
- After around a year the Team manager put in his papers and the management got fresh and better talent in his place to handle projects efficiently. Some good technical sr. staff were promoted too to handle the projects effectively

The Conclusion / Recommendations:

- The intent of the management is the first key to success
- Clear goals and objectives to be defined
- After the AS IS study, correct diagnosis of the problem is necessary
- A proactive, positive and common communication channel should be established during the execution of the project and a transparent working to be advocated which drives values
- The project is strategic, but it should be aligned to the operational level policies, people and processes for it to be successfully implemented
- Participative approach creates a strong buy in such projects from all stake holders.
- If the employees do not see value in the process or it does not benefit them, how much even state of the art it is, they will not implement it and the risk of the process transformation not being successful is there
- The implementation of the process has to be constantly monitored else it will fail.
- Feedback collection and fine tuning is a must for the process to be accurate and effective
- Regular process Audits in the long run required
- Deliverables:** Knowledge, skills and attitudes are your employee's most important equipment. Acquiring them however, requires considerable financial investment. JB can help you ensure returns on your HR investments with programs designed not only to inform your employees but to equip them with the necessary Knowledge, Skills, Attitude and Habit (K.A.S.H.) to serve their customers better, to work with each other and to deliver better results.
- When I delivered HR & Business development program I made sure of the following:
- The necessary mindset for better performance was ready

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- New sets of information
 - A new set of skills to practice
 - New tools in the form of templates, process steps and checklists

REFERENCES

1. Enable Process Transformation in 6 easy steps - Hazal Simsek
2. What is Business Process Transformation? | The Ultimate Guide (softwareag.com)
3. Business Transformation- a study of selected organisations-by Vaneeta Malhotra - Dphil Commerce-Delhi 2009
4. Business process reengineering in selected enterprises: methodology and empirical issues- by Namrata Sharma – 2013
5. About SME in India | SME Chamber of India
6. Process Driven Organizations - The Ultimate Approach | LinkedIn - Craige Corte-Senior Vice President Operational Excellence at Houghton Mifflin Harcourt
7. HBR
8. Mckinsey Report
9. Person Dependence in Organizations and Steps to Manage or Reduce the Same (management studyguide.com)

BUSINESS TRANSFORMATION THROUGH RESEARCH INNOVATIONS

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ABSTRACT

It is no surprise the research is very for every business not only in domestic market but non domestic market and research cannot be considered without Innovation. Needle to Aeroplane manufacturing cannot perform without research Innovation. The aim is to write this paper to know how to transform a business through research innovation .How set up our enterprises through research Innovation. I discuss business models importance of research Innovation in present scenario etc.

Keywords: Innovation, Transform Enterprises, business model

INTRODUCTION

Business transformation is an umbrella term for making fundamental changes in how a business or organization runs. This includes personnel, processes, and technology. These transformations help organizations compete more effectively, become more efficient, or make a wholesale strategic pivot. Business transformations are bold, seismic shifts that organizations make to accelerate change and growth beyond typical incremental advancements. The scope is broad and strategic, such as switching to new business or operating models. Organizations undertake business transformations to create additional value. It may mean unlocking the potential of employees, harnessing intellectual property and proprietary technology for other purposes, or becoming more efficient to maximize the company's potential. Business transformations are large, multi-year initiatives requiring wholesale changes to fundamental aspects of the transforming companies. Given the size, scope, and timeframe of the undertaking, it must be driven from the top—be it the CEO or the Board of Directors—to position the company for sustained success and growth for the foreseeable future. These transformations used to take many years. Now, the urgency of these changes and the support available have accelerated the timelines. Many are completing them in months versus years. Research conducted or describing the business problem(s) of a particular business, is called Business research. For example, in order to start a particular business it is very crucial for the entrepreneur or the owner to have information about the type of customers and nature of competition in the market. It helps in designing business plan for the organisation. All these information can be availed only through the business research. It plays a key role in deriving consumer demand for the existing business, The scope of business research covers small topics (like finding an idea and a name for the business) as well es, big and thorough topics (like collecting information about consumer demand, buying trends, competitor analysis, etc.). In fact, the overall business research process is focused to help business through collecting important information from the market. Business research refers to the process of conducting research to assist with the launch or operation of a company. Business research involves gathering data and using it to make business predictions, plans or decisions. It may involve analyzing market trends, collecting consumer information or comparing competitors within the industry.

OBJECTIVES

To know how to help the research innovation in business transformation

To know how to maximize the business profit

To know how to satisfy the customers

RESEARCH METHODOLOGY

It is descriptive nature study it is based on secondary data many websites, research articles, research journals, magazines, news papers used for data collection.

ANALYSIS**Business Transformation through Innovation**

Innovation can help your business adapt and evolve in order to survive and grow. In your business, innovation may be driven by the need to solve a problem or capture a new opportunity.

Innovate your Business model

Leaders frequently define their business in terms of the products and services they deliver and so focus on these for innovation. However, with technological advances and globalisation presenting so many new opportunities - and threats - leaders are now looking to gain a competitive advantage through innovative business models.

Business model innovations have the power to transform businesses and reshape entire industries. Business model innovation is about being different, really different. You can be different in ANY industry.

Business model Case Study - Apple

When Apple introduced the iPod with the iTunes store it revolutionised portable entertainment, creating a new market and transforming the company. Apple was not the first company to bring digital music players to market; there were two other players in 1998 and in 2000. Both products worked well, were portable and stylish. The key difference was that Apple did something far smarter than take a good technology and wrap it in a snazzy design. It took a good technology and created a new business model.

This innovative business model combined hardware, software and service, and made downloading digital music easy and convenient. Apple essentially 'gave away' the low-margin iTunes music to lock in the purchase of the high-margin iPod. This model defined value in a new way and provided industry-changing convenience to the customer (Johnson et al. 2008).

Business Model Elements

The business model is the way(s) that businesses make money out of their ideas, resources and technologies. Every business has a business model, whether it is documented or not. Osterwalder and Pigneur in their book *Business Model Generation* discuss 9 key elements of a business model. They are:

- Customer segments – defines the different groups or organization's a business aims to reach and serve.
- Value proposition – describes the bundle of products and services that create value for a specific customer segment.
- Channels – describe how a business communicates with and reaches its customer segments to deliver a value proposition.
- Customer relationships – describes the types of relationships a business establishes with specific customer segments.
- Revenue streams – represents the cash a business generates from a customer segment.
- Key resources – describes the most important assets required to make a business model work.
- Key activities – describes the most important things a business must do to make its business model work.
- Key partnerships – describes the network of suppliers and partners that make the business model work.
- Cost structure – describes all costs incurred to operate a business model.

Business Research

Business Research can be simply defined as a process of gather comprehensive data and information of all the areas of business and incorporating this information for sales and profit maximization. If you are wondering what is Business Research, it is a systematic management activity helping companies to determine which product will be most profitable for companies to produce. Also, there are multiple steps in conducting research, with each thoroughly reviewed to ensure that the best decision is made for the company as a whole.

When it comes to the question why Business Research is important, it has an essential role to play in varied areas of business. Here are some of the reasons describing the importance of Business Research:

- It helps businesses gain better insights about their target customer's preferences, buying patterns, pain points, as well as demographics.
- Business Research also provides businesses with a detailed overview of their target markets, what's in trend, as well as market demand.
- By studying consumers' buying patterns and preferences as well as market trends and demands with the help of business research, businesses can effectively and efficiently curate the best possible plans and strategies accordingly.
- The importance of business research also lies in highlighting the areas where unnecessary costs can be minimized and those areas in a business which need more attention and can bring in more customers and hence boost profits.
- Businesses can constantly innovate as per their customers' preferences and interests and keep their attention towards the brand.

- Business Research also plays the role of a catalyst as it helps business thrive in their markets by capturing all the available opportunities and also meeting the needs and preferences of their customers.

WAY TO IMPROVE BUSINESS THROUGH RESEARCH

1. Improve Your Branding

Many companies don't have a good handle on their brand. They ask themselves: How do customers perceive us? How does our brand stack up against our competition?

You can use market research to improve your branding by exploring such subject as:

- Brand awareness—Are customers aware and familiar with your brand?
- Competitive comparisons—how do customers view your company compared to the competition?
- Personification—what characteristics and traits do customers associate with your brand?

You can also survey customers to gather feedback on marketing content such as logos, brochures, websites, etc. Brand research is typically conducted by interviewing customers or organizing focus groups. In this way, you can explore different topics in-depth and get feedback from the participants. The results will help you develop brand positioning and improve your marketing assets.

2. UNDERSTAND YOUR CUSTOMERS BETTER

Sometimes entrepreneurs need better information on the size of their market, their target customers and how best to reach them. We recently completed a study for a client who had developed a new kitchen product and wanted insights on her target market. Here are some of thing we wanted to find out about typical customers for this new product.

- How old are they?
- Are they male or female?
- What is their marital status?
- Do they have children?
- Where do they live?
- What is their level of education?
- What kind of social media do they use?

We designed a questionnaire to be answered online by 1,000 consumers across Canada. This type of consumer study helps us to understand the profile of the target audience so that we can develop focused brand positioning. By focusing your efforts on the right target market, you can see faster results, improved efficiency and greater overall performance from your marketing campaigns.

3. MEASURE THE EFFECTIVENESS OF YOUR MARKETING

Lots of entrepreneurs want to do a better job promoting their companies and generating sales. Market research can help by providing information on the effectiveness of your marketing efforts. We can design studies to gather feedback from customers on the look and feel of your marketing messages. We can also measure customer awareness and reaction to specific marketing campaigns and activities. Gathering this type of data can really help maximize your marketing budget by helping you design marketing that reaches and resonates with your audience.

4. IDENTIFY NEW OPPORTUNITIES

Market research can help you identify new market opportunities that might be available to your company. It can help identify geographic regions for expansion and/or test the market's readiness for your new products or services. For example, you could be looking to open a new retail store and need to find the right location. Or you may be planning to change your distribution channel and need to determine how the decision will affect your customer base. To answer these questions, we could analyze existing data from government publications, Statistics Canada data and/or industry specific reports. These sources provide insights in such areas as:

- Market size
- Demographics
- Market share statistics

- Industry dynamics
- Major industry suppliers
- Key competitors
- General industry data such as number of firms and their geographic distribution

Obtaining this type of market data is a necessary first step to help firmly “size up a new market” to determine the optimal business strategy and operations.

5. GET INSIGHTS INTO PRODUCT FEATURES

If you’ve come up with a new product or are improving an existing one, you will want to know whether you have the right features and packaging. Research will provide insights your company can use to refine your products before you commit to expensive production costs. When we design new product research, we gather consumer feedback on a concept and/or a prototype. We also collect data on consumer reaction to the product and its features, including its look, design, usability, colours, packaging and other variables. We might also ask how consumers would shop for this product to gather insights for a distribution plan. We can also ask for reactions to the marketing messages, creative content and promotional ideas that are planned for the product launch. Typically, we’d start with qualitative research (interviews or focus groups) because this conversational format allows us to gather rich, in-depth feedback from consumers. If possible, we would provide a prototype or sample of the product for customers to touch and use. After that, we would validate the research insights with comprehensive survey with a similar audience but a larger sample set (i.e. more than 100 consumers). By doing this, we will have rich data to make informed decisions on finalizing the product concept and/or design.

SIGNIFICANCE OF RESEARCH IN BUSINESS

India is working hard to bring in an expansive culture of innovation through government initiatives, organisations, schools, and universities. So far, the problem has been that all these different areas have not been talking to each other much in the past. Working in silos have prevented interdisciplinary exchange of knowledge, information, and insights. Cutting-edge disruptive innovation requires a passion and dedication which means looking beyond selling to make money, and genuinely making attempts to change the lives of people. Research is an area that needs to get a lot more glamorous focus; something it has not received outside academic circles. One of the reasons the US has enjoyed supremacy is due to the respect research experiences at its universities. Academic research is one of the most fundamental methods for innovating. Research is the process of discovering something that has happened in the past, so how can it be connected to innovating? The answer is that research is a fundamental building block of the process of idea development. Some critical points in the idea life-cycle, where research can be leveraged are problem development, market research, competitive research, and feasibility and requirements study. The problem is, it is difficult to predict all of the outcomes or benefits that research might lead to. It is equally impossible to anticipate all the types of research knowledge that will contribute to a transformative innovation in the future. Another thing that has kept us wary of research is it’s link to failures. However, these factors should not stop organisations from pursuing it. According to a research paper – Furthering America’s Research Enterprise, published in 2014 – measuring the economic and other returns of research doesn’t show a clear correlation or a linear path to innovation or success. It is not as simple as input X plus Y and output Z. There have been smaller insights and discoveries along the way which have, in turn, culminated into more substantial path-breaking innovations. We will have to start with a vision, of course, but get comfortable with floundering along the way and yet being open to what we learn and discover. Design thinking and agile methodologies also propagate the same concept and, hence, are being adopted by many organisations to become disruptive. Majority organisations primarily focus on creating products and services that are similar to what already exists, which leads to increased competition and price wars. According to Uday Prabhu, General Manager for Innovation, Bosch, corporates need to work with the hard core academic research world together to indeed bring innovation in companies. It means that companies must invest heavily in this area of fundamental research without expecting immediate returns. The long-term benefits of this will be phenomenal. Alongside, well-reputed colleges and institutes will also need to get curious about what is going on in the corporate world to align their research machinery with it.

CONCLUSION

Research innovation is the key to success of every business no business cannot successful without research innovation .it is the need of time. Research and development is compulsory to survive in this cut throat competition

REFERENCES

1. Lanzolla, G., & Anerson, J. (2008). Digital transformation Business strategy Review, 19(2), 72-76.
2. Matt, c., Hess, T., & Benlian, A. (2015). Digital transformation strategies. Business & Information systems Engineering, 57(5), 339-343.
3. Accenture (2017). Accenture Technology Vision 2017. Available on <<https://www.accenture.com/us-en/insight-disruptive-technology-trends-2017>> (Accessed July 7 2019).

PSYCHOLOGICAL ANTECEDENTS OF EMPLOYEE VOICE BEHAVIOR IN HIGHER EDUCATION**¹Dr. Abhijeet Singh Chauhan, ²Dr. Richa Banerjee and ³Dr. Subeer Banerjee**¹Assistant professor, ²Senior Assistant Professor and ³Assistant Professor, Prestige Institute of Management and Research, Gwalior**ABSTRACT**

Employee voice is a way through which organizations can create several alternatives through utilizing employees' ideas, suggestions, and opinions regarding workplace. The research was conducted on faculties of different educational institutes across India. Findings indicate that perceived organizational support, felt obligation for constructive change, psychological safety and affective commitment are significant contributors of employee voice behavior. In addition, affective commitment and felt obligation for constructive change mediates the relationship between perceived organizational support and employee voice behavior. Moreover, felt obligation for constructive change and psychological safety also mediated the relationship between affective commitment and employee voice behavior.

Keywords: Perceived organizational support; Felt obligation for constructive change; Psychological Safety; Affective commitment; Employee voice behavior; Indian higher education institutes.

1. INTRODUCTION

Employee voice refers to the degree to which workers share their views, opinions, information, difficulties, and concerns with the company's upper management; this type of constructive behaviour can have a significant impact on the success and the survival of any business (Rasheed et al., 2017). In order to effectively make judgements and repair errors in the face of complex market scenarios, managers need information from a lower level of the organisation. Even if they hold important knowledge that could have repercussions, workers are hesitant to share it with superiors or coworkers, according to numerous studies (Milliken, Morrison, & Hewlin, 2003; Perlow & Williams, 2003; Pinder & Harlos, 2001).

When employees do not share information inside the organisation, decision-makers are unable to make appropriate decisions or address potential major concerns. Several tragedies have befallen organisations, including the Columbia Space Disaster, the United Airlines flight 173 tragedy, and Enron's explosion of a British oil site, in which workers failed to disclose process or system anomalies to their management team (Associated Press via staugust). The issue with employee voice in the current context is that employees are unclear whether to speak or hide information owing to the perceived worries, opinions, and threats (Morrison, 2014). Employee feedback can be a game-changer for businesses, but only if the top-level receives accurate input from the bottom. It aids in the creation and implementation of the correct decisions. Thus, they might have numerous positive organisational outcomes. In the linked topic, researchers are striving to promote voice in organisations by implementing system enhancements, culture, and oversight, etc. They are also interested in learning several causes for employee quiet.

Many predictors of employee voice behaviour are responsible for encouraging employee voice behaviour in every organisation and can have a variety of positive organisational effects. Indicators such as psychological security, Employee voice is influenced by perceived organisational support, felt-obligation for constructive change, and voice-efficacy. FOCC is another element that influences the probability of employees to engage in organisational voice activity. FOCC refers to the willingness of employees to share essential knowledge in the form of constructive ideas, thoughts, and perspectives that contribute to the success of corporate choices.

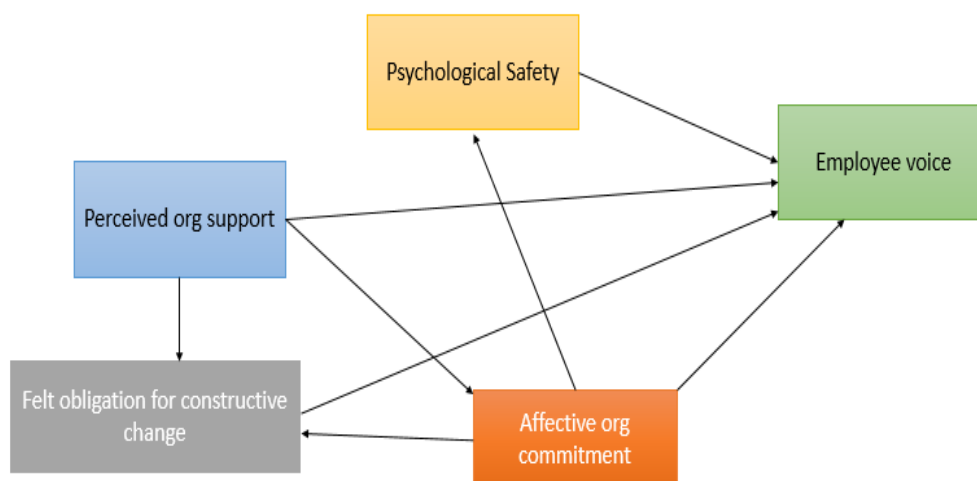
FOCC is contingent upon the degree of organisational support the employee receives from the organisation, instilling in employees the responsibility to share constructive ideas, opinions, and perspectives (Fuller et al., 2006). Employees expressed a degree of apprehension when speaking up in the workplace. POS indicates the degree to which the employer is concerned with employee welfare. It increases the overall motivation of the organization's personnel and decreases their work-related fears (Rhoades & Eisenberger, 2002). When employees are motivated and see a certain amount of psychological safety in the workplace, they are not shy to present their ideas (Edmondson, Kramer & Cook, 2004). Employees are unable to share their valuable ideas, thoughts, opinions, and concerns at work due to a lack of organisational support and psychological safety (Tangirala & Ramanujam, 2008). When employees restrict their expression, it hinders organisational decision-making since the organisation will not receive fresh ideas and suggestions from its employees (Bonaccio & Dalal, 2006). Due to lack of voice efficacy, employees feel conflicted about whether to raise their voices or not

(Cortina & Magley, 2003). Voice Effectiveness guarantees that employees are confident in what they wish to communicate to the organisation. Voice effectiveness is mostly determined by employees' perceptions of psychological safety within their firm, which reduces their voice-related anxiety (Duan, Kwan & Ling, 2014). Vocal behaviour among employees frequently contributes to workplace outcomes such as work dedication, affective commitment, and job satisfaction. Engaged employees are cognitively, emotionally, and behaviorally committed to their organisation. They are extremely helpful and utilise their resources to contribute to the success of the organisation. When employees are permitted to speak and their voices are heard, they exhibit optimism and enthusiasm in their work, resulting in higher levels of employee engagement. Employee voice behaviour research has determined that when a company promotes employee feedback, views, and beliefs, it fosters a sense of value among employees (Gao, Janssen & Shi, 2011). They recognise that their organisations value their cognitive role, fostering a sense of ownership and enhancing their organisational commitment. Emotionally invested employees are more loyal, productive, and devoted to their organisation. The greatest obstacle for firms in the current environment is employee job satisfaction (Sageer, Rafat & Agarwal, 2012). Many elements, such as working environment, remuneration, supervision, etc., affect employee satisfaction. In addition to these variables, employee feedback is a predictor of job satisfaction in the organisation. Workers have important and pertinent organisational knowledge. When organisations permit employees to express their opinions, their level of frustration decreases. Limiting employee ideas and input irritates them, limits their contentment, and fosters bad perceptions of their firm, resulting in unsatisfied employees (Vakola & Bouradas, 2005).

2. THEORY AND HYPOTHESIS

2.1. Self-Determination Theory

Self-determination is the capacity to make decisions and manage one's own life. Being self-determined means you have a better sense of control over your life, as opposed to being non-self-determined, which might make you feel as though your life is under the influence of others. People are motivated to grow and change by three innate (and universal) psychological demands, according to this theory. Important to this theory is the concept of intrinsic motivation, or engaging in activities for the inherent reward of the conduct itself. The research has its roots in self-determination theory, Through this study researchers strive to provide a self-determination perspective to employee voice in higher education institutions. The constructs of the study such as Perceived organizational support and affective commitment covers the relatedness aspect of the theory, Psychological safety covers the autonomy aspect, whereas felt obligation acts as the intrinsic motivation and employee voice as the performance aspect of self-determination theory.



2.2. Perceived Organizational Support and Employee voice behavior

Employee voice depends on several organizational factors which influence the willingness of employees to express them; among those factors one is perceived organizational support. Employees' tend feel secure in terms of raising voice due to the support received from the organization. There are very few studies establishing the linkages amongst POS & employees' voice. Andiyasari, Matindas & Riantoputra (2017) noted that employees' voice is depended on the amount of ownership and support perceived by the employees at work. It has been revealed that psychological ownership intervenes the linkages amongst organization support &

employees' voice. Sitorus (2017) revealed that employee voice was significantly and positively affected by POS & internal communication. More organizational support the employee perceives, the more employee raises voice at work leading to an efficient internal communication. Wang & Hsieh (2013) measured the relationship amongst perceived ethical climate, POS and employee silence and it was revealed that above mentioned constructs negatively influenced employee silence. Bergeron & Thompson (2020) noted that when employees perceive politics at work as a result they predict that it is not safe to speak-up at work therefore, it negatively influences it. While, POS weakens the negative linkages amongst constructs. Kanten & Ulker (2012) demonstrated that employees with proactive personality and organizational support substantially influence employee voice at work. Tucker et al. (2008) evaluated influence of safety based support on safety based voice and observed a positive relationship. Additionally, coworkers' support mediated link between POS for safety on employee safety voice. Karakaş (2019) reported that POS positively influences quiescence and acquiescent silence which is a result of perceived unsupportiveness among the employees. In absence of support from their supervisors or organization they prefer to remain silent then to express themselves. Zhang et al. (2019) emphasized on adoption & utilization of high commitment work systems by introducing PS, POS & Voice-efficacy as its components. It was shown that PS & POS had substantial contribution in employees' voice. Contrary to this voice-efficacy negatively influenced employees' voice. Singh & Malhotra (2015) suggested that organizations' top management must instill a positive atmosphere in the workplace by praising accomplishments & valuing employees' efforts making them more participative in terms of expressing themselves at work. Loi, Ao & Xu (2014) noted that coworker support & POS substantially influence promotive & prohibitive aspects of voice. Moreover, POS had stronger effect on prohibitive voice as compared with coworker support. Based on the above mentioned literature it can be proposed that:

H1: Perceived organizational support significantly effects employee voice behavior

H2: Affective organizational support mediates the relationship between POS and Employee voice behavior

H3: Felt obligation for constructive change mediates the relationship between POS and Employee voice behavior.

2.3. Psychological Safety and Employee voice behavior

The PS assesses a person's propensity to feel secure and certain in both their personal and professional lives. Although there isn't much literature that explicitly supports the relationship between PS and voice efficacy, there is evidence that PS and self-efficacy are related in some way. Zhang et al. (2010) discovered a positive association between the two dimensions and identified the role of psychological safety in determining knowledge sharing efficacy. The effectiveness of knowledge sharing was found to be improved by psychological safety, which led to knowledge being expressed as proposals and ideas for improving the organisation. In a study on healthcare professionals, Roussin et al. (2018) discovered that psychological safety increased self-efficacy levels, leading to improved voice behaviour among healthcare professionals. According to Kim, Lee, and Connerton (2020), PS and self-efficacy have a positive relationship. It was also found that self-efficacy indirectly affects the relationships between PS and team performance. According to Lee et al. (2020), psychological safety increases creativity-based self-efficacy, which encourages service employees to engage in creative activity.

H4: Psychological safety significantly affects employee voice behaviors

2.4. Felt obligation for constructive change and Employee voice behavior

FOCC is reciprocation of employees for the support received from the organization. When employers bestow supportiveness for employees it instills them to feel obligated, in-turn they think about the betterment of their organization resulting in expressing constructive suggestions, opinions in front of the management. There are very few researches being done on the linkages amongst FOCC & employee voice behavior. Liao & Shaw (2020) performed a study to evaluate linkages amongst authentic leadership, FOCC & employees' voice. It was observed that authentic leadership played a major role in inculcating employees' FOCC due to which they engross themselves in expressing constructive suggestions in front of management. Alyusef & Zhang (2015) states that consultation with management is successful when workers feel obligated to make constructive change in the company and share their ideas and opinions. Arba'i (2019) revealed that FOCC is subsequent in influencing employee's moral voice moreover it also intervened the links amongst ethical-leadership and employees' moral voice. Hassan & Batool (2015) revealed a positive link between FOCC & employees' voice. A responsive atmosphere and a neutral response from management will increase their engagement in two ways: as a promoter of positive change and to prohibit potential losses. Liang, Farh & Farh (2012) noted FOCC's role in strengthening employees' voice in work. Moreover it found to strengthen the influence of psychological

safety towards employees' voice in positive way. Yang et al. (2019) observed that FOCC indirectly strengthened the effect posed by spiritual leadership towards employees' voice. Additionally, Carnevale et al. (2020) also revealed a positive association of FOCC with employees' voice. FOCC also acts as an indirect tie amongst the linkages of leader member exchange & employees' voice. Xie et al. (2015) suggested that coworkers' support towards their colleagues in the form of encouragement develops a stronger sense of responsibility employees to suggest or implement positive change at work, which results in a constructive voice.

H5: Felt obligation for constructive change significantly effects employee voice behavior

2.5. Affective Organizational Commitment and Employee voice behavior

Rashid, Dastgeer & Kayani (2018) measured linkages amongst LMX, voice & two forms of employee commitment (Normative & affective). It was revealed that LMX positively influence employee voice behavior resulting in enhanced normative and affective commitment among the academic staff in Pakistan. Demirtas (2018) observed substantial linkages amongst job satisfaction, AOM & organizational values. Values within a company had substantial influence on organizational silence. Job satisfaction is allied with intensification in affective commitment. Silence within an organization has a detrimental effect on AOM. Jena, Bhattacharyya & Pradhan (2017) reported substantial linkages amongst employees' voice behavior & AOM. Moreover, employees' voice also acts as a mediator among the ties amongst employee engagement & AOM. Nisar et al. (2020) revealed substantial linkages amongst compassion, employees' voice & AOM and it was also revealed that employees' voice substantially influences AOM among employees. Kim et al. (2018) performed a comparative study among American and Chinese employees to evaluate linkages amongst employees' voice, team-member exchange, job satisfaction & AOM. Employees' voice had substantial influence on AOM amongst chinese employees as compared to US employees. Though, Gen-Y hotel employees in US who participated in high-quality team- member exchanges reported higher AOM than those in China. Kim & Leach (2020) evaluated the influence of digital employees' voice on positive change & AOM & found a positive effect of digital employees' voice in fostering positive change & AOM. Ohana & Stinglhamber (2019) linked coworker's voice climate to the extent of affective commitment among employees and it was revealed that positive perception of voice climate among coworkers positively influences the levels of AOM. Ohana (2016) observed that team-voice was powerful & reliable factor in team citizenship activities, & the effect was mediated through affective commitment and moderated by intrinsic motivation & neuroticism. Rogiest, Segers & Witteloostuijn (2015) states that employees' partaking in decision making positively influenced their extent of AOM towards an establishment. Bos (2014) had shown profound influence of employees' voice on affective commitment. Additionally, AOM profoundly intervened linkages amongst employee voice & innovative behavior. Ditchburn & Hames (2014) states that work engagement & AOM were positively associated with voice encouragement. Moreover, voice-climate effectiveness was substantially linked with work engagement.

H6: Affective organizational commitment significantly effects employee voice behavior

H7: Psychological safety mediates the relationship between Affective organizational commitment and employee voice behavior.

H8: Felt obligation for constructive change mediates the relationship between Affective organizational commitment and employee voice behavior.

3. METHODOLOGY

3.1 Sample

The survey was performed among the faculty members working in public/private higher education institutes/universities among the selected cities of Madhya Pradesh state. These faculty members were engaged in teaching Technical and Non- Technical Graduate and post graduate courses. The sample constitutes of faculty members designated on job profiles such as Professors, Associate professors, Assistant professors and Guest faculties. In total, 600 survey forms were distributed via online and offline modes out of which 500 responses were considered for use. The response rate of 83% was achieved which is considered very good (Babbie, 1990). There are several rules of thumbs for deciding the item to response rate. Rummel (1970) has provided 1:4 & Schwab (1980) provided 1:10. In present study there were 47 items including all the constructs in the study. According to 1:10 Item to response rate criteria, sample of 500 respondents indicates an acceptable ratio range. For the data collection purpose, college and university wise complete list of faculty members was not available that is why the researcher decided to employ non-probability convenient sampling technique. The method was employed to approach maximum of the respondents who could be easily approachable and ready to give responses (Henry, 1990).

3.2 Procedures

Individual faculty members were approached personally and through online modes (Gmail, linkedIn, Whatsapp etc.). During the offline data collection phase, the faculty members were contacted at their respective institutes/universities and were requested to fill the questionnaire. While, during online data collection phase a survey form invitation link was sent on their gmail, linkedIn and whatsapp accounts and was requested to fill the survey form. Informed consent was received from the respondents before filling the responses in order to know the willingness of the respondents. The participants were assured that their information will remain confidential and used for educational purposes mainly. Additionally, the anonymity of the respondents was also assured.

Table 1: Participants

Job Profile	No of Respondents
Professors	51
Associate Professors	79
Assistant Professors	225
Guest Faculties	145
Total	500

3.3 MEASUREMENT SCALES

1. Employees' Voice

Van Dyne & Lepine (1990) constructed a six-item scale that was used to gather responses on employee voice behavior.

2. Psychological Safety (PS)

Brown et al. (1996) constructed a five-item scale that was used to gather responses on psychological safety.

3. Felt obligation for Constructive Change

Eisenberger et al. (2001) constructed a five-item scale that was used to gather responses on FOCC.

4. Perceived Organizational Support (POS)

Eisenberger & Huntington (1986) constructed an eight-item scale employed to gather responses on POS.

5. Affective Organizational Commitment (AOM)

Allen & Meyer (1990) constructed a five-item scale employed to gather responses on AOM.

3.4 Tools for Data Analysis

The data was analyzed through SMART PLS software

4. ANALYSIS

4.1 Measurement Model Assessment

Measurement model assessment deals with the calculation of outer loadings, reliability and validity. The outer-loadings of all the items were greater than 0.5 (Heir et al., 2017). The second step of measurement model assessment is to check the internal consistency and validity of the constructs. The internal consistency reliability, rhoA, and composite reliability values were all greater than the threshold value i.e. 0.7, hence, it fulfilled the internal consistency criteria (Hair et al., 2017, 2020). The convergent validity of the constructs was evaluated through AVE's which should be greater than 0.5 (Fornell and Larcker, 1981; Hair et al., 2019). The constructs of the study, Perceived organizational support, psychological safety, felt obligation for constructive change, Affective organizational commitment and Employee voice all fulfilled the convergent validity requirements stated by the researchers.

Table 2: Reliability and Convergent validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
AOC	0.947	0.948	0.959	0.824
Employeevoice__	0.962	0.966	0.968	0.749
FOCC	0.943	0.946	0.957	0.816
POS	0.962	0.963	0.968	0.790
PS	0.804	0.920	0.885	0.654

4.1.1 Discriminant Validity

Fornell and Larcker (1981) technique estimates the AVE’s square root and compares it with the correlations between latent variables. The off-diagonal values mentioned in table 3 were higher than the correlations among the variables. Hence, met the first criterion of discriminant validity.

Table 3: Fornell and Larcker Criterion

	AOC	Employee voice	FOCC	POS	PS
AOC	0.908				
Employee voice	0.858	0.866			
FOCC	0.906	0.744	0.903		
POS	0.901	0.803	0.825	0.889	
PS	0.700	0.744	0.850	0.717	0.808

4.2. Structural Model Assessment

In structural model evaluations, the relationship between the constructs and their predictive value has been examined (Hair et al., 2017). 5000 bootstraps were executed to obtain the required probability values (Hair et al., 2020). The structural model must be devoid of multi-collinearity problems. VIF values were evaluated and were less than 3.33, which is the indicated threshold value (Diamantopoulos et al., 2008) for all constructs in the study.

The coefficient of determination (Adjusted R²) for all the constructs, such as Affective organizational commitment (84.5%), Employee voice (90%), Felt obligation for constructive change (87.5%) and Psychological safety (71.2%) were greater than 20%. In social science study, R² or Adj. R² values of more than 20% are regarded as high (Rasoolimanesh et al., 2017). F² values indicate the magnitude of the effect of exogenous constructs on endogenous constructs. There are rules for calculating the effect size of constructs, such as "0.02 (Small effect), 0.15 (Medium effect), and 0.35 (Large effect)" (Cohen, 2013). Felt obligation for constructive change (0.795) shows high effect size for employee voice. Affective organizational commitment revealed high effect size for felt obligation for constructive change (0.163) and Psychological safety (2.475). Perceived organizational support shows high effect size for affective organizational support (5.449) and felt obligation for constructive change (0.438).

Table 4: Direct Effects

Direct Effects	Original Sample (O)	T Statistics (O/STDEV)	P Values
AOC -> Employee voice	0.110	3.599	0.000
AOC -> FOCC	0.362	5.187	0.000
AOC -> PS	0.844	71.975	0.000
FOCC -> Employee voice	0.797	22.748	0.000
POS -> AOC	0.919	135.178	0.000
POS -> Employee voice	0.184	3.977	0.000
POS -> FOCC	0.592	8.255	0.000
PS -> Employee voice	0.091	2.177	0.030

The results of direct effects revealed that Affective organizational commitment has positive effect on Employee voice ($\beta=0.110^{***}$), Felt obligation for constructive change ($\beta=0.362^{***}$) and Psychological Safety ($\beta=0.844^{***}$). Perceived organizational support shows positive effect on affective organizational support ($\beta=0.919^{***}$), Employee voice ($\beta=0.184^{***}$) and Felt obligation for constructive change ($\beta=0.592^{***}$). Moreover, Felt obligation for constructive change shows positive effect on employee voice ($\beta=0.797^{***}$). Psychological safety also reveals a positive effect on employee voice ($\beta=0.091^{***}$)

Table 5: Indirect Effects

Indirect Effects	Original Sample (O)	T Statistics (O/STDEV)	P Values
POS -> AOC -> Employee voice	0.101	3.601	0.000
AOC -> FOCC -> Employee voice	0.288	4.894	0.000
POS -> FOCC -> Employee voice	0.472	8.359	0.000
AOC -> PS -> Employee voice	0.076	2.177	0.030

The results of indirect effects revealed that felt obligation for constructive change positively mediates the relationship between Perceived organizational support ($\beta=0.472^{***}$), Affective organizational commitment ($\beta=0.288^{***}$) and employee voice. Moreover, Affective commitment also mediated the relationship between

perceived organizational support and employee voice ($\beta=0.101^{***}$). Psychological safety was also found to mediate the relationship between affective organizational commitment and employee voice (0.076^{***}).

5. DISCUSSION

Study demonstrated that psychological safety significantly effects employees' voice. (Pacheco, Moniz & Caldeira, 2015; Karakaş, 2019). Consistent with the previous findings it was revealed POS to positively encourage employees' voice at work. Perceived organizational support inculcates the positive notion about speaking up at work and they believe that it will not be futile to raise voice at work as they will receive consideration from the side of organization (Tucker et al. 2008; Andiyasari, Matindas & Riantoputra, 2017; Wang & Hsieh, 2013; Singh & Malhotra, 2015 & Loi, Ao & Xu, 2014). Research identified the positive influence of perceived organizational support in enhancing FOCC. FOCC is employees' reciprocation of the support received from the organization with inspires them raise constructive ideas & suggestions for betterment of organization (Eisenberger et al., 1986). FOCC is associated with raising constructive ideas and suggestions at work in a positive manner. Consistent with findings, Researchers in related field also observed that FOCC is the major motivating factor behind raising voice at work (Liao & Shaw, 2020; Alyusef & Zhang, 2015; Arba'i, 2019; Hassan & Batool, 2015; Liang, Farh & Farh, 2012). Voice efficacy builds positive notion among the employees that they have enough skills and expertise in raising voice at work and it also reduces their anxiety associated with speaking up at work which makes them feel psychologically safe in terms of raising voice at work (Zhang et al., 2010; Roussin et al., 2018; Kim, Lee & Connerton, 2020; Kish-Gephart, Detert, Trevino, & Edmondson, 2009; Xu & Yang, 2018; Dedahanov, Rhee & Gapurjanova, 2019).

6. CONCLUSION

The research provides the significance of employee voice at work and how it can lead to positive outcomes for employee and work. The research measured the role of perceived organizational support, felt obligation for constructive change, psychological safety and affective organizational commitment in predicting employee voice at work. The research concludes that perceived organizational support, felt obligation for constructive change, psychological safety and Affective organizational support significantly predict employee voice at work. In addition, it was also observed that felt obligation for constrictive change mediates the relationship between affective organizational commitment and employee voice and also between perceived organizational support and employee voice. On the other hand, Affective organizational support mediates the relationship between perceived organizational support and employee voice. The relationship between affective organizational support and employee voice was mediated through psychological safety. The research provides that how employee voice can be encouraged in organizations through the variables discussed in the research.

7. IMPLICATIONS, LIMITATIONS AND FUTURE DIRECTIONS

The present research was performed to bring in the significance of employee voice in organizations. Employee voice is the way by which employees share their views, concerns and suggestions of promotive and prohibitive nature. Through the inputs of employee's organizations can make improvements related to different aspects of the organizations and it also helps the organization to stop existing harmful organizational practices.

When employees are being heard then it inculcates a sense of belongingness towards the organization resulting in enhanced obligation, engagement and citizenship towards their organizations. The present research gives a self-determination perspective to employee voice. The constructs of the study such as Perceived organizational support and affective commitment covers the relatedness aspect of the theory, Psychological safety covers the autonomy aspect, whereas felt obligation acts as the intrinsic motivation and employee voice as the performance aspect of self-determination theory.

Despite having several implications, the study also comprises of several limitations. First, its cross-sectional nature as the research was conducted in particular timeframe. A longitudinal research might have provided variability in employee voice in different time frames ascertaining the generalizability of results. The other limitation of the research is that it was limited to higher education sector of central India. Future researches on employee voice may be performed in different sectors and samples. The research provides a self-determination perspective to employee voice covering limited components of the theory but it was not possible to cover all the aspects of theory in a single study. Future researches on employee voice may cover the remaining aspects of self-determination theory.

REFERENCES

1. Allen, N. J. (2003). Organizational commitment in the military: A discussion of theory and practice. *Military Psychology*, 15(3), 237-253.

2. Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of occupational psychology*, 63(1), 1-18.
3. Alyusef, M. I. G., & Zhang, P. (2015). The effects of managerial consultation on voice futility with organizational justice as moderator: mediating role of psychological safety. *European Scientific Journal*, 11(35).
4. Andiyasari, A., Matindas, R. W., & Riantoputra, C. D. (2017). Voice behavior: The role of perceived support and psychological ownership. *The South East Asian Journal of Management*, 11(1), 1.
5. Arba'i, I. T. (2019). *Ethical Leadership And Employee Moral Voice: The Mediating Role Of Psychological Safety and Felt Obligation for Constructive Change* (Doctoral dissertation, President University).
6. Babbie, E. R. (1990). *Survey research methods*, 2nd Edition, Wadsworth Pub. Co Belmont, Calif.
7. Bergeron, D. M., & Thompson, P. S. (2020). Speaking up at work: the role of perceived organizational support in explaining the relationship between perceptions of organizational politics and voice behavior. *the Journal of Applied Behavioral Science*, 56(2), 195-215.
8. Bonaccio, S., & Dalal, R. S. (2006). Advice taking and decision-making: An integrative literature review, and implications for the organizational sciences. *Organizational behavior and human decision processes*, 101(2), 127-151.
9. Bos, B. (2014). *The effect of employee voice on innovative behavior, mediated by affective commitment* (Master's thesis, University of Twente).
10. Brown, S. P., & Leigh, T. W. (1996). A new look at psychological climate and its relationship to job involvement, effort, and performance. *Journal of applied psychology*, 81(4), 358-368.
11. Carnevale, J. B., Huang, L., Uhl-Bien, M., & Harris, S. (2020). Feeling obligated yet hesitant to speak up: Investigating the curvilinear relationship between LMX and employee promotive voice. *Journal of Occupational and Organizational Psychology*, 93(3), 505-529.
12. Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. Academic press.
13. Cortina, L. M., & Magley, V. J. (2003). Raising voice, risking retaliation: Events following interpersonal mistreatment in the workplace. *Journal of occupational health psychology*, 8(4), 247.
14. Demirtas, Z. (2018). *The Relationships between Organizational Values, Job Satisfaction, Organizational Silence and Affective Commitment*. Online Submission, 4(11), 108-125.
15. Diamantopoulos, A., Riefler, P., & Roth, K. P. (2008). Advancing formative measurement models. *Journal of business research*, 61(12), 1203-1218.
16. Ditchburn, G. J., & Hames, K. (2014). Voice Climate Perceptions: A Multidimensional Model as a Determinant of Affective Commitment, Work Engagement, Neglect and Exit. *Australasian Journal of Organisational Psychology*, 7, e3.
17. Duan, J., Kwan, H. K., & Ling, B. (2014). The role of voice efficacy in the formation of voice behaviour: A cross-level examination. *Journal of Management & Organization*, 20(4), 526-543.
18. Edmondson, A. C., Kramer, R. M., & Cook, K. S. (2004). Psychological safety, trust, and learning in organizations: A group-level lens. *Trust and distrust in organizations: Dilemmas and approaches*, 12(2004), 239-272.
19. Eisenberger, R., Armeli, S., Rexwinkel, B., Lynch, P. D., & Rhoades, L. (2001). Reciprocation of perceived organizational support. *The Journal of applied psychology*, 86(1), 42-51.
20. Eisenberger, R., Fasolo, P., & Davis-LaMastro, V. (1990). Perceived organizational support and employee diligence, commitment, and innovation. *Journal of Applied Psychology*, 75(1), 51-59
21. Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology*, 71(3), 500-507.
22. Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research*, 18 (3), 382-388.

23. Fornell, C., Johnson, M. D., Anderson, E. W., Cha, J., & Bryant, B. E. (1996). The American customer satisfaction index: nature, purpose, and findings. *Journal of marketing*, 60(4), 7-18.
24. Fuller, J. B., Marler, L. E., & Hester, K. (2006). Promoting felt responsibility for constructive change and proactive behavior: Exploring aspects of an elaborated model of work design. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 27(8), 1089-1120.
25. Gao, L., Janssen, O., & Shi, K. (2011). Leader trust and employee voice: The moderating role of empowering leader behaviors. *The Leadership Quarterly*, 22(4), 787-798.
26. Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2017). A primer on partial least squares
27. Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2-24.
28. Hair, Joseph F., Matthew Howard, and Christian Nitzl. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research*, 10(9), 101–110.
29. Hassan, M. U., Hassan, I. E., & Batool, F. (2015). Employee voice behaviour in organisations: Evidence from Pakistan. *Asian Journal of Management Science and Applications*, 2(2), 195-212.
30. Henry, G. T. (1990). *Practical sampling* (Vol. 21). Sage.
31. Jena, L. K., Bhattacharyya, P., & Pradhan, S. (2017). Employee engagement and affective organizational commitment: Mediating role of employee voice among Indian service sector employees. *Vision*, 21(4), 356-366.
32. Kantén, P., & Ulker, F. E. (2012). A relational approach among perceived organizational support, proactive personality and voice behaviour. *Procedia-Social and Behavioral Sciences*, 62, 1016-1022.
33. Karakaş, A., & Tezcan, N. (2019). The relation between work stress, work-family life conflict and worker performance: A research study on hospitality employees. *European Journal of Tourism Research*, 21, 102-118.
34. Kim, M., Knutson, B. J., & Choi, L. (2016). The effects of employee voice and delight on job satisfaction and behaviors: Comparison between employee generations. *Journal of Hospitality Marketing & Management*, 25(5), 563-588.
35. Kim, S., Lee, H., & Connerton, T. P. (2020). How psychological safety affects team performance: mediating role of efficacy and learning behavior. *Frontiers in psychology*, 11, 1581.
36. Kim, S., Lee, H., & Connerton, T. P. (2020). How Psychological Safety Affects Team Performance: Mediating Role of Efficacy and Learning Behavior. *Frontiers in psychology*, 11, 1581.
37. Li, C., Liang, J., & Farh, J. L. (2020). Speaking up when water is murky: An uncertainty-based model linking perceived organizational politics to employee voice. *Journal of Management*, 46(3), 443-469.
38. Li, X., Xue, Y., Liang, H., & Yan, D. (2020). The impact of paradoxical leadership on employee voice behavior: a moderated mediation model. *Frontiers in Psychology*, 11, 537756.
39. Liao, H. Y., & Shaw, K. H. (2020). Authentic Leadership and Employee Voice: Roles of Obligation Perception and Power Distance Orientation. *Business and Management Research*, 9(3), 25-33.
40. Loi, R., Ao, O. K., & Xu, A. J. (2014). Perceived organizational support and coworker support as antecedents of foreign workers' voice and psychological stress. *International Journal of Hospitality Management*, 36, 23-30.
41. Milliken, F. J., Morrison, E. W., & Hewlin, P. F. (2003). An exploratory study of employee silence: Issues that employees don't communicate upward and why. *Journal of management studies*, 40(6), 1453-1476.
42. Morrison, E. W. (2014). Employee voice and silence. *Annu. Rev. Organ. Psychol. Organ. Behav.*, 1(1), 173-197.
43. Nisar, A., Abid, G., Elahi, N. S., Ahsan Athar, M., & Farooqi, S. (2020). Impact of Compassion on Voice Behavior: A Moderated Mediation Model. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), 148.

44. Ohana, M. (2016). Voice, affective commitment and citizenship behavior in teams: The moderating role of neuroticism and intrinsic motivation. *British Journal of Management*, 27(1), 97-115.
45. Ohana, M., & Stinglhamber, F. (2019). Co-workers' voice climate and affective commitment towards the team: A test of mediation and moderation. *Human Resource Management Journal*, 29(3), 395-412.
46. Perlow, L., & Williams, S. (2003). Is silence killing your company?. *Ieee Engineering Management Review*, 31(4), 18-23.
47. Pinder, C. C., & Harlos, K. P. (2001). Employee silence: Quiescence and acquiescence as responses to perceived injustice. In *Research in personnel and human resources management* (Vol. 20, pp. 331-369). Emerald Group Publishing Limited.
48. Rasheed, M. A., Shahzad, K., Conroy, C., Nadeem, S., & Siddique, M. U. (2017). Exploring the role of employee voice between high-performance work system and organizational innovation in small and medium enterprises. *Journal of Small Business and Enterprise Development*, 24(4), 670-688.
49. Rasoolimanesh, S. M., Ringle, C. M., Jaafar, M., & Ramayah, T. (2017). Urban vs. rural destinations: Residents' perceptions, community participation and support for tourism development. *Tourism Management*, 60, 147-158.
50. Rhoades, L., & Eisenberger, R. (2002). Perceived organizational support: a review of the literature. *Journal of applied psychology*, 87(4), 698.
51. Rogiest, S., Segers, J., & van Witteloostuijn, A. (2015). Climate, communication and participation impacting commitment to change. *Journal of Organizational Change Management*, 28(6), 1094-1106.
52. Rummel, R. J. (1988). *Applied factor analysis*. Northwestern University Press.
53. Sageer, A., Rafat, S., & Agarwal, P. (2012). Identification of variables affecting employee satisfaction and their impact on the organization. *IOSR Journal of business and management*, 5(1), 32-39.
54. Schwab, D. P. (1980). Construct validity in organizational behavior. *Res Organ Behav*, 2, 3-43.
55. Singh, B. S., & Malhotra, M. (2015). The mediating role of trust in the relationship between perceived organizational support and silence. *International Journal of Scientific and Research Publications*, 5(9), 1-10.
56. Sitorus, F. (2017, December). The Influence of Perceived Organizational Support and Internal Communication toward Work Engagement. In *2nd International Conference on Social and Political Development (ICOSOP 2017)* (pp. 280-287). Atlantis Press.
57. *Structural equation modeling (PLS-SEM) (2nd ed)*. Thousand Oaks, CA: SAGE Publications.
58. Tangirala, S., & Ramanujam, R. (2008). Exploring nonlinearity in employee voice: The effects of personal control and organizational identification. *Academy of Management Journal*, 51(6), 1189-1203.
59. Tucker, S., Chmiel, N., Turner, N., Hershcovis, M. S., & Stride, C. B. (2008). Perceived organizational support for safety and employee safety voice: the mediating role of coworker support for safety. *Journal of occupational health psychology*, 13(4), 319.
60. Vakola, M., & Bouradas, D. (2005). Antecedents and consequences of organisational silence: an empirical investigation. *Employee relations*.
61. Van Dyne, L., & LePine, J. A. (1998). Helping and voice extra-role behaviors: Evidence of construct and predictive validity. *Academy of Management journal*, 41(1), 108-119.
62. Wang, D. S., & Hsieh, C. C. (2013). The effect of authentic leadership on employee trust and employee engagement. *Social Behavior and Personality: an international journal*, 41(4), 613-624.
63. Xie, X. Y., Ling, C. D., Mo, S. J., & Luan, K. (2015). Linking colleague support to employees' promotive voice: A moderated mediation model. *PloS one*, 10(7), e0132123.
64. Yang, X., Meng, Y., Qiu, Y., & Feng, Y. (2019). Why am I willing to speak up? The impact of spiritual leadership on employee voice behavior. *Frontiers in psychology*, 10, 2718.
65. Zhang, J., Akhtar, M. N., Zhang, Y., & Rofcanin, Y. (2019). High-commitment work systems and employee voice: A multilevel and serial mediation approach inside the black box. *Employee Relations: The International Journal*, 41(4), 811-827.
66. Zhang, J., Li, J., & Huang, J. (2020). How self-sacrificial leadership influences employee voice: Psychological safety as a mediator. *Social Behavior and Personality: an international journal*, 48(12), 1-8.

A STUDY ON IMPACT OF SOCIAL MEDIA ADVERTISEMENTS ON BUYING BEHAVIOR OF CONSUMER IN 21ST CENTURY IN INDIA

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Social media denotes to the means of communications among people in which they create, share, exchange information and ideas in virtual communities and networks (Halonen&Heinonen, 2008). Social media is one of the powerful tools to advertise the product. Consumers are using social networks in daily life for various reasons. Most of them want to maintain relationships with relatives or colleagues/friends. These allow users to connect with peers by adding them to network of friends, which facilitate communication particularly among peer groups. Online groups utilize a noticeable influence on the behavior and consumer buying intent and implicitly on the purchase decision. The outcome of this present study shows that people daily usage of social network is growing rapidly, on an average people spending two hours per day in social media. For marketing professionals, social media is a new outlet that can potentially be used to help increase the interest in a product or service. This research is focused on relationship between social media use and the impact of social-media advertisements on buying behavior of consumers.

Keywords: Consumer, Buying Behavior, social media, Advertisement

INTRODUCTION

Social media sets consumers spinal to the midpoint of the business world and offers marketers a new set of tackles to interact with consumers and to integrate them into brands through pioneering ways. Marketers have to understand how the social media has influenced consumer buying behavior.

Social media speaks to a new way of understanding how individual users are interacting with branded content via online publishers, social networks, blogs, and applications. Before the proliferation of social media, the primary way for users to receive advertiser information was one-way. Social Media has changed the paradigm of how people consume online media. The most profound difference is that Social Media has added a participatory element where an individual not only receives information but has the ability to take part in the creation and distribution of content. Furthermore, social media tools have enabled a dialogue and discovery around this content.

It is the combination of these unique and appealing aspects that defines the true value of social media .According to Andreas Kaplan and Michael Haenlein who define social media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content". (Haenlein Michael, 2010). Furthermore, social media depends on mobile and web-based technologies to create highly interactive platforms through which individuals and communities share, co-create, discuss, and modify user-generated content.

It introduces substantial and pervasive changes to communication between organizations, communities and individuals. H.Kietzmann, Jan; Kristopher Hermkens (2011) . This particular technical revolution during the last decade has drastically revolutionized the traditional marketing approaches and brought marketers to a new era. The traditional advertising approach of mass media communication for instance newspaper, magazines and televisions, aims at carrying messages to a larger group of viewers in the hope of reaching the few interested ones.

Types of Advertising

Popular social media sites, Facebook, Twitter, and YouTube, offer different ways to advertise brands. Facebook gives advertisers options such as promoted posts, sponsored stories, page post ads, Facebook object (like) ads, and external website (standard) ads. To advertise on Twitter there are promoter tweets, trends, and promoted accounts that show up on users newsfeeds. Foradvertising on YouTube there are branded channels, promoted videos, an in video advertising. (Goyal 2013).

Consumer Behavior:Everyday people buy things that are relevant to their needs. At the same time they are making purchasing decisions. Specific consumer behavior is defined as “the activities people undertake when obtaining, consuming, and disposing of products and services” (Blackwell, Miniard and Engel, 2001). Consumer behaviors are influenced by personal and environmental factors (Blyth, 2008) .

Social Media Marketing:The use of social media websites and social networks to market a company’s products and services. Social media marketing provides companies with a way to reach new customers and engage with existing customers.

A central part of consumer behavior is, consumers’ purchasing decision that included several steps. Generally social networks such as groups or individuals who own the power over consumers can affect consumers’ purchase decision (Solomon, Bamossy, Askegaard& Hogg, 2010).

Statement of the Problem

This research intends to study the growing influence of social media advertisement on consumer consciousness and the user factors involved for buying behavior of consumer.

LITERATURE REVIEW

Internet and virtual communities have transformed consumers, societies, and corporations with wide spread access to information, better social networking and enhanced communication abilities (Kucuk and Krishnamurthy, 2007).Therefore social networks are defined to be websites which link millions of users from all over the world with same interests, views and hobbies. Blogs, YouTube, MySpace, Facebook are examples of social media that are popular among all level of consumers. (Sin, et al., 2012).

In recent past social media websites have provided an opportunity for businesses to engage and interact with potential consumers, encourage an increased sense of intimacy with consumers, and build all important relationships with potential consumers. (Mersey, *et al.*, 2010). Internet is a social place where created new forum for consumers. Virtual communities, blog, and online social networking sites provide a platform to influence consumers’ purchase decisions (OTX research, 2008).

Now a days users are using several online formats to communicate, (e.g., blogs, podcasts, social networks, bulletin boards, and wikis) to share ideas about a given product, service, or brand and contact other consumers, who are seen as more objective information sources. (Kozinets, 2002).

Fandos& Flavian (2006) stated that purchase intention indicates consumer’s predictable behavior, meaning purchase intention can be used to predict what products or brands consumers will buy next time when they do shopping. Positive purchase intention not only indicates high probability of actual purchase but also reflects a consumer’s positive commitment or loyalty towards products and brands (Moorman, Deshpandé, &Zaltman, 1993).

Sin et.al., (2012) applied the technology acceptance model as the basis of the theoretical framework and found out that the more Malaysian young consumers find online social media to be useful, the more likely they will have the intention to purchase through social media websites. Meanwhile, young consumers have the intention to buy online through social media if the delivering and ordering process offered by social media is easy and simple to understand.

RESEARCH METHODOLOGY

The research focuses on the behavior of end consumers and particularly within the retailing industry. Regarding different categories of social media: 1. Social networking sites 2. Social news 3.media sharing 4. blogs and 5. Microblogging have been considered. Each of these social media platforms has provide unique features and experiences to individuals and entities, for instance marketers and consumers, in the social media sphere.

Sampling method which is used in this study is non probability sampling for the selection of 74 respondents . A structured questionnaire was mailed to respondents for the collection of primary data. The secondary data were collected from the books, journals and websites. Descriptive statistics, Chi-square test and weighted average ranking techniques have been used to find out the impact of social media advertisement influence on consumer buying behaviour. The Collected data was processed with the help of SPSS 14.

OBJECTIVES OF THE STUDY

- To examine the social media advertisements that helps consumers in buying behavior
- To study the consumers consciousness of social media advertisements.
- Defining the categories of products that consumers buy online.

Hypotheses of the study

- H1: There is no strong relationship between Social Media advertisement and Consumers buying Behavior.
- H2: There is no significant relationship between Social Media advertisement and consumer Consciousness.
- H3: There is no significant relationship between influence of social media and consumers buying decision.
- H4: social media is not playing significant role in buying behavior of consumers.

LIMITATIONS

Considering the time and resource constraints, convenient sampling is the most appropriate technique for this study even though there might be biasedness in the sample selection. Sample selection and number of respondents may be less for generalizing the results.

ANALYSIS AND DISCUSSION

Table 13: Demographic Factors

Profile of Respondents	Number of Respondents	Percentage
Gender		
Male	36	48.6
Female	38	51.4
Total	74	100
Age		
a) Below 18	2	2.7
b) 19-22	39	52.7
c) 23 – 27	15	20.2
d) 28 – 32	11	14.9
e) 33 & Above	7	9.5
Total	74	100
Occupation		
Student	43	58.1
Salaried	8	10.8
Self-employed	10	13.5
Home-maker	13	17.6
Total	74	100

Source: Primary Data

It is seen from the table 13 that out of 74 respondents the ratio of the female is more than i.e. female respondents' were 48.6% and male respondents were 51.4%. Age group is considered in order to observe the influence of social media on various age groups customers. Majority were of (52.7%) 19-22 age group, followed by 23-27 age group (20.2%) and 28-32 age group (14.9%). So, young people are more inclined towards the use of social media. Importantly, students devote more time (58.1 percent) on these web-sites as compare to other users.

Table 14: Time Spend on social networking sites per day

Hours	No of Respondents	Percentage
Less than one hour	11	14.9
1 – 2 hours	12	16.2
2 – 3 hours	23	31.1
More than 3 hours	28	37.8
Total	74	100

Source: Primary Data

Based on the data obtained from this research table 14 demonstrates that people spend more than three hours per day on the social media websites (37.8%) followed by spending 2-3 hours (31.1%) 1-2 hours (16.2%) and less than one hour (14.9%). One an average spending two hours on social networking is quite common among respondents.

Table 15: Weighted Average Score on Social Media

Social Media	Total Score	WAS	Rank
Facebook	610	67.7	1

Twitter	343	38.1	4
YouTube	413	45.8	2
Linkedin	401	44.5	3
Google+	313	34.7	6
Instagram	300	33.33	7
Blog	259	28.7	8
Pinterest	319	35.44	5
Foursquare	189	21	9

Source: Primary Data, WAS: weighted Average Score

H₀: there is significant effect on social media site advertisement

Table 16: Test Startistics

Test Statistics	
N	74
Chi-Square	42.757
df	23
Asymp. Sig.	.007

It is clear from the table 15, that the highest weighted average score was given to Facebook rank 1 that is considered to be most important social media website many respondents using this site for connecting with the people followed by YouTube rank 2, LinkedIn rank 3, Twitter rank 4, Pinterest rank 5, Google+ rank 6, Instagram rank 7, Blog rank 8 and Foursquare rank 9. With the significant value of 0.000, it is clear that ranking of the respondents regarding the social media at 1% level of significance. The hypothesis is rejected, and from the table 16, it can be concluded that respondents have different level of opinion on their social media usage.

Table 17: Kinds of advertisements in the social media websites

Advertisements	Number of Respondents	Percentage
Web banner	12	16.2
Pop up	36	48.6
Flash ads	8	10.8
Video ads	18	24.3
Total	74	100

Source: Primary Data

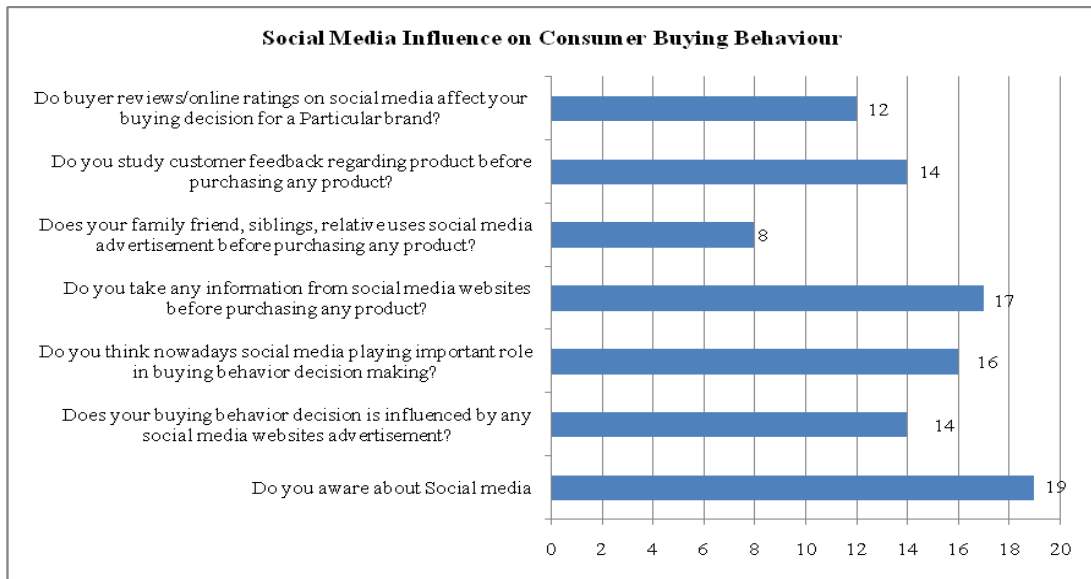
The above table 17, explains the kinds of advertisements respondents come across on the social media websites majority: 48.6% accepted that they watch pop ups, 24.3% like Video ads, 16.2% impressed by web banner and small number of respondents 10.8% like flash ads. So, Pop up ads have great impact on their buying decision.

Table 19: Brand communication attract Social Networking Sites

Brand Communication	Number of Respondents	Percentage
Interactive	6	8.1
Flash ads	5	6.8
Banner ads	9	12.2
Games, quiz, updates	24	32.4
video ads	30	40.5
Total	74	100

Source: Primary Data

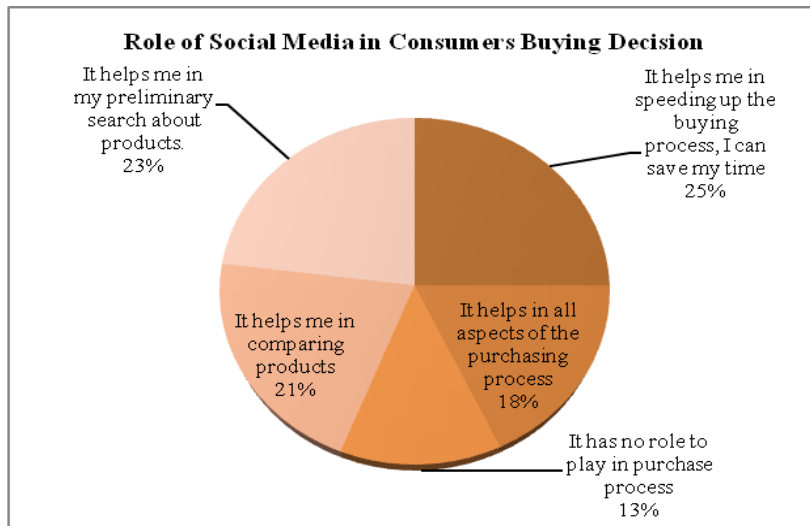
It is understood from the table that majority of respondents (43) are students out of which 15 respondents have strongly accepted the role of social media in consumer buying decision whereas 1 respondent of self-employed hasdenied and out of 13 homemakers 5 strongly accepted the role of social media. It is observed from the above table 24, that the *p* value is more than 0.001, the null hypotheses is accepted at one percent level of significance. Hence the alternative hypotheses “H₁: there is significant relationship between occupation and role of social media in consumers buying decision” is disproved.



Social Media Influence

Ho: There is significant relationship between social media influence and consumer buying decision.

There are many factors influencing the consumers buying behavior regarding particular product or service. The diagram 26 revealed that the factors responsible for consumers buying behavior. Among the list of factors 19% of respondents expressed that awareness about social media followed by 17% respondents to take the information from social media websites before purchasing a product, 16% said social media playing important role in decision making 14% respondents usually study customers feedbacks regarding product/service before purchasing, 14% respondents buying behavior is influenced by social media advertisements, 12% respondents said that buyers reviews/ratings on social media affect their buying decision for a particular brand and only 8% respondents come to know their family members, friends, siblings and relatives use social media before purchasing any product. The Null hypothesis is accepted. The outcome of the data analysis presented in the above chart shows that respondents (19%) were aware about social media. “H₁: There is no significant relationship between social media influence and consumer buying decision” is proved.



Role of Social Media

H₀: There is no relationship between role of social media and consumer buying decision.

The above diagram-27, exhibits the role of social media in consumers buying decision majority of (25%) respondents have said that social media helps me in speeding up the buying process, so that I can save time, 23% respondents said it helps me in fulfilling my preliminary search about product and 21% respondents said that it helps me in comparing products. 18% respondents said that It helps in all aspects of the purchasing process and 13% respondents said It has no role to play in purchase process. The Null hypothesis is rejected. The result of the data analysis presented in the above chart shows that (13%) respondents said that social media

has no role to play in purchase process. “H₁: There is a significant relationship between role social media and consumer buying decision” is proved.

Important Suggestions given by customers

- The product information should be true and correct one. Product should be of good quality.
- The social media advertisement should present true facts about the product on social media, advertisement. They should present product in interesting way so that the users get excited to view it and purchase it. It should be more informative and more unique (This is because most advertisement look same). There are certain products that are not represented in their true form.
- Ads should give the full information about the product like features, Compatibility, price and extra features.
- Social media should not continuously show the ads once if the consumer is not interested.
- There are sites on which the COD of the product is not available. The consumers are expecting COD facilities on all the sites.

CONCLUSION

To conclude, from the findings of this research, it can be observed that consumers in India are actively utilizing social media platforms as a tool in validating of the purchase decisions; however, consumers are deemed to be inactive in sharing their word of mouth to others with the available social media platforms. Based on the data and contemporary frameworks theories relating to consumer behavior and regarding social media marketing, it has suggested that the spirit of consumer behavior remains the same even after the introduction of social media, in which individuals have to go through the all the stages before a purchase, instead of straight to the purchase decision once a thought of purchase being triggered. Marketing through social media should focus on building relationships between consumers and companies. As many respondents have reflected that social media has provided a more effective platforms to communicate with one another and with the company. Finally the core objective of the entire research was to find out the social media advertisement influence on consumers buying decision, social media has took consumers in each stage of their decision making process. According to the findings, social media still cannot be considered as a powerful tool to trigger a purchase in India, whereas individuals have reflected that mass media still remains a certain influence in gaining awareness.

REFERENCES

- ❖ <http://www.iab.net/socialmetrics>
- ❖ Andreas M. Kaplan, Michael Haenlein Users of the world, unite! The challenges and opportunities of Social Media, ESCP Europe, 79 Avenue de la République, F-75011 Paris, France Business Horizons (2010) 53, 59—68
- ❖ Jan H Kietzmann, Kristopher Hermkens, Ian P. McCarthy and Bruno S Silvestre Social Media? Get Serious! Understanding the Functional Building Blocks of Social Media
- ❖ Goyal, S. (2013). Advertising on social media. Scientific Journal of Pure And Applied Sciences, 2(5), 220-223. doi:10.14196/sjpas.v2i5.551
- ❖ <http://www.investopedia.com/terms/s/social-media-marketing-smm.asp>
- ❖ Roger D. Blackwell, Paul W. Miniard, James F. Enge “Consumer Behavior”, Pennsylvania State University Harcourt College Publishers, 2001
- ❖ Jim Blythe (2008) Consumer Behaviour Thomson Learning, London (ISBN 978-1-8448-0381-1, 456 pages)
- ❖ http://www.anglohigher.com/magazines/magazine_detail/80/35#ixzz3mBIbSV3J
- ❖ Kuruk K., (2007). An analysis of consumer power on the Internet, Technovation, 27(1–2), 47–56.
- ❖ Sin S., Nor K. M. & Al-Agaga A. M., (2012). Factors Affecting Malaysian young consumers’ online purchase intention in social media websites, Procedia - Social and Behavioral Sciences, 40, Pages 326-333.
- ❖ Mersey R., Davis, Malthouse E. & Calder B., (2010). Engagement with Media, Journal of Media Business Studies, 7(2), 39 -56.
- ❖ Kozinets, R.V., (2002). The field behind the screen: using netnography for marketing research in online communities. Journal of Marketing Research 39 (1), 61–72.

-
- ❖ Moorman, C., Deshpandé, R., & Zaltman, G. (1993). Factors Affecting Trust in Market Research Relationships. *Journal of Marketing*, 57(1), 81-101
 - ❖ Sin, S. S., Nor, M. K., & Al-Agaga, A. M. (2012). Factors affecting Malaysian young consumers' online purchase intention in social media websites. *Procedia Social and Behavioral Science*, 40, 326-333.
 - ❖ Journal of Direct, Data and Digital Marketing Practice (2008) 9, 274-277. doi:10.1057/palgrave.dddmp.4350096
 - ❖ Glen Drury Opinion piece: Social media: Should marketers engage and how can it be done effectively? *Journal of Direct, Data and Digital Marketing Practice* (2008) 9, 274-277. doi:10.1057/palgrave.dddmp.4350096

CONTEMPORARY BUSINESS MANAGEMENT THROUGH ANCIENT INDIAN SCRIPTURES**Dr. Urmila Yadav**

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ABSTRACT

Truth and honesty, as well as a mindset towards clients, stakeholders, and society that fosters reciprocal trust and management of expectation, are essential for Business success. Management is a systematic way of doing all activities in any field of human effort. It is about keeping oneself engaged in interactive relationship with other human beings in the course of performing one's duty. Its task is to make people capable of joint performance, to make their weaknesses irrelevant -so says the Management Guru Peter Drucker

Management has become an essential part in everyday life, be it at home, office, factory, Government, or in any other organization. Where a group of human beings assemble for a common purpose, management principles come into play through their various facets like management of time, human resources, materials, machinery, finance, planning, priorities, policies and practice. Management has gained tremendous importance.

This paper will be attempt to know how ancient Indian Scriptures and values which have stood the test of time can help modern management philosophy to create a more sustainable model of management and to establish the relevant transformational leadership practices of Ancient Indian scriptures like Vedas, Ramayana, Bhagavad Gita etc. in the practice of Modern Management, through which we can not only better manage on an individual as well as institutional and global level management.

Keywords- Ancient Scriptures, contemporary, Buisness Management, Values, Veda,

INTRODUCTION

Today there are many professionals and industrialists who are great achievers but unfortunately suffering from stress, competition, jealousy and psychological problems. On the other hand there are people who are contended and happy but are not achievers. Today is a requirement of a combination of these two qualities. One should be a great achiever and at the same time should live a peaceful and happy life. No culture of the world has given such comprehensive mission of life. Thus we can say that ancient Indian wisdom as contained in Vedas, Puranas, Upanishadas etc. is total integration of management for all walks of life. The Vedic seers emphasized on single minded efforts, co-operation and human welfare. They were fully aware of resource management in private as well as public life. They also laid down compendium of guidelines for effective management of these resources. Thus we find ancient wisdom for management was unique, practical and effective. It was effective for the society of Vedic age, is equally effective for the present times and will also cater to the needs of future society with equal effectiveness. We need only to interpret and implement it according to the call of the times.

The objective of this paper is to extract and explore some of the principles of managerial effectiveness as found in Ancient Indian scriptures.

Ancient Indian wisdom for management-The Indian civilization, with recorded history of more than 5000 years is one of the oldest civilizations in the world and the contribution of India and Indians to this world is vast in countless areas of knowledge including management field. We can extract wisdom from Several classics such as Vedas, Puranas, Upanishads, Ramayana, Mahabharata etc. These ancient Hindu scriptures offer several management lessons which can be useful even in modern context.

Management principles from Vedas: Oh God, may we with our ears listen to what is good, with our eyes see what is good and may we with firm body composed of healthy strong organs, work the mission bestowed upon us as long as we are alive (Rig-Veda). Every management book instructs us to learn from others by listening and watching and doing the mission oriented work using the health. Rig-Veda again gives the beautiful message: Oh God bestow on us the best treasures: the efficient mind and spiritual luster, the increase of wealth, the health of bodies and sweetness of speech and fairness of days. The integration of prosperity, wealth, mental, communicative and spiritual enlightenment is expected in Vedas and also in modern days.

Philosophies of ancient Indian management**1. What was work? According to vedas Work was define as-**

- a. Yagnayacharatah karma: Work is to be done with the spirit of Yagna (Teamwork, Selflessness).
- b. Parasparam Bhavayantah: Nurture each other (Win-win approach).

2. The Purpose of Work was: Each soul was essentially divine. Discovering Divinity was the purpose of work.

a. Tat Tvam Asi: You are That (Supreme) - Everybody may make himself a Genius.

b. Aham Brahmasmi: I have immense potential. I can make the impossible possible.

3. Why Work? a. Atmano Mokshaya Jagat Hitaaya Ca:- For individual development and For the Welfare of the World. In short our private benefits with public benefits.

4. How to work? a. Seva + Tyag: Serve others. Give our best for the good of others.

5. Spirit of Work: a. Yogah Karmasu Kaushalam: Skill & Excellence in action is Yoga.

6. The Resources: a. Sukshma/Subjective or subtle factors are more important than Sthula/Objective or gross factors. b. Karma-Kshetra is Dharma-Kshetra, Means- the workplace was a sacred place therefore Making clean and bringing orderliness and regularity was the (dharma) duty of a person.

Concepts of Vasudhev Kutumbhkam "Vasudhev Kutumbhkam" stresses on the familial feeling and treating humankind as members of family. The feature of divine work culture and principles of Vedas stresses on the ethics and code of conduct while doing management work. Faith on "yogah karmasu kaushalam" is stressed and poured into the minds of managers via Vedas.

Concept of Yagna- and Niyamas

The Vedic path consists of ten general rules of moral conduct. There are five for inner purity, called the yamas – satyas or truthfulness, ahimsa or non-injury to others and treating all beings with respect, asteya or no cheating or stealing, brahmcharya or celibacy and, aparighara or no selfish accumulation of resources for one's own purpose. The five rules of conduct for external purification are the niyamas– shaucha or cleanliness and purity of mind and body, tapas or austerity and preservice, swadhyay or study of the Vedas, and santosh or contentment, as well as ishvara- pranidhana, acceptance of the Supreme.

There are also ten qualities that are the basis of dharmic (righteous) life. These are dhriti (firmness or fortitude), kshma (forgiveness), dama (self – control), asteya (refraining from stealing or dishonesty), shauch (purity), indriyanigraha (control over the senses), dhii(intellect), vidya(knowledge), satyam (truth) and akrodhah (absence of anger).

The Purusha Sooktam described the process of creation and how the entire creation had been created through the Yagna.

In modern context, there are two meaning of yagna-

a. Any self-sacrificing work undertaken in a spirit of self-dedication, for the blessing of all.

b. Any social, communal, national or personal activity into which the individual is ready to pour himself forth entirely in a spirit of service and dedication.

Management Education from Ramayana-

The Ramayana contains lessons on strategic management, statecraft, good governance and values based leadership, the focus is on righteousness or dharma that is the rightful conduct which should be earthwork of all leadership actions. According to lord Rama the king must ensure that he appoints courageous, knowledgeable and strong-willed men with high emotional quotient because the quality of advice is a critical determinant of quality of governance. Teamwork is an important principle in management, and Rama applied the same in search of Sita and was successful in the mission. Another one is in an organization one must be treated affectionately which Rama did when he met Guhan and Vibhishana. If we describe Rama as a leader and as a manager we can say that Rama was independent assertive but also respectful, was firm in his decisions, was open and frank, did not misuse power, delegated power to lieutenants motivated troops honorably and led from the front.

Management Education from Mahabharata and GITA: Bhagavad Gita a book of 700 verses is the most widely read Hindu religious text. It was possibly composed around 500-300 bc and it took its present form around 300 ad. It is a part of the wider epic Mahabharata. Pitamaha Bheeshma, when he was lying on the bed of arrows, had given certain advices to Yudhisthir on better management of public services. One of the greatest contributions of India to the world is Holy Gita which is considered to be one of the first revelations from God. Bhagavad-Gita is the essence of Vedic Literature and a complete guide to practical life. It provides "all that is needed to raise the consciousness of man to the highest possible level." Arjuna got mentally depressed when he saw his relatives with whom he has to fight. (Mental health has become a major international public health

concern now). To motivate him the Bhagavad Gita is preached in the field Kurukshetra by Lord Krishna to Arjuna as counseling to do his battle duty while multitudes of men stood by waiting. It has got all the management tactics to achieve the mental equilibrium and to overcome any crisis situation. The critical question in all managers' minds is how to be effective in their job. The answer to this fundamental question is found in the Bhagavad Gita, which repeatedly proclaims that "you must try to manage yourself." The reason is that unless a manager reaches a level of excellence and effectiveness, he or she will be merely a face in the crowd. The Bhagavad Gita, written thousands of years ago, enlightens us on all managerial techniques leading us towards a harmonious and blissful state of affairs in place of the conflict, tensions, poor productivity, and absence of motivation and so on, common in most of Indian enterprises today and probably in enterprises in many other countries. The modern (Western) management concepts of vision, leadership, motivation, excellence in work, achieving goals, giving work meaning, decision making and planning, are all discussed in the Bhagavad Gita. There is one major difference. While Western management thought too often deals with problems at material, external and peripheral levels, the Bhagavad Gita tackles the issues from the grass roots level of human thinking. Once the basic thinking of man is improved, it will automatically enhance the quality of his actions and their results.

The Bhagavad Gita in Ch.6 Verse 17 says – "Moderation is the best policy." Moderation in food, sleep, action & meditation increases one's efficiency and alertness. Fatigue and illness are major time-wasters. The Ashrama system of Indian culture helps one to plan the time of one's life. Assuming that one would live for 100 years, they divided life-span into 4 quarters. First 25 years – student life, next 25 – household life, next 25 years – Retired life, last 25 years – life of a renunciate. Whatever be the lifespan, we find that this pattern of living is universally applicable in any era. The principles of Bhagavad Gita reveals that managing men, money and materials in the best possible way is the most important factor for successful management. Lack of management causes disorder, chaos, confusion, wastage and destruction. Bhagavad Gita repeatedly proclaims that one must try to manage oneself. Instinctive reasoning, behind such sayings, that unless a manager reaches a level of excellence and effectiveness, he or she will merely be a face in the crowd. The modern management thinking of vision, leadership, motivation, excellence in work, achieving goals, giving work meaning are all well versed in the Bhagavad Gita.

Following modern management principles existing today can be derived from the body of knowledge of the ancient Indian scriptures.

Utilization of available resources-the first lesson of management science is to choose wisely and utilize scarce resources optimally. During the curtain raiser before the Mahabharata War, Duryodhana chose Sri Krishna's large army for his help while Arjuna selected Sri Krishna's wisdom for his support. This episode gives us a clue as to the nature of the effective manager - the former chose numbers, the latter, wisdom

Work commitment-A popular verse of the Gita advises "detachment" from the fruits or results of actions performed in the course of one's duty. Being dedicated work has to mean "working for the sake of work, generating excellence for its own sake." If we are always calculating the date of promotion or the rate of commission before putting in our efforts, then such work is not detached. It is not "generating excellence for its own sake" but working only for the extrinsic reward that may (or may not) result. It is in this light that the counsel, "yogah karmasu kausalam" should be understood. "Kausalam" means skill or technique of work which is an indispensable component of a work ethic. "Yogah" is defined in the Gita itself as "samatvam yogah uchyate" meaning an unchanging equipoise of mind (detachment.)

Work results-The Gita further explains the theory of "detachment" from the extrinsic rewards of work in saying: If the result of sincere effort is a success, the entire credit should not be appropriated by the doer alone. If the result of sincere effort is a failure, then too the entire blame does not accrue to the doer. The former attitude mollifies arrogance and conceit while the latter prevents excessive despondency, de-motivation, and self-pity. Thus both these dispositions safeguard the doer against psychological vulnerability, the cause of the modern managers' companions of diabetes, high blood pressure and ulcers. Assimilation of the ideas of the Gita leads us to the wider spectrum of "lokasamgraha" (general welfare) but there is also another dimension to the work ethic - if the "karma yoga" (service) is blended with "bhaktiyoga" (devotion), and then the work itself becomes worship, a "sevayoga" (service for its own sake.) Along with bhakti yoga as a means of liberation, the Gita espouses the doctrine of nishkama karma or pure action untainted by hankering after the fruits resulting from that action. Modern scientists have now understood the intuitive wisdom of that action in a new light.

Stress management-

1. Perform the duties without attachments & insistence on particular results. Accept the results gracefully, gratefully.
2. Spend some time in doing pranayama.
3. Follow the Moderation-Yoga. Moderation in food, sleep, speech, exercise, recreation & meditation eliminates stress.
4. There is nothing which is more purifying than Knowledge. Clarity in Thinking about the roles that we are playing and the Essential Reality that we are is important.
5. Faith in the Higher Reality is a great source of strength. A man is what his faith is. As the faith so will be our desires, thoughts and action.
6. Few minutes of Prayers & Meditation daily, go a long way in building up reserves of Peace and happiness within. Stress is the Arjuna-disease each one of us go through when faced with a challenge. Bhagavad-Gita is the Krishna-cure for this disease. After listening to Gita, Arjuna regained his clarity & strength. Modern psychology says that there should be 'healthy stress' in life, which motivates one towards action. Indian Masters say that all stress is unhealthy and one can be totally stress-free. The Sthita-Prajna lakshana in the second chapter of the Bhagavad Gita mentions the characteristics of a person who is completely free from Stress.

Time Management 1. High Priority Tasks: "O Bharata, there are tasks, where the investment is small, the returns are high. Hope you identify such High Priority Tasks." – Sri Rama's advice to his brother, Valmiki Ramayana. Never give-in to urgency syndrome, neglecting what is truly important. 2. Most important 2 words for Time management are: No and Now For action – 'Now' is the time. Never procrastinate. For distraction – 'No' is the right word. – Valmiki Ramayana

Fear Management

1. The Law of Karma – "As you sow, so you reap." We get what we deserve. No one can give us what we don't. No one can take away what we deserve.
2. Vairagya Shatakam says- Detachment alone leads to fearlessness. Attachment causes fear of losing the object of attachment.
3. Mundaka Upanishad says- Honesty and noble virtues give us inner strength and fearlessness.
4. Bhagavad Gita says - "O son of Kunti! Go and declare to the world that my devotee shall never perish." Faith in a Higher Power makes one fearless.
5. Bhagavad Gita says - Even a little bit of prayers, meditation, giving up insistence on results etc. releases one from fear.
6. Bhagavad Gita says - It is better to die doing one's own duties according to one's temperaments.
7. Taittiriya Upanishad says - Where ever there is duality, there is fear. In Non-duality alone there is fearlessness.

Concept of Yoga- Meditation is the best way by which men can relax and solves a problem. Yoga means union of body, mind and soul which is what all Indian management is based upon. Many Business-schools are emphasizing on this concept to provide tensionless mind in such a hectic and busy world to provide an upper edge to forthcoming managers.

CONCLUSION

From the above discussions we conclude that, much of modern management principles existing today can be derived from the body of knowledge of the ancient Indian scriptures. Through the wisdoms of Vedas, Mahabharata, Ramayana, Bhagavad Gita we can not only promote a more ethical and responsible leadership on an individual or institutional level but also move towards the direction of restoring harmony among the Organizations towards establishing a sustainable business through spiritual congruence.

REFERENCES

1. Knapp, S. (2006). The Power of the Dharma: An Introduction to Hinduism and Vedic Culture. Indiana, United States: I Universe
2. Saigal, K. (2000). Vedic Management: The Dharmic and Yogic Way. New Delhi: Gyan Books.
3. Bhatia, V. P. (2016). Ethical and Spiritual Values in Indian Scriptures. Chennai: Notion Press

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4. Mukherjee, S. (2017). Bhagavad Gita: The Key Source of Modern Management. Asian Journal of Management Volume No: 8 Issue No. : 1 , 02.
 5. Nandram, S. (2014). Vedic Learning and Management Education. Journal of Management Development Vol. 33 Iss 8/9 , 865.
 - 6.. Nigal, S. G. (2009). Vedic Philosophy of Values.New Delhi: Northern Book Centre.
 7. Rajak, M. P. (2014). Ancient Indian Wisdom in Modern Management: A Review of its scope and prospects. AWEshkar Vol. XVIII Issue 2 September 2014 WeSchool.
 8. Rao, N. &. (2013). Management Dynamics and Bhagwad Gita. Management Trends Vol. 10, No. 1-2

A COMPARATIVE STUDY OF FACTORS INFLUENCE THE PRICE OF GOLD IN INDIAN & GLOBAL MARKETSFOR INVESTORS

¹Ashutosh Sharma and ²Ayushi Gupta¹Assistant Professor, I.T.S School of Management, Ghaziabad²Student, PGDM (2022-24 Batch), I.T.S School of Management**ABSTRACT**

This study aims to analyze the characteristics of gold as a diversifier, a hedge or a safe haven against the stock market collapse in five countries. We propose the standard and quantitative techniques in the volatility models, with the time-varying conditional variance of monthly and weekly prices of gold in Indian and global markets. In our study we took last 10 years monthly and weekly price/oz data (with highest & lowest prices in each month & week) of gold against INR & USD. To analyse the data SPSS software is used. Factors like Indian marriage season, Indian festivals, Duration of China's New year, Duration of Christmas in US & UK, Pandemic etc. have been taken into consideration for investigation of the changes in the price of gold for investment purposes. Study concludes that due to visible direct-factors gold exhibits considerable evidence of the strong hedge in India and the US and diversified role in China. With regards to its role as a safe haven, gold retains its status as a key investment particularly in the countries where gold has a preeminent cultural role, i.e., India, as well as in the US and the UK.

Keywords: Indian & Global gold market, Volatile, Visible direct-factors, Safe-heaven, investment

1. INTRODUCTION

Gold always have been a centre of attraction for investors of commodity. In India, gold is considered a symbol of social status, financial security and cultural legacy. As a financial instrument, investments in gold or gold-backed products are driven by the various functions they perform. For instance, gold performs the dual role of savings as well as collateral for credit that can help households mitigate risks, smoothen consumption as well as raise funds to fulfill important goals such as marriage, education and capital for business. In the last decade, the purchasing value of gold in India has increased sharply by 96% while the total value of gold purchased has risen by a moderate 35%.⁴ This indicates that the demand for gold by Indian households is moderately inelastic. The strong preference for gold is also reflected in Indian households' wealth allocation towards this asset. Revolution in the finance industry is brought about through the advent and evolution of behavioural finance. Investors hardly act rationally in taking decisions while investing. Investors simply react on the available information possessed by them and react accordingly. Lots of consideration is required to be dealt with before investing in the commodity market. As per the CMIE-CPHS62019 data, there is a near universal demand for gold as 99% of households own some form of gold. In terms of share of total wealth, an average Indian household holds 84% of their total : Gold is considered by many, to be the best investment you can make to protect yourself during stock market declines and inflation. In fact, history shows that the performance of gold goes up in times of high inflation. However, the price of gold also has its highs and lows and you could just as easily lose money investing in gold as with any other investment. Factors need to be considering while investing in gold) Forms of buying gold: any investor has to be aware of the different forms of buying gold. Jewellery, the most traditional and the dominant form of buying gold in India and Bank coins, bullion bars, gold exchange trades etc are other forms of investment. Gold does not carry much risk at least in India, as we hardly see deflation in the real sense. Gold scores the highest in terms of liquidity, compared to all other investments. At any time of the day and any day gold can literally be converted to cash. Now a days banks are offering loan on jewellery, which somehow ensures that gold is a good choice for investment.



Figure - 1

(Source – Investing.com as on 06.04.2023)

In above figure Graphs of XAU/USD (from 2012 to 2023 with monthly sticks), XAU/INR (from 2012 to 2023 with monthly Line graph) and DX (from 2012 to 2023 with monthly candle sticks) have been shown. Graph is showing high negative correlation between the price of XAU/USD and DX (Dollar Index).

2. LITERATURE REVIEW

According to Ritu and Ankur (2012), the role of gold has increased not only as a store of value but also as an important alternative asset class providing investment benefits. During COVID-19 we all have seen growth in the price of gold, which again proves that gold is most favourable asset to invest even when other sectors for investment are completely shutdown. If the returns on bonds, equities and real estate are not adequately compensating for the risk involved and the rate of inflation, then the demand for gold and other alternative investments such as commodities increases.

Nigel Desebrock (2002) holds that in India, while cultural, adornment and other factors influence the purchase of gold jewelry, its parallel role as an investment is also relevant and that demand tends to be sensitive to the movements in the price of gold. He opines that the attitude of owning gold jewelry for ‘adornment’ and ‘investment’ purposes are no longer homogenous across the population. Among the urban or rural, rich or poor and young or old, they have started to diverge. This divergence is the outcome of varying rates of economic and social change among the different population groups. Denver Gold Group (2010), report that gold has served three important functions. It assumes the role of a financial asset, held by individual investors as a store of wealth and has proven as a premium portfolio diversifier. It has been a commodity, used primarily in jewelry but also in electronics, dentistry, and many other technological applications. Finally, it has been a monetary asset, used by governments as a reserve asset, as a form of money, and as a backing for their own currencies.

Roche (2010) observes that, when analyzing the price of gold, it is important to understand that gold price do not move like most of the other commodities. It has certain built-in unquantifiable characteristics that drive the price. The price of gold is actually a function of four things: its replacement potential for the U.S dollar, the future rate of inflation, sentiments - generally fear based, and true supply and demand.

3. RESEARCH OBJECTIVES

- i). The first objective of this study is to know the factors which influence the price of gold.
- ii). To study the relationship between price of gold in Indian market and in global market as well as with the value of Dollar Index.

4. METHODOLOGY

Data Source/Location	Data type – Primary/Secondary	Analytical Tools
Last 10 years data about the price (highest & lowest along with closing price) of gold is collected from Investing.com and Trading view websites	Last 10 years secondary data of price of gold (Monthly & Weekly) of XAU/USD, XAU/INR & DX is collected.	SPSS & Excel software are being used to draw graphs and to calculate Range, Variation, Skewness, Correlation, Regression & Time series trend line.

5. DATA ANALYSIS

Following is the data of last 10 years Monthly (May, 2016 to 6th April, 2023) prices (in \$) of gold per oz (1 oz = 28.35 gram) in global market; (Source; Investing.com)

Table - 1

Last 10 years (April , 2012 to April, 2023) Price data of XAU/USD pair						
Date	Price	Open	High	Low	Chg%	H-L
Apr-23	2,018.86	1,968.20	2,032.08	1,949.81	2.59%	63.88
Mar-23	1,967.90	1,827.24	2,010.19	1,809.40	7.70%	182.95
Feb-23	1,827.15	1,927.92	1,959.77	1,804.65	-5.22%	31.85
Jan-23	1,927.88	1,823.85	1,949.27	1,823.85	5.67%	125.42
Dec-22	1,824.40	1,768.54	1,833.39	1,765.32	3.16%	64.85
Nov-22	1,768.45	1,633.40	1,786.68	1,616.18	8.29%	153.28
Oct-22	1,633.12	1,661.30	1,729.73	1,617.21	-1.60%	68.43
Sep-22	1,659.67	1,711.09	1,735.37	1,614.35	-2.98%	24.28
Aug-22	1,710.70	1,765.05	1,807.90	1,709.10	-3.09%	42.85
Jul-22	1,765.22	1,807.31	1,814.36	1,680.78	-2.31%	7.05
Jun-22	1,806.89	1,837.37	1,877.38	1,802.20	-1.64%	40.01
May-22	1,837.09	1,896.09	1,910.03	1,786.95	-3.13%	13.94
Apr-22	1,896.40	1,937.51	1,998.60	1,872.19	-2.11%	61.09
Mar-22	1,937.23	1,908.19	2,070.29	1,890.03	1.54%	162.10
Feb-22	1,907.90	1,796.72	1,974.48	1,788.39	6.20%	177.76
Jan-22	1,796.47	1,830.14	1,853.98	1,779.88	-1.75%	23.84
Dec-21	1,828.39	1,774.15	1,830.58	1,753.84	3.08%	56.43
Nov-21	1,773.78	1,783.24	1,877.40	1,758.45	-0.51%	94.16
Oct-21	1,782.81	1,756.91	1,814.22	1,745.45	1.49%	57.31
Sep-21	1,756.66	1,813.57	1,834.55	1,721.07	-3.13%	20.98
Aug-21	1,813.43	1,814.34	1,832.10	1,684.77	-0.01%	17.76
Jul-21	1,813.58	1,770.06	1,833.99	1,765.47	2.47%	63.93
Jun-21	1,769.80	1,907.53	1,916.84	1,750.11	-7.16%	9.31
May-21	1,906.36	1,768.49	1,913.15	1,765.91	7.79%	144.66
Apr-21	1,768.59	1,708.09	1,798.29	1,705.42	3.61%	90.20
Mar-21	1,707.01	1,733.40	1,760.02	1,676.70	-1.53%	26.62
Feb-21	1,733.49	1,863.05	1,871.84	1,717.26	-6.10%	8.79
Jan-21	1,846.09	1,897.69	1,959.60	1,810.46	-2.66%	61.91
Dec-20	1,896.49	1,777.40	1,906.93	1,775.52	6.72%	129.53
Nov-20	1,777.02	1,878.59	1,965.92	1,764.69	-5.37%	87.33
Oct-20	1,877.95	1,885.80	1,933.45	1,859.67	-0.40%	47.65
Sep-20	1,885.44	1,967.63	1,992.38	1,848.45	-4.28%	24.75
Aug-20	1,969.75	1,980.98	2,073.41	1,864.30	-0.25%	92.43
Jul-20	1,974.69	1,781.60	1,981.22	1,757.68	10.90%	199.62
Jun-20	1,780.67	1,738.05	1,786.02	1,670.74	3.15%	47.97
May-20	1,726.30	1,685.95	1,765.94	1,670.06	2.75%	79.99
Apr-20	1,680.09	1,571.00	1,747.85	1,566.97	6.94%	176.85
Mar-20	1,571.05	1,591.10	1,702.96	1,451.50	-0.86%	111.86
Feb-20	1,584.74	1,590.20	1,689.11	1,547.40	-0.32%	98.91
Jan-20	1,589.81	1,517.24	1,611.15	1,517.12	4.80%	93.91
Dec-19	1,517.01	1,467.03	1,525.45	1,453.91	3.63%	58.42
Nov-19	1,463.90	1,513.32	1,515.81	1,445.61	-3.26%	2.49
Oct-19	1,513.16	1,472.30	1,518.81	1,459.00	2.80%	46.51
Sep-19	1,472.00	1,520.10	1,557.38	1,464.42	-3.15%	37.28
Aug-19	1,519.85	1,411.34	1,555.13	1,400.65	7.52%	143.79
Jul-19	1,413.55	1,392.83	1,452.96	1,381.84	0.32%	60.13
Jun-19	1,409.10	1,307.40	1,438.99	1,306.62	7.96%	131.59
May-19	1,305.25	1,283.59	1,307.11	1,266.18	1.71%	23.52

Apr-19	1,283.35	1,291.48	1,310.96	1,266.25	-0.66%	19.48
Mar-19	1,291.90	1,312.94	1,324.57	1,281.10	-1.58%	11.63
Feb-19	1,312.66	1,320.93	1,347.11	1,302.53	-0.60%	26.18
Jan-19	1,320.56	1,282.78	1,326.65	1,276.58	2.95%	43.87
Dec-18	1,282.73	1,223.19	1,284.34	1,221.22	4.98%	61.15
Nov-18	1,221.88	1,215.24	1,237.74	1,196.19	0.64%	22.50
Oct-18	1,214.14	1,192.19	1,243.63	1,183.24	1.88%	51.44
Sep-18	1,191.69	1,200.29	1,212.90	1,180.68	-0.75%	12.61
Aug-18	1,200.71	1,223.97	1,225.10	1,160.19	-1.86%	1.13
Jul-18	1,223.41	1,253.49	1,266.26	1,211.48	-2.30%	12.77
Jun-18	1,252.25	1,298.79	1,309.64	1,245.67	-3.52%	10.85
May-18	1,297.92	1,315.40	1,326.17	1,282.00	-1.30%	10.77
Apr-18	1,314.95	1,326.21	1,365.37	1,310.29	-0.68%	39.16
Mar-18	1,324.00	1,318.22	1,356.87	1,302.76	0.48%	38.65
Feb-18	1,317.66	1,345.08	1,361.97	1,306.99	-2.01%	16.89
Jan-18	1,344.70	1,302.62	1,366.26	1,302.60	3.24%	63.64
Dec-17	1,302.45	1,274.59	1,307.97	1,236.27	2.20%	33.38
Nov-17	1,274.36	1,270.94	1,299.44	1,265.49	0.25%	28.50
Oct-17	1,271.20	1,279.20	1,306.46	1,260.51	-0.62%	27.26
Sep-17	1,279.10	1,322.03	1,357.74	1,277.60	-3.22%	35.71
Aug-17	1,321.60	1,269.05	1,326.19	1,251.36	4.14%	57.14
Jul-17	1,269.05	1,241.76	1,271.29	1,204.73	2.24%	29.53
Jun-17	1,241.20	1,268.90	1,296.26	1,236.78	-2.12%	27.36
May-17	1,268.09	1,268.50	1,274.30	1,214.18	0.03%	5.80
Apr-17	1,267.65	1,248.30	1,295.66	1,243.69	1.52%	47.36
Mar-17	1,248.63	1,248.57	1,261.41	1,194.89	0.01%	12.84
Feb-17	1,248.52	1,210.60	1,264.18	1,198.04	3.14%	53.58
Jan-17	1,210.51	1,151.09	1,220.21	1,145.99	5.13%	69.12
Dec-16	1,151.46	1,173.01	1,188.09	1,122.69	-1.81%	15.08
Nov-16	1,172.70	1,276.90	1,337.85	1,170.72	-8.19%	60.95
Oct-16	1,277.28	1,317.83	1,319.93	1,241.46	-2.93%	2.10
Sep-16	1,315.80	1,309.35	1,353.03	1,302.33	0.56%	43.68
Aug-16	1,308.45	1,349.97	1,367.69	1,305.02	-3.12%	17.72
Jul-16	1,350.59	1,323.40	1,375.30	1,310.80	2.18%	51.90
Jun-16	1,321.78	1,215.85	1,358.47	1,206.02	8.82%	142.62
May-16	1,214.69	1,293.69	1,303.97	1,199.88	-6.08%	10.28
Apr-16	1,293.36	1,232.70	1,296.58	1,209.00	4.98%	63.88
Mar-16	1,231.95	1,238.19	1,282.90	1,208.55	-0.47%	44.71
Feb-16	1,237.76	1,117.85	1,261.17	1,116.24	10.75%	143.32
Jan-16	1,117.64	1,061.09	1,128.30	1,060.74	5.35%	67.21

And following is the data of last 10 years Monthly (May, 2012 to 6th April, 2023) prices (inRs.) of gold per oz (1 oz = 28.35 gram) in Indian market; (Source; Investing.com)

Table - 2

Last 10 years (April , 2012 to April, 2023) Price data of XAU/INR pair								
Date	Price	Open	High	Low	Chg%	H-L	(H-L) in \$	Closing - Open (in \$)
Apr-23	1,65,393	1,61,933	1,66,591	1,60,705	2.25%	5,886	71.93	42.28
Mar-23	1,61,748	1,51,077	1,66,191	1,48,359	7.14%	17,832	217.92	130.40
Feb-23	1,50,965	1,57,685	1,60,925	1,49,223	-4.17%	11,702	143.00	-82.12
Jan-23	1,57,527	1,50,914	1,58,902	1,50,585	4.39%	8,317	101.64	80.81
Dec-22	1,50,909	1,43,966	1,51,995	1,43,804	4.92%	8,191	100.10	84.85
Nov-22	1,43,831	1,35,208	1,45,124	1,33,975	6.41%	11,149	136.25	105.38
Oct-22	1,35,166	1,35,431	1,41,339	1,33,921	-0.09%	7,418	90.65	-3.24
Sep-22	1,35,288	1,36,038	1,37,844	1,32,015	-0.47%	5,829	71.23	-9.17

Aug-22	1,35,921	1,40,058	1,43,678	1,35,845	-2.97%	7,833	95.72	-50.56
Jul-22	1,40,075	1,42,687	1,43,360	1,34,205	-1.78%	9,155	111.88	-31.92
Jun-22	1,42,618	1,42,548	1,46,705	1,40,802	0.09%	5,903	72.14	0.86
May-22	1,42,486	1,45,118	1,45,714	1,39,190	-1.81%	6,524	79.73	-32.16
Apr-22	1,45,115	1,47,083	1,52,389	1,43,543	-1.25%	8,846	108.10	-24.05
Mar-22	1,46,952	1,44,149	1,59,633	1,42,828	2.01%	16,805	205.36	34.25
Feb-22	1,44,063	1,34,041	1,49,374	1,33,710	7.58%	15,664	191.42	122.47
Jan-22	1,33,911	1,36,319	1,38,592	1,32,466	-1.65%	6,126	74.86	-29.43
Dec-21	1,36,155	1,33,295	1,37,852	1,31,976	2.22%	5,876	71.81	34.95
Nov-21	1,33,193	1,33,627	1,39,625	1,31,021	-0.27%	8,604	105.14	-5.30
Oct-21	1,33,560	1,30,343	1,35,976	1,29,648	2.54%	6,328	77.33	39.31
Sep-21	1,30,253	1,32,340	1,33,917	1,27,872	-1.49%	6,045	73.87	-25.50
Aug-21	1,32,225	1,34,885	1,35,849	1,25,081	-1.92%	10,768	131.59	-32.51
Jul-21	1,34,817	1,31,642	1,36,722	1,31,300	2.45%	5,422	66.26	38.80
Jun-21	1,31,594	1,38,331	1,39,470	1,30,074	-4.88%	9,396	114.82	-82.33
May-21	1,38,344	1,31,037	1,39,226	1,30,674	5.64%	8,552	104.51	89.29
Apr-21	1,30,964	1,24,899	1,35,765	1,24,749	4.89%	11,016	134.62	74.12
Mar-21	1,24,864	1,28,162	1,29,461	1,22,950	-2.56%	6,511	79.57	-40.30
Feb-21	1,28,140	1,35,828	1,36,717	1,26,969	-4.76%	9,748	119.13	-93.95
Jan-21	1,34,538	1,38,653	1,43,253	1,32,399	-2.95%	10,854	132.64	-50.29
Dec-20	1,38,629	1,31,509	1,40,454	1,31,099	5.46%	9,355	114.32	87.01
Nov-20	1,31,450	1,40,108	1,45,377	1,30,463	-6.14%	14,914	182.26	-105.80
Oct-20	1,40,049	1,38,738	1,42,141	1,37,557	0.97%	4,584	56.02	16.02
Sep-20	1,38,702	1,44,157	1,45,747	1,36,301	-3.76%	9,446	115.43	-66.66
Aug-20	1,44,118	1,48,030	1,55,298	1,39,166	-2.60%	16,132	197.14	-47.81
Jul-20	1,47,959	1,34,565	1,48,457	1,31,365	10.03%	17,092	208.87	163.68
Jun-20	1,34,468	1,31,477	1,34,909	1,26,486	2.86%	8,423	102.93	36.55
May-20	1,30,734	1,26,669	1,34,233	1,26,303	3.29%	7,930	96.91	49.68
Apr-20	1,26,568	1,18,851	1,33,751	1,17,955	6.92%	15,796	193.03	94.31
Mar-20	1,18,375	1,15,417	1,26,028	1,07,734	2.98%	18,294	223.56	36.15
Feb-20	1,14,948	1,13,747	1,21,428	1,10,167	1.07%	11,261	137.61	14.68
Jan-20	1,13,735	1,08,267	1,15,753	1,08,062	5.08%	7,691	93.99	66.82
Dec-19	1,08,239	1,05,258	1,08,850	1,03,207	2.90%	5,643	68.96	36.43
Nov-19	1,05,193	1,07,390	1,07,581	1,03,512	-2.03%	4,069	49.73	-26.85
Oct-19	1,07,373	1,04,013	1,07,895	1,03,411	3.25%	4,484	54.80	41.06
Sep-19	1,03,993	1,08,616	1,12,148	1,03,463	-4.26%	8,685	106.13	-56.50
Aug-19	1,08,617	97,376	1,11,628	96,826	11.58%	14,802	180.89	137.37
Jul-19	97,341	96,036	1,00,044	94,980	0.19%	5,064	61.88	15.95
Jun-19	97,154	90,969	99,706	90,849	6.98%	8,857	108.24	75.58
May-19	90,817	89,399	92,031	87,822	1.62%	4,209	51.44	17.33
Apr-19	89,367	89,351	90,814	88,157	-0.01%	2,657	32.47	0.20
Mar-19	89,374	93,035	93,170	88,988	-3.91%	4,182	51.11	-44.74
Feb-19	93,012	93,740	96,078	92,367	-0.79%	3,711	45.35	-8.90
Jan-19	93,750	89,315	94,349	88,823	5.12%	5,526	67.53	54.20
Dec-18	89,188	85,195	90,509	85,058	4.81%	5,451	66.61	48.80
Nov-18	85,092	89,827	90,919	84,692	-5.22%	6,227	76.10	-57.86
Oct-18	89,774	86,446	91,357	86,134	3.91%	5,223	63.83	40.67
Sep-18	86,398	85,227	87,852	84,827	1.35%	3,025	36.97	14.31
Aug-18	85,250	83,793	85,782	81,120	1.80%	4,662	56.97	17.81
Jul-18	83,742	85,814	87,031	83,265	-2.30%	3,766	46.02	-25.32
Jun-18	85,717	87,562	88,525	85,404	-2.01%	3,121	38.14	-22.55
May-18	87,477	87,421	89,357	86,592	0.11%	2,765	33.79	0.68
Apr-18	87,378	86,356	89,104	85,848	1.36%	3,256	39.79	12.49
Mar-18	86,206	85,957	87,968	84,907	0.34%	3,061	37.41	3.04
Feb-18	85,917	85,475	87,307	83,987	0.56%	3,320	40.57	5.40

Jan-18	85,436	83,174	86,753	82,887	2.77%	3,866	47.24	27.64
Dec-17	83,135	82,197	83,501	79,613	1.17%	3,888	47.51	11.46
Nov-17	82,175	82,293	84,349	81,713	-0.15%	2,636	32.21	-1.44
Oct-17	82,297	83,545	84,587	82,046	-1.47%	2,541	31.05	-15.25
Sep-17	83,529	84,524	86,750	83,314	-1.14%	3,436	41.99	-12.16
Aug-17	84,490	81,505	84,896	79,702	3.74%	5,194	63.47	36.48
Jul-17	81,442	80,242	81,554	77,754	1.55%	3,800	46.44	14.66
Jun-17	80,200	81,856	83,512	79,704	-1.95%	3,808	46.54	-20.24
May-17	81,798	81,552	82,205	78,521	0.40%	3,684	45.02	3.01
Apr-17	81,472	80,965	83,544	80,446	0.61%	3,098	37.86	6.20
Mar-17	80,979	83,298	83,646	78,626	-2.72%	5,020	61.35	-28.34
Feb-17	83,240	81,754	84,320	80,803	1.93%	3,517	42.98	18.16
Jan-17	81,660	78,273	83,052	78,233	4.38%	4,819	58.89	41.39
Dec-16	78,235	80,488	80,816	76,234	-2.77%	4,582	55.99	-27.53
Nov-16	80,464	85,183	89,489	80,281	-5.52%	9,208	112.53	-57.67
Oct-16	85,163	87,584	87,841	82,681	-2.74%	5,160	63.06	-29.59
Sep-16	87,561	87,663	89,808	87,227	-0.06%	2,581	31.54	-1.25
Aug-16	87,617	89,982	91,497	87,419	-2.62%	4,078	49.84	-28.90
Jul-16	89,974	89,259	92,860	88,061	0.86%	4,799	58.65	8.74
Jun-16	89,212	81,673	92,587	81,184	9.29%	11,403	139.35	92.13
May-16	81,626	85,932	86,592	80,470	-4.97%	6,122	74.81	-52.62
Apr-16	85,898	81,673	86,036	80,234	5.25%	5,802	70.90	51.63
Mar-16	81,617	84,490	86,367	80,843	-3.35%	5,524	67.51	-35.11
Feb-16	84,450	75,890	86,284	75,782	11.34%	10,502	128.34	104.61
Jan-16	75,852	70,238	76,914	70,141	8.07%	6,773	82.77	68.61

Table – 3

Descriptive Statistics of (H-L) for XAU/USD		Descriptive Statistics of (H-L) for XAU/USD	
Mean	52.81	Mean	83.91
Standard Error	3.88	Standard Error	4.06
Median	40.85	Median	69.84
Mode	63.88	Mode	68.73
Standard Deviation	44.61	Standard Deviation	46.81
Sample Variance	1989.69	Sample Variance	2191.45
Kurtosis	1.12	Kurtosis	2.04
Skewness	1.25	Skewness	1.52
Range	198.49	Range	225.86
Minimum	1.13	Minimum	31.05
Maximum	199.62	Maximum	256.91
Sum	6970.84	Sum	11160.21
Count	132.00	Count	133.00

Table – 4

Descriptive Statistics of (Closing - Opening Price in \$ per OZ) for XAU/USD		Descriptive Statistics of (Closing - Opening Price in \$ per OZ) for XAU/INR	
Mean	2.12	Mean	6.56
Standard Error	5.55	Standard Error	4.56
Median	-5.01	Median	3.01
Mode	#N/A	Mode	-25.32
Standard Deviation	63.82	Standard Deviation	52.60
Sample Variance	4073.12	Sample Variance	2766.49
Kurtosis	0.07	Kurtosis	0.22
Skewness	0.23	Skewness	0.47
Range	349.40	Range	271.15
Minimum	-156.31	Minimum	-107.47
Maximum	193.09	Maximum	163.68

Sum	279.39	Sum	872.25
Count	132.00	Count	133.00

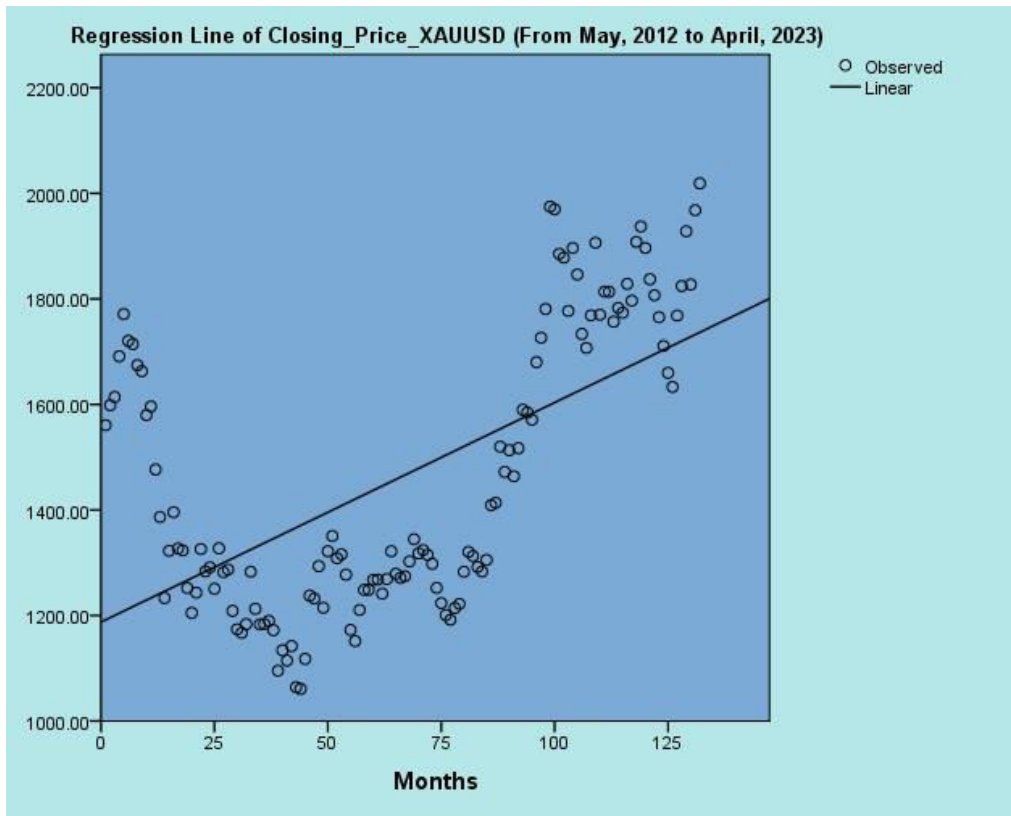


Figure – 2 – Regression (Trend) Line of XAU/USD

Table – 5 - Model Summary and Parameter Estimates
Dependent Variable: Closing Price

Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Linear	.358	72.643	1	130	.000	1187.583	4.159



Figure – 3 – Regression (Trend) Line of XAU/INR

Table - 6 - Model Summary and Parameter Estimates

Dependent Variable: Closing Price XAU/INR

Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Linear	.697	300.757	1	131	.000	62054.665	568.763

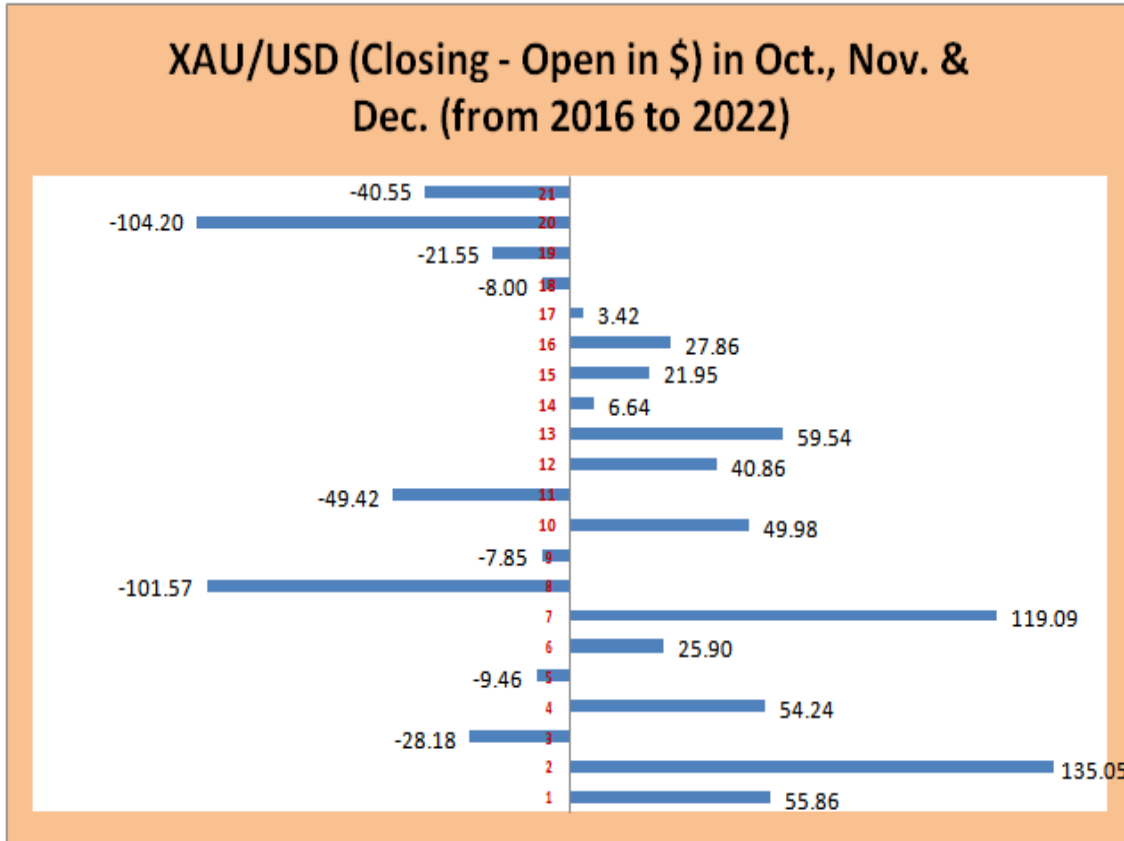


Figure - 4

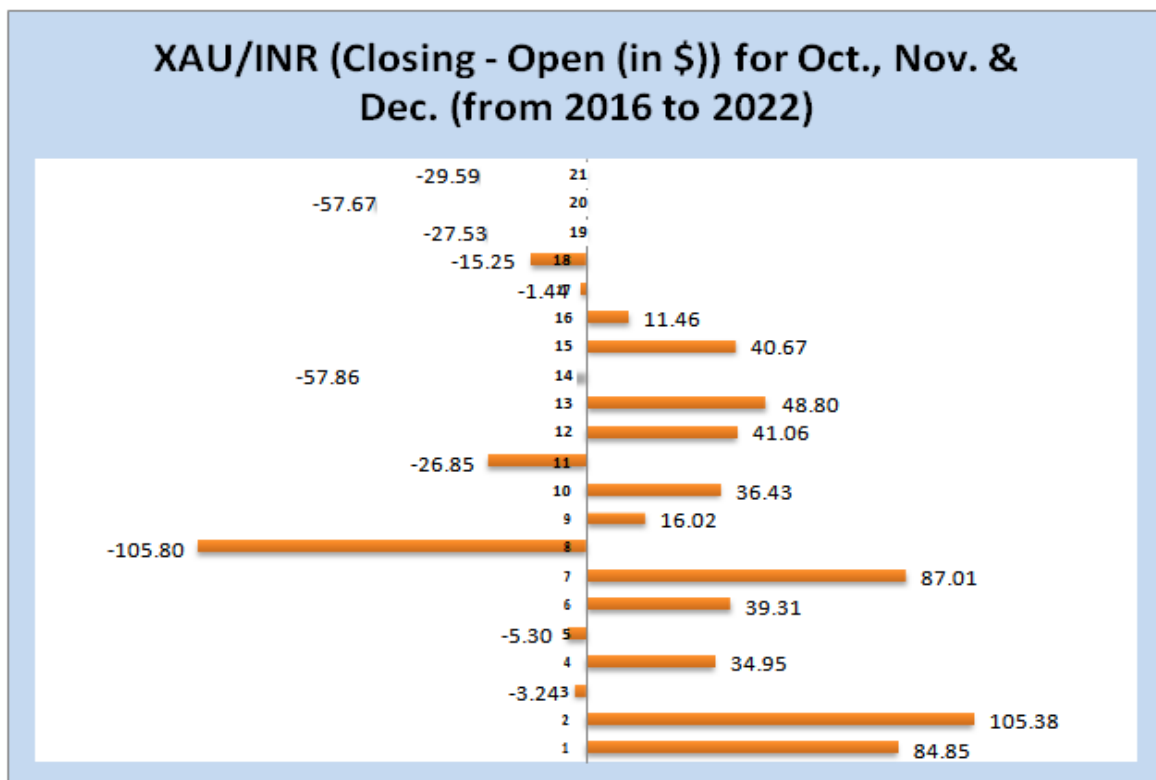


Figure - 5

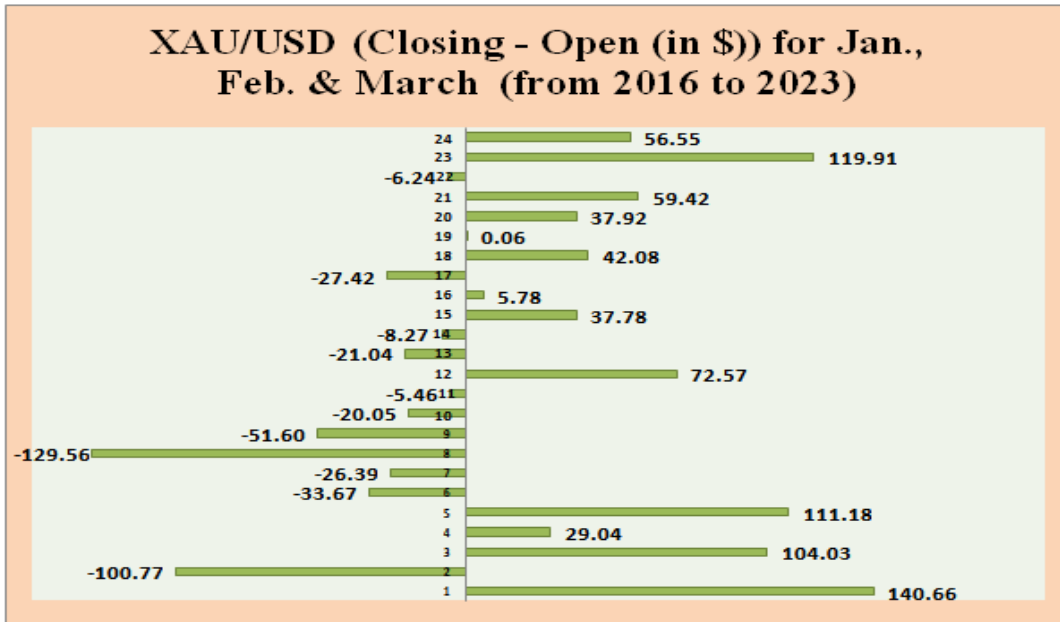


Figure – 6

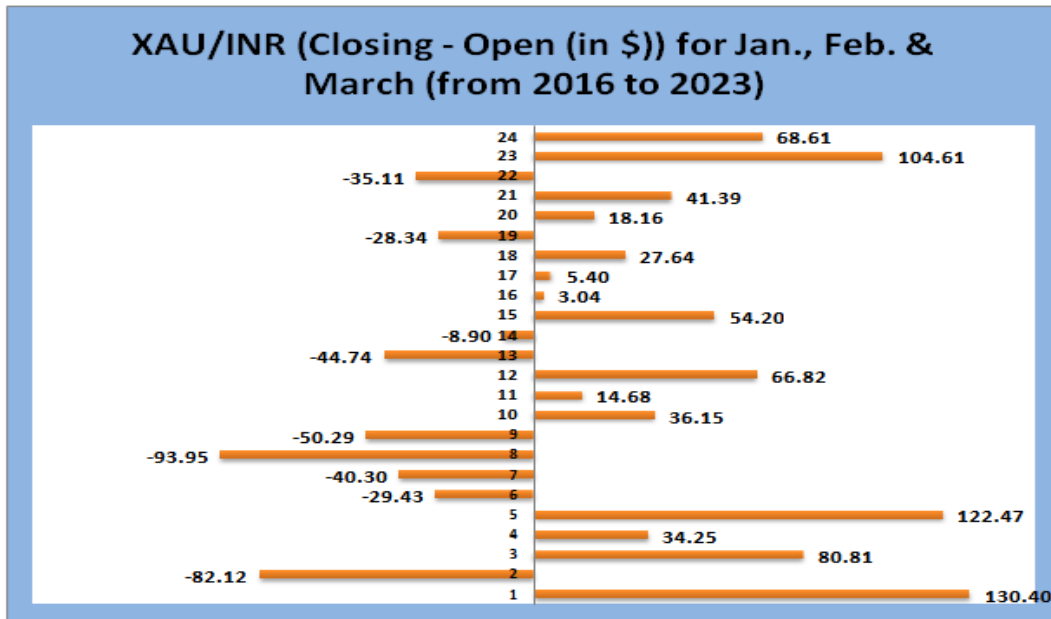


Figure – 7

6. INTERPRETATION

- i). From the above analysis Table-3 is showing Descriptive Statistics of Range of XAU/USD and XAU/INR pairs, which reveals that price of gold is very volatile, which makes it more attractive for early investors (who want to make money on a faster rate). Also statistics are showing that price of gold is more volatile in Indian market than in global market.
- ii). Table-4 is showing Descriptive Statistics of difference between monthly closing and opening prices/OZ of XAU/USD and XAU/INR pairs. From the statistics we noticed a higher variation in the prices/OZ of gold in Global market as compared to Indian market.
- iii). Figure-2 & Table-5 are showing increasing trend in price/OZ (taken closing price (in \$) at the end of every month) of gold (XAU/USD) in global market with significant value of regression coefficient (b1) = 4.159. (Taken year 2012 as base year)
- iv). Figure-3 & Table-6 are also showing increasing trend in price/OZ (taken closing price (in Rs.) at the end of every month) of gold (XAU/INR) in Indian market with significant value of regression coefficient (b1) = 568.763. (Taken year 2012 as base year)

- v). In figure-4 the chart is showing that in the months of October, November & December XAU/USD pair out of 21, 12 times closing price have been quite higher than the opening price. Because from October to December there are festivals around the world including Diwali, Christmas and New year Eve, therefore during this duration we can say is the good time to buy XAU/USD pair for investment purposes.
- vi). Same situation is with figure-5 in which chart is showing that in the months of October, November & December XAU/INR pair out of 21, 12 times closing price have been quite higher than the opening price. Because from October to December there are festivals Like; Deshera, Diwali therefore during this duration also price of pair XAU/INR likely to be increased.
- vii). In figure-6 the chart is showing that in the months from January to March XAU/USD pair out of 22, 11 times closing price have been quite higher than the opening price. So there are (50-50)% chances to sell or buy XAU/USD pair from Jan. to March.
- viii). Though figure-7 the chart is showing that in the months from January to March XAU/INR pair out of 22, 15 times closing price have been quite higher than the opening price, And it is basically because of wedding season in India from mid of Jan. to mid of March.

7. DISCUSSIONS AND RECOMMENDATIONS

The returns generated by gold and other asset classes as of May 2020 over different period are given during the rise of COVID-19 in India, gold as an asset generated 12% returns, while bank deposit generated a negative return of 5.3% and equity markets generated a negative return of 2.9%. Gold is a good choice for short term as well as for long term investors. However, the findings from the primary research were that investors still preferred to invest in bank deposits rather than in gold.

8. CONCLUSIONS

- i). In our study we found that gold is a safe heaven asset for long term investors, and can be considered as a good choice for long term investors without making much investigation.
- ii). Our study shows that for short term investors gold is highly volatile and provides great opportunity to make money at a very fast growth rate, but proper planning and investigation about the factors influencing the price of gold (Globally) is required. We found that Indian market plays a very important role in deciding about buy/sell gold globally as well as in Indian market. Factors like Marriage season in India, Navratra & Diwali festivals also play very important role in influencing the price of gold.

We conclude that the recent worldwide financial crises have increased the investment demand for gold over the last 17 years at least. Gold has a key role as a strategic long term investment and as a mainstay allocation in a well-diversified portfolio. Investors have been able to recognise much of gold's value over time by maintaining a long-term allocation and taking advantage of its safe-haven status during periods of economic uncertainty.

We believe that our study will help the investors in deciding about buy/sell XAU/USD & XAU/INR pairs.

9. REFERENCE

- [1] Aayog, N. (2018). Transforming India's Gold Market.
- [2] A banker for all seasons, part II: John Exter's views on financial crises, money demand and 'Exter Pyramid'; Retrieve from: <https://www.goldmoney.com/research/goldmoney-insights/a-banker-for-all-seasons-part-ii>
- [3] ICE 360 Survey, Price Research Team (2014)
- [4] India Gold Policy Centre, Annual report, (2015-2020)
- [5] Is gold a luxury (rich man's) product, ICE 360, Price Research Team. Retrieved from IIMA website 34 KPMG. 2020. Return of gold financiers in India's organised lending market. Annual Report, New Delhi: KPMG.
- [6] Niti Aayog. 2018. Transforming India's Gold Market. Status Report, New Delhi: Niti Aayog.
- [7] Reserve Bank of India, covid-19 regulatory package, March 2020
- [8] The Hindu. (2020, July 30). India's gold demand in April-June plunges 70% on covid-19 disruptions. The Hindu. World Gold Council. (2019). India Report.
- [9] Vyas, Mahesh. 2020. "21 million salaried jobs lost." *CMIE Economic Outlook*. September 5. Accessed January 5, 2021. <https://www.cmie.com/kommon/bin/sr.php?kall=warticle&dt=2020-09-07%2017:52&msec=996>.

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- [10] World Gold Council. (2020). Online Gold Market in India.
- [11] World Gold Council. (2020, May). [www.gold.org](https://www.gold.org/gold-hub/gold-focus/2020/05/covid-19-steals-sheen-gold-demand-akshaya-tritiya). Retrieved from <https://www.gold.org/gold-hub/gold-focus/2020/05/covid-19-steals-sheen-gold-demand-akshaya-tritiya>
- [12] World Gold Council, India Report (2019)
- [13] ASSOCHAM (2012), India's Gold Rush: Its impact and Sustainability. Denver Gold Group (2010): Investing in Gold.
- [14] Investing.Com, 2023 (Online gold price/OZ data)

SECURITY AND PRIVACY MANAGEMENT: ISSUES AND BEST PRACTICES IN SMART HOMES IN ERA OF 6G

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ABSTRACT

Smart home or smart farm technology is now very common in the current era and it does provide a desired level of conveyance to the users. Smart home devices (TV, doors ,locks , alarms ,HVAC etc) embedded with a IoT (Internet of things) system which contains sensors , actuators and controllers and these devices are capable enough to share their data over the smart home network using standard protocols like WiFi, cellular (3G/4G/5G/ upcoming 6G). Many big companies like Amazon, Google, KNX, etc are investing huge capital in this industry. Smart home solution must take care of different kinds of security threats and issues (data Confidentiality, availability, privacy, integrity etc), these kinds issues may reduce the level of trust of users of smart home solution and may cause huge loss of revenue, because smart home need real sense of security and privacy management. This paper focuses on different security and privacy issues of smart home, security and privacy management, impact of the upcoming communication protocol 6G on the smart home applications and security and privacy management aspects to enhance the level of trust of users on smart home solutions.

Keywords: IoT, Smart home, Security, privacy, 6G, security management

1. INTRODUCTION

Smart home in simple terms refers as a home equipped with automated lighting, entertainment, heating, and electronic appliances, surveillance system, smart doors and locks etc that can be accessed and controlled remotely or locally by phone, tablet or computer. In some context smart home referred to as „domotics“ (from the Latin word “Domus” meaning home) or home automation, the smart home and smart buildings is set of ideas , innovations and solution developments to control appliances are all about home automation. This kind of automation provides better safety & security, convenience, energy efficiency and sustainability, ease of device handling etc Smart home’s equipments are generally open to operate via internet with proper authentication and authorization with the help of central control system[1]. Below diagram shows the basic smart appliance (but not limited to shown in diagram) which contained by a smart homes.

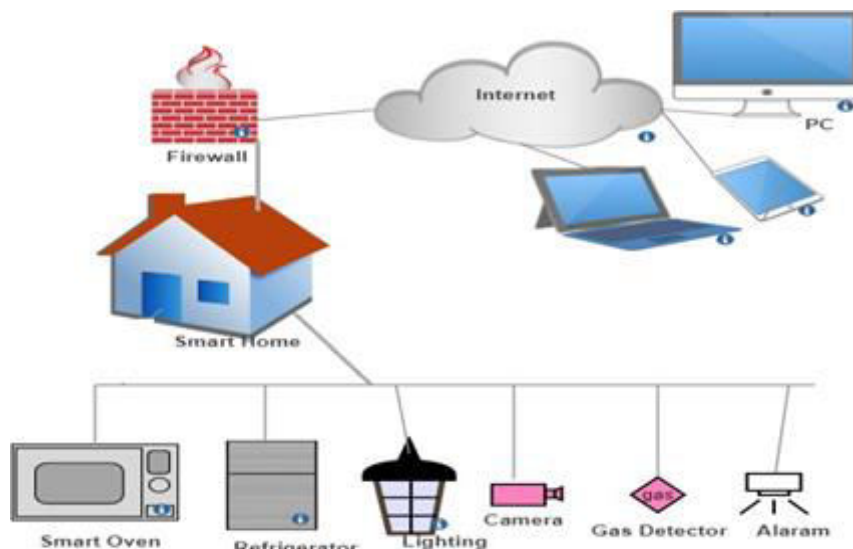


Figure-1 Smart Home

The diagram of smart home shows that smart home contains the different home appliances connected with the help of wired or wireless communication protocols like Ethernet WiFi , Bluetooth, Z-wave, Zigbee , Cellular connection (3G/4G/5G) etc to the central control system which act as local controller which having multiple service like authentication authorization , device configuration management , routing capability, local storage etc CPS also contain a firewall service which provide the permission or authentication establish connection to the internet for accessing the cloud services and permit the home owner to access the devices of smart home with the help of smart phone ,laptop with a web based user interface.

The demand of smart home is increasing day by day and the size of smart home market was evaluated worldwide at USD 80.45 billion in 2022 and it is expected to be market size worth around USD 581.85 billion by 2032, which is growing at a CAGR (compound annual growth rate) of 21.88% from year 2023 to 2032. The advancement in smart devices is continuously growing adoption in homes with result it is boosting the growth of revenue in the smart home market [2].

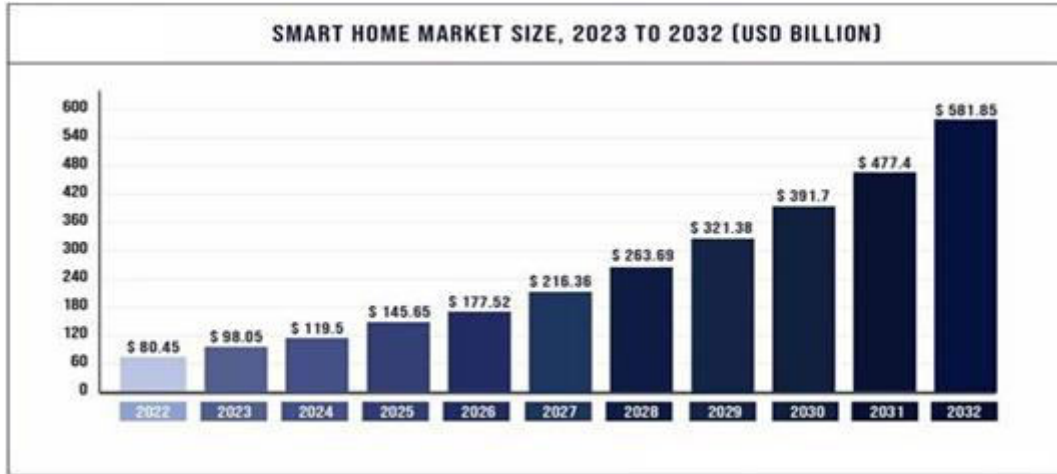


Figure 2: Growth of market share worldwide [2]

The home automation systems consists of appliances with embedded wireless or wired communication protocol support ,unique identification, sensing computing and actuating capability , This kind of capability only provided by IoT (Internet of things). It is revolutionary technology which provides the world of connected things those operate together, share own data or resources through internet standard protocols. In simple term IoT (internet of things) is a internet of devices [3]. The device management like (controlling, coordinating, actuating) efficiency of smart appliance depend IoT system embed in that device.

The IoT based applications consists of four layers as shown in below figure -3 [4]. The layer-1 or sensor layer consists of things with embedded sensors, local controller and actuator. Sensor senses the working environment or intended work of interest and generate data either digital or analog form which passes to the controlling system which contain local microcontroller or microprocessor system with some programming logic to store, process and share the sensed data and if required the controller system send instruction to actuator to activate some other service of devices or other device for corrective or subsequent actions.

Network layer (Layer-2) which provides communication protocols, transmission technique to data from one device to another or from device to internet. This layer provides the service of data acquiring systems (DAS) and Network gateways to provide connection to the external world. A DAS generally performs data aggregation and conversion functions in appropriated format of sensed data from layer-1 and provided formatted data to layer -3 (Processing layer) which is brain of the IoT applications and do the data analytics and provide the result to the application layer (Layer-4) . Application layer has application specific services that’s provide a set user interface and appropriate visual aids for the better understanding of operation , accessibility of services and showing the result in appropriate format.

Application layer Layer(4) Smart application and management
Processing Layer (layer 3) Data analytics and results
Network Layer (layer2) Gateways , data acquisition system
Perception/ Sensor Layer (Layer 1) Physical objects , sensors , actuators

Figure -3 Layers of IoT system

IoT convert the concept of smart home in really and provides better services a good sense of convenience, security and safety. The smart home system needs a good communication system which must contains fast data transmission rate, longer range (specially for farm houses/larger house), better security and privacy management , low latency , fast images or CCTV stream transmission etc. All these services may improved in upcoming 6G cellular communication protocol expected to launch in 2030 in India.

2. EVOLUTION OF 6G AND ITS IMPACT ON IOT

With the increase in use of smart terminals and rapid growth of internet based application and IoT uses, the under laying cellular network (5G) is not capable of handling the emerging new technical necessities. A new framework with emerging technologies like Artificial Intelligence is projected to be new stepping stone towards 6G communication.

Although 5G is still in the development phase, where most of areas like business model for IoT and industry applications are untouched. Researchers are looking forward to fulfill future communication needs of society, which fore bind them to move towards the next generation mobile communication system referred as 6G [5] and it is expected that standardization with deployments will be starting before 2030.

The main focus of 5G communication is to enable the fourth industrial revolution i.e. industry 4.0 by connection all big and small things together. A virtual representation of real-world entities both physical and biological known as Digital Twins is underpinning requirement for future digital world. Digitalization has also shown a way for creating new virtual worlds with digital representation of imaginary object that can be used with digital twin to create mixed-reality [6]. The integration of Physical, Biological and Digital world will enables to create a unified new experience for human beings using 6G communication.

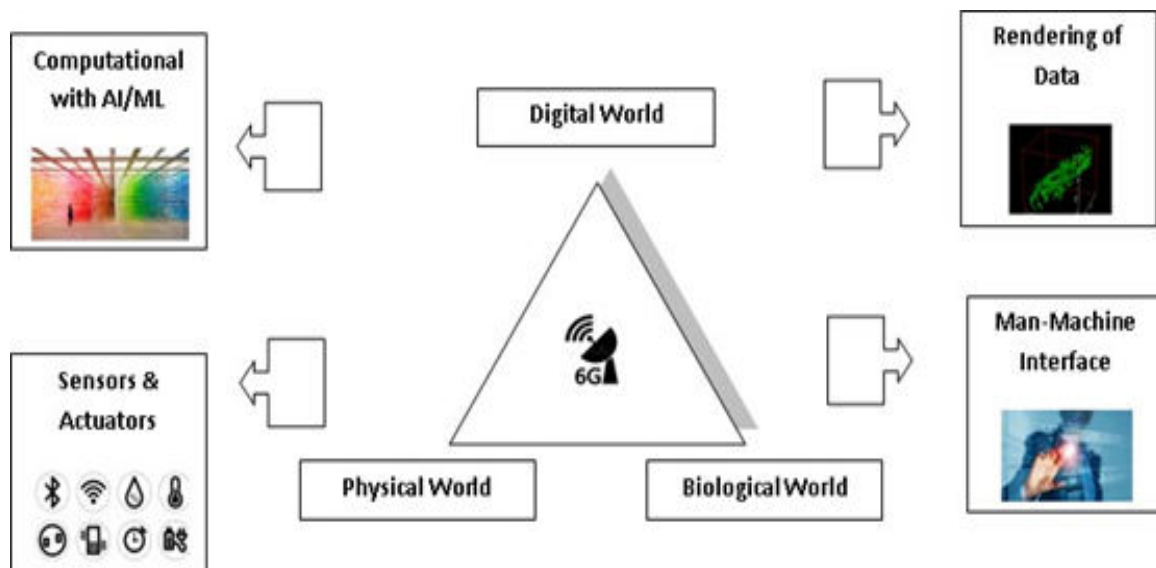


Figure -4 : 6G with real world sensing

The new theme emerges from new communication are:

- i) **Man-Machine Interface:** to collect data from multiple entities.
- ii) **Computational with AI/ML:** Edge computing (Distributive) among multiple device and cloud.
- iii) **Rendering of Data:** System that store, process and convert the data which can be used as knowledge base for decision making
- iv) **Sensor and Actuators:** to sense and control the data from physical world [A6].

Networks have evolved from first-generation (1G) networks to sixth-generation (6G) networks (Illustrated in above figure), with various changes in data rate, latency time, reliability, energy consumption, spectrum, security etc.

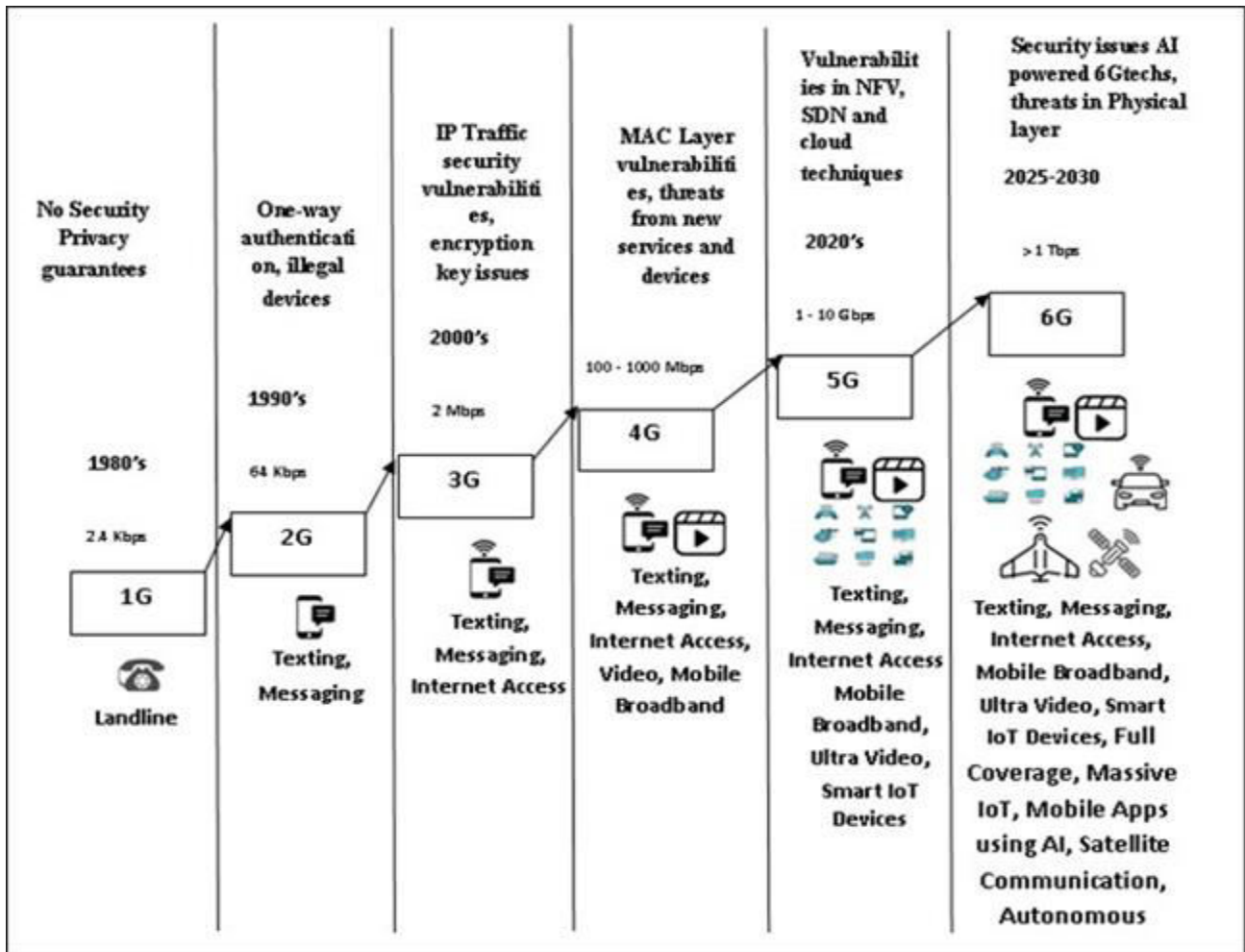


Figure – 5 Evolutions from 1G to 6G

6G will introduce new use cases which will help in optimization and cost reduction in networks. At the same time, new ideas and innovation will also be increased which was not even thought of or imagine till now. 6G will bring more border and wider aspects towards low-cost and ultra-reliable low latency in both IoT (Internet of Things) and IIoT (Industrial Internet of Things). The advancement in AI/ML in effective and complex problem solving in various directions will help to improve performance of the operational environment [A6].

3. SECURITY AND PRIVACY ISSUES

To make the smart homes security and maintain the privacy, first one need to ensure the system must have integration with secure communication protocols support, tight role management and operate continuously without failure. The most important security issues related to smart homes are described below [7].

1. **Confidentiality:** data and information should be known to only authorize user.
2. **Integrity:** as system are connected through networks, there is high priority of getting attack by attacker and malevolent application with wicked code can harm the system, thus secure integrity of smart homes is required, which can be done by using a hash function and a digital signature for essential data[8][9].
3. **Availability:** Smart devices needs to communicate to and from within the network. It is important to make information/data available anytime and where with the network. To make the availability of information/data secure different action at different functions is required and to provide functional access to functions [10] [11].
4. **Authenticity:** In smart homes, smart devices communicate with each other over a network. There is possibility that several devices whose security is not taken into consideration. Attacker may find loopholes and attack the system. Thus, it is very important to provide authentication of the entire smart device by using a certificate [9] [12].
5. **Authorization:** right access control measure must be used to make sure that right access of each and every entity in the system [A12].

- 6. **Non-repudiation:** truthfulness verification proof is required for any entity in system, who claims to be part of system.

Security attacks in smart home environment, security attacks are done by usually compromising one or more security goals [13].

4. SECURITY & PRIVACY MANAGEMENT OF SMART HOME

Smart home comprises of smart appliances and at bottom these appliances embedded with IoT system for controlling and communication purpose and generally IoT nodes has limited processing capability therefore these devices are soft target for attackers. As statistics presented by “SonicWall “ a cyber security company from USA noted that it was 112.3 Millions of attacks specially (IoT malware) happed on IoT System in year 2022 which was a significant growth as compared to 2021 which has 60.1 Millions of attacks it shows a growth 87% in cyber attacks[14]. Not only IoT malware but smart home may suffer with ransomware attack, man in middle attack, identity theft, Bot attacks etc . Therefore smart home system must have a security and privacy attack plan and service like firewall, Intrusion detection/prevention system, secure gateways, and end point security system for data servers, to avoid, mitigate and handle such kind of attacks. These systems may increase the overall cost of implementation of smart home systems. This kind of implementation required proper security and privacy planning and cost analysis to assure better return on investment.

Security deals with the data security, network security and device security. Privacy deals with restricting the use, sharing and modification of personal data. To maintain security and privacy of smart home increasingly very difficult to handle. Security and privacy management of smart home network have the following stages as shows in diagram. It’s a cycle because as security system improves their services in same manner cyber attack changes their nature and pattern.

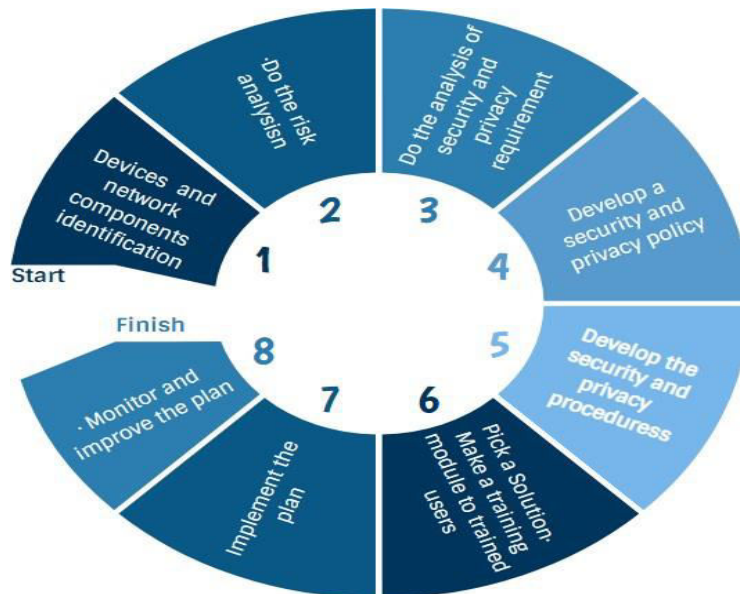


Figure -6 Security and privacy mitigation plan

- **Devices/Appliances and Network Components Identification:** Identifying the appliance and network devices that need to be protected is the first stage of designing a security strategy. This focuses to insure that appropriate and important resources are preserved. Network assets in smart home may consist of network host like gateway, central control system DVR (Digital Video Recorder), home appliances, switches and routers and these devices can be identified on the basis of their host name , allocated internet protocol address and MAC (Media access control) address. In addition, security system should monitor incoming and outgoing both traffic to find out all possible entry points. Setting appropriate and concise network, device and resource access rights makes identify intrusions of attacks simpler.
- **Do the Risk Analysis:** This stage focus on detecting and assessing possible communication network and nodes/devices related threats, attack vectors, vulnerability of smart home network. The most important component of this phase is to analyze and evaluate the probability of attack occurring and the level of severity of that risk if attack does occur. Threats can be vary in nature like simple virus, violent attacker, passive attacks, Denial of service attack, attack to due inexperience individual etc [15]. Therefore, it required a thorough comprehension of possible treats and its impact on the network resources and losses. The output of this analysis is a risk assessment report which identifies the most susceptible nodes of the network and

provides the corrective major to be implemented. Risk assessment is continuous process and it continues even after the implementation of security strategy.

- **Do the Analysis of Security and Privacy Requirement:** This stage requires reviews the risks and network devices, together with evaluating the security needs of the smart home owner. In general in smart home following basic needs opted by the owners
 - a) Maintaining confidentiality, privacy and security of data of sensors (in rest or in transit), user's data ,logs etc. so that only legitimate and authorized users can access data of smart home like footage of surveillance system, status data of sensor nodes etc .
 - b) Data integrity insures that server has valid data and only authorized users can update sensitive data if required.
 - c) System and data availability that allows the legitimate users for ongoing access to important smarthome,,s resources.
 - d) Service provider must insure the implementation of cyber security strategy and data protection guidelines provided the government or local authorities.

On the basis of this requirement analysis, budget and scope and limitation of network security can be determined. But in smart home, owner must opt for the contemporary technologies so that any contemporary dangers can avoid.

- **Develop a Security Policy for Smart Home:** It is a written declaration of the rules and regulation that anyone who accesses the smart home's network, appliances and data must follow. It advises users or home owner and service provider personnel about their responsibilities for securing data technological assets. Senior management of security provider companies is mainly responsible for developing security policy with the support of network and security administrators. Over the time changes in risks and new forms of attacks can also compels the changes in security policy.

A typical smart home security policy must have at least the following components: like access policy, authentication policy, accountability policy, privacy policy, compatible hardware / appliance purchasing guidelines, System and network maintenance policy, violation reporting policy, attack incidence handling and disaster recovery policy etc.

- **Develop the Security and Privacy Procedures:**

Security procedures execute the security policies in effective way. Device configuration, auditing, authentication and authorization, and device/network maintenance are procedures. Smart home users, security administrator, and network managers /administrators are the intended audience for the security processes. The handling of attack events must be outlined in the attack incidence handling and disaster recovery policy or in security protocols. Users and administrators of smart home network must learn about security protocols and disaster recovery procedure via some mock drills.

This stage of security management also includes the initialization and development of implementation strategy of security plan .Implementation strategy is a core technical task that helps the security plan to put in effect in intended environment. While developing security procedure in era of 6G which have a huge data transfer rate up to 1TB/sec must use intrusion detection/prevention system using AI& ML and deep learning [16] to find out the unusual pattern of communication to maintain high level of privacy and security in the intended system.

- **Make a Training Module to Trained Users:** The smart home users and administrators should aware of security mitigations procedure to insure the understanding of security concerns, attack prevention and recovery procedure. The training program must cover all aspects of security attacks vectors and their possible solution in current context in some demonstration (in some context), which helps to build security-first culture in users and security administrators.
- **Implement the Plan:** The implementations of security and privacy strategy all at once may disturb the working of the smart home system , therefore it should be implemented when the traffic condition at its lowest use. In some cases security administrators who implement the security strategy prioritize the vulnerabilities and implementation is done in parts. After implementations, do some trials to ensure the working of security solutions or patches. If security strategy is complex to implement take some buffer time and focus on the proper implementation, do outsourcing (if required) and also make sure that disaster prevention/recovery strategy implemented in proper way and operational.

- **Monitor and Improve the Plan:** After implementation of security strategy, a regular monitoring is required because attacks (passive or active) may happen any time. Regular monitoring of audit logs, scanning of network traffic, performance scanning the uses of IoT devices, bandwidth monitoring, end points communication logs , review of device identity etc . This kind of monitoring can be done by manually with help of tools or use some intrusion detection/prevention system for this purpose. The service provider must have some dedicated IT expert to reacts on the any kind of security breaches in smart home environment , which boost the confidence of smart home owner

5. BEST PRACTICES FOR SMART HOME SECURITY MANAGEMENT

As normal homes become smarter with applications of Internet of things in the appliances and surveillance systems, and these smart appliances open to the internet for controlling therefore the smart home likely making “insecure” home. But security and privacy management solutions can resolve the issues, users and administrator must follow the following practices [17] in their configuration management of appliances and network devices to make smart home more secure.

- a) Set up smart home router/gateway correctly by changing device default name, set unique and difficult password and use highest level of encryption like WAP 2.0 and WAP 3.0.
- b) Use difficult and strong passwords and use minimum user privileges while using web applications to access the nodes of smart home.
- c) Many modern routers and gateways having capability to setup a secondary network (guest network) for secondary users like guests and friends. Don’t connect these uses to smart home controlling network.
- d) Open minimum ports of router/gateway/data server/ Control server and disable features which don’tin use.
- e) Keep home appliances or network devices up to date in terms of security patches, in some case update for IoT devices software manually if devices don’t update automatically.
- f) Use current versions of security firewall which having features of intrusion detection, SSL/SSH interception, virtual private network support, quality of service etc.
- g) In some important devices always use multi-factor authentication ,one time password , Google authenticator etc

6. CONCLUSION AND FUTURE SCOPE

The Internet of things has a crucial and important role in the implementation of Smart home solutions to provide different kinds of services to the end user or home owner. Smart homes not only integrate IoT but also need fast and secure communication protocol and user interface for ease of operation. Smart home is an IoT solution, which converts a normal home into smart and follows the four layers (perception layer, network/communication layer, processing layer and application layer) and every layer has some dedicated tasks. As 6G is an emerging communication technology with huge data rate up to 1 TB/s , fast imaging capability, AI support and much more . Therefore 6G will obviously change the working and services of the Smart home system. With all such capability, better data security and privacy become a more important and indistinguishable part of every solution. Smart home solutions must focus on a variety of security issues like data Confidentiality, availability, privacy, integrity etc and try to handle these issues in a better security and privacy mitigation plan and also follow the security and privacy best practices to maintain better data and device security and privacy. The use of 6G with its expected features in smart homes, security and privacy issues and their solutions will increase the opportunities for researchers and security experts to explore and find more AI/ML and more sensitive solution data security and privacy techniques and tools, which will help in security optimization and cost reduction of smart networks.

REFERENCES

- [1] C. Paul, A. Ganesh and C. Sunitha, "An overview of IoT based smart homes," 2018 2nd International Conference on Inventive Systems and Control (ICISC), Coimbatore, India, 2018, pp. 43-46, doi: 10.1109/ICISC.2018.8398858.
- [2] “ICT- Smart Home Market “URL: <https://www.precedenceresearch.com/smart-home-market> last seen March 2023.
- [3] L. Ma, Z. Li and M. Zheng, "A Research on IoT Based Smart Home," 2019 11th International Conference on Measuring Technology and Mechatronics Automation (ICMTMA), Qiqihar, China, 2019, pp. 120-122, doi: 10.1109/ICMTMA.2019.00033..

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- [4] "IoT Architecture – Detailed Explanation" URL : <https://www.interviewbit.com/blog/iot-architecture/> published on June 2022 last seen March 2023
- [5] Zhao, Y., Yu, G., & Xu, H. (2019). 6G Mobile Communication Network: Vision, Challenges and Key Technologies. arXiv preprint arXiv:1905.04983.
- [6] Harish Viswanathan and Preben E. Mogensen, "Communications in the 6G Era" IEEEAccess
- [7] [A11] G. Mantas, D. Lymberopoulos, and N. Komninos, "Security in Smart Home Environment," 2011.
- [8] [A12] C. Lee, L. Zappaterra, Kwanghee Choi, and Hyeong-Ah Choi, "Securing smart home: Technologies, security challenges, and security requirements," in 2014 IEEE Conference on Communications and NetworkSecurity, 2014, pp. 67–72.
- [9] [A13] S. Lee, J. Kim, and T. Shon, "User privacy-enhanced security architecture for home area network of Smartgrid," *Multimed. Tools Appl.*
- [10] [A14] A. Jose, R. M.- SmartCR, and undefined 2015, "Smart home automation security," *researchgate.net*.
- [11] [A15] G. Agosta, A. Antonini, A. B.-S. T., and undefined 2015, "Cyber-security analysis and evaluation for smart home management solutions," *ieeexplore.ieee.org*.
- [12] [A16] S. Chitnis, N. Deshpande, and A. Shaligram, "An Investigative Study for Smart Home Security: Issues, Challenges, and Countermeasures," *Wirel. Sens. Netw.*, vol. 08, no. 04, pp. 61–68, Apr. 2016.
- [13] [A17] Zaid Shouran, Ahmad Ashari and Tri Kuntoro Priyambodo, "Internet of Things (IoT) of Smart Home: Privacy and Security" *International Journal of Computer Applications (0975 – 8887) Volume 182 – No. 39, February 2019*
- [14] Amber Wolff, "Latest Threat Intelligence Tracks Shifting Cyber Frontlines in 2022" URL: <https://blog.sonicwall.com/en-us/2023/02/latest-threat-intelligence-tracks-shifting-cyber-frontlines-in-2022/> Date of publication 28 Feb 2023
- [15] A. Brauchli and D. Li, "A solution based analysis of attack vectors on smart home systems," 2015 International Conference on Cyber Security of Smart Cities, Industrial Control System and Communications (SSIC), Shanghai, China, 2015, pp. 1-6, doi: 10.1109/SSIC.2015.7245682.
- [16] D. Paikaray and S. Parikh, "A new way of Smart Home Security using ML Face Recognition," 2022 11th International Conference on System Modeling & Advancement in Research Trends (SMART), Moradabad, India, 2022, pp. 1628-1632, doi: 10.1109/SMART55829.2022.10047397.
- [17] Travis Goodreau "7 Actionable Tips to Secure Your Smart Home and IoT Devices" URL: [https:// www.computer.org/publications/tech-news/trends/7-actionable-tips-to-secure-your-smart-home-and-iot-devices](https://www.computer.org/publications/tech-news/trends/7-actionable-tips-to-secure-your-smart-home-and-iot-devices) last seen Feb 2023.

ASSESSMENT OF ENERGY DEMAND AND CARBON EMISSION IN THE TRANSPORT SECTOR USING SYSTEM DYNAMICS MODEL**Saumya Jain¹ and Dr. Gyanesh Kumar Sinha²**¹Undergraduate Student, BBA Honours, 3rd year School of Management (SOM) Bennett University, Times of India Group, Greater Noida²Professor, Operations & Analytics, School of Management (SOM) Bennett University, Times of India Group, Greater Noida**ABSTRACT**

India has witnessed rising standards of living over the last few decades. This has led to the shift in demand from non-motorized to motorized personal transportation. India's modest vehicle fleet in relation to its big population is expanding quickly, as is the need for internal combustion engine (ICE) vehicles, due to the fast urbanization and population expansion. Further, the International Energy Agency (2022) report has identified the transport sector as the biggest consumer of fossil fuels. Due to the significant rise in global GHG emissions over the last 100 years, the 2015 Paris Agreement on Climate Change (under the UNFCCC) has suggested countries take necessary steps to keep the global temperature at 1.5 degrees Celsius. As part of the Paris Agreement temperature objective, the Indian government recently unveiled a five-point plan to achieve Net Zero by 2070 at the 26th Conference of Parties (CoP26). Road transportation accounts for 13.5% of India's energy-related CO₂ emissions from the transport sector. The main objective of this paper is to analyze historical trends for transport energy demand in India and forecast the transport energy demand and carbon emission projections with special reference to road transport. The present paper has reviewed various scholarly published papers in leading journals. Key variables for data analysis were identified from the published literature and reports. The data for predicting energy demand, carbon emissions, critical assumptions were taken from peer-reviewed journals and the official websites of several government agencies. The analysis was done also for carbon emissions by vehicle and fuel type. Between 2010 and 2050. Trend analysis was done on three important parameters which were final energy consumption, vehicular activity, and CO₂ emissions the latter of which, in the majority of situations, only refers to tailpipe emissions. Where applicable, these trends are further broken down by fuel type and kind of vehicle. Urban transportation energy consumption has been forecasted and analyzed based on a variety of factors, including socioeconomic indicators, the overall size and type of vehicle fleet operations, mobility, etc., using a System Dynamics model with Vensim software. The scenario analysis has been done on three different levels, i.e., business as usual scenario (BAU), new policy scenario, and aggressive effort scenario. The study at the preliminary level has found that in a new policy setting, the demand for passenger road transport will increase by 200% to 400% between 2025 and 2050, driven by increases in population and GDP per capita, which are expected to increase by about 30% and 350%, respectively. For each scenario, the need for road passenger travel in 2050 is further analyzed. The best outcomes come from BAU settings. The projections of demand for road passenger transport that result from aggressive scenarios are the lowest. Policies like better urban planning can reduce the passenger miles traveled in 2050 by 0% to 33% compared to levels under new policy scenarios. By 2050, this modeling experiment predicted that the rising demand for transportation and vehicle use will result in higher energy consumption and CO₂ emissions. Increases in passenger transport activity cause energy demand to increase between 200% to 500% in new policy scenarios, mostly because of increasing car use. Growth of vehicles in terms of numbers and a rising percentage of travel by vehicle modes which are more energy-intensive in nature, including passenger automobiles, more than offset energy efficiency improvements. In the absence of new policy initiatives, the sharp increase in energy consumption will result in a significant rise in CO₂ emissions. The outcomes of extreme scenarios demonstrate that new policy announcements can significantly impact future CO₂ emissions in the transportation sector. Important policy actions in this regard include encouraging modal shifts from private passenger vehicles and focusing on improvements in energy efficiency, which include the adoption of electric vehicles and low-carbon fuels

Keywords: Urban transport, Energy demand, CO₂ Emission, System Dynamics Model

INTRODUCTION

India is the second most populated country in the world with 140.75 million people (World Bank, 2021). In terms of greenhouse gas (GHG) emissions from fuel combustion, India is ranked 4th in the world (IEA, 2020a). However, it's per capita emissions are very low compared to the global average (IEA, 2020a). Rising standards of living and a shift in demand from non-motorized to motorized personal transportation are two factors that cause economic activity to increase in developing nations like India. As per the study report by International

Energy Agency i.e. IEA (2022), the transport sector has been the biggest consumer of fossil fuels as compared to any other sector and accounted for 37% of CO₂ emissions from end-use sectors in 2021. In India, transport is a key contributor to CO₂ emissions and one of the fastest-growing emissions sectors in the country, along with industry (Godinho & Coetzee, 2020; International Energy Agency, 2020a). Within the transport sector, road transport is responsible for 90% of total energy consumption (Hagemann et al., 2020). The on-road vehicle stock was anticipated to nearly treble to over 200 million by 2030 before the COVID-19 outbreak, but India's motor vehicle fleet has been expanding quickly in recent years (Kumar et al., 2022). At present, the energy used in road transport is mostly from petroleum, and the majority of that is imported (Bansal & Bandivadekar, 2013). Additionally, in its Nationally Determined Contribution (NDC) under the Paris Agreement, India has committed to reducing the emissions intensity of its gross domestic product (GDP) by 33% to 35% below 2005 levels by 2030 (Climate Action Tracker, 2020). Although the government has set goals for the entire economy to reduce emissions, there aren't any sector-specific goals yet for high-emitting industries like transportation and industry. The development of highly efficient vehicle technologies and the transportation systems themselves could be influenced by market forces and governmental regulations, with the potential to change the demand for transportation fuels in the future, lower emissions, increase energy security, and result in significant energy savings. According to experts, the long-term development of the entire transportation industry could be the widespread adoption of alternative vehicle and transport technologies along with the expansion of mass transit infrastructure and personal mobility. The transportation sector supports all significant economic and social activities. All nations have established plans to be followed in order to lessen their impact on energy usage. To reduce CO₂ greenhouse emissions, for instance, the manufacturing of new cars tends to switch out traditional cars for electric or hybrid models. The technical characteristics of these vehicles will help to meet environmental commitments (Mazurova and Galperova, 2018).

Transport and Energy

Transport is a major source of energy demand. Coal, oil, and solid biomass meet over 80 percent of India's energy requirements. Rising vehicle ownership and road transport use have led to rapid growth in oil consumption (IEA, 2021). When compared with the population, India's commercial energy resource base is significantly low. Diesel, with a share of 66%, and motor gasoline, which represent 24% of the overall energy consumption, together accounted for 90% of the final energy utilized in the transportation sector (Pinna et al., 2014). The transport sector plays a very important role in the country's economy, and its study is critical to understand oil demand and direct emissions. Appropriate policy in the transport sector can help in mitigating carbon emissions in the future significantly. The current research attempts to analyse the state of Indian transportation, taking into account changes in passenger transit, associated energy use, and carbon emissions. The paper examines future transport scenarios in India, taking into account work done by several research institutes and outlining key aspects that should be taken into account in future work on mitigating carbon emission in transport, based on key policy options for the short term and long term, focusing on measures taken at both national and urban levels.

Urbanization and Motor-Vehicle Registered in India

Urban areas account for half of world population and contribute more than two third of total GHG emission globally. According to current trends and estimates, India is expected to surpass China as the world's most populated nation by 2025. The urbanisation rate rose from 27.81% in 2001 to 31.16% in 2011 as a result of rural residents moving to big cities. 600 cities create more than 60% of the global GDP, with developed regions making the largest contributions. This will quicken the rate of ecological destruction and the unchecked generation of greenhouse gases (GHGs). The need for travel will increase further as a result of the rate of urbanisation in developing nations like China and India, placing tremendous strain on the resources and infrastructure already available for transportation. Two wheelers and cars grew higher at a CAGR 10.3% and 9.6% respectively as compared to the growth in buses, which was 8.7% (Government of India, Annual Report 2011–12, Ministry of Road Transport and Highways, Government of India, Eleventh and Twelfth Five Year Plan, Ministry of Road Transport and Highways). In the year 2020, buses accounted for roughly 20% of all pkm and at least 25% of India's urban residents depend on public transport (Abhishek, 2020). Since the use of private mode of transportation is low among people with low income, the role of buses in the urban modal mix of India is dominant for these people. Although buses play a significant role in India's modal mix for passenger transportation, many Indian cities are still not ready to provide high-quality and inclusive mobility. Only a small fraction of the country's population's transportation needs are met by formal city bus networks, which are only present in a few bigger Indian cities including Delhi, Bangalore, and Chennai. With more than 35 million cars on Indian roads in 2019, passenger cars accounted for just below 20% of all passenger transport activity in 2020 (OICA, 2016; OICA, 2019). This comparatively low proportion of travel by passenger automobile is primarily a

result of the low rates of vehicle ownership compared to other major countries. However, the percentage of people who own a car is rising quickly, having almost doubled in the past ten years. Urban congestion has also increased as a result of this Bengaluru is having the worst global levels of traffic congestion, with New Delhi in eighth positions (TomTom, 2019).

Passenger Transportation Activity

Going to the workplace through walking mode remains the existing mode of transport for Indian people today. Sales of cars have already started picking up rapidly. Bicycles are the most widely used vehicle type owned by the citizens of India. The bus transport has a high passenger load transport as the traveling by bus accounts for 56% of total passenger km. (Pinna et al., 2014)

The passenger-km in India has increased from 1,327 billion passenger-kilometers to 2,933 billion passenger-kilometers between 1990 and 2004, at an average annual growth rate of 5.9% (Pinna et al., 2014). As per the estimate by ITF (2021) passenger transport activity in India has significantly increased to 6 trillion passenger kilometres (pkm), which is almost more than tripled from the year 2000 to the year 2020. With an average annual growth rate of 6.4%, road transport is currently the fastest-growing form of transportation, followed by air at 6.2% and rail at 3.6.

Carbon Emission

Due to high oil dependency, the carbon emissions, accounting for its emissions during fuel combustion, from the transport sector are strongly linked with energy consumption are estimated at 300 Mt in 2020.

Problem Statement

The transport sector's contribution to final energy demand in 2020 reached an estimated 4.3 exajoules (EJ) in 2020, almost 20% of the final energy use for India (IEA, 2020b), which is still lower than the global average of 29% (IEA, 2020c). Transport energy use has shown growth of around 50% since 2010, Oil products contribute 95% of final energy used in the Indian transport sector (IEA, 2020b) with natural gas, biofuels and electricity make up the remaining 5%. End-use and refining demand are accounting for approximately 50 percent to the total demand for oil in India. It makes India the world's third-largest consumer of oil and the fourth-largest oil refiner (IEA, 2020b).

According to estimates, passenger travel in India's transportation industry accounted for 60% of all final energy use in 2020, compared to 40% for freight transport. With more than a third of the total, cars accounted for the majority of the final energy requirement for passenger transport (mostly gasoline and diesel). However, it is worth noting that passenger cars in India are comparably fuel efficient by international standards, mostly due to their small size and weight (ITF, 2021). tank to wheel In 2020, it is predicted that India's transportation sector will emit 300 Mt of greenhouse gases (including maritime transport). Due to the transportation sector's heavy reliance on oil, trends in energy consumption is strongly linked with carbon emissions from this industry. The Indian transportation industry also emits local pollutants, which have a substantial detrimental effect on people's health in addition to GHG emissions. In 2019, India's capital Delhi was the worst city in the World Air Quality Report's ranking of annual fine particulate matter (PM_{2.5}) levels (IQAir, 2020). IOAir (2021) reported that major sources for PM_{2.5} emissions in urban areas industry and vehicles

REVIEW OF LITERATURES

Several modelling and prediction studies of total and sectoral energy have been presented elsewhere by some researchers. For example, Geem (2011) developed models artificial neural network (ANN) for forecasting transport energy in South Korea by considering various independent variables such as gross domestic product (GDP), population (POP), oil price, number of vehicle registrations and amount of passenger transportation. Zhang et al. (2009) developed a partial least squares regression model with GDP, urbanization rate, passenger transportation amount and freight transportation volume (ton-kilometer) for transport energy forecasting. Maduekwe et al. (2020) used the Long rang Alternative Energy Planning (LEAP) model to project future energy demand and greenhouse gas emissions. Their study aimed at calculating the fuel efficiency and energy consumption and CO₂ emissions. Plakandaras et al. (2019) predicted air, road and train transport demand for the U.S. domestic market based on econometric and machine learning methodologies. The forecasting studies have also been the objective of several papers but in relation to other sectors. For example, in the USA Kialashaki et al. (2013) developed an energy model capable of predicting energy demand in the residential sector using the artificial neural network (ANN) technique. In 2020, Guefano et al. (2021) have demonstrated a model for predicting electricity consumption in Cameroon through a hybrid model. Gholami et al. (2021) developed the energy demand of 1156 buildings in the city of Bologna, their study proposes an archetype coding. Beyca et al. (2019) employed three alternative popular machine learning tools for rigorous projection of

natural gas consumption in the province of Istanbul. Zhang et al. (2019) and Nan (2017) conducted study for transport energy consumption and carbon Emission forecasting in Beijing city of China based on system dynamics using Vensim software.

RESEARCH GAP

Various studies in the different countries modelled the forecasting for energy demand and carbon emission in the transport sector. However, those studies, even in India, conducted in have mostly focussed at national level rather at city of state level. Further, no study has been done to forecast the transport energy demand under different scenario to achieve under Net-Zero emission target, as set by Govt of India in the year 2021, for metro cities like Delhi-NCR, Mumbai etc. Modelling for mix vehicle type of fuel type in order to restrict the carbon emission below specified level in the next 20-30 years are missing in the earlier studies. As the fuel efficiency standards have been set by Indian Govt, it is imperative to do further study taking into these standards for different vehicles for the future scenario.

OBJECTIVES OF THE STUDY

- Analysing historical trends for urban transport energy demand in India
- Forecasting the transport energy demand and carbon emission projections with special reference to passenger vehicle under urban road transport in India

RESEARCH METHODOLOGY

This analysis excludes railroads and is limited to the road transportation industry. Data have been gathered to analyse trends in the transportation industry. The data for the predicting of energy demand or use, carbon emissions, critical assumptions, and emissions by vehicle and fuel type were taken from papers, journals, and the official websites of several government agencies. How much of an emissions reduction from the road transport industry could be achieved by proactive policy initiatives?

Between 2010 and 2070, trends for three important parameters—vehicle activity, energy consumption (final energy), and CO2 emissions have been reported in this study, the latter of which, in the majority of situations, only refers to tailpipe emissions. Where applicable, these trends are further broken down by fuel type and kind of vehicle. Urban transportation energy consumption has been forecasted and analysed based on a variety of factors, including socioeconomic indicators, the overall size and type of vehicle fleet operations, mobility, etc., using a System Dynamics model with Vensim software.. The scenario analysis has been done on three levels

Level 1: Business as usual scenario (BAU)

Level 2: New policy scenario

Level 3: Aggressive effort scenario

DATA ANALYSIS

The present study aimed at quantifying transport demand for the future period (2025 and 2070) as well as CO2 emissions in India considering the present conditions, policies which are existing and technologies, and possible future developments. There are number of assumptions have been made and used data points to model future transport demand.

Road Transportation Energy Demand Calculation

According to the General Principles of Comprehensive Energy Consumption, GBT2589-2008 and related literature, the calculation formula of energy demand is as follows (Leiyu Zhang et al, 2019; Ramachandra and Shwetmala, 2012)

$$E = \sum e_i \cdot p_i$$

Where E: Comprehensive energy system

e_i : Physical quantity of ith energy consumption in production and service activities

p_i : Conversion factor of ith energy converted according to the equivalent value of energy.

The road transportation energy demand expression is as follows .

$$e = \sum N_i \cdot G_i \cdot M_i$$

Where e: Total fuel consumption of vehicles in road transportation

N_i : Vehicle ownership

G_i : Average fuel consumption per 100 km of vehicle type

M_i : Average annual mileage of vehicle type

Further,

$$e = \sum V_i \times R_i$$

Where e : Road transport energy demand

V_i : Turnover of various types of transportation modes in road transportation

R_i : Unit turnover energy consumption of each type of operation mode.

The energy calorific value is converted into a standard coal conversion coefficient, and the average calorific value and the converted standard coal coefficient are calculated as follows.

$$\bar{e} = \frac{e}{n} \quad N$$

\bar{e} : Average calorific value (kcal/kg)

e : Measured energy low calorific value (Kcal/kg)

n : Quantity of energy (t)

N : Quantity of energy

In order to identify relevant trends and considerations for future work on transport decarbonization in India, results addressing trends in transportation, energy, and GHG emissions are provided. These documents contain a portion of the statistical information required to build each scenario using 2016 as the base year. The stock-turnover model (Rivera-González et al, 2020) has been utilised for the demand methodology analysis, and Equation (1) defines the energy consumption in the road transport industry for each vehicle class::

$$EC = \text{Sum of } [TVS_i(t) \times VKT_i(t) \times FE_{ij}(t)] \tag{1}$$

where TVS is the total vehicles stock of class i , VKT is the average annual vehicle kilometre travelled (mileage) of the class i , and FE is the average fuel economy of class i of the fuel type j (vehicle kilometre/litre), in the time t in years. The total energy consumption for the sector is calculated by adding the results of each class.

The forecast for carbon emission was estimated using Equation (2):

$$EP = \sum EC_j(t) \times EF_{jk}(t) \tag{2}$$

Where EC represents consumption of the energy for the fuel type j and EF is the emission factor of pollutant type k under fuel type j , with time t in years.

i. Fuel Efficiency

The Central Institute of Road Transport (CIRT, 2011) released an annual profile and performance statistics for buses run by state transportation operations under government control (STUs). The fuel economy for Delhi Transport Corporation's CNG buses, according to CIRT, is 2.9 km/litre. According to Reynolds et al. (2011), a sample of in-use 4-stroke and 2-stroke CNG-based 3Ws in Delhi had an average fuel efficiency of 48 and 40 kilometres per kilogramme, respectively.

ii. Passenger Transport demand projections

Modelling efforts have been made to measure transportation activity and CO2 emissions as well as to predict future changes while accounting for various policy frameworks.

iii. Model for Transport Emission

The ASIF (Activity–Share–Intensity–Factor) methodology was applied to calculate the vehicle exhaust emissions (Schipper et al., 2000; Yan et al., 2011), in which, the parameters are defined as total travel activity (A), modal shares (S), fuel intensity (I), and appropriate emission factor (F) as mass pollutant emitted per vehicle-km travelled.

Business-as-usual (BAU), new policy initiatives, and aggressive effort scenarios are the three basic categories into which the scenarios created for the current study are divided.

- BAU scenarios are designed to anticipate future transportation demand and GHG emissions in the absence of new policy initiatives. Macroeconomic factors like population and economic growth are hence the principal agents of change in BAU scenarios. BAU scenarios take current government policy into consideration. However, policies that have been proposed but have not yet been put into effect are not taken into account.
- The new policy initiative scenarios is to make assessment on the impact of all recently announced policy initiatives
- Aggressive scenarios seek to ascertain the impact that new, strict government regulations may have on enhancing various outcomes for the transportation industry, such as lowering CO2 emissions.

System Dynamics Model

Based on the variables identified from various literatures a causal loop diagram was developed as part of system dynamics model as shown in the figure 1. Simulation was run using this model.

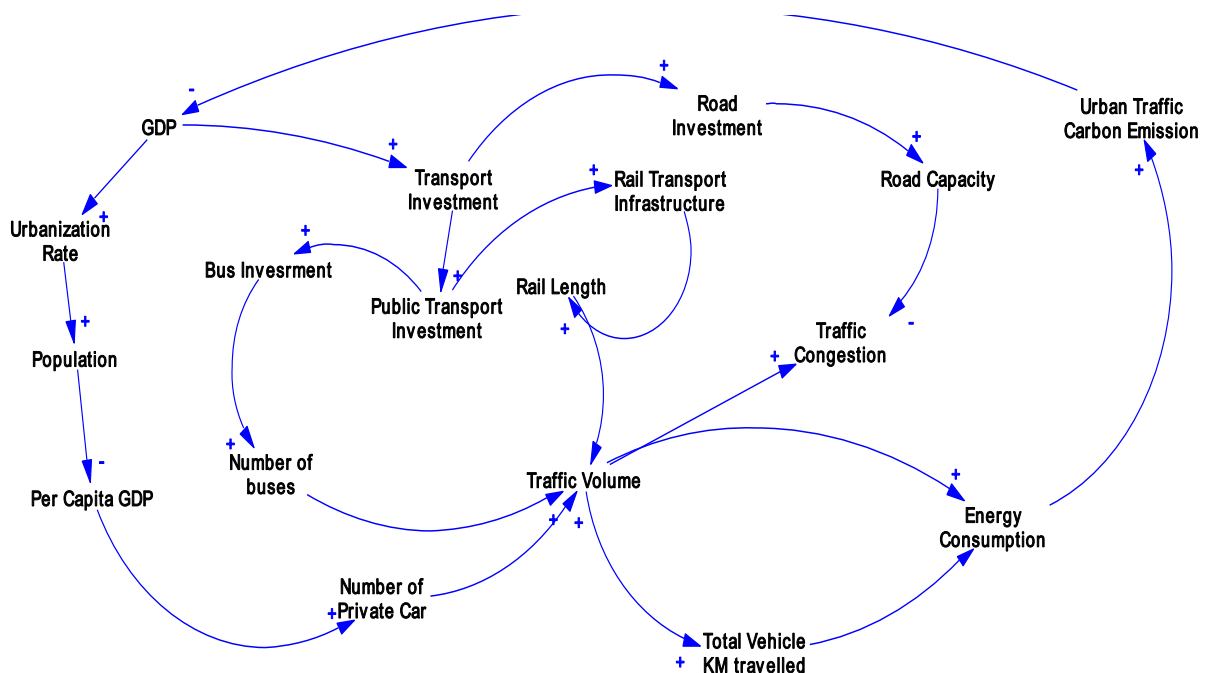


Figure1: Causal loop diagram for policy scenario analysis

Source: Author’s compilation

In a new policy setting, the demand for passenger road transport (expressed in pkm) will increase by 200% to 400% between 2025 and 2070, due to increase in population and GDP per capita, which are likely to increase by about 25% and 350%, respectively.

For each scenario, the need for road passenger travel in 2070 is further described. The best outcomes come from BAU settings. Estimates of demand are reduced when fresh policy announcements are included, emphasising the significance of implementing previously made announcements. The projections of demand for road passenger transport that result from aggressive scenarios are the lowest. Policies like better urban planning can reduce the passenger miles travelled in 2050 by 0% to 33% compared to levels under new policy scenarios.

iii. Transport Energy and Greenhouse gas emissions

By 2070, this modelling experiment predicts that the rising demand for transportation and vehicle use will result in higher energy consumption and CO2 emissions. Increases in passenger transport activity cause energy demand to increase between 200% to 500% in new policy scenarios, mostly because of increasing car use. Growth of vehicles in terms of numbers and a rising percentage of travel by vehicle modes which are more energy-intensive in nature, including passenger automobiles, more than offset energy efficiency improvements. In the absence of new legislative initiatives, the sharp increase in energy consumption will result in a significant rise in CO2 emissions.

The outcomes of extreme scenarios demonstrate that new policy announcements can significantly impact future CO2 emissions in the transportation sector. Important policy actions in this regard include encouraging modal shifts from private passenger vehicles, and focus on improvements on energy efficiency, which include the adoption of electric vehicles and low carbon fuels. In extreme cases, CO2 emissions might peaked before 2070.

SUGGESTIONS AND RECOMMENDATIONS

The present study's data summary is only applicable to direct CO₂ emissions from moving automobiles. Carbon emissions and energy consumption are directly impacted by transportation. In the case of EVs, it is necessary to quantify the contributions of emissions from the production of fuel production and the generation of electricity. For instance, the carbon intensity of electricity generation depends on the energy sources employed and contributes significantly to the overall emissions linked to the lifetime use of EVs. For the Paris Agreement's global decarbonization goals to be realised, it will be essential to reduce these emissions. The other energy sources like hydrogen that replace petroleum related products must take into account similar factors.

Electric vehicles do not emit CO₂, and if renewable energy sources are used to generate electricity, this can reduce the amount of energy used in the production of electricity that emits GHGs. However, a short-, medium-, and long-term road transportation strategy is required, with a strong emphasis on increasing fuel efficiency, electrifying vehicles, and shifting from private vehicles to public transportation.

REFERENCES

- [1] Bansal, G., & Bandivadekar, A. (2013). India's vehicle emissions control program. Retrieved from the International Council on Clean Transportation, <https://theicct.org/publications/indias-vehicle-emissions-control-program>
- [2] Beyca, O. F., Ervural, B. C., Tatoglu, E., Ozuyar, P. G., & Zaim, S. (2019). Using machine learning tools for forecasting natural gas consumption in the province of Istanbul, *Energy Economics*, vol. 80, p. 937–949, doi: 10.1016/j.eneco.2019.03.006.
- [3] CIRT (2011). State Transport Undertakings, Profile & Performance 2008–09. Central Institute of Road Transport, Pune, India.
- [4] Climate Action Tracker. (2020). India. <https://climateactiontracker.org/countries/india/>
- [5] International Energy Agency. (2020a). Data and Statistics (India CO₂ emissions by sector). <https://www.iea.org/data-and-statistics/data-browser?country=INDIA&fuel=CO2%20emissions&indicator=CO2BySector>.
- [6] IEA (2022). Improving the sustainability of passenger and freight transport. <https://www.iea.org/topics/transport>
- [7] Geem, Z. W. (2011). Transport energy demand modeling of South Korea using artificial neural network. *Energy Policy*, 39 (8), p. 4644–4650, doi: 10.1016/j.enpol.2011.05.008.
- [8] Gholami, M., Torreggiani, D., Tassinari, P., Barbaresi, A. (2021). Narrowing uncertainties in forecasting urban building energy demand through an optimal archetyping method, *Renewable and Sustainable Energy Reviews*, vol. 148, p. 111312., doi: 10.1016/j.rser.2021.111312.
- [9] Guefano, S., Tamba, J. G., Azong, T. E. W., & Monkam, L. (2021). Forecast of electricity consumption in the Cameroonian residential sector by Grey and vector autoregressive models, *Energy*, vol. 214, p. 118791, doi: 10.1016/j.energy.2020.118791.
- [10] Godinho, C., & Coetzee, K. (2020). Climate transparency report. Retrieved from the International Climate Transparency Partnership, <https://www.climate-transparency.org/wp-content/uploads/2020/11/Climate-Transparency-Report-2020.pdf>
- [11] Hagemann, M., Emmrich, J., Nilsson, A., Jeffery, L., Wilson, R., Ramalope, D., Attard, M.-C., & Coetzee, K. (2020). Decarbonising the Indian transport sector. Retrieved from Climate Action Tracker. https://climateactiontracker.org/documents/832/CAT_2020-12-09_Report_Decarbonising_Indian_Transport_Sector_Dec2020.pdf.
- [12] IEA (2020b), India 2020 - Energy policy review, IEA, Paris, www.iea.org/reports/india-2020 (Accessed on 10.01 2023).
- [13] International Energy Agency. (2021). India Energy Outlook 2021. OECD. <https://doi.org/10.1787/ec2fd78d-en>
- [14] IQAir (2020), 2019 World Air Quality Report, www.iqair.com/world-most-pollutedcities/world-air-quality-report-2019-en.pdf.
- [15] IQAir (2021), Air Quality in India: Air Quality Index (AQI) and PM_{2.5} air pollution in India, www.iqair.com/india (Accessed on 19.06.2021).

- [16] ITF (2021). Decarbonising India's Transport System: Charting the Way Forward, International Transport Forum Policy Papers, No. 88, OECD Publishing, Paris.
- [17] Kumar, M., Shao, Z., Barun, C., & Bandivadekar, A. (2022). Decarbonizing India's Road Transport: A Meta-Analysis of Road Transport [White paper]. International Council on Clean Transportation . https://theicct.org/wp-content/uploads/2022/05/Meta-study-India-transport_final.pdf.
- [18] Kialashaki, A., & Reisel, J. R. (2013). Modeling of the energy demand of the residential sector in the United States using regression models and artificial neural networks, *Applied Energy*, vol. 108, p. 271–280, doi: 10.1016/j.apenergy.2013.03.034.
- [19] Leiyu Zhang et al (2019) IOP Conf. Ser.: Earth Environ. Sci. 252 052043. DOI 10.1088/1755-1315/252/5/052043
- [20] Mazurova, O., & Galperova, E. (2018). Energy Consumption in the Transport Sector: Trends and Forecast Estimates, International Multi-Conference on Industrial Engineering and Modern Technologies (FarEastCon), Vladivostok, p. 1–7. doi: 10.1109/FarEastCon.2018.8602478.
- [21] Maduekwe, M., Akpan, U., & Isihak, S. (2020). Road transport energy consumption and vehicular emissions in Lagos, Nigeria: An application of the LEAP model, *Transportation Research Interdisciplinary Perspectives*, Vol.6, doi: 10.1016/j.trip.2020.100172.
- [22] Nan, H. (2017). System Dynamics Prediction and Analysis of Urban Passenger Transport Demand..*Journal of Wuhan University of Technology (Transportation Science & Engineering)*, Vol.4 (41) , p.33-36.
- [23] OICA (2016), PC world vehicles in use, www.oica.net/wp-content/uploads/PC_Vehicles-in-use.pdf.
- [24] OICA(2019), New PC registrations or sales. www.oica.net/wp-content/uploads/pc_sales_2019.pdf.(Accessed on 18.09.2022).
- [25] Pinna, I., Chiara, B. D., & Pant, K. (2014). Energy used by transport systems in India: The role of the urban population, sources, alternative modes and quantitative analyses. *Energy Production and Management in the 21st Century*, Vol.1, 661–675. <https://doi.org/10.2495/EQ140631>
- [26] Plakandaras, V., Papadimitriou, T., & Gogas, P. (2019). Forecasting transportation demand for the U.S. market, *Transportation Research Part A: Policy and Practice*, Vol. 126, p. 195–214, doi: 10.1016/j.tra.2019.06.008.
- [27] Reynolds, C. C. O., Grieshop, A. P., & Kandlikar, M. (2011). Climate and Health Relevant Emissions from in-Use Indian Three-Wheelers Fueled by Natural Gas and Gasoline. *Environmental Science & Technology*, 45(6), 2406–2412. <https://doi.org/10.1021/es102430p>
- [28] Ramachandra,T.V., & Shwetmala (2012). Decentralised carbon footprint analysis for opting climate change mitigation strategies in India. *Renewable and Sustainable Energy Reviews*, 16(8). 5820-5833. <https://doi.org/10.1016/j.rser.2012.05.035>
- [29] Rivera-González, L., Mazadiego, L. F., Naranjo-Silva, S., & Escobar-Segovia, K. (2020). Long-Term Forecast of Energy and Fuels Demand Towards a Sustainable Road Transport Sector in Ecuador (2016–2035): A LEAP Model Application. *Sustainability*, 12(2), 472.
- [30] Schipper, L., Marie-Lilliu, C., Gorham, R., 2000. Flexing the Link between Transport and Greenhouse Gas Emissions-A Path for the World Bank.
- [31] TomTom (2019), Traffic Index 2019, www.tomtom.com/en_gb/traffic-index/ranking/ (Accessed on 12.11.2021).
- [32] World Bank (2021), World Bank Open Data: GDP (Current US\$), [https:// data.worldbank.org/ indicator/ NY.GDP.MKTP.CD? year_high_desc=true](https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?year_high_desc=true)
- [33] Yan, F., Winijkul, E., Jung, S., Bond, T.C., Streets, D.G. (2011). Global emission projections of particulate matter (PM): I. Exhaust emissions from on-road vehicles. *Atmos. Environ.* 45, 4830–4844.
- [34] Zhang L. et al (2019). Forecast and Analysis of Road Transportation Energy under Background System Dynamics.IOP Conference Series: Earth and ScienceVol.252 (5). doi:10.1088/1755-1315/252/5/052043.
- [35] Zhang, M., Mu, H., Li, G., & Ning, Y. (2009). Forecasting the transport energy demand based on PLSR method in China, *Energy*, 34 (9), p. 1396–1400, doi: 10.1016/j.energy.2009.06.032.

MARINE OIL SPILL - ECONOMIC INNOVATIVE METHODS OF CLEANING**M. Barani, Ph.D¹ and Dr. D. Janagam²**¹Research Scholar and ²Professor, Department of Economics, Periyar University, Salem– 636011**ABSTRACT**

In basic terms, it refers to the impact of an oil spill caused by two ships colliding in an uncontrolled sea or water or coastal area. It has a direct effect on maritime ecology just because of the human activity and it is also a kind of pollution. It is the discharge of liquid petroleum hydrocarbon. Oil spills have special effects on civilization economically, ecologically and informally. The quantities in which the spills have taken place are amongst several thousand tons to more than a few lakh tons. Oil spills consequence in the harm of the seashores, marshes, maritime living thing, fish, and birds. Leaks may take from days to years of cleaning.

Oil spills are hazardous as the marine ecosystem is affected, and the marine life-forms existence gets unnecessarily threatened. Frequently oil assessment from marine resources has become a necessity, and oil spills happen unintentionally, it becomes important to service various oil spill clear-out approaches. Oil spill pollution is one of the most important plentiful pollutants in the oceans and seashore.

Types of Oil Spills Clean-Up old Methods Using Oil Booms, Using Skimmers, Using Sorbents, Burning In-situ, Using Dispersants, Hot Water and High-Pressure Washing, Using Manual Labour. Four Ways to Clean Up an Oil Spill Natural Dispersal. Oil spill impacts can ultimately disrupt nature, if the spill is in a tropical region; chemical dispersants are usually employed, Biological Agents, Floating Devices, and Oil Spill Analysis.

Oil spills are among the most serious disruptions to the tourism industry. It has high service and cost value. Contamination of coastal areas by oil spills can result in severe economic losses by industries and individuals dependent on coastal resources.

Innovations in oil spill clean-up techniques. Magnetic soap, autonomous robots and ultra-absorbent sponges are just some of the boundary-pushing approaches actuality used to clean up oil spills from one place to another the ecosphere. Developed by innovation-driven researchers and scientists, the new methods are designed to remove oil from the water as quickly and efficiently as possible.

Keywords: Oil spill, Causes, Impacts, common methods, Innovative Cleaning methods.

INTRODUCTION

An oil spill is usually caused by the collision of two or more ships or by a break or damage to a cargo ship. An oil spill is oil spilled by a cargo ship, accidentally or intentionally on the surface of the sea, spilled onto the surface of water bodies and spread or moved from one place to another by wind, currents and waves. This causes sea pollution. It poses a threat to marine life and biodiversity. This is because the oil spill has spread over the surface of the sea water, depriving marine life of the air they need to breathe. and clog the airways of marine organisms, causing them to suffocate and die. Solid oil spills coat the wings of seabirds and pose a threat to marine life that feed on the oil spill.

The impact of oil on marine life depends on the amount of oil spilled and its impact on the spread of the oil. As described earlier, oil spills spread to the surface in the upper layer of ocean water, in coastal areas. If the oil does not disperse, it will remain on the surface. Currents carry oil toward coastal areas, harming coastal organisms such as mammals and birds. However, organisms such as fish, plankton and larvae readily fall victim to oil toxicity.

OBJECTIVES

1. To know about basics of knowledge about Oil spill.
2. To explain the methods of cleaning up oil spill in water and how there are working.
3. To know the new innovative methods of cleaning in marine oil spill and identify the smart working methods.

METHODOLOGY

Secondary data used for this research paper. Data Collect from various source like, articles and journals etc...

STATEMENT OF THE PROBLEM

The process of cleaning up marine oil spills using modern invented machines as an alternative to the conventional methods that have been used in cleaning up oil spills in the sea for ages. It also illustrates that dealing with new methods is more helpful, easy and scalable than dealing with old ones. Clearly explains the difference in money spent between both the old system and the new system.

Marine Oil Spills

Oils are the largest non-renewable source of world's production energy at 34% followed by coal and natural gas (World Energy, 2018). They are the strength of the modern industrial ecosphere and the sole basis of income generation for the oil-based economies. Here is unremitting utilization and exploitation of oil properties by these realms to enlarge the frugality of their country. According to OPEC (Organization of the Petroleum Exporting Countries) report 2018, global oil demands are expected to grow by 97 million barrels per day (mbpd) from 2017 to 111.7 mbpd by 2040. In the present century, with the progress of human civilization, there is a gradual increase in the global energy demand of oil as a source for heating fuel, transport fuel and starting product for chemical industries. The main sources of oil production are the oil refineries and petrochemical plants. The fast-growing industrialization and rapid economic development of the countries mount a lot of pressure on the energy-yielding resources that are heavily dependent on the available natural reservoirs of crude oils. Petroleum-based crude oil is one of the most vital raw materials in modern time because of its wide use as a fuel source in diverse productive sectors like the production of electric energy, industries, and transportation. Petroleum oil and its products are the naturally occurring fossil fuels formed billions of years ago under high temperature and high pressure through the geochemical processes below the earth's surface.

Fate of Spilled oil – The Weathering process

Oil spilled into the oceans undergoes through various physical, chemical and biological processes that are collectively called as weathering (Reed et al., 1999). Weathering plays a crucial role in determining the fate of the spilled oil. The relative significance of each of the process involved in the weathering process depends upon the environmental conditions of the spill site, oil spill location and time, nature and physio-chemical composition of the oil and duration of spillage. The toxicity of the oil on the ecology and marine organisms is considerably influenced by the behaviour of the oil. Weathering brings about a continuing change in oil character and redistributes it to the other parts of the environment.

Some of the oil weathering processes (OWP) is **spreading, dispersion, evaporation, dissolution, emulsification, sinking, sedimentation and biodegradation**. Spreading of the oil as soon as it is spilled into the oceans occurs with drifting and transportation in multiple directions at or near the water surface. The upward undertaking of the oil finished the aquatic pillar takes place if the oil is cleared under the outward. The oil moves horizontally in direction of prevailing winds and currents forming an oil slick with thickness as few millimetres over the water surface. The rate of spreading depends upon viscosity and density of oils; environmental factors such as temperature, direction of winds and currents that decides the oil film thickness and area affected by the spill. The trajectory pattern of the oil and drift velocity can affect the effectiveness of the response strategies used. Spreading generally solubilizes the compounds into carbon dioxide and water affecting evaporation, emulsification, and dispersion.

Causes of Oil spill

Oil spills into stream, natural harbour, and the marine most often are initiated by coincidences including transporters, pushes, tubes, plants, puncturing rigs, and storage facilities. Falls can be: public's creation mistakes or presence uncaring, tools breaking down.

Several Reasons for Oil Spills**1. When Oil Tankers have Equipment Faults**

When oil tankers break down, it may get struck on shallow land. When the tanker is Attempted to move out of shallow land, abrasion may cause a hole in the tanker that will lead To large amount of oil being released into the oceanic bodies. However, although this form of oil spill is the most commonly known and has the highest media attention, only 2% of oil in a water body is a result of this action.

2. Nature and Human Activities on Land

The large majority of oil spilled is from nature seeps geological seeps from the ocean floor as well as leaks that occur when products using petroleum or various forms of oil are used on land, and the oil is washed off into water bodies.

3. Water Sports

Other causes of oil spills are spills by petroleum users of released oil. This happens when various water sports or water vehicles such as motorboats and jet skis leak fuel.

4. Drilling Works Carried out in Sea

When drilling works carried out in the sea, the oil and petroleum used for such activities are released into the sea, thus causing an oil spill.

Impacts on Environment

Oil spills prove detrimental to the environment and economy of a nation. It has become one of the serious environmental issues worldwide during the past few decades that need immediate attention. The oil spill affects the **Marine Planktons, Benthic Marine Invertebrates, Fish, Birds, Mammals and Reptiles Vegetation and marine environment** etc...

Oil exposure can cause immediate mortality, acute toxicity, decreased feeding, delayed egg production, slow hatching rates, reduced swimming speeds, reproductive abnormalities in planktonic copepods.

Benthos are the diverse group of bottom-dwelling organisms living near the deep sea sediments called as the benthic zone. These are widely distributed over the ocean floors prevailing in economic niches and have the least susceptibility to toxicological impacts of oil in the offshore environment.

Fish are the most commercially valuable component of the marine ecology used widely as a food source. The ubiquitous hazardous components (PAHs) dissolved in the oil endangers the development of fish embryos with lethal impacts even at very low exposure concentrations of 0.5 µg/L causing cardiac dysfunction, morphological impairment such as altered jaw and spinal curvature, abnormal kidney development, neural cell death and heart circulation failure, cardio toxicity and morphological imperfections.

Seabirds and shorebirds are extremely vulnerable and sensitive to oil spills. Inhalation or ingestion of PAHs and other oily constituents by the birds can result in loss of the weather proofing ability of their feathers eventually leading to drowning and hypothermia. Toxic PAHs present can cause long-term chronic impacts in the sea birds such as mortality on large scale; pathological malformations in lungs, kidneys, liver, and glands; disturbs the thyroid homeostasis and metabolism, anemia immunotoxicity.

Marine animals are generally exposed to oil spills in open ocean environments. The adherence of the oil to the outer furred surface of the mammals affects the normal functioning of these animals causing hypothermia, drowning, and death.

The marine environment is a diverse system which includes a variety of species like aquatic plants, sea grasses, seaweeds, algae (intertidal micro-algae and macro-algae), kelp forests and shrubs. It is associated with the interactions and inter-connections of different ecosystems grouped together i.e. coral reefs, salt marshes, tidal flats, mangroves, beaches and rocky shorelines with related effects on each other. Exposure to dissolved crude oils proves to be toxic to corals resulting in smothering or coating; stunted growth rates; reduced lipid contents; altered morphology; loss of survival of eggs and larvae; bleaching and decolouration.

Effects of Oil Spill

If the oil that is used as fuel in vehicles and used to travel happily gets into the sea, the consequences will be severe. Sun's rays do not penetrate the sea water when there is an oil film in the sea. This will kill the marine life. Many sea turtles are now dying and washing ashore. Seabirds have died from oil on their wings.

Oil contamination in oceans has become one of the most serious forms of marine pollution causing severe impact on environment, ecosystems and natural resources. The fundamental causes behind the oil spills are the anthropogenic factors occurring due to human activity such as land runoffs, accidental discharges from tankers and vessels, pipeline vandalism, shipping traffic, the discharges from transporting ships, mechanical faults in drilling machines, unintentional leaks from oil tanks during clean-up.

Methods of Recovery for Oil Spill Clean-up at Sea

1. Using Oil Booms

Booms are routinely used **to surround and contain oil spilled at sea and to deflect its passage away from sensitive resources or towards a recovery point.** The success of booming operations can be limited by the rapid spread of floating oil and the effects of currents, tides, wind and waves.

2. Using Skimmers

Skimmers **use belts, disks, or continuous mop chains of lyophilic materials to blot the oil from the water surface. The oil is then squeezed out or scraped off into a recovery tank.**

Oil skimmers are **very effective in removing oil from wastewater before discharge** but are also perhaps the most efficient and economical approach. Despite these advantages, oil skimmers are not found in every power plant.

3. Using Sorbents

Although they are used as a clean-up method for small spills, sorbents are often used to remove final traces of oil or in areas that skimmers cannot reach.

4. Burning In-Situ

Burning can eliminate large volumes of oil quickly and effectively; however, it also burns off plant life and leaves residue that can adversely affect the ecosystem. Special fire-resistant booms must be used to contain open-water burns, as burning oil may spread rapidly in water.

5. Using Dispersants

Dispersants are chemicals that are sprayed on a surface oil slick to break down the oil into smaller droplets that more readily mix with the water. Dispersants do not reduce the amount of oil entering the environment, but push the effects of the spill underwater.

6. Hot Water and High-Pressure Washing

High-pressure, hot-water washing of shorelines is often a viable method for removing stranded oil from hard surfaces, like large rocks and seawalls. However, while effective, it can directly and indirectly injure and kill plants and animals in the treated zone, both in the short-term and long-term.

7. Using Manual Labour

Manual recovery is the most common method of shoreline clean-up and involves teams of workers using rakes, shovels, and other tools to remove oil and debris. The oiled materials are collected in buckets and drums for transfer to a processing station.

8. Bioremediation

Bioremediation of petroleum contaminated environments is a process in which the biological pathways within microorganisms or plants are used to degrade or sequester toxic hydrocarbons, heavy metals, and other volatile organic compounds found within fossil fuels.

9. Chemical Stabilisation of Oil by Elastomers

Experts have recently been using compounds like 'Elastol', which is basically polyiso-butylene (PIB) in a white powdered form, to confine oil spills. The compound gelatinizes or solidifies the oil on the water surface, thus preventing it from spreading or escaping.

10. Natural Recovery

Even in large oil spills, natural recovery of biological resources begins as soon as oil levels reach nontoxic concentrations. Most habitats begin to recover immediately and will be recovered by natural processes to baseline within 1 to 3 years.

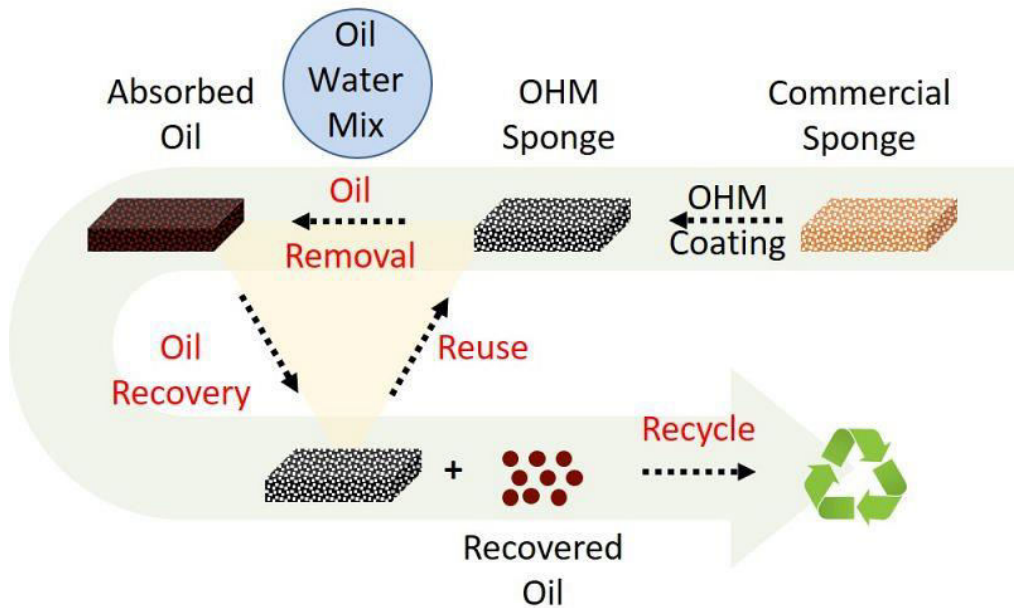
The Latest Innovative Ways to Clean Up Oil Spills

Special sponges, magnetic soap and autonomous robots are among the latest wave of inventions aimed at tackling oil spills. Magnetic soap, autonomous robots and ultra-absorbent sponges are just some of the boundary-pushing methods being used to clean up oil spills around the world. Developed by innovation-driven researchers and scientists, new methods are designed to remove oil from water as quickly and efficiently as possible.

Incidents such as the recent spill in Mauritius illustrate the need for faster and more environmentally friendly clean-up methods. In addition to threatening delicate marine and coastal ecosystems, oil spills pose a serious threat to local communities that rely on the sea for fishing and tourism.

Special Sponges

A new 'smart sponge' designed to clean up oil spills in the ocean has been developed at North-western University, Illinois in the U.S. The sponge is described as highly porous and works by selectively soaking up oil, sparing both water and wildlife. It can absorb over 30 times its weight in oil and then be reused up to several dozen times afterwards. The secret to the sponge lies in its lyophilic, hydrophobic, magnetic (OHM) Nano composite coating. This chemical coating allows oil to be extracted from water with ease, meaning the process can turn any regular, cheap sponge into a smart sponge.



It was the largest marine oil spill in the history of the petroleum industry. At the time, the U.S. federal government estimated the total oil discharge was up to 4.9 million barrels and, as such, the event is widely considered to be the one of the most damaging environmental disasters in American history.

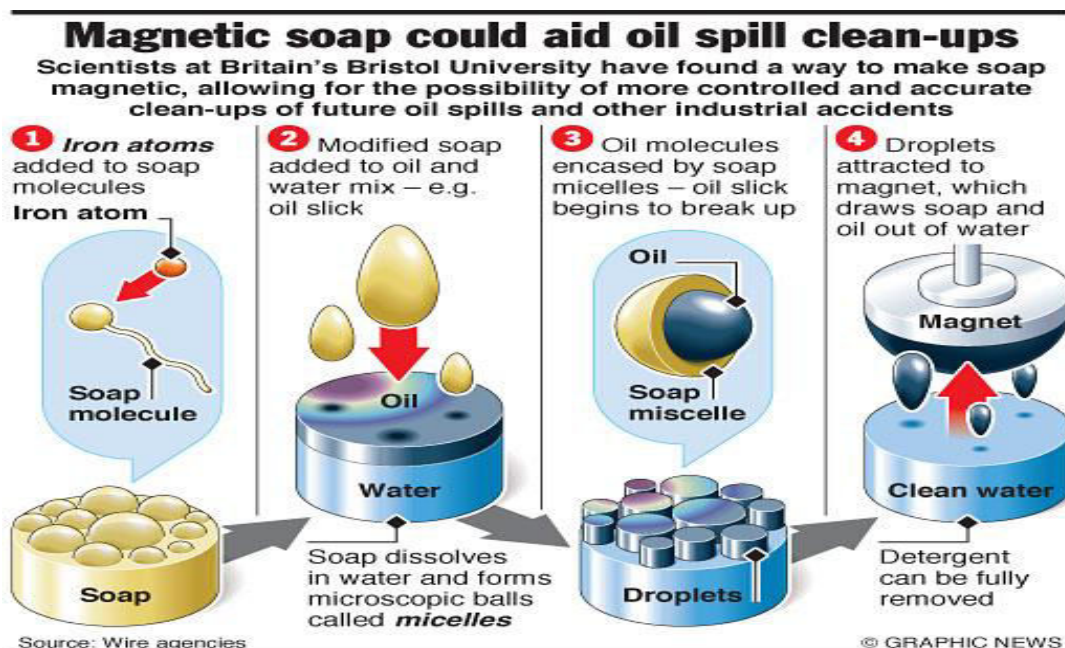
A huge response ensued to protect beaches, wetlands and estuaries from the spreading oil, but many marine and wildlife habitats were completely destroyed. Fishing and tourism industries were also adversely affected as the spill lasted several months. Clean-up crews were still working to manage the effects of the spill three years later in 2013.

Magnetic Soap

Prof Julian Easton, part of the team who developed the magnetic soap, hopes one day the soap may move into commercial usage. “The potential applications of magnetic surfactants are huge,” he said. “Their responsiveness to external stimuli allows a range of properties, such as their electrical conductivity, melting point, the size and shape, and how readily it dissolves in water, to be altered by a simple magnetic on and off switch.”

Magnetic soap is another unusual option for cleaning up oil spills. Scientists from Bristol University have created a soap composed of dissolvable iron rich salts, which responds to magnetic fields when placed in solution. It is hoped the soap could one day revolutionise industrial cleaning operations and environmental clean-up procedures.

Click on the Graphic for an Expanded view.



Magnetic Soap Could Clear Oil Spills

Autonomous Robots

Self-driving navigating robots may be another solution. Carlo Ratti, the director of the MIT Sensible City Lab, pioneered the Sea Swarm robot in response to the Deepwater Horizon oil spill.

“This technology was conceived to be deployed anywhere it was needed – in oceans, rivers, or seas. It’s mostly useful in deltas and zigzagging coastlines where most of the other technologies fail,” Ratti said. “We all need to be accountable for the environment. Some accidents are still bound to occur, so we still need to develop mitigation or cleaning strategies.”

“Oil spills have devastating and immediate effects on the environment, human health and economy,” says Nandwana’s colleague Vinayak Dravid, who led the research. “Although many spills are small and may not make the evening news, they are still profoundly invasive to the ecosystem and surrounding community.



This device floats on the water after being set out from a helicopter or boat. It can track the source of the spill and concentrate on cleaning the spill in that area. In the middle of the robot is a compartment full of oil hungry bacteria. As the oil splashes into the compartment, the bacteria degrade the oil and returns clean ocean water.

Oil spill: Clean-up Costs

Under the Oil Pollution Act of 1990, the owner or operator of a facility from which oil is discharged (responsible party) is liable for the costs associated with the: containment, clean-up, and. damages resulting from the spill. The government will call the Indian Coast Guard for immediate action.

Cleanup costs for an oil spill could be between **Rs. 19, 84,475.8** and **Rs. 54, 50,654.77** lacks in Indian rupees. While it is impossible to know exactly how much an oil spill would cost, experts are able to estimate the financial risks by examining historic major spills.

Average Cost of Cleaning up an Oil Spill

In Indian currency terms survey data indicated that spills that had time to spread to groundwater were significantly more expensive to clean up. Most of the clean-ups working is continuing in above four months the spending cost is may less: **Rs. 16, 55,218.00**. Typical clean-up cost range: **Rs. 81, 81,108.1** to **Rs. 41, 38,275.00** in Indian Rupee. Average cost of cleanup including both marine and beach: **Rs 74, 49,570.00**.

The government will immediately issue a notice to the ship owners Shipyard in the oil spill clean-up operation. If the ship owner pays the penalty for the spill immediately, the government will take immediate action to clean it up. Thus the government will have to pay the cost of cleaning up the owners along with the fine.

In case the person(s) to whom the notice is served fails to comply with the actions to be undertaken as specified in the notice, the Central Government cause the directives given in the notice to be carried out by a specified agency of the government and costs incurred by the Central Government shall be recovered from all or any of the person(s) who had been notified.

Cost of Cleaning Methods (Old Methods)

Table: 1

S No	Name of the Method	Cost Cleaning in Rs.
1	Oil Booms.	2,847,00
2	Skimmers.	2,15,052.50

3	Sorbents	1,82,700
4	Burning In-situ	3, 54,250
5	Dispersants	1,73,146.76
6	Hot Water and High-Pressure Washing	3,723.14
7	Bioremediation	1,65,466
8	Chemical stabilisation of oil by elastomers	2,80,250

Source: <https://www.marineinsight.com/environment/10-methods-for-oil-spill-cleanup-at-sea/>

Cost of Cleaning of Innovative Methods (New Methods)

Table: 2

S.No	Name of Method	Cost of in Rs.
1	Special sponges	1,35,000
2	Magnetic soap	3,00,000
3	Autonomous robots	6,86,629

Source: <https://www.marineinsight.com/environment/10-methods-for-oil-spill-cleanup-at-sea/>

Cost Factors

Reviewing a white paper on estimating clean-up costs shows that there are many factors that drive the cost of an oil spill. Those factors include: location, oil type, clean up strategies, and spill amount.

- **Oil Cost:** As you can imagine heavy fuels and crude oil carry the biggest per tonne clean-up costs at **Rs. 1, 65,466 to Rs. 6, 86,629**, respectively. The lowest is Petrol at Rs.2, 89,588.25 per tonne.
- **Spill Amount.** Here the cost per tonne declines as the oil spill size increases. It ranges from \$10,000 per tonne at the smallest spills to less than \$1,000 for the very largest spills.
- In terms of Indian money, the cleanup costs for the oil spill are estimated to be between Rs 19, 86,252.33 to Rs 35, 45,000.

Increases over time are another factor due to increasing litigation as well as changing social and political pressures around environmental responsibility.

FINDINGS AND DISCUSSION

Special sponges, magnetic soaps and autonomous robots, compared to conventional methods, have been found to reduce human labour and cost many times more to the government than conventional methods. And the work load for the cleaners is less though moreover, the livelihoods of maritime industries that depend on the sea are prevented from being affected.

These techniques offer better quality clean up than conventional methods such as containment booms, skimmers, and use of dispersants amongst others. Their superiority is attributed to their unique properties such as cost-effectiveness, biodegradability, recyclability, and higher yield of oil-water mixture separation.

The above mentioned old methods take long days for cleaning and cost Rs.2,00,000 to Rs.3,72,350 in Indian currency. Only specialized sponges, magnetic detergents, and autonomous robotic systems that stand still in high workload situations are typically estimated at Rs 3,00,000 to Rs 6,86,629 lakh compared to older systems. It is 50. % more expensive than the old method but can clean up the oil spill in the sea quickly and safely.

In the price list of the oil spill treatment plant, bioremediation and special sponges cost a much lower price of Rs 1,65,466 and Rs 1,35,000 respectively.

CONCLUSION

Finally, in the disposal of oil spills in the sea, cleaning methods should be dealt with depending on the severity of the environment. As far as other oil spills are concerned, booms

Dispersant can be used to clean up on the first day, but if the spillage is severe, modern methods such as special sponges & autonomous robots are the best method. Reference.

REFERENCE

1. **The Latest Innovative Ways to Clean Up Oil Spills-**
[https:// www.petro- online.com/news/analytical-instrumentation/11/breaking-news/the-latest-innovative-ways-to-clean-up-oil-spills/53371](https://www.petro-online.com/news/analytical-instrumentation/11/breaking-news/the-latest-innovative-ways-to-clean-up-oil-spills/53371)

2. https://www.researchgate.net/publication/222958441_Two-dimensional_numerical_simulation_for_transport_and_fate_of_oil_spills_in_seas
3. https://www.webefit.com/101WaystoDie/101Ways_OilSpill.html
4. McGill, W.B. (1977-04-01). "Soil Restoration Following Oil Spills - A Review". *Journal of Canadian Petroleum Technology*. **16** (2). doi:10.2118/77-02-07. ISSN 0021-9487.
5. ^ Walls, W.D. (May 2010). "Petroleum refining industry in China". *Energy Policy*. **38** (5): 2110–2115. doi:10.1016/j.enpol.2009.06.002. ISSN 0301-4215.
6. ^ YANG, Si-Zhong; JIN, Hui-Jun; WEI, Zhi; HE, Rui-Xia; JI, Yan-Jun; LI, Xiu-Mei; YU, Shao-Peng (June 2009). "Bioremediation of Oil Spills in Cold Environments: A Review". *Pedosphere*. **19** (3): 371–381. doi:10.1016/s1002-0160(09)60128-4. ISSN 1002-0160.
7. ^ (Council, National Research (1969-12-31). *In Situ Bioremediation: When Does it Work?*. Doi: 10.17226/2131. ISBN 9780309048965.
8. ^ Atlas, Ronald M.; Hazen, Terry C. (2011-08-15). "Oil Biodegradation and Bioremediation: A Tale of the Two Worst Spills in U.S. History". *Environmental Science & Technology*. **45** (16): 6709–6715. Bibcode:2011EnST...45.6709A. doi:10.1021/es2013227. ISSN 0013-936X. PMC 3155281. PMID 21699212
9. <https://maritimeindia.org/16478-2/#:~:text=India%20imposes%20civil%20liability%20upon,The%20Merchant%20Shipping%20Act%201958.>
10. <https://www.google.com/search?q=oil+spill+cleaning+cost&oq=oil+spill+cleaning+cost&aqs=chrome..69i57j0i22i30i625j0i22i30i2j0i22i30i625i3j0i15i22i30j0i390i2.6365j0j15&sourceid=chrome&ie=UTF-8>

BUSINESS GROWTH THROUGH DIGITAL TRANSFORMATIONS “DIGITAL INNOVATIONS IN BUSINESS AND ECONOMY”**Dr Anusha Aggarwal¹ and Prof Neha Shrotriya²**¹(Economics), Mewar University, Rajasthan²Research Scholar (Economics), Mewar University, Rajasthan**ABSTRACT**

Digital transformation refers to the adoption of digital technologies to transform the way business is conducted. The digital revolution has brought about significant changes in the business landscape, and companies that have embraced digital transformation have seen tremendous growth. This paper examines the role of digital transformation in business growth, the benefits of digital transformation, and the challenges faced in implementing digital transformation. The world is a changing place every moment, full of uncertainties and surprises. The pace of digital innovation and transformation is increasing. According to analysts, the Digital India plan could boost GDP up to \$1 trillion by 2025. It can play a key role in macro-economic factors such as GDP growth, employment generation, labor productivity, growth in a number of businesses and revenue leakages for the Government. With the invent of such digital innovations, economy at a whole needs proper management and planning. Digital innovation isn't only about being better equipped to effectively respond to specific incidents, but it involves any business and economy to be more alert to changing business values and economic activities.

This paper presents an insight into the analysis of innovations in digital markets, as a process and as a value-laden system, both of which have substantial consequences to our approach to research. Through more democratic research practices and recognizing digital innovation strategies as a system beyond its tools, researchers can increase their knowledge on devise strategies to come out of uncertain conditions and also decide on the future course of action.

Keywords: Digital innovations, Government policies, Strategies, Economy, Global trends, technological innovations,

INTRODUCTION

With the world having become a global village demand for a whole new level of global selling has emerged.

The digital revolution has changed the way we live and work. The rise of digital technologies such as cloud computing, artificial intelligence, big data, and the Internet of Things has transformed the business landscape. Companies that have embraced digital transformation have been able to take advantage of these technologies to grow their businesses.

Digital transformation refers to the adoption of digital technologies to transform the way business is conducted. It involves the integration of digital technology into all areas of a business, from customer service to product development, to marketing, to supply chain management. Digital transformation has become a key strategy for businesses looking to stay competitive in today's digital economy.

The Role of Digital Transformation in Business Growth

Digital transformation has become a key driver of business growth. It enables businesses to streamline their operations, reduce costs, and improve efficiency. Companies that have embraced digital transformation have been able to gain a competitive advantage by leveraging the power of digital technologies to transform their business models. Digital transformation has enabled companies to:

- 1. Improve Customer Experience:** Digital transformation has enabled businesses to create personalized customer experiences that meet the needs of their customers. By leveraging customer data and analytics, businesses can create customized products and services that meet the unique needs of each customer.
- 2. Increase Operational Efficiency:** Digital transformation has enabled businesses to streamline their operations, automate processes, and reduce costs. By automating processes such as inventory management, supply chain management, and customer service, businesses can reduce costs and improve efficiency.
- 3. Expand Their Reach:** Digital transformation has enabled businesses to reach new markets and customers. By leveraging digital channels such as social media, search engines, and e-commerce platforms, businesses can expand their reach and tap into new markets.

4. **Develop New Products and Services:** Digital transformation has enabled businesses to develop new products and services that meet the changing needs of their customers. By leveraging data and analytics, businesses can identify emerging trends and develop new products and services that meet the needs of their customers.
5. **Improve Decision-Making:** Digital transformation has enabled businesses to make data-driven decisions. By leveraging data and analytics, businesses can gain insights into customer behavior, market trends, and operational performance, which can inform decision-making.

Understanding Digital Transformation

Digital transformation is not just about implementing new technologies. It is a holistic approach to transforming a business, encompassing people, processes, and technology. At its core, digital transformation is about leveraging technology to create new business models, improve customer experiences, and drive operational efficiencies. This can involve a range of technologies, from cloud computing and big data analytics to artificial intelligence and the Internet of Things (IoT)

Digitalization has long been seen as a crucial tool for any economy's development. At its core, **digital innovation** is the use of **digital** technology and applications to improve existing business processes and workforce efficiency, enhance customer experience, and launch new products or business models. The concept of digital economy is evolving all the time because of its multifaceted and dynamic nature and due to the transformational power of digital technologies.

The recent studies highlight diffusion of the digital economy within the whole economy and claim that "it can no longer be described as a separate part, or subset, of the mainstream economy. It goes beyond e-commerce and e-business and includes doing business, conducting communications and providing services across all sectors including transport, financial services, manufacturing, education, healthcare, agriculture, retail, media, entertainment and business using digital technologies. Digital economy plays a significant role in accelerating global economic development, enhancing productivity of existing industries, cultivating new markets and industries, and achieving inclusive, sustainable growth.

OBJECTIVES

1. To know the impact of "Digitalization" on business growth.
2. To review the economic and social impacts of Digital India plan.
3. To know the important dimensions of change to innovation across different industries in context of the digital transformation.
4. To check out the feasibility of "Digital India plan", its policies and programs on business growth.
5. To open new vistas for future research.

Digitalization and Indian Economy-

India's digital consumer base is the second largest in the world and is rapidly growing. The government's digital model is narrowing the digital divide and bringing technology to even the most remote parts of the country.

About 50 percent of the potential economic value of the US \$1 trillion could come from new digital ecosystems in diverse sectors, including, among others, financial services, agriculture, healthcare, logistics, jobs, and e-governance.

Digital India is the government's flagship program and has been transforming the country into a digitally empowered society and knowledge economy. The rate of technology adoption increased between 2013 and 2018, bolstered by government initiatives and mobile penetration. During this time, the country clocked 1.22 billion *Aadhaar* registrations, 870 million *Aadhaar*-linked bank accounts, and 98 million daily e-government transactions. Building on this foundation, India can further scale-up its digital economy.

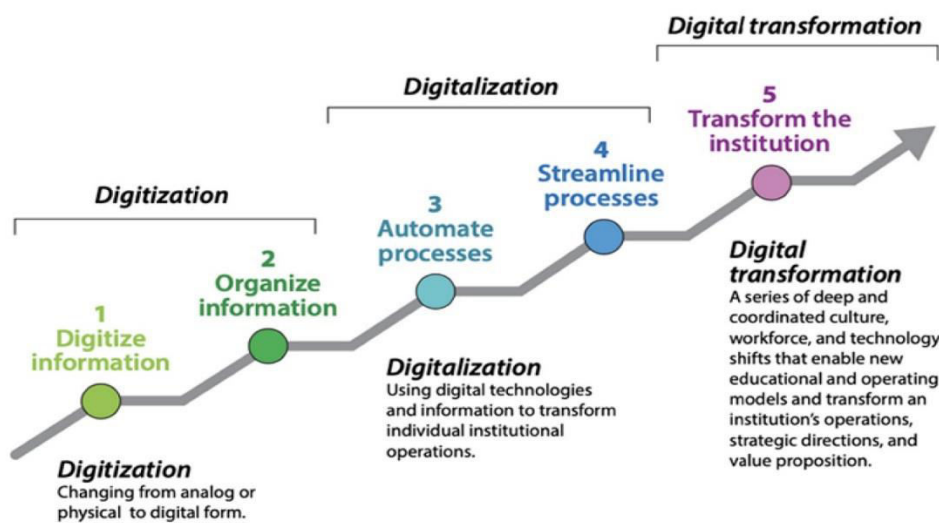
India is the second-fastest digitizing economy among the leading economies of the world, according to the report's Country Digital Index, which is based on 30 metrics to measure digital adoption in 17 mature and emerging digital economies (Brazil, China, Indonesia, Russia, South Korea, Sweden, and the United States).

Drivers of Digital Transformation:

Several key drivers are fueling the growth of digital transformation, including:

There are several drivers of digital transformation, including changes in customer behavior, competition, and technology. Customers are increasingly using digital channels to engage with businesses, and expect seamless, personalized experiences across all touchpoints. This is driving businesses to invest in digital technologies to better understand and meet customer needs.

1. **Technological Advances:** Rapid advances in digital technologies, such as artificial intelligence, the internet of things, and cloud computing, are making it easier and more cost-effective for organizations to adopt digital solutions.
2. **Changing Customer Behavior:** Customers are increasingly demanding digital experiences and personalized services. Organizations that fail to meet these demands risk losing market share.
3. **Competitive Pressures:** Digital disruption is changing the competitive landscape, with new players entering the market and traditional incumbents struggling to keep up.
4. **Regulatory and Compliance Requirements:** Regulations such as the General Data Protection Regulation (GDPR) are forcing organizations to take data privacy and security more seriously, and adopt.



Drivers of Digital Transformation

Competition is also a key driver of digital transformation. As new digital-native competitors enter the market, traditional businesses need to adapt to remain competitive. Digital transformation can help businesses to innovate and differentiate themselves from competitors.

Finally, advances in technology are making digital transformation more accessible and cost-effective than ever before. Cloud computing, for example, allows businesses to scale their operations quickly and cost-effectively, while big data analytics can provide valuable insights into customer behavior and business operations.

REVIEW OF LITERATURE

Digital economy is defined by *Oxford Dictionary* as “an economy which functions primarily by means of digital technology, especially electronic transactions made using the internet.

According to *OECD*, the digital economy enables and executes the trade of goods and services through electronic commerce on the internet.

According to *Forbes19*, 125,000 large organizations are launching digital business initiatives with estimated digital revenue increase by more than 80% by 2020.

Midha Rahul (2016) concluded that digital India is a great plan to develop India for knowledge future but its improper implementation due to inaccessibility and inflexibility to requisite can lead to its failure. Though digital India program is facing number of challenges yet if properly implemented it can make the best future of every citizen.



RESEARCH METHODOLOGY

The research method adopted for the study includes collection of secondary data.

The secondary data has been extracted from various sources like research articles, publications from Ministry of Commerce, Government of India, various bulletins of RBI and authenticated websites.

The research was conducted to study the impact of Digitization on business Growth and how it helps in providing economic development in Indian Economy and business programs.

FINDINGS

Various challenges have been identified while checking the parameters for digital transformation.

Challenges in Implementing Digital Transformation

Despite the benefits of digital transformation, there are also challenges associated with implementing digital transformation. Some of the key challenges include:

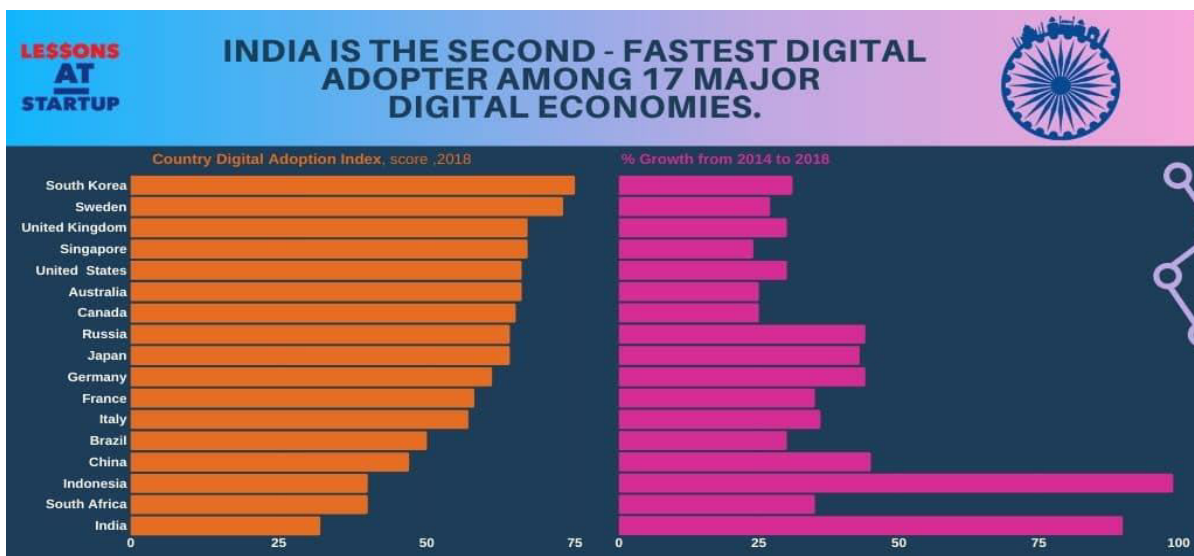
While digital transformation can deliver significant benefits, it is not without its challenges. To ensure success, businesses need to carefully consider a range of factors, including:

1. **Leadership:** Digital transformation requires strong leadership and a clear vision for the future of the business.
2. **Culture:** Businesses need to create a culture of innovation and agility, and be willing to experiment and learn from failure.
3. **Talent:** Digital transformation requires a skilled workforce with the ability to use and manage digital technologies effectively.
4. **Technology:** Businesses need to carefully evaluate and select the right digital technologies for their needs, and ensure that they are integrated effectively into existing systems and processes.
5. **Security:** Digital transformation can expose businesses to new security risks, so it is important to implement robust security measures to protect against cyber threats.
6. **Resistance to Change:** Implementing digital transformation requires a change in organizational culture, which can be met with resistance from employees who are used to doing things a certain way.
7. **Organizational Culture:** Digital transformation often requires a significant shift in organizational culture, with a focus on innovation, agility, and collaboration. This can be challenging for organizations that are used to a more traditional, hierarchical culture.
8. **Skills and Talent:** Digital transformation requires a range of new skills and capabilities, including data analytics, artificial intelligence, and digital marketing. Organizations must invest in training and development to ensure they have the right talent in place to drive digital transformation.
9. **Legacy Systems and Processes:** Digital transformation often requires organizations to modernize legacy systems and processes. This can be costly and time-consuming, and may require significant organizational change.

Talent, Technology and Tools (infrastructure) are going to be three pivotal ingredients that will usher in a sustainable and growth-oriented digital economy

The digital India mission would make all the government services available to people of country through common service delivery outlets. This is helping in inclusive growth by enabling access to business organizations, products, education, healthcare and government services to all the citizens of the country. People are getting better advice on agriculture and health care services. Transparency in respect of LPG, Panchayat, NRC (Assam), banking, filling of data is being made online and easily accessible to citizens of the country.

Governance will help in reducing corruption and getting things done quickly. Digital locker facility is become a great help for citizen to store digitally their important documents like Pan card, passport, mark sheets etc. It will help in getting things done easily. It saves times and no need to stand in long queues for getting our documents would be reduced and helping in decreasing documentation and reducing paper work. Digital India mission is away for cashless transactions and country is already in move towards less cash economy. According to analyst the digital India could boost GDP up to \$1 trillion by 2025. According to World Bank report a 10% increase in mobile and broadband penetration increases per capita GDP by 0.81% and 1.31% respectively in developing countries.



Impact of Digital India, Digitization in India 2022

SUGGESTIONS

Digital India plan/Digitization can't be successful on its own. Policy changes are needed to make digital India a reality. Few of the suggestions are –

1. Digital literacy is first step in empowering citizens. People should know how to secure their online data.
2. To make this programme successful, a massive awareness programme has to be conducted. There is pressing need to educate and inform the citizens, especially in rural and remote areas, about the benefits of internet services to increase the growth of internet usage.
3. Digital divide needs to be addressed.
4. Manufacturing content is not government's strength. This mission needs content and service partnerships with telecom companies and other firms.
5. PPP models must be explored for sustainable development of digital infrastructure.
6. Private sector should be encouraged for development of last mile infrastructure in rural and remote areas. To encourage private sector, there must be favorable taxation policies, quicker clearance of projects.
7. The success of digital India project depends upon maximum connectivity with minimum cyber security risks. For this we need a strong anti-cybercrime team which maintains the database and protects it round the clock.
8. To improve skill in cyber security, we need to introduce cyber security course at graduate level and encourage international certification bodies to introduce various skill based cyber security courses.

9. There is need for effective participation of various departments and demanding commitment and efforts. Various policies in different areas should support this goal.
10. For successful implementation, there must be amendments in various legislations that have for long hindered the growth of technology in India.

CONCLUSION

Digitization in India is in its nascent stage. There is a long way to go before the maximum potential can be realized. Only ICT and Digital India alone cannot drive the economy of the country. The citizens of the country have huge responsibility on their shoulders and they have to utilize these initiatives to achieve a fully developed economy. Many strengths and opportunities fuel the development of India, while at the same time new threats and challenges arise. The impact of the Internet in India is constrained by current gaps and obstacles in the Internet ecosystem due to the following obstacles: Limited availability of Internet infrastructure, High cost of access and usage, Lack of awareness and low digital literacy, Narrow range of applications and services and an unfavorable business environment.

REFERENCES

1. Deloitte & Touché Consulting, *At the Dawn of E-Government: The Citizen as Customer*, 2000.
2. McKinsey & Company, *Digital Consumer Research*, 20121.
3. Digital India. *Unlocking the trillion Dollar Opportunity: ASSOCHAM-Deloitte report*, November 2016. Retrieved from www.assochem.org
4. Digital India Programme: Importance and Impact retrieved at <https://iasscore.in/national-issues/digital-india-programmeimportance-and-impact>
5. Digital India: Opportunities & Challenges retrieved at <http://iec.edu.in/blog/digital-india-opportunities-challenges/>
6. https://en.wikipedia.org/wiki/Digital_India
7. Brand Finance (2015), "India is the 7th Most valued nation brand in the world" Mail Online India 1 st November, 2015 [12]
8. Ernst & Young (2015), "India is 1st amongst the world's most attractive investment destinations" EY's India Attractiveness Survey, 2015. "India is 1st amongst the world's fastest growing economies in both 2016-2017", WESP Report 2016, United Nations

**A THEORETICAL LEARNING ON FIXED ASSETS MANAGEMENT IN GOVERNMENT SECTOR
IN INDIA****Dr. Pankaj Jain¹ and Dr. Rajeev Goyal²**¹Assistant Professor, SGT University, Gurugram²Assistant Professor, SKITM, Bahadurgarh**ABSTRACT**

Fixed assets play an important role in the successful operation and constitute a major proportion of total capital employed by an enterprise. An appraisal of fixed assets is a particular procedure of establishing a relationship between fixed assets and some associated variables. Further, an assessment of fixed assets is significant enough in terms of capital investment of industries and the public sector. In this paper, an effort has been made to appraise and critically explain the fixed assets' performance of selected Central Public Sector Enterprises (CPSEs) in India through different parameters. It also makes an effort to observe and compare the effectiveness of the use of fixed assets between sample firms. The objective is to analyze and discuss whether there is any significant difference in fixed assets performance between sample firms or not throughout the period under study. Appropriate variables are chosen into a uniform limit to compare inter-firm performance. The data were collected from the secondary sources. Relevant financial ratios were applied and hypothesis test, such as ANOVA has been employed to determine considerable conclusions.

Keywords: Fixed assets Management; CPSEs; Comparative study; ANOVA.

INTRODUCTION

Fixed assets are long-lived assets that facilitate the production of the goods and generate profits for enterprises. On a record of their bodily substance, fixed assets most commonly appear on real estate, machinery, equipment, furniture, fixtures, fittings, leasehold improvements and related items. Besides this, fixed asset are a primary key resource for businesses and can represent a significant section of the net worth captured on the balance sheet.

Furthermore, fixed asset performance refers to a business ability to manage operational resources and produce profitable returns. It is the capacity of a business to persuade positive performance out of its assets. Possessing strong asset performance is one of the criteria for resulting in optimistic company performance. Normally, an improvement in fixed asset performance means that a company can either earn a higher return using the same amount of assets or is competent enough to make the same amount of return using lesser amount assets.

Financial ratios are often used to measure asset performance. It measures how efficiently operations are being operated and determines whether a company is considered a good or not. It gives a guideline to compare one company's performance over time against its competitors. Comparative study is typically used to compare the performance of several companies across the industry. It focuses on the position where the unit stands in contrast to the other units. It compels the management to challenge the standards accepted and adopted by the outside world. A company has to improve its performance in the light of the current information gathered from competent members of the industry. Thus, it is a technique of evaluation and is based upon the comparison of productivity, efficiency, cost, and profit as yardstick among different business units in the same industry.

Central public sector enterprises play a vital role in the development of the country in the global arena. The status of Maharatna, Navratna, Miniratna to Central Public-Sector enterprises is conferred as the crown jewels of India's socialist legacy. Giving Navratna, Maharatna and Miniratna status to CPSEs was just a step to make companies self-reliant. With continued focused efforts towards achieving excellence, several of them have become self-reliant and are playing a vital role in building the Indian economy. The purpose of the present work is to make an appraisal of fixed assets of the Ratna status oil refineries and construct an indicator based on the comparison by using the financial ratio. To be precise, an attempt has been made to find out their potential being utilization of fixed assets.

FIXED ASSETS MANAGEMENT

After determining the amount of capital required and advantageous sources of procuring the necessary capital, the next important task is the efficient allocation of capital among different assets in such a way to assure maximum return on it. This is particularly true in the case of investment of capital in long-term assets or popularly known as fixed assets. The investment decisions regarding these assets are the most challenging and intricate ones demanding management shrewdness, objective study and business initiative. In the long run, the

success of an enterprise is determined by the effectiveness with which management commits resources to fixed assets in amount, type and timing.

REVIEW OF LITERATURE

Antill and Arnott (2002) assert that if the company cannot perform concerning shareholder value in comparison to competing firms, then the company should return money to the shareholder, who can utilize it more productively. It effectively measures to assess shareholder return, but there are several problems with this judgment and indeed with other dimensions of value-based management. Following the path, Schenckery (2005) emphasized the Cross-sectional comparison of operations and, indeed, costs, suffers from the problem of comparing companies in the upstream, the key problem is that geology differs. It differs in terms of where it is located. As a result, good companies can appear to execute badly, and poor companies come into sight. In the oil stratum, this is much less of a problem since the laws of chemistry are common and so the operational performance of refineries is more easily comparable.

Victor (2007) examining 90 firms showed that the largest private companies are nearly three times better than National Oil Companies at converting reserves into actual production. But this could simply reflect the depletion choices of the producer administration rather than the effectiveness of the National Oil Company. The National Oil Companies may be under instructions of the Government not to expand capacity. Stevens and Mitchell (2008) conclude that measuring National Oil Companies performance is difficult due to national mission, lack of transparency and aggregation problem. In some cases, the performance measure is simply the result of how the oil sector is organized.

Mishra and Gupta (2011) investigated the factors that affected the central Public Sector Undertakings in India. The results indicated that the capital structure of the profit-making manufacturing central Public Sector Undertakings is affected by assets, tangibility, profitability and tax. The results stated that tangibility and growth have a positive effect on the leverage ratio, while profitability and tax have a negative effect on capital structure. Taqi (2013) in his research paper on Financial Appraisal and Analysis of Minerals and Metals Trading Corporation, he has measured the financial performance with the help of liquidity ratios, profitability ratios and activity ratios. In order to analysis the financial performance researcher has used various statistical tools. Growth in various ratios is judged by applying one sample t - test.

Valand (2014) authored an article entitled, "The challenges and Future Prospects of India's Petroleum Product Refineries." He has mainly focused on key challenges of the petroleum industry in India in his research study.

A research paper authored by Yameen and Ahmad (2015) titled as "Impact of Corporate Governance practices on Financial Performance of Hindustan Petroleum Corporation Limited" tested the role corporate governance practices for the improvement of the operating performance, financial efficiency, and shareholder's wealth in the organization. The study revealed that corporate governance has a positive impact on the overall financial performance of HPCL. The review of chosen literature in related domain indicates that many studies have been approached the various aspects of analyzing financial performance. But the researcher couldn't come across to compare the PSUs in the light of fixed assets performances. Therefore, the present is undertaken to give an insight into the comparative performance by attempting to offer a detailed examination of fixed assets.

OBJECTIVES OF THE STUDY

The main objective of the present work is to appraise the performance in respect of fixed assets on selected Ratna enterprises. More specially, it seeks to do well upon mainly the following issues:

- To analysis the concept of fixed assets appraisal based on financial ratio.
- To identify the industry-specific measure of selected key appraisal ratio.
- To contrast the association of summated performance of fixed assets.

MATERIALS AND METHODS

It is not easy to find out the fixed assets appraisal concept of every „Ratna“ status company so that the parallel public sector units suchas petroleum refinery and marketing CPSEs has been selected for the research purpose. The study was conducted taking the samples of five comparable public sector units considering all the three categories from Maharatna, Navratna and Miniratna statuses given bygovernment for appraisal conception.

The selected CPSEs for research are as follows:

- Indian Oil Corporation Limited (IOCL)

- Bharat Petroleum Corporation Limited (BPCL)
- Hindustan Petroleum Corporation Limited (HPCL)
- Mangalore Refinery and Petrochemical Limited (MRPL)
- Chennai Petroleum Corporation Limited (CPCL)

The present study covers a period of 10 years from 2008 to 2017. Since the acquisition of fixed assets involves a long-term policy, a period of 10 years is considered as long enough to study the fixed assets. The data is based fully on secondary in nature and those are collected along with the study preference. The annual reports of the IOCL, HPCL, BPCL, MRPL and CPCL are studied to collect financial data. Available data has been analyzed to collect Net worth, Long-term fund, Fixed assets, Depreciation and Net sales of each of five selected firms for each of the specific time series 2008-2017. Thereafter, five fixed assets performance measurement ratios of selected firms, such as Net Sales to Fixed Assets, Fixed Assets to Net Worth, Fixed Assets to Long-Term Fund, Depreciation to Fixed Assets and Depreciation to Sales were computed. Subsequently, five identical ratio specific rectangular matrixes structured upon each having the order 10x5 were obtained (Row -10 successive years and Column - 5 matching ratios).

Thus, the value of respective financial ratios of each of the 10 years of 5 firms representing parallel score. The parallel score helps to calculate row average (year specific) and column average (company-specific) as well. Further statistical tools like ANOVA is used to test the significant relationship and draw meaningful conclusion of each of the 5 identical ratio specific matrixes.

Analysi s and Findings Net Sales to Fixed Assets.

The sales to fixed assets ratio is a performance measurement tool which measures efficiency. It is typically a function of the capital intensity of an industry with which the company is employing its fixed assets to generate revenue. A high turnover indicates that assets are being utilized competently and a huge number of sales are generated using a little amount of assets. A low turnover, on the other hand, indicates that the company isn't fully using its assets. Ratios that are higher than the industry average are desirable.

Calculation: Sales to Fixed Assets Ratio = (Net Sales ÷ Fixed Assets)

There is no benchmark for the best fit sales to fixed asset ratio, and we must compare the ratio of the similar company over the past couple of years to get better appraisal results.

Besides, this ratio is more useful when it makes a comparison of different companies in the same industry. The „ Net sales to fixed assets ratio of selected companies“ is presented in Table 1.

Table 1: Net Sales to Fixed Assets Ratio of Selected Companies

Year	IOCL	HPCL	BPCL	MRPL	CPCL
Mar '08	5.9	3.57	8.65	7.93	8.42
Mar '09	5.8	3.49	9.57	9.42	8.97
Mar '10	4.29	9.81	7.43	6.19	5.95
Mar '11	4.86	6.84	8.93	5.49	7.25
Mar '12	5.42	7.5	11.95	4.77	8.63
Mar '13	5.67	5.59	12.56	4.93	9.04
Mar '14	4.89	5.98	11.76	4.94	10.64
Mar '15	4.27	7.05	8.51	3.71	8.62
Mar '16	3.09	7.46	5.25	2.63	4.46
Mar '17	3.03	7.32	4.69	3.00	4.17
Average	4.72	6.46	8.93	5.30	7.62

Source: Compiled from www.moneycontrol.com

Interpretation of Table 1: The Fixed Assets to Sales ratio shows a fluctuating trend to selected companies. BPCL maintained the highest of average Fixed Assets to Sales ratio of 8.93, while it was the least as 4.7 in case of IOCL. The overall industry average of the same ratio was highest at 7.65 during the year 2012 and the lowest at 4.44 in the year 2017. The industry average was 6.89 in the year 2008, which increased to 7.45 in the year 2009. After that, it decreased to 6.73, and then increased to 7.65 in 2012 and then again it decreased to 7.56. At last, it decreased for the three last consecutive years, and attained a value of 6.43, 4.58 and 4.44 in the year 2015, 2016 and 2017 respectively. Further, ANOVA test (one way) is applied in MS-Excel to judge whether the difference in the mean values of Net Sales to Fixed assets ratio between the companies during the period, the following hypothesis is framed and tested. H0: There is no significant difference in net sales to fixed assets ratio between the companies.

Table 2: ANOVA Table (Net Sales to Fixed Assets Ratio)

Source of Variation	SS	df	MS	F	P-value	F crit (5% Level)
Between Groups	116.9256	4	29.23141	6.997468	0.000181	2.578739
Within Groups	187.9842	45	4.177426			
Total	304.9098	49				

It is evident from the Table 2 that the differences between Net Sales to Fixed Assets in between the companies are significant because the calculated value of „F“ (6.997468) is more than the table value of „F“ (2.578739) at 5% level of significance. Hence, the null hypothesis is rejected. Thus, there is a significant difference in the Net sales to Fixed Assets ratio of selected companies.

Fixed Assets to Net Worth

Fixed assets to net worth is a ratio that indicates the extent to which the owners' cash is blocked in the form of fixed assets, such as property, plant, and equipment, and the extent to which funds are available for the company's working capital. A higher fixed asset to Net worth ratio usually reveals the firm is investing high amount in capital excessively as well as non-liquid assets.

Calculation: Fixed assets to Net Worth = (Net fixed assets ÷ Net worth)

The fixed asset to net worth ratio finds widespread application to measure the solvency of a company. If the ratio is less than 1, it is a warning sign of the firm's income which means that stockholders' equity is more than the fixed assets and the stakeholders' equity is financing not only the fixed assets, but also a part of the working capital.

Interpretation of Table 3: The Fixed Assets to Networth ratio (Table 3) shows less fluctuation in comparison to Fixed Assets to Net Sales during the period of study. HPCL maintains the highest of average Fixed Assets to Net Worth ratio of 1.82, while it was the least as 1.22 in case of BPCL. The overall industry average of the same ratio was highest at 1.94 during the year 2015 and the lowest as 1.12 in the year 2008. The industry average was 1.12 in the year 2008, which increased by every year and reached to 1.94 in the year 2015. After that, it decreased to 1.61 in 2016 and then again it increased to 1.75 in the year 2017.

Table 3: Fixed Assets to Net Worth

Year	IOCL	HPCL	BPCL	MRPL	CPCL
Mar '08	1.02	1.44	1.09	1.09	0.97
Mar '09	1.20	1.55	1.15	0.86	1.17
Mar '10	1.24	1.66	1.24	0.92	1.22
Mar '11	1.22	1.78	1.21	1.09	1.21
Mar '12	1.27	1.93	1.19	1.54	1.25
Mar '13	1.29	2.02	1.15	2.31	2.34
Mar '14	1.47	2.03	1.14	1.64	2.69
Mar '15	1.51	2.03	1.25	1.97	2.94
Mar '16	1.28	1.92	1.33	2.21	1.33
Mar '17	1.19	1.86	1.45	2.99	1.25
Average	1.27	1.82	1.22	1.67	1.64

Source: Compiled from www.moneycontrol.com

Further, ANOVA test (one way) applied in MS-Excel to judge whether the difference in the mean values of Fixed Assets to Net Worth ratio between the companies during the period, the following hypothesis is framed and tested. H0: There is no significant difference in the Fixed Assets to Net Worth ratio between the companies. It is evident from the Table 4 that the differences between Fixed Assets to Net Worth in between the companies are significant because the calculated value of „F“ (3.182663) is more than the table value of „F“ (2.578739) at 5% level of significance. Hence, the null hypothesis is rejected. Thus, there is a significant difference of Fixed Assets to Net Worth ratio of selected companies.

Table 4: ANOVA Table (Fixed Assets to Net Worth Ratio)

Source of Variation	SS	df	MS	F	P-value	F crit (5% Level)
Between Groups	2.78038	4	0.695095	3.182663	0.021928	2.578739
Within Groups	9.82802	45	0.2184			
Total	12.6084	49				

Fixed Assets to Long-Term Fund

This ratio complements the judgment of a company's debt coverage capabilities. It indicates the degree to which long-term liabilities can be covered with the company's tangible fixed assets. Tangible fixed assets represent the probable source of financing of the company's liabilities. Whatever the source of shareholders' funds and outsiders' funds raised should be used for the acquisition of Long-Term assets; it means that the total volume of fixed assets should be equivalent to the amount of Long-Term funds. It facilitates understanding apparently about the overcapitalization or undercapitalization of the assets of the company.

Calculation: Fixed assets to Long-Term Fund = (Net Fixed Assets ÷ Long-Term Funds)

Table 5: Fixed Assets to Long-Term Fund

Year	IOCL	HPCL	BPCL	MRPL	CPCL
Mar '08	2.99	0.82	3.25	2.04	2.93
Mar '09	2.80	1.16	3.73	2.05	3.97
Mar '10	3.07	0.61	1.33	3.44	3.77
Mar '11	4.15	0.24	6.41	6.65	8.16
Mar '12	4.37	0.25	8.21	2.86	5.67
Mar '13	3.68	0.32	3.47	2.06	4.15
Mar '14	3.06	0.51	1.87	2.06	2.32
Mar '15	3.13	0.46	2.38	2.92	4.86
Mar '16	4.51	0.30	2.64	2.34	5.78
Mar '17	5.84	0.17	3.13	1.43	5.02
Average	3.76	0.48	3.64	2.79	4.66

Source: Compiled from www.moneycontrol.com

The ideal norm of the ratio should be equal to 1, which means that the Long-Term funds raised only utilized for the acquisition of Long-Term assets of the enterprise. A ratio results lesser than one denotes that the firm made use of short-term fund for the acquisition of

Long-Term assets. The ratio results greater than one implies that the acquired fixed assets are lesser in quantum than Long-Term funds raised for the purpose. Interpretation of Table 5: The Fixed Assets to Long-Term Fund ratio (Table 5) shows a fluctuating trend to selected companies. CPCL maintained the highest of average Fixed Assets to Long-Term Fund ratio of 4.66, while it was the least as 0.48 in case of HPCL. The overall industry average of the same ratio was highest at 5.12 during the year 2011 and the lowest as 1.96 in the year 2014. The industry average was 2.41 in the year 2008, which increased to 2.74 in the year 2009, and then it decreased to 2.44 in the year 2010. After that, it increased to 5.12 in the year 2011, it further decreased to 1.96 in the year 2014 and at last increased to 3.12 in the year 2017.

Further, ANOVA test (one way) applied in MS-Excel to judge whether the difference in the mean values of Fixed Assets to Long-Term Fund ratio between the companies during the year period, the following hypothesis is framed and tested. H0: There is no significant difference in the Fixed Assets to Long-Term Fund ratio between the companies.

Table 6: ANOVA Table (Fixed Assets to Long-Term Fund Ratio)

Source of Variation	SS	df	MS	F	P-value	F crit (5% Level)
Between Groups	101.095	4	25.27376	12.16597	8.72E-07	2.578739
Within Groups	93.48366	45	2.077415			
Total	194.5787	49				

It is evident from Table 6 that the differences between Fixed Assets to Long-Term Fund in between the companies are significant because the calculated value of „F“ (12.16597) is more than the table value of „F“ (2.578739) at 5% level of significance. Hence, the null hypothesis is rejected. Thus, there is a significant difference of Fixed Assets to Long-Term Fund ratio of selected companies.

Calculation: Depreciation to Fixed Assets = (Depreciation ÷ Fixed Assets)

The Depreciation to Fixed Assets ratio will fluctuate largely among different industries and measurement of this ratio needs to be done in a company that operates within the same framework of the industry. High depreciation to fixed assets ratio may suggest that the present fixed assets have a short useful life and, therefore, need to be replaced quickly.

Interpretation of Table 7: The Depreciation to Fixed Assets Ratio (Table 7) shows a fluctuating trend to selected companies. BPCL maintained the highest average Fixed Assets to Sales ratio of 0.076, while it was the least as 0.05 in case of MRPL. The overall industry average of the same ratio was highest at 0.07 during the year 2014 and the lowest as 0.048 in the year 2017. The industry average was 0.068 in the year 2008 and 2009 as

well, which decreased to 0.052 in the year 2010. After that, it increased to 0.07, and then decreased to 0.048 in 2017.

Table 7: Depreciation to Fixed Assets

Year	IOCL	HPCL	BPCL	MRPL	CPCL
Mar '08	0.06	0.05	0.08	0.08	0.07
Mar '09	0.05	0.06	0.07	0.09	0.07
Mar '10	0.05	0.06	0.07	0.02	0.06
Mar '11	0.07	0.06	0.09	0.05	0.06
Mar '12	0.07	0.06	0.10	0.04	0.07
Mar '13	0.07	0.07	0.09	0.04	0.07
Mar '14	0.06	0.07	0.09	0.05	0.08
Mar '15	0.04	0.06	0.08	0.03	0.04
Mar '16	0.04	0.07	0.05	0.05	0.05
Mar '17	0.05	0.06	0.04	0.05	0.04
Average	0.056	0.062	0.076	0.05	0.061

Source: Compiled from www.moneycontrol.com

Further, ANOVA test (one way) applied in MS-Excel to judge whether the difference in the mean values of Depreciation to Fixed assets ratio between the companies during the year period, the following hypothesis is framed and tested. H0: There is no significant difference in Depreciation to Fixed assets ratio between the companies.

It is evident from the Table 8 that the differences between Depreciation to Fixed Assets in between the companies are significant because the calculated value of „F“ (3.974359) is more than the table value of „F“ (2.578739) at 5% level of significance.

Hence, the null hypothesis is rejected. Thus, there is a significant difference of Depreciation to Fixed Assets ratio of selected companies.

Table 8: ANOVA Table (Depreciation to Fixed Assets Ratio)

Source of Variation	SS	df	MS	F	P-value	F crit (5% Level)
Between Groups	0.00372	4	0.00093	3.974359	0.007603	2.578739
Within Groups	0.01053	45	0.000234			
Total	0.01425	49				

Depreciation to Sales

Depreciation is used in accounting to convert costs connected to the purchase of a tangible fixed into anon cash outlay of a company’s operation over time. The Depreciation to Sales ratio measures the proportion of a company’s non-cash expenses in relation to its total sales. The depreciation is divided by a farm’s total sales denote its “value of production.”

Calculation: Depreciation to Sales = (Depreciation ÷ Sales)

Table 9: Depreciation to Sales

Year	IOCL	HPCL	BPCL	MRPL	CPCL
Mar '08	0.011	0.008	0.010	0.012	0.009
Mar '09	0.009	0.008	0.008	0.010	0.008
Mar '10	0.012	0.011	0.010	0.004	0.011
Mar '11	0.014	0.011	0.011	0.010	0.009
Mar '12	0.012	0.010	0.009	0.008	0.009
Mar '13	0.012	0.010	0.008	0.009	0.009
Mar '14	0.012	0.010	0.009	0.010	0.008
Mar '15	0.010	0.010	0.011	0.009	0.005
Mar '16	0.014	0.015	0.010	0.018	0.011
Mar '17	0.011	0.014	0.009	0.016	0.010
Average	0.0117	0.0107	0.0095	0.0106	0.0089

Source: Compiled from www.moneycontrol.com

The measure varies depending on the type of company. Higher amounts of depreciation provide some information on the amount of equipment a business has in use. Efficiency may be evaluated by calculating this ratio and comparing it against the firm’s financial results in prior periods, or against results from similar firms in the same industry.

Interpretation of Table 9: The Fixed Assets to Sales Ratio shows a fluctuating trend to selected companies. IOCL maintained the highest average Depreciation to Sales ratio of 0.0117, while it was the least as 0.0089 in case of CPCL. The overall industry averages.

of the same ratio was highest at 0.014 during the year 2016 and lowest as 0.009 in the year 2009 and 2015 respectively. The industry average was 0.010 in the year 2008, which decrease a little to 0.009 in the year 2009 and maintained a steady average of 0.010 for the next few years. After that it increased to 0.014 in the year 2016, and then decreased to 0.012 in 2017.

Further, ANOVA test (one way) applied in MS-Excel to judge whether the difference in the mean values of Depreciation to Sales ratio between the companies during the year period, the following hypothesis is framed and tested.

H0 – There is no significant difference in the Depreciation to Sales ratio between the companies.

Table 10: ANOVA Table (Depreciation to Sales Ratio)

Source of Variation	SS	df	MS	F	P-value	F crit (5% Level)
Between Groups	4.81E-05	4	0.00001202	2.181048	0.08635	2.578739
Within Groups	0.000248	45	5.51111E-06			
Total	0.000296	49				

It is evident from the Table 10, that the differences between Depreciation to Sales in between the companies are insignificant because the calculated value of „F“ (2.181048) is less than the table value of „F“ (2.578739) at 5% level of significance. Hence, the null hypothesis is not rejected. Thus, there is no significant difference of Depreciation to Sales ratio of selected companies.

CONCLUSIONS

The number of fixed assets shows steady growth over the period as because of Sales to Fixed Assets ratio clearly showed a moderate fluctuation due to fluctuation in sales, but the quantum of sales generated should be improved to enjoy stability. Fixed Assets to Net worth Ratio is 1.5 times on an average due to the accumulation of capital assets but better performance may be obtainable by the selected companies. In the case of Fixed Assets to Long-Term Fund Ratio, the selected firms are managed to generate enough long-term resources for investing in fixed assets, HPCL is the only exception. The result of depreciation of fixed assets clearly showed that the sample companies suffered from volatility over the period of study and failed in achieving the usual rate. A similar result is being noticed only in the utilization of depreciation to sales. Hence the number of indicators results that the selected companies did not follow a definite policy of utilizing their fixed assets and required a specific policy of acquisition.

Thus the said industry required a reviewed plan for conducting a suitable fixed assets management policy.

REFERENCES

1. Antill, N., & Arnott, R. (2002). Oil company crisis, managing structure, profitability and growth. SP 15, Oxford Institute for Energy Studies. Retrieved from <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2010/11/SP15-OilCompanyCrisisManagingStructureProfitabilityandgGrowth-NAntillRArnott-2003.pdf?v=c86ee0d9d7ed>.
2. Mishra, C. S. & Gupta, V. (2011). Determinants of capital structure – a study of manufacturing sector PSUs in India. Retrieved from <https://www.semanticscholar.org/paper/Determinants-of-Capital-Structure-A-Study-of-Sector-Mishra-Gupta/61e26a41c5df494f1a228db36531f5087bf009dd>.
3. Schenckery, M. (2005). Comparative performance of firms in the upstream oil sector in Latin America. Paper presented to the IAEE Annual Conference, Taiwan. Retrieved from <http://www.seeds.usp.br/pir/arquivos/congressos/IAEE2005/program/pdf/CS32-3%20Maxime%20Schenckery.pdf>.
4. Stevens, P. & Mitchell, J. V. (2008). Resource depletion, dependence and development: Can theory help? Chathan House Programme Paper.

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5. Taqi, M. (2013). Financial appraisal and analysis of minerals and metals trading corporation (MMTC). *Journal of Management and Social Sciences*, 9(1), 49-66.
 6. Valand, P. P. (2014). The challenges and future prospects of India's petroleum products refineries. *Indian Journal of Applied Research*, 4(6), 69-70.
 7. Victor, N. M. (2007). On measuring the performance of national oil companies. Retrieved from <https://pesd.fsi.stanford.edu/publications/nocperformance>.
 8. Yameen, M., & Ahmad, I. (2015). Impact of corporate governance practices on financial performance of Hindustan Petroleum Corporation Limited. *International Journal of Advancements in Research & Technology*, 4(2), 135-148.

ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT IN MARITIME TRANSPORT**S. Bharathi Priyanka¹ and Dr. K. Jayaraman²**¹Ph.D Research Scholar and ²Professor & Head, Department of Economics, Periyar University, Salem-636011**ABSTRACT**

Maritime Transport is the backbone of international trade and the Global Economy. Around 90 Percent of the volume of International Trade goods is carried by sea. An economic way to move goods in large volumes around the world. The major mode of transport utilized to transport raw materials (oil, coal, grains, etc.) over long distances, is referred to as maritime transport. This paper examines Green Shipping and Sustainable Development in Maritime Transport. CO2 Emission control as a critical factor to reduce global warming. According to the Economic Sector Report (2021) Emissions of carbon dioxide in the transportation sector accounted for 38 percent of energy-related emissions in the United States in 2021—the largest share of such emissions of any sector of the economy. Greenhouse gases, are compound gases that trap heat or in the atmosphere. Their presence in the atmosphere makes the Earth's surface warmer. The greenhouse gas (GHG) emissions — including carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), expressed in CO₂e — of total shipping (international, domestic and fishing) have increased from 977 million tonnes in 2012 to 1,076 million tonnes in 2018 (9.6% increase). The share of shipping emissions in global anthropogenic emissions has increased from 2.76% in 2012 to 2.89% in 2018. The problem of the study is shipping industry accounts for around 3% of global greenhouse gas emissions annually. The main objectives of the study are to the greenhouse gas emission from shipping industry. This helps in having sustainable viable advantage. This promotes the healthy development of the world economy and trade.

Keywords: Shipping, International Trade, Green shipping, Sustainable Growth

INTRODUCTION

Global economic development is facilitated by the commercial shipping industry. Shipping operations contribute to the growth of international trade activities, which need ships to carry cargoes from places of production to places of consumption (Lun and Browne 2009). According to the IMO (International Maritime Organization) report. Maritime transport is the backbone of international trade and the global economy. Around 90% of the volume of international trade goods is carried by sea. An economic way to move goods in large volume around the world. The main mode of transport used to transport raw materials (oil, coal, grains, etc.) over long distances, referred to as sea transport. Emission control is a critical factor to reduce global warming. Green shipping can reduce carbon emissions in maritime transport. Therefore many shipping firms have begun to adopt green shipping practices (GSPs) to “Green” their operations. GSP can be considered as being environmentally sustainable in the performance of shipping activities (Venus Lun et.al 2014). GSP is becoming an important issue for shipping firms to improve their operations. GSPs affect all the functional areas of shipping firms. The study of green operations focuses on assessing the capability of shipping firms in simultaneously enhancing their operational efficiency and reducing the negative environmental impacts of their shipping activities (Lun, Lai, and Cheng 2013). The challenge to sustainability is to ensure that industries support economic growth while ensuring environmental protection. The growing interest in sustainable development has led many firms to examine ways to deal with environmental issues (Bevilacqua et al. 2007). The gas emissions generated by container trucks on the road from the origin of the cargoes to the ports.

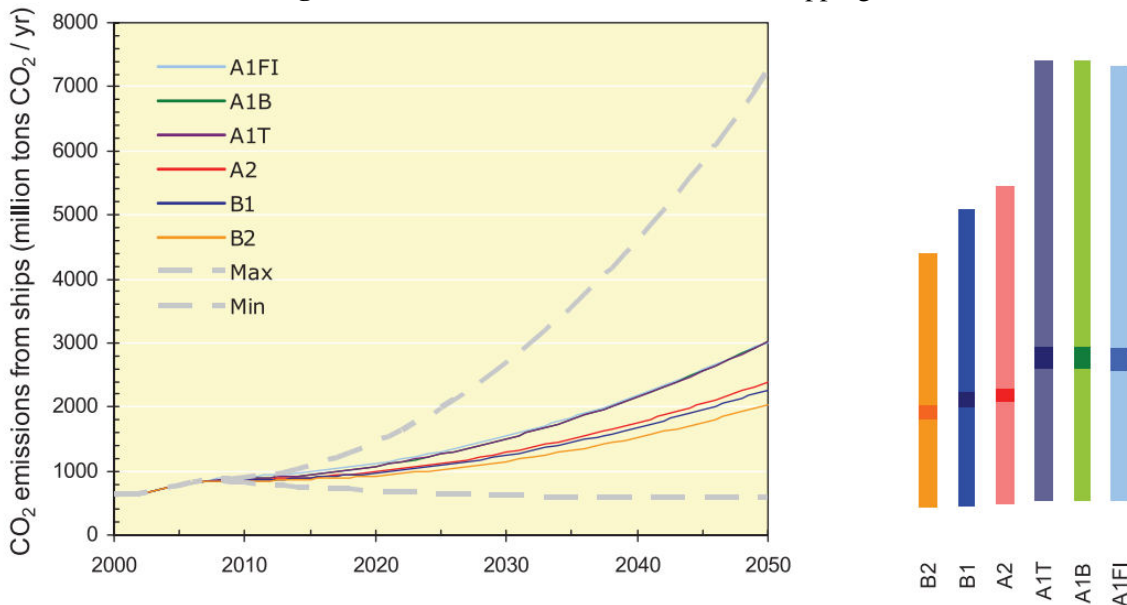
Greenhouse Gas Emissions

Greenhouse gases, are compound gases that trap heat or in the atmosphere. Their presence in the atmosphere makes the Earth's surface warmer. The greenhouse gas (GHG) emissions — including carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), expressed in CO₂e — of total shipping (international, domestic and fishing) have increased from 977 million tonnes in 2012 to 1,076 million tonnes in 2018 (9.6% increase). The share of shipping emissions in global anthropogenic emissions has increased from 2.76% in 2012 to 2.89% in 2018.

Increased economic activity and fossil fuel combustion generate greenhouse gas (Green House Gas) emissions contributing to global climate change. According to the IPCC (Intergovernmental Panel on Climate Change) (2014), atmospheric CO₂ concentrations have increased 40% since pre-industrial times leading to an increase in global temperature of 0.85 °C (IPCC, Intergovernmental Panel on Climate Change, 2014). If these emissions continue to rise, it will cause further warming, so “substantial and sustained” reductions of emissions are required to mitigate impacts of climate change (IPCC, Intergovernmental Panel on Climate Change, 2014).

GHG PI's primarily focus on reducing fuel consumption to reduce emissions. GM encourages participants to maintain annual Green House Gas emission inventories and to adopt energy performance plans (e.g., to achieve Level 3). Each company is responsible for defining its own emission-reduction strategy and must demonstrate ongoing Green House Gas emission reductions to attain Levels 4 (e.g., adoption of an energy performance plan and a plan for reducing air pollutants, which defines reduction measures and establishes reduction targets) and 5 (e.g., continuous reduction of the participant's direct Green House Gas emissions (in intensity), achieved by implementing the measures described in the energy performance and air pollutant reduction plan) (Green Marine Environmental Program, 2015c).

Fig-1: CO2 Emissions from International Shipping



Source: 2nd IMO GHG study, 2009

Fig-1: Trajectories of the emissions from international shipping. Columns on the right –hand side indicate the range of results for the scenarios within individual families of scenario. Annual increases of CO2 1.32 emissions, in the range of 1.9–2.7%, are found in base scenarios, with extreme scenarios indicating increases of 5.2% and –0.8%, respectively. The increase in emissions is driven by the expected growth in seaborne transport. The scenarios with the lowest emissions show reductions in CO2 emissions in 2050 compared to emissions during 2007.

OBJECTIVES

To study about the greenhouse gas emissions from shipping industry.

PROBLEM OF THE STUDY

The environmental impact of maritime transport still generates negative impacts on the marine environment, including air pollution, greenhouse gas emissions, releases of ballast water containing aquatic invasive species, historical use of antifoulants, oil and chemical spills, dry bulk cargo releases, garbage. The climate impacts of emissions from ships was performed, Emissions from international shipping produce significant impacts on atmospheric composition, human health and climate. Increases in well-mixed GHGs, such as CO2, lead to positive “radiative forcing,”(RF) and to longlasting global warming. For 2007, the RF from CO2 from shipping was calculated to be 49 mW m⁻², contributing approximately 2.8% of total RF from anthropogenic CO2 in 2005. For a range of 2050 scenarios, the RF of CO2 from shipping was calculated to be between 99 and 122 mW m⁻², bounded by a minimum/maximum uncertainty range (from the scenarios) of 68 mW m⁻² and 152 mW m⁻². Climate stabilization will require significant reductions in future global emissions of CO2. The projected emissions from shipping for 2050 that have been developed for this work – which are based on SRES non-climate intervention policy assumptions – constitute 12% to 18% of the WRE450 stabilization scenario, which corresponds to the total permissible global emissions of CO2 in 2050 if the increase in global average temperature is to be limited to 2°C with a probability greater than 50%. While the control of emissions of NOx, SO2 and particles from ships will have beneficial impacts on air quality, acidification and eutrophication, reductions of emissions of CO2 from all sources (including ships and other freight modes) will be required to reduce global warming. Moreover, a shift to cleaner combustion and cleaner fuels may be enhanced by a shift to technologies that lower the emissions of CO2.

Measures to Reduce Ships’ Carbon Intensity

International Maritime Organization (IMO) adopts key mandatory measures to reduce ships’ carbon intensity; establishes ship rating system. New mandatory measures to cut the carbon intensity of international shipping have been adopted by the International Maritime Organization (IMO), setting shipping on a course to meet greenhouse gas reduction targets established in the 2018 Initial IMO Strategy for Reducing GHG Emissions from Ships. IMO’s Marine Environment Protection Committee (MEPC 76), meeting in a remote session from 10 to 17 June 2021, adopted amendments to the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI that will require ships to reduce their greenhouse gas emissions. These amendments combine technical and operational approaches to improve the energy efficiency of ships, also providing important building blocks for future GHG reduction measures.

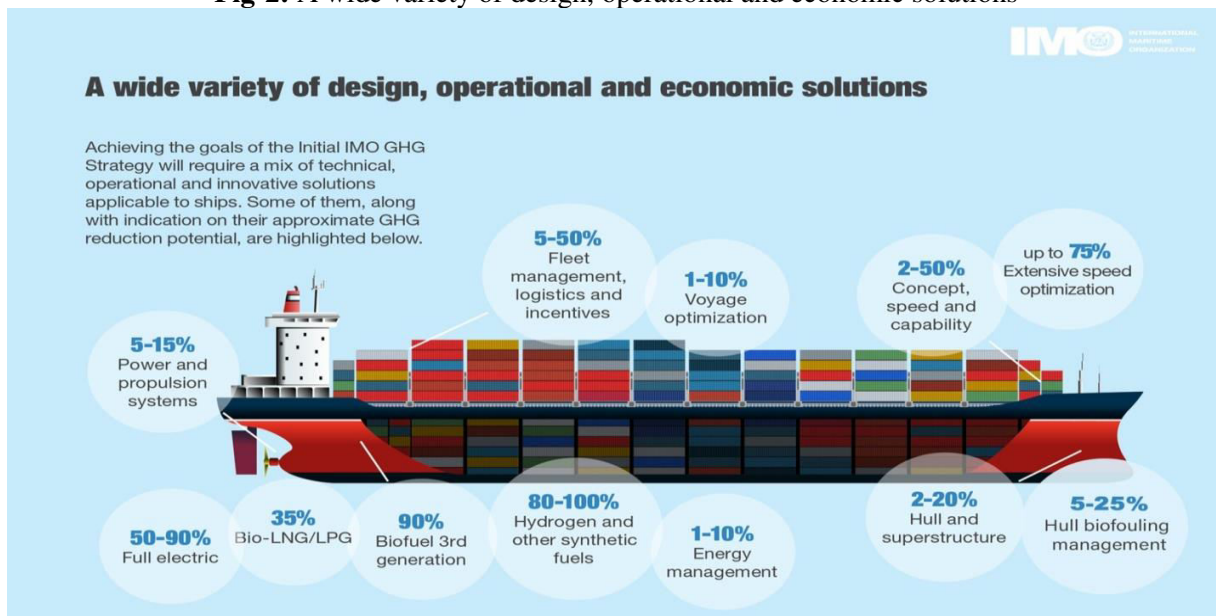
The new measures will require all ships to calculate their Energy Efficiency Existing Ship Index (EEXI) following technical means to improve their energy efficiency and to establish their annual operational carbon intensity indicator (CII) and CII rating. Carbon intensity links the GHG emissions to the amount of cargo carried over distance travelled. Ships will get a rating of their energy efficiency (A, B, C, D, E - where A is the best). Administrations, port authorities and other stakeholders as appropriate, are encouraged to provide incentives to ships rated as A or B also sending out a strong signal to the market and financial sector. A ship rated D for three consecutive years, or E, is required to submit a corrective action plan, to show how the required index (C or above) would be achieved. IMO Secretary-General Kitack Lim said the adoption of the new measures would build on IMO’s previously adopted mandatory energy efficiency measures, to lead shipping on the right path towards decarbonisation.

"The path to decarbonization is a long, but also a common path in which we need to consider and respect each other's views. We have made a considerable amount of progress since the start of our journey," Mr. Lim said, "... your progress will continue to provide the benefit of experience to be able to make ambitious, and evidence-based decisions for phase 3 of the implementation of the operational measure which will be further strengthened and developed taking into account the review of the short-term measure and the latest climate science," he added. The amendments to MARPOL Annex VI (adopted in a consolidated revised Annex VI) are expected to enter into force on 1 November 2022, with the requirements for EEXI and CII certification coming into effect from 1 January 2023. This means that the first annual reporting will be completed in 2023, with the first rating given in 2024. A review clause requires the IMO to review the effectiveness of the implementation of the CII and EEXI requirements, by 1 January 2026 at the latest, and, if necessary, develop and adopt further amendments.

Table-1: Pillars for Sustainable Maritime Development

Safety culture and environmental stewardship	Maritime security and antipiracy actions
Energy efficiency	Maritime traffic management
New technology and innovation	Maritime infrastructure development
Maritime education and training	Global standards at IMO

Fig-2: A wide variety of design, operational and economic solutions



This figure shows that in wide variety of design, operational and economic solutions in Maritime Transportation. 5-15 per cent of power and propulsion systems. 5-50 per cent of fleet management, logistics and incentives. 1-10 per cent of voyage optimization. 2-50 per cent of concept, speed and capability. Up to 75 per cent of extensive speed optimization. 2-20 per cent of hull and superstructure. 5-25 per cent of hull biofouling management. 1-10 per cent of energy management. 35 per cent of Bio-LNG/LPG. 50-90 per cent of full electric. 80-100 per cent of hydrogen and other synthetic. 90 per cent of biofuel 3rd generation.

CONCLUSION

Shipping is estimated to have emitted 1,046 million tonnes of CO₂ in 2007, which corresponds to 3.3% of the global emissions during 2007. International shipping is estimated to have emitted 870 million tonnes, or about 2.7% of the global emissions of CO₂ in 2007. Exhaust gases are the primary source of emissions from ships. Carbon dioxide is the most important GHG emitted by ships. Both in terms of quantity and of global warming potential, other GHG emissions from ships are less important. Mid-range emissions scenarios show that by 2050, in the absence of policies, carbon dioxide emissions from international shipping may grow by a factor of 2 to 3 (compared to the emissions in 2007) as a result of the growth in shipping. A significant potential for reduction of GHG through technical and operational measures has been identified. Together, if implemented, these measures could increase efficiency and reduce the emissions rate by 25% to 75% below the current levels. Many of these measures appear to be cost-effective, although non-financial barriers may discourage their implementation. Shipping has been shown, in general, to be an energy-efficient means of transportation compared to other modes. However, not all forms of shipping are more efficient than all other forms of transport. The emissions of CO₂ from shipping lead to positive “radiative forcing” (a metric of climate change) and to long-lasting global warming. In the shorter term, the global mean radiative forcing from shipping is negative and implies cooling; however, regional temperature responses and other manifestations of climate change may nevertheless occur. In the longer term, emissions from shipping will result in a warming response as the long-lasting effect of CO₂ will overwhelm any shorter-term cooling effects. If a climate is to be stabilized at no more than 2°C warming over pre-industrial levels by 2100 and emissions from shipping continue as projected in the scenarios that are given in this report, then they would constitute between 12% and 18% of the global total CO₂ emissions in 2050 that would be required to achieve stabilization (by 2100) with a 50% probability of success.

REFERENCE

1. Felício, J. A., Rodrigues, R., & Caldeirinha, V. (2021). Green shipping effect on sustainable economy and environmental performance. *Sustainability*, 13(8), 4256.
2. Lai, K. H., Lun, V. Y., Wong, C. W., & Cheng, T. C. E. (2011). Green shipping practices in the shipping industry: Conceptualization, adoption, and implications. *Resources, Conservation and Recycling*, 55(6), 631-638.
3. LEN, D. A. G. (2013). The flagship journal of international shipping and port research.
4. Lister, J. (2015). Green shipping: Governing sustainable maritime transport. *Global Policy*, 6(2), 118-129.
5. Lun, Y. V., Lai, K. H., Wong, C. W., Cheng, T. C. E., Lun, Y. V., Lai, K. H., ... & Cheng, T. C. E. (2016). Adoption of green shipping practices. *Green Shipping Management*, 17-29.
6. Lee, P. T. W., Kwon, O. K., & Ruan, X. (2019). Sustainability challenges in maritime transport and logistics industry and its way ahead. *Sustainability*, 11(5), 1331.
7. International Maritime Organization

ANALYSIS OF FINANCIAL STATEMENT OF TRICOLITE ELECTRICAL INDUSTRIES LTD.**Ms. Kashish Singhal¹ and Dr Gurpreet Kaur²**¹MBA 2021-23 and ²Assistant Professor, Institute of Technology and Science (I.T.S)**ABSTRACT**

This paper aims to conduct a financial analysis of Tricolite Electrical Industries Ltd. in terms of liquidity, solvency, operational effectiveness, and profitability. Management practices with a professional approach tend to boost the financial performance of the organisation by utilising certain cutting-edge tactics to minimise controllable costs and increase revenue.

INTRODUCTION

Scientific analytical financial statements, which primarily include Tricolite Electrical Industries Ltd.'s Balance Sheet and Profit & Loss account, serve as the foundation for financial analysis, planning, and decision-making. This financial report's executive summary includes detailed analytical information that may be used to evaluate the Tricolite Electrical Industries Ltd.'s operational effectiveness and financial stability.

What is Financial Statement?

Financial statements are a systematic portrayal of a company's financial health and performance. Financial statements are documents that describe a company's operations and financial performance. Government organizations, accounting companies, etc. frequently audit financial statements to guarantee accuracy and for tax, financing, or investing purposes.

The information in financial statements includes:

- i) Assets
- ii) Equities and liabilities
- iii) Gains and losses in relation to income and expenses;
- iv) Cash flows.

Significance of Analysis of Financial Statement

For many users, financial analysis is significant and beneficial in the following ways:

- (a) **Finance Manager:** Financial analysis techniques give the finance manager the ability to conduct ongoing analyses of the sugar factory's actual financial operations in order to identify the root causes of significant deviations, which may aid in the implementation of corrective measures.
- (b) **Top Management:** Financial analysis aids the Top Management in gauging the effectiveness of the business' operations, rating employee performance, and assessing the internal control framework.
- (c) **Trade Payables:** The ability of the sugar factory to satisfy its claims within a relatively short time frame, which assesses the factory's liquidity position, is of special relevance to the traders.
- (d) **Lenders:** Tricolite Electrical Industries Ltd.'s long-term viability and existence are a worry for banks and financial institutions. To evaluate the company's potential profitability and solvency, they examine the historical financial statements.
- (e) **Investors:** Investors who have staked money in a company's stock are curious about its profitability in the present and the future to determine how it will affect earnings.
- (f) **Others:** Economists, researchers, the government, etc. examine the financial statements to assess the situation of the economy in order to determine how prices should be set, taxes should be levied, and other related issues.

Tools of Analysis of Financial Statement

The following are the financial analysis methods that are most frequently used:

Common Size Statement:

In order to determine where we truly are in relation to the prior year and what the precise causes of deviation are, the common size statements analysis analyses each item with a base item of two separate years. The term "vertical analysis" also applies to this analysis.

INCOME	Notes	As at	As at	Percentage of Revenue from Operations (net Sales)	
		March 31, 2022	March 31, 2021	Previous Year (%)	Current Year (%)
		Rs. in Millions	Rs. in Millions		
Revenue from Operations	2.20	1,825.88	1,315.11	100	100
Other Income-Non-Operating Income	2.21	7.82	4.83	0.43	0.37
Total Income		1,833.70	1,319.94	100.42	100.37
EXPENDITURE					
Cost of Material Consumed	2.22	1,408.23	910.82	77.13	69.26
Changes in Inventory		(13.71)	67.36	(0.75)	5.12
Employee benefits expense	2.23	217.26	167.73	11.9	12.75
Financial Costs	2.24	24.75	24.97	1.36	1.90
Depreciation & Amortization exp	2.12	23.33	22.73	1.28	1.73
Other Expenses	2.25	109.50	93.75	6.0	7.13
Total Expenses		1,769.38	1,287.37	96.90	97.89
Profit Before Tax		64.32	32.57	3.52	2.48
Tax Expenses:					
Current tax / minimum alternative tax		19.55	9.20	1.07	0.7
Deferred tax (charge) / credit		(1.85)	(1.01)	(0.10)	(0.08)
Income Tax for earlier years		-	0.05	0	0.004
Profit / (Loss) for the period		46.63	24.33	2.55	1.85

Ratio Analysis:

It is a tool for comparing data from the company unit, other entities, and the industry from the previous year. It aids management in making wise decisions following analysis.

Ratios	Formulas	2021-22	2020-21	% Variance	Reason for variance
Current Ratio	Current Assets- Current Liabilities	1.33	1.36	-2.17%	NA
Debt-equity ratio	Shareholder's Equity - Long Term Debt	0.39	0.46	-14.78%	NA
Debt service coverage ratio	Net operating income/ Debt service	2.36	0.75	216.37%	Prepayment of Term Loan
Return on equity ratio	Net income / Average shareholder's equity	10.72%	6.10%	75.87%	Increase in Profitability due to increase in Turnover
Inventory turnover ratio	Cost of good sold / Average value of Inventory	5.63	3.46	62.52%	Better management of Inventory
Trade receivables turnover ratio	Net credit sales/ average accounts receivable	2.71	2.46	10.11%	NA
Trade payables turnover ratio	Net credit purchases / Average accounts payables	2.78	1.79	55.63%	Better Fund Flow Management

Net capital turnover ratio	Net sales / Working Capital	6.80	5.34	27.25%	Increase in Turnover
Net profit ratio	Net Profit / Net Sales	2.55%	1.85%	38.03%	Increase in Profitability due to increase in Turnover
Return on capital employed	Earnings before interest and taxes/ Capital Employed	17.00%	11.37%	49.54%	Increase in Turnover
Return on investment	Net Income / Cost of Investment	10.17%	5.91%	71.90%	Increase in Profitability due to increase in Turnover

Interpretation

- Prepayment of Term Loan
- Increase in Turnover
- Increase in Profitability due to an increase in Turnover
- Better Fund Flow Management
- Better management of Inventory

Trend Analysis:

In order to determine the percentage changes in particular data, trend analysis examines a company's financial history, operational outcomes, and financial condition over a period of years utilizing historical data.

Particulars	Rs. In millions			Trend percentage		
	Year 1 (2020)	Year 2 (2021)	Year3 (2022)	Year 1 % (2020)	Year 2 % (2021)	Year3 % (2022)
EQUITY AND LIABILITIES						
1) Shareholders fund						
a) Share capital	29.34	29.34	29.34	100	100	100
b) Reserves and Surplus	357.67	382.00	429.24	100	106.80	120.01
2) Noncurrent Liability						
Long term borrowings	29.90	47.15	28.17	100	157.69	94.21
3) Current Liability						
Trade Payables						
A) Total outstanding dues of micro enterprises and small enterprises	18.69	9.02	12.68	100	48.26	67.84
B) Total outstanding dues of Creditors other than micro enterprises and small enterprises	497.60	446.22	554.42	100	89.67	111.42
Total	933.2	913.73	1053.85	100	97.91	112.93
ASSETS						
1) Noncurrent assets						
a) Fixed assets						
Property, Plant & Equipment						
- Tangible Assets	219.03	218.54	200.59	100	99.78	91.58
- Intangible Assets	5.66	5.84	4.33	100	1.03	76.50
- Capital Work in Progress	1.53	0	0.44	100	0	28.76
b) Noncurrent investments	7.54	2.44	27.71	100	32.36	367.51
2) Current assets						

a)	Inventories	332.88	232.30	263.49	100	69.78	79.15
b)	Cash & cash equivalents	40.15	66.53	70.49	100	165.70	175.57
	Total	606.79	525.65	567.05	100	86.63	93.45

Interpretation

The financial trend is shown in the above table to be negative in 2021 due to COVID 19, but it is changing to positive as a result of the company's improved financial management year after year.

Cash Flow Statement:-

It is the examination of the real movement of cash within an organization. Cash inflow and outflow are terms used to describe the movement of money into and out of Tricolite Electrical Industries Pvt Ltd. The net cash flow is the difference between the inflow and outflow of cash.

Cash Flow Statements of Tricolite Electrical Industries Limited for the Year Ended March 31, 2022

	Particular	For the year ended 31.03.22	For the year ended 31.03.21
A	Cash Flow from Operating Activities	64.32	32.57
	Adjustment for:-		
	Depreciation	23.33	22.73
	Interest Income/ Other Income	(7.01)	(3.53)
	Loss on sale of Assets	0.52	0.71
	Profit on sale of Assets	-	(0.56)
	Profit on sale of Investment	(0.03)	(0.24)
	Interest Paid	18.45	19.56
	Foreign Exchange Gain/(Loss)	-	(0.47)
	Profit from Share of Profit from JV	(0.78)	-
	Defferred Tax Asset	(1.85)	(1.01)
	Operating Profit Before Working Capital Changes	96.94	69.77
	Decrease/(Increase) in Debtors	(109.65)	(169.11)
	Decrease/(Increase) in Inventories	(31.18)	100.58
	Decrease/(Increase) in Loans & Advances	(8.84)	20.36
	Increase/(Decrease) in Other Liabilities	11.99	20.93
	Increase/(Decrease) in Creditors	111.86	(50.44)
	Cash Generated from Operations	71.13	(7.91)
	Income tax Paid	(17.70)	(8.24)
	Net Cash Generated from Operations	53.43	(16.15)
B	Cash Flow from Investing Activities		
	Proceeds from Sale of Fixed Assets	0.58	9.14
	Purchase of Fixed Assets	(5.41)	(30.19)
	Sale/(Purchase) of Investment	(24.66)	5.10
	Profit on Sale of Investments	0.03	0.24
	Profit from Share of Profit from JV	0.78	-
	Interest Income/ Other Income	7.01	3.53
	Net Cash from Investing Activities	(21.67)	(12.18)
C	Cash flows from Financing Activities		
	Proceeds/(Repayment) of Long Term Borrowings	(16.13)	5.95
	Proceeds/(Repayment) from Short Term Borrowings	9.62	56.14
	Proceeds from Car Loan	-	21.22
	Repayment of Car Loan	(2.86)	(9.51)
	Interest Paid	(18.45)	(19.56)
	Decrease/(Increase) in FDR	(4.42)	(26.85)
	Foreign Exchange Gain	-	0.47
	Dividend	-	-
	Net Cash received from financing activities	(32.22)	27.86
	Net increase in cash and cash equivalents	(0.46)	(0.47)

	Cash and Cash equivalents at the beginning of the period	0.46	0.93
	Cash and Cash equivalents at the end of the period (Note A)	-	0.46
	Note A:		
	COMPONENTS OF CASH AND BANK BALANCES		
	Cash and cash equivalents		
	Cash on hand	-	-
	Balances with banks:		
	In current accounts	-	0.46
	Cash and cash equivalents at the end of the year	-	0.46
	Effect of exchange rate changes	-	(0.47)
	Cash and cash equivalents at the end of the year as restated	-	(0.02)

Interpretation

The company's two-year cash flow statement reveals that COVID 19 has increased operating profit but decreased cash received from financing and investing activities, leaving zero in cash and cash equivalent at year's conclusion.

CONCLUSION

Through an investigation of the links between these numerous financial elements, financial ratio analysis and common-size analysis assist in determining the financial performance and condition of a company. Examining a company's profitability, solvency, liquidity situation, and effectiveness in using its assets are all necessary components of a thorough financial analysis. To understand where a company has been, we can apply the methods of common-size analysis and financial ratio analysis. Then, using pro forma analysis to anticipate the income statements and balance sheets of the company for subsequent periods, we use relationships between financial statement accounts to determine how the performance is expected to change. The influence of COVID-19 is minimal, but the corporation makes an effort to highlight the success of various financial analysis kinds, which are now crucial to improving the sick units' financial situation.

INDIAN PETROLEUM SUPPLY CHAIN TO SRI LANKA: A GEOPOLITICAL BUSINESS PERSPECTIVE**¹Professor Kumar Biswas and ²Dr. Shailendra Kumar Dube**

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ABSTRACT

Two Asian neighbors— India and Sri Lanka, have relationship spanning several centuries. With aggressive China making inroads into Sri Lanka, India is using Petroleum to Sri Lanka, among other avenues, as a geo-political business tool.

This paper explores the strategies of Indian Government, using petroleum supply chain management to thwart the advances of China and win over Sri Lankan population. It also examines the probable future prospect along the energy corridor.

Keywords: Petroleum, Supply chain management, Strategy, Indian Ocean Region, Soft diplomacy, Renewable energy.

1.0 INTRODUCTION

India and Sri Lanka are two neighboring Asian countries having cultural, social, racial, commercial, political, linguistic and religious relationship spanning more than 2500 years. In the fourth century BCE, one son of Maurya Emperor Ashoka of India, named Mahinda had introduced Buddhism into Sri Lanka. Besides religious relations, economic and trade relationship between two nations dates back almost the same period.

Once upon a time, both the countries were ruled by British Empire. India got independence on 15th August 1947 and Sri Lanka was freed from British Rule, only six months later, on 04th February 1948. Thus, they are countries of Commonwealth of Nations.

Noble Laureate Indian poet Rabindranath Tagore had composed the national anthem of India (Jana Gana Mana) and had influenced that of Sri Lanka (Namo Namo Matha), composed by Ananda Samarakoon.

These two countries are historically connected through several ways. Since time immemorial, two countries have been living in great harmony, courtesy the rulers and religious influencers / preachers of both sides. Under geographical context, India is the only neighbor of Sri Lanka.

As per popular belief of a section of worshippers of Lord Rama, the Hindu God of epic Ramayana, there exists an underwater bridge between Southern India and Sri Lanka. They call it Ram Setu (bridge), supposed to be built by the monkey army of Lord Rama, connecting India and Sri Lanka. In the parlance of geography, it is known as Adam's bridge. At one end of it is Dhanushkodi of Pamban Island of India, and Mannar island of Sri Lanka is situated on the other end. Satellite images have proved its existence and geologists argue that it was a strip of land connection between two landmasses which existed in ancient time and now is submerged under water.

In today's time, there is one different kind of passageway which is also invisible and connects two countries. It is the flow of liquid black gold petroleum, from India to Sri Lanka, across the water. The trade and supply chain of petroleum products are binding two neighbors, stronger than ever in the history. Today these two Asian neighbors are strongly tied together through an energy corridor - petroleum.

2.0 LEARNING OBJECTIVES

A study was undertaken to understand the soft diplomacy of India in entering into petroleum business of Sri Lanka.

2.1 Examine whether is it only from international business point of view or more driven by the geopolitics of the south Asia Pacific region? Is the bilateral petroleum-based association purely on geo-economic ground or any strategic angle involved?

2.2 Qualitatively measure the influence of petroleum supply chain on the bilateral relationship

2.3 Explore, in the long term, how petroleum or rather energy scene is likely to emerge between two nations?

3.0 SRI LANKA

As per available documents, the country has historical references, dating back 3000 years. Since ancient times, the island nation has been referred under various names viz., for Greek sailors it was Taprobane, for Arab traders it was known as Serendib, and European geographers mentioned it as Ceylon on their marine maps. The name Ceylon was popular among international traders and sailors. The country is geographically situated in a strategic shipping trade route. The name changed from Ceylon to Sri Lanka in the year 1972. Today it is Democratic Socialist Republic of Sri Lanka. Because of the shape of the island like a teardrop, the country is also known as Teardrop of India.

Southern India and Sri Lanka are separated by Palk Strait and Gulf of Mannar of mighty Indian Ocean. On Indian side, it is the Tamil Nadu state and on the other side, it is Jaffna district of the Northern Province of Sri Lanka.

Due to limitation of draft, only small vessels and fishing boats can pass through the Palk Strait. For big ships, the normal shipping route is around Sri Lanka. Because of its strategic coordinate on a major international naval trading route, the country was always a focal point of several European countries. Many wars have been fought, since historical times, by the colonial powers, to take over and control the island nation.

The landmass of the nation spreads over an area of 65,610 square kilometers. According to Worldometer elaboration of the latest United Nations data, as on 15 April 2023, the population of Sri Lanka was 21,662,450. The country and its citizens have been experiencing growing demand as well as facing shortage of energy resources over past a few decades.

Today Sri Lanka is a spectacular cauldron of multi-culture, multi-religion and multi-lingual citizens. Major ethnic groups are -

- a. Sinhalese
- b. Tamils
- c. Muslims
- d. Burgers

Major religions practiced are -

- a) Buddhism
- b) Hinduism
- c) Islam
- d) Christianity

Major spoken languages are -

- A. Sinhala
- B. Tamil
- C. English

The Sinhala society has distinct influences of Portuguese, Dutch and British rulers of yesteryears, including Indian inspirations.

3.1 ENERGY SCENARIO OF SRI LANKA

The energy sector of Sri Lanka is governed by twin ministries viz., one is Ministry of Power, Energy and Business Development (for power sector) and another one is Ministry of Petroleum Resources Development (for petroleum business). The regulatory role is played by the Public Utilities Commission of Sri Lanka (PUCSL). The renewable energy domain is looked after by Sri Lanka Sustainable Energy Authority (SLSEA).

Both public sector enterprises and private sector companies are involved in different domains of energy business. However, the state-owned public-sector entities play a larger role in managing the business. Private sector enterprises are more actively associated with power distribution, distribution of oil and gas, and limited oil and gas exploration activities, etc.

As per available data of 2017, on the demand side in Sri Lanka, following are the share-outs of energy demand:

- A. Domestic households + Commercial users = 40%
- B. Transport sector = 36%
- C. Industry segment = 34%

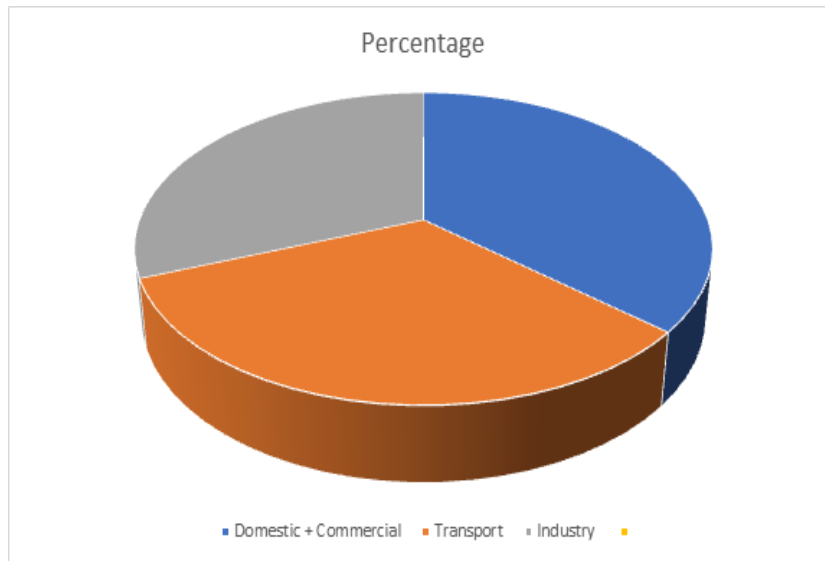


Fig 1: Share-out of energy demand of Sri Lanka

On the supply side, following are the contributions of the resources in the energy basket:

- a) Petroleum = 43%
- b) Biomass = 37%
- c) Coal = 11%
- d) Hydro-electricity = 6%
- e) Renewable energy = 3%

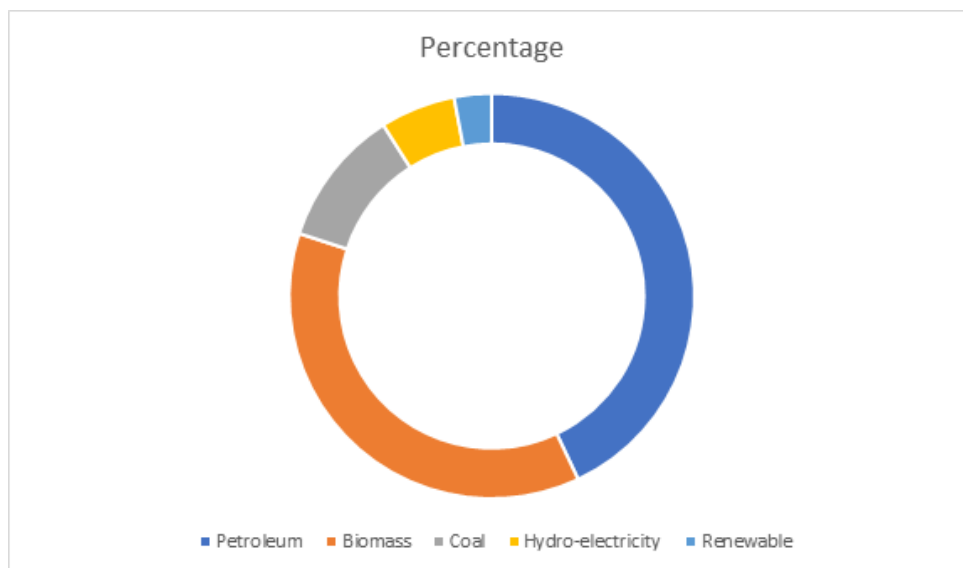


Fig. 2: Energy supply side basket of Sri Lanka

Sources of the components of the energy basket are as under:

- a. **Coal:** Import
- b. **Petroleum:** Crude oil (30-40% of demand) through import for refining + Balance as finished products through direct import
- c. **LPG:** Import + part from the domestic refinery
- d. **Renewables:** Domestic sources

Sri Lanka has set the target of net zero by 2050. Being an island nation, the country has abundance of sunlight and vast coastline (1,585 km long). Thus, it has immense potential for renewable energy sources viz., solar energy, wind energy etc. The ambitious future plan to add capacities, between 2018 to 2037 is as under:

Thermal Powered Generation

- A. Coal based power = 2,700 MW
- B. Petroleum oil-based power = 425 MW
- C. Natural gas-based power = 1,500 MW

Hydro Powered Generation

- a. Large hydro projects = 842 MW
- b. Small hydro projects = 215 MW

Renewable Resources Powered Generation

- a) Solar power = 1,389 MW
- b) Wind power = 1,205 MW
- c) Biomass power = 85 MW

However, the above is subject to various internal and external factors. In Sept'2022, Sri Lanka government has announced that no more coal based thermal power plant would be set up in the country. However, if need be, it may upgrade and expand the existing power plants.

3.2 IMPORT OF CRUDE PETROLEUM OIL AND FINISHED PRODUCTS BY SRI LANKA

During 2020, crude petroleum oil was the fourth top ranking import item for Sri Lanka. Total crude petroleum oil import was worth USD 384 million and main suppliers were: -

United Arab Emirates = USD 361 million

Egypt = USD 23.1 million

And others viz. South Korea, USA, Italy etc.

In the year 2020, refined petroleum products were the topmost import item for Sri Lanka. The imports of petroleum products for the year from source countries are as under:

Singapore = USD 367 million

India = USD 259 million

Malaysia = USD 210 million

United Arab Emirates = USD 143 million

China = USD 127 million

3.3 CONSUMPTION OF PETROLEUM PRODUCTS IN SRI LANKA

Petroleum oil consumption of Sri Lanka: -

1965 = 15.364 barrel per day (bpd) – for reference purpose

2019 = 135.362 bpd (highest ever)

Dec 2020 = 122.592 bpd

Dec 2021 = 118.525 bpd

3.4 CEYLON PETROLEUM CORPORATION (CPC)

In 1961, Government of Sri Lanka nationalized all existing private oil companies operating on the soil of the country. The combined new entity was established as Ceylon Petroleum Corporation (CPC) in the year 1962, fully owned by the government. In 1969, government again permitted international petroleum companies to have establishment in the country.

3.5 PETROLEUM OIL REFINERY

Sri Lanka, as a country, though has undertaken certain exploration activities, is yet to discover any economically viable domestic source of petroleum crude oil and natural gas. In Aug 1969, in collaboration with National Iranian Oil Company, a petroleum oil refinery was established at Sapugaskanda. Since there is no source of domestic crude oil, the input crude oil is imported. Initially the refinery processed Iranian light crude oil. Today it processes other crude oils of similar characteristics viz., Upper Zakum, Miri light crude oils etc. The refinery at Sapugaskanda (capacity 38,000 barrels per day) is the only refinery of the country and is operated by Ceylon Petroleum Corporation (CPC).

3.6 ENERGY INFRASTRUCTURE OF SRI LANKA

3.6.1 Port infrastructure

As an island nation, Sri Lanka has strong marine infrastructure.

The following are major marine ports:

1. **Colombo-** Operated by Sri Lanka Port Authority (formed in 1979). It is a major container handling port in this region. Colombo port is the transit point for to and fro cargo for Asia (East and South), Persian Gulf, EU, East Africa, etc.
2. **Galle-** A natural harbor, popular for yachting but not fit for bigger vessels due to draft limitation. A secondary port. It has approval for handling petroleum oil and natural gas vessels.
3. **Trincomalee-** The second-best natural harbor in the world. The oil jetty has LOA (length) 200 m and 9.75 m alongside draft. A significant port for supply chain management of petroleum products of the country.
4. **Hambantota International Port-** A port developed under PPP (Public Private Partnership) model by the government of Sri Lanka and CM Port of China. Afterwards, when Sri Lanka failed in repayment of Chinese loan, in 2017, it was forced to hand over the port to China for a lease of 99 years. Besides other terminals, the port has two oil terminals, each of 300 m LOA and 17 m draft.

There are a few other ports viz. Kankasanthurai and Oluvil ports.

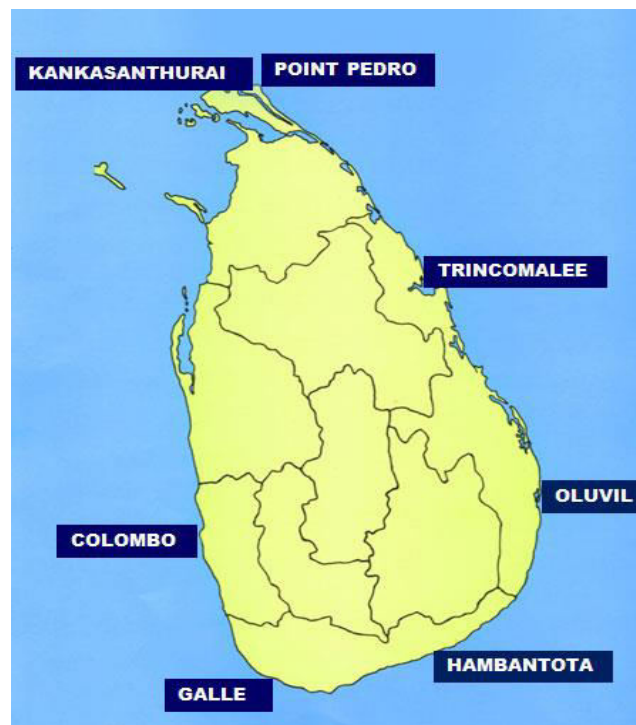


Fig 3: Major ports of Sri Lanka (Source: Internet)

3.6.2 Trincomalee Port

Trincomalee, under the then British rulers, was a critical logistics base in Indo-pacific World War II theatre. At China Bay, Trincomalee, 100 number of above ground tanks were constructed by the British Government, between 1924 and 1930, for storage of petroleum products as logistics support for their war machineries. Due to bombing by Japanese fighter aircraft, one storage tank was destroyed and 99 tanks were left. At the end of the World War II, British left Sri Lanka. Subsequently, this infrastructure was abandoned. Over the years, because of idling, there was growth of vegetation, in and around the abandoned oil terminal and today it is under a cover of thick vegetation. Trincomalee tank farm is divided into two parts - Upper and Lower farm. The upper tank farm has 84 tanks and there are 15 tanks in the lower tank farm.

Redevelopment of Trincomalee tank farm as joint efforts between two countries, dates back an Indo-Sri Lankan Agreement of 1987. The agreement assures that the respective territories (Trincomalee inclusive) would not be used for activities which are prejudicial to the unity, integrity and security of each other. Much later, in the year 2003, Sri Lanka agreed to lease idling British era petroleum storage tanks to Lanka IOC. They handed over 15 storage tanks (lower farm) out of 99, to Lanka IOC for a lease period of 35 years.

3.6.3 Rail Network

Sri Lanka Railways is the national railway agency owned by the government. It has railway network which spans 1447 kilometers.

Out of 11 Lines of Credit (LOC) extended by Export Import Bank of India, during last 15 years to Sri Lanka, among others, several railway centric projects have been undertaken. Laying of new railway track (Omanthai-Pallai), relaying of railway line (Pallai-Kankesanthurai), upgradation of existing railway track (Colombo to Matara), to quote a few. While some of them are related to passenger traffic, a few benefited transportation of petroleum products. Supply of diesel locomotives, tank wagons etc., by Indian government to Sri Lanka, are a few of them.

3.6.4 Road Infrastructure

Sri Lanka has one of the highest road densities of the world. The country has about 1.5 km of paved roads per one km square of the land. The total length of paved road for the country is more than 100,000 km. Sri Lanka has huge demand of automotive fuels and marine fuels for meeting the demand of the transport sector.

4.0 India

India with a population of 1.3 billion (nearly 17% of global population), second largest populous country in the world, next to China, has an insatiable demand of energy. While the domestic production of crude petroleum oil and natural gas is on the decline, the demand for the same is increasing by leaps and bounds over the years. India depends on import to support its domestic demand. Nearly 85% of petroleum oil and 15% of natural gas are imported from international market. While the demand of petroleum products for the year 2021-22 was 204 million metric tonnes, the refining capacity of the nation was 250 million metric tonnes (both figures rounded off). Thus, India has surplus refined petroleum products, after meeting domestic demand. The country has moved from net importer of petroleum products status to net exporter of the same. This is due to excess combined refining capacities of public sector and private sector refineries of the country. As India exports refined petroleum products to advanced countries and developing countries, it cannot ignore the demand of its next-door neighbors viz., Nepal, Bangladesh and Sri Lanka.

India has a 'Neighborhood First' policy. According to that Sri Lanka fits in which in turn protects strategic interest of India in Indian Ocean Region (IOR). Under this policy, India has extended USD 4 billion of line of credit to Sri Lanka. The domains, in which the financial and technical assistance extended were fuel, fertilizer, pharmaceuticals, defense, infrastructure, railway transport, renewable resources etc.

India has enormous demand for energy which is controlled and monitored by various ministries of government of India:

1. Ministry of Petroleum and Natural Gas
2. Ministry of Power
3. Ministry of Coal
4. Ministry of Renewable Energy and Climate Control etc.

4.1 India's interest in Sri Lanka

In the given geo-politics, geo-economics and geo-strategic attentions of Indo-Pacific region, the interest of India about its southern neighbor stems from various factors.

Some of them are:

1. Sri Lanka has a very large population of Tamil speaking citizens.
2. In May 2009, the armed conflict between Sri Lankan Forces and the Liberation Tigers of Tamil Eelam (LTTE), which spanned nearly three decades, came to an end. While government of India supported Sri Lankan government's action against terrorism, at the same time, it conveyed the concern for the civilians caught between two warring sides.
3. The India Sri Lanka Free Trade Agreement (ISFTA) was signed by Chandrika Bandarnaike Kumaratunga, the then President of Sri Lanka and Atal Behari Vaipayee, the then Prime Minister of India on 28 December 1998. It came into force effective 01 March 2000. Signing of ISFTA has paved the way of expansion of trade volume between two countries
4. Besides, both countries are signatories of South Asia Free Trade Agreement (SAFTA)

5. Traditionally, India has been largest trade partner of Sri Lanka
6. Within SAARC members, Sri Lanka is the largest trade partner of India
7. India has investment on Sri Lankan soil in the areas of petroleum, tourism and hotel, IT and telecommunication, real estate, manufacturing, banking and financial services etc. Renewable energy is likely to expand the list
8. As mentioned above, India has surplus petroleum products which are exported to both of developed and developing nations. On one hand, India exports Euro Grade VI refined automotive fuels to countries like USA, EU member countries and at the same time Euro Grade IV refined products find way to export market of African countries and others. Logically, it makes sense to explore the opportunity at next door market.
9. Colombo port is situated on the strategic shipping route through which ships crisscross Indian Ocean. It is a vital port between exporters of gulf countries and consumer countries of Asia. The port has twin attraction – one is lucrative bunker business and another one is transshipment operations of container vessels. It will not be out point to mention that more than 70% of transshipment that happen in Colombo port has origin from Indian ports. The supply of marine fuel to the vessels is called bunker. Besides bunker business, several other commercial activities also take place at Sri Lankan ports viz., supply of fresh water, crew change etc., all are revenue generators

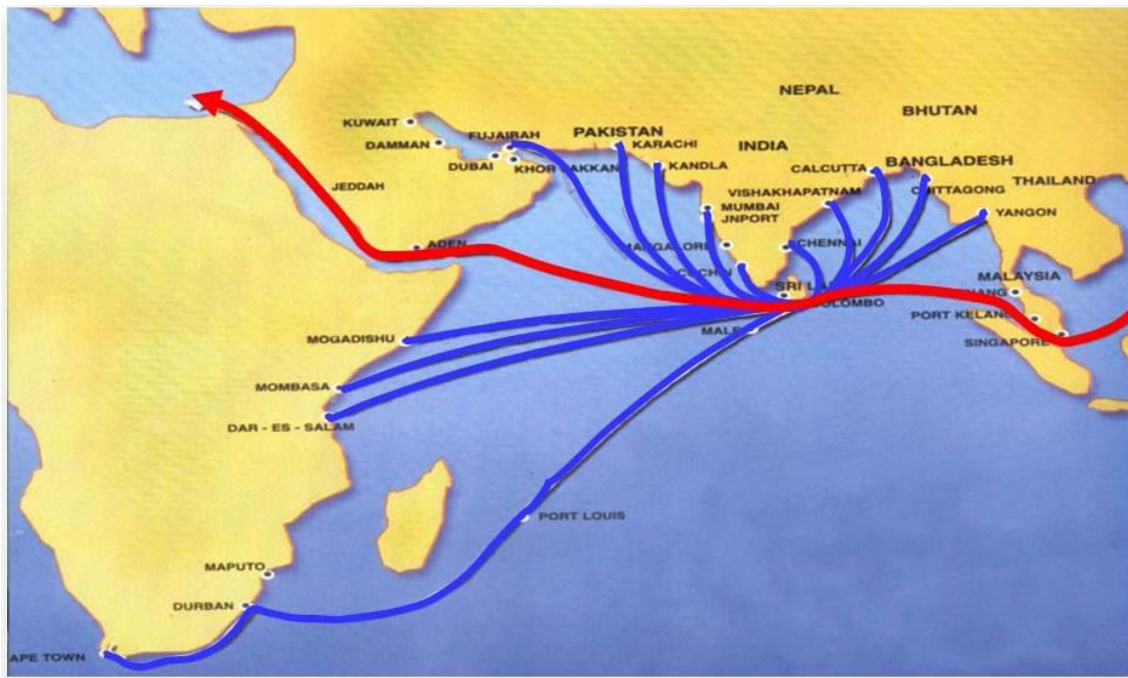


Fig 4: Trade/energy sea route around Colombo (Source: Internet)

10. China is expanding its military presence in Indian Ocean Region (IOR) and has developed friction with all its neighboring countries. In Sri Lanka, China has scored brownie points by taking early lead under the disguise of BRI scheme. Presence of China, on the soil of Sri Lanka is not at all a good sign for India from national security point of view. There was an urgent need of diplomatic move to counter the move of China. It was possible only when India would have a foothold on Sri Lankan soil.

Based on the diplomatic and commercial considerations, it was prudent for India to use petroleum products and its supply chain as tactical tool to enter Sri Lanka.

4.2 STRATEGIES OF INDIAN GOVERNMENT

4.2.1 Strategy No. 1: Lanka IOC

In 2003, Indian Oil Corporation Ltd., a public sector enterprise of Government of India, incorporated a wholly owned subsidiary named Lanka IOC (LIOC) to spearhead the entry into petroleum business in Sri Lanka. The shareholding is as under:

Indian Oil Corporation Limited = 75.12%

J B Cocoshell (Pvt) Ltd = 3.00%

Ceybank Unit Trust = 1.13%

Balance Others

Post-nationalization, there was no private or MNC oil company operating on the soil of Sri Lanka. Ceylon Petroleum Corporation (CPC) enjoyed monopoly over the market. At this time, with the entry, Lanka IOC became only private player in petroleum business in Sri Lanka.

4.2.2 Strategy No. 2: Term Contract of Lanka IOC

In the beginning, in the year 2002, Indian Oil Corporation Ltd., entered into a term contract with government of Sri Lanka. According to the contract India would export 30,000 tonnes of gas oil (diesel) and 10,000 tonnes of jet fuel (JetA1) per month till 30 September 2003, which was later extended till 31 December 2003. Term Contract is a type of agreement wherein a state contracting agency accepts a bid for supplies (products or materials) at an agreed price for a specific period of time.

4.2.3 Strategy No. 3: Terms of agreement

A deal was struck sometime in the year 2003 for \$75 million between Indian oil Corporation Ltd., and Government of Sri Lanka to obtain marketing right for automotive fuels by Indian Oil into Sri Lankan market. The retailing of petroleum products would be through Lanka IOC. The terms of the agreement would allow Indian Oil to -

1. Export petroleum oils from India into Sri Lanka
2. Own and operate 100 petrol bunks, including modernization after purchase and take over from Ceylon Petroleum Corporation
3. Acquire additional petrol stations of franchise model under Lanka IOC umbrella
4. Share the existing petroleum infrastructure of Ceylon Petroleum Corporation viz., storage terminals, pipelines etc.
5. Takeover of 15 old British era above ground storage tanks (out of total 99 tanks, each of capacity of 12,000 kiloliters,) at a tank farm at China Bay, Trincomalee, on a lease of 35 years
6. Import of Aviation Turbine Fuel or Jet Fuel
7. Enter into aviation business by building Aviation Fueling Station at Bandaranaike International Airport (CMB) or Colombo international airport etc.

On 05 January 2022, government of Sri Lanka executed a new agreement with Lanka IOC to lease 75 storage tanks. This was in line with securing fuel credit worth USD 500 million from government of India at the backdrop of unprecedented economic crisis caused by shortage of foreign exchange. According to the revised agreement, the new lease structure of Trincomalee tanks would be as under:

Lanka IOC = 14 Tanks (already under operating condition) on 50-year lease

Trinco Petroleum Terminal Private Ltd. = 61 tanks to be redeveloped

Ceylon Petroleum Corporation = 24 tanks

Total number of tanks = $75+24 = 99$

In other words, while Lanka IOC will have stake in $14+61 = 75$ tanks, Sri Lanka will have stake in $61+24 = 85$ storage tanks, in some form or other. This agreement would make earlier 2003 agreement between Lanka IOC and Sri Lankan government null and void.

Shareholding of Trinco Petroleum Terminal Private Ltd., is as under: -

Ceylon Petroleum Corporation = 51 %

Lanka IOC share = 49%

Others' share = 1%

Besides, a JV was formed by Lanka IOC and Ceylon Petroleum Corporation named Ceylon Petroleum Storage Terminals Limited. Lanka IOC has 1/3 share-holding. The JV company operates 13 oil terminals in the island nation.

4.2.4 Strategy No. 4: Expansion plan

At present, Lanka IOC operates 200+ petrol bunks in the country as against that of 1100+ operated by Ceylon Petroleum Corporation. Lanka IOC has announced that it would add 50 more fuel retailing stations in the country. Also, tap the full potential of the lucrative bunker business at Sri Lankan ports.

4.3 Inward logistics of petroleum to Sri Lanka

The distance between Chennai port in east coast of India and Colombo port of Sri Lanka is 401 nautical miles. Indian Oil Corporation Ltd., has its refinery at Chennai, under its subsidiary – Chennai Petroleum Corporation Ltd., (formerly Madras Refinery Ltd.).

Cochin (Kochi) port in west coast of India, is 353 nautical miles away from Colombo port. The Kochi (known as Cochin earlier) refinery belongs to another public sector company of India – Bharat Petroleum Corporation Ltd.

These are two nearest refinery locations of public sector enterprises of India for Sri Lanka.

Indian Oil Corporation Ltd., has another large refinery in east coast at Paradip, Odisha which is 1122 nautical miles apart from Colombo.

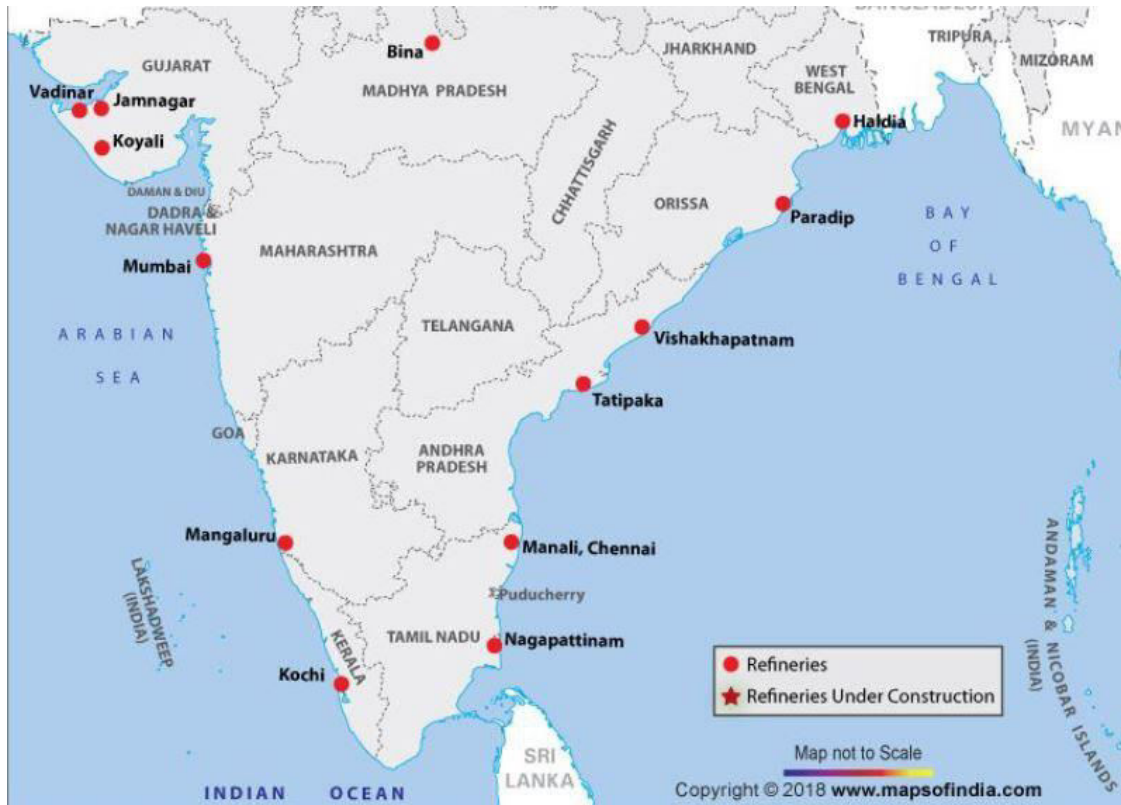


Fig 5: Refineries of East, West & Southern India

However, distance alone is never a single-most criteria for an efficient and cost-effective supply chain management. Product availability, tax structure, geo-economics etc., play significant roles in decision making process for international petroleum trading. In order to maintain global standard of importation of petroleum products into Sri Lanka, Lanka IOC follows the route of tendering in the market. The respondents for the floated tender for import are generally large global petroleum oil traders viz. Trafigura, Vitol, Glencore etc. Sometime Reliance Petroleum Ltd., with its refinery at Jamnagar, Gujarat in the west coast of India would also participate in the tender process. Even Indian Oil Corporation has to participate into tough competition of tendering process to supply its own subsidiary Lanka IOC. The objective is to import products at most transparent way at competitive price.

Apparently, no surplus petroleum product is available ex- Chennai Petroleum Corporation Ltd., after meeting its local demand. This has caused Indian Oil Corporation Ltd., look for alternative sources for supplying to Lanka IOC. In the east coast, it has adequate product available at its own Paradip refinery. On the west coast, refinery of Reliance Petroleum Ltd., which provides adequate surplus products. Thus, input to Lanka IOC by major suppliers can be classified as under:

- I. **Global Traders:** From Singapore or other sources
- II. **Reliance Petroleum Ltd.:** From Jamnagar refinery
- III. **Indian Oil Corporation Ltd.:** Either from Paradip refinery or sourcing from Jamnagar refinery of Reliance Petroleum Ltd., under commercial terms

5.0 SRI LANKA AND CHINA

China has been considered as all-weather friend of Sri Lanka. China made large investment in port and airport, roadways and railway projects etc., in Sri Lanka. President Gotabaya Rajapaksha had preference for China over India, as economic partner, resulted China surpassing India in 2016 as largest import partner.

5.1 Debt Trap

Along with other 151 countries and 32 international organizations, Sri Lanka too has joined the ambitious Belt-Road Initiative (BRI) of Chinese President Xi Jinping. Like several low-income countries, Sri Lanka too has fallen into Chinese debt trap. This has caused rising public debt, economic mayhem and outburst of public anger in the country. According to AidData, following was the status of debts of a few top defaulter countries:

1. Pakistan = \$77.3 billion
2. Angola = \$36.3 billion
3. Ethiopia = \$7.9 billion
4. Kenya = \$7.4 billion
5. Sri Lanka = \$7.0 billion

For comparison purpose, for a typical loan, the rate of interest and repayment period between Chinese money vs OECD-DAC (Germany, France or Japan) loan are as under:

Chinese interest rate = 4.2%

OECD-DAC interest rate = 1.1%

Chinese loan repayment period = 10 years

OECD-DAC repayment period = 28 years

By the end of June 2022, Sri Lanka owed nearly USD 40 billion to bilateral, multilateral and commercial loans and Chinese loans amounted to about USD 8 billion (20 % of the total debt owed).

6.0 INDIA, SRI LANKA, AND CHINA

6.1 Colombo International Container Terminal (CICT)

CM Ports (China Merchant Port Holdings), a Chinese port operator is one of the top ten global port terminal operators. It has operations at 40+ ports, across the globe. In 2011, CM Ports and Aitken Spence, a Sri Lankan conglomerate, entered under BOT model for Colombo International Container Terminal (CICT) at USD 500 million. During 2012, Aitken Spence sold their share to CM Ports whose stake increased to 85%. In the year 2013, the terminal was commissioned.

In Dec 2017, Sri Lanka defaulted in loan repayment of \$1.4 million, it had borrowed from Beijing. Loan defaulter Sri Lanka compelled to give CM Port, China another port - Hambantota (260 kms south of Colombo), on 99-year lease, plus another 99 years after expiry of the first.

Meanwhile the throughput of the terminal kept on increasing. During 2019, Colombo port handled 7.2 million containers and CICT handled 40%. It will not be out of point to mention that 70% of transshipment containers at this port was of Indian origin.

6.2 Chinese submarine

On 31 Oct' 2014, a Chinese submarine (Changzheng-2) and warship (Chang Xing Dao) docked at Sri Lankan port Colombo for five days. Considering it as a serious security threat, India raised strong objection to the Sri Lankan authority through diplomatic channel. In the face of India's tough and fierce protest, Sri Lanka agreed not to grant further similar permission. In May 2017, when China requested for berthing for another submarine at Sri Lankan port, it was rejected.

6.3 MV BBC Naples

A Chinese vessel named MV BBC Naples, on its way from Rotterdam to China, berthed at Hambantota port in April 2021. It was found that the vessel was on-carrying undeclared radioactive Uranium Hexafluoride. After lots of hue and cry, on 21 Apr 2021, the vessel was forced out of Sri Lankan water.

6.4 Yuan Wang 5

A third-generation Chinese surveillance ship, with space tracking capabilities, was scheduled to berth Sri Lankan port Hambantota on 11 Aug 2022. The vessel was viewed as 'dual-use spy ship' by India. According to

US Defense Department, the vessel belongs to People's Liberation Army (PLA) of China, with capabilities of tracking satellites, missile launching systems etc. A major diplomatic friction erupted between Indian and Sri Lankan governments. Consequently, the berthing was delayed and after berthing on 16 August 2022, it stayed for six days, and left the port of 22 Aug 2022 for next port of call - Jiang Yin of China.

6.5 Yuan Wang 6

Nov'2022: India planned a launch of long-range missile and Chinese spy vessel 'Yuan Wang-6' entered Indian Ocean Region (IOR). However, the Indian missile launch program was deferred.

Dec'2022: India rescheduled its missile launch and 'Yuan Wang-6' again appeared in IOR.

Both these cases cannot be mere coincidental.

6.6 Remote satellite ground station

In order to enlarge its footprint on Sri Lankan soil, China has proposed to set up a remote satellite receiving ground station system in Sri Lanka. The facilities will be set up by Aerospace Information Research Institute under the Chinese Academy of Sciences and the University of Ruhuna in southern Sri Lanka. Once operational, it will be a direct threat to sensitive Indian security information through clandestine interruption. It is no secret that Chinese satellite facilities are employed for dual-use purposes. Apparently, it is meant for civilian application but since Chinese civil space program works in tandem with Chinese military authorities, it is very easy to join the dots. Once set up, these Chinese facilities in Sri Lanka, can interfere and possibly interrupt Indian space operations at Sriharikota and Dr. Abdul Kalam Island (formerly Wheeler Island) off the coast of Odisha. This stationary facility will be in addition to berthing facilities of so-called survey vessels of Chinese People's Liberation Army (PLA) at Hambantota port of Sri Lanka.

6.7 IMF

Under COVID-19 situation, due to drying up of foreign remittance by Sri Lankan expats and loss of tourism dollars, Sri Lanka was in dire straits in economic front. An unprecedented financial crisis hit Sri Lanka in 2022. The foreign exchange reserve of the country plummeted below USD 500 million. The resultant was civil unrest and political turmoil. It caused downfall of Rajapaksa family.

Sri Lanka appealed to IMF for a bailout package. In September 2022, IMF approved a package of USD 2.9 billion over 4 years in 8 six monthly instalments, subject to restructuring its debts with its creditors (both bilateral and sovereign bondholders).

In this financial difficult time of the country, China declined to sign off on a 10-year moratorium of debt repayment, as suggested by IMF. The first letter provided by Chinese authorities on cooperating with Sri Lanka's Extended Fund Facility (EFF), as required by IMF, was 'not compatible with what IMF wants.' (M U M Ali Sabry, Foreign Minister of Sri Lanka). IMF's Extended Fund Facility (EFF) to Sri Lanka was granted later after hard negotiation.

6.8 Status of financial crisis of Sri Lanka

The country owes in debt to: -

- 1) China = USD 7.4 billion (towards financing infrastructure projects namely ports, airports, power plants, road etc.)
- 2) India = USD 1.0 billion (bilateral) + USD 4.0 billion (outside bilateral trade in the form of food, fuel and pharmaceutical aids)
- 3) India offered support for IMF fund for 10-year loan moratorium + 15 years debt restructuring
- 4) China offered only 2-year debt moratorium for Hambantota port (for 99-year lease)

India is playing a key role in helping Sri Lanka securing IMF fund.

7.0 FUTURE SCENARIO

7.1 Both countries have explored possibilities to trade in INR currencies, rather than doing in USD, which is a prevailing global practice. This process of de-dollarization, will enhance trade transaction and economic cooperation between two. A system of trade transaction through respective Vostro/Nostro account is operational between Reserve Bank of India (RBI) and the Central Bank of Sri Lanka (CBSL) since 2022. Reserve Bank of India, so far, has approved 60 Special Rupee Vostro Account (SRVA). Sri Lanka is one of the countries, in the growing list of countries like Russia, Singapore, Germany, Israel, Malaysia, Mauritius, Myanmar etc., who have already opened SRVA account.

7.2 Northern Sri Lanka wind power project by Adani group may become a reality after lot of delays. A system of transmission of renewable power (in the form of solar and/or wind electricity) from Sri Lanka to India will open new lane in the energy corridor between two countries.

7.3 \$700 million Colombo West Container Port project may be executed after much delay

7.4 Trincomalee has a potential to be developed as a strategic international petroleum inventory point

7.5 On 25 July 2022, government of Sri Lanka invited EoI from interested reputed petroleum oil companies for importation, distribution and selling of petroleum products in the country. Twenty-four oil companies from the following ten countries have responded to the EoI:

1. India
2. China
3. Russia
4. United States
5. United Arab Emirates
6. Saudi Arabia
7. Malaysia
8. Philippines
9. Norway
10. UK

This is an area which needs to be kept under constant watch by India. Entry of new global players will heat up the market, setting triangular competition among CPC, Lanka IOC and new entrant/s. However, as early mover, Lanka IOC will enjoy a few advantages. But the real situation will be known once the local market opens up. Indian Government may use tactical maneuver to stall the process.

8.0 CONCLUSION

8.1 Notwithstanding the antipathy of Sri Lanka towards Indian assistance and investment in the country, India has both commercial as well as strategic interest in the island nation. Sri Lanka cannot deny the mutually beneficial relation with India. But because of internal compulsions and influence by the big lender China, the uncertainties and resistances towards Indian business interests is likely to continue.

8.2 Lanka IOC has brought an ocean change in the petroleum retail sector in Sri Lanka. Common people have become used to swanky petrol bunkers and improved services (compared to those provided by Ceylon Petroleum Corporation retail outlets), dotting the country. Sri Lankan citizens are also aware of the role of Indian government in supplying automotive fuels, medicines etc., when they needed them most. Supply chain management of petroleum products by India has touched the chords of ordinary men. The fruit of positive impact on bilateral relation can be expected, in future, in favor of India.

8.3 In the energy front, India is likely to expand its portfolio in Sri Lanka, from petroleum products to renewable energy. The expected action plan may constitute two-pronged action. One through already established Lanka IOC in the conventional energy sector. In the renewable front, the role of Indian private sector, with proven track record, may strengthen the relationship. With the committed target of net zero by 2050 of Sri Lanka, it may be a bait to bite.

Acknowledgement: Subodh Dakwale, Former Managing Director, Lanka IOC, Sri Lanka

Disclaimer: Views expressed are personal of the authors.

BIBLIOGRAPHY

1. Sri Lanka - Energy Sector Assessment, Strategy, and Road Map (December 2019) - Asian Development Bank
2. Free Trade Agreement between the Republic of India and the Democratic Socialist Republic of Sri Lanka - Department of Commerce, Ministry of Commerce and Industry, Government of India
3. Lanka IOC, Annual Reports 2011-12; 2012-13; 2013-14; 2014-15; 2015-16; 2016-17; and 2017-18

WEBLIOGRAPHY

- 1) <https://iocl.com/lanka-ioc-plc>
- 2) <https://www.lankaioc.com/>

FOOT NOTES

- <https://www.worldometers.info/world-population/sri-lanka-population/>
- Sri Lanka: Economic, Political and Social Issues - Quan Vinh
- Sri Lanka - Energy Sector Assessment, Strategy, and Road Map - ADB
- <https://www.trade.gov/country-commercial-guides/sri-lanka-energy>
- <https://oec.world/en/profile/bilateral-product/refined-petroleum/reporter/lka>
- <https://www.ceicdata.com/en/indicator/sri-lanka/oil-consumption>
- https://www.icwa.in/show_content.php?lang=1&level=3&ls_id=5864&lid=4065&kval=sri%20lanka
- <https://www.hcicolombo.gov.in/pages?>
- <https://www.hcicolombo.gov.in/>
- <https://commerce.gov.in/international-trade/trade-agreements/india-sri-lanka-fta/free-trade-agreement-between-the-republic-of-india-and-the-democratic-socialist-republic-of-sri-lanka/>
- <https://timesofindia.indiatimes.com/business/india-business/IOC-pays-45m-to-Lanka-gets-ready-to-retail-fuel/articleshow/440262.cms>
- <https://idsa.in/issuebrief/sri-lanka-china-fiasco-over-fertiliser-gsultana-100222>
- <https://www.aiddata.org/blog/aiddatas-new-dataset-of-13-427-chinese-development-projects-worth-843-billion-reveals-major-increase-in-hidden-debt-and-belt-and-road-initiative-implementation-problems>
- <https://economictimes.indiatimes.com/news/international/business/china-silent-on-debt-reduction-targets-for-sri-lanka-to-get-imf-bailout-loan/articleshow/97955813.cms>
- <https://www.thehindu.com/news/national/chinese-dual-use-facilities-in-myanmar-and-sri-lanka-raises-security-concerns-in-india/article66741343.ece>
- <https://www.hindustantimes.com/world-news/china-offers-two-year-debt-moratorium-to-cash-strapped-sri-lanka-101678166635893.html>
- <https://www.newscutter.lk/sri-lanka-news/eois-called-for-oil-companies-to-import-distribute-sale-of-petroleum-products-in-sl-26072022-44022/>

SUSTAINABLE SUPPLY CHAIN IN INDIAN DAIRYINDUSTRY : A COMPARATIVE CASE STUDY

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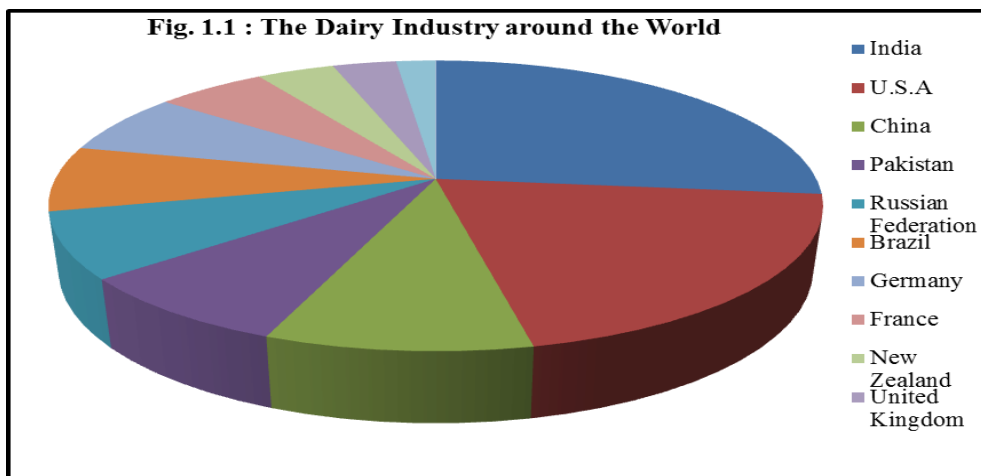
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ABSTRACT

The Indian dairy industry is one of the fastest growing industries in the world it employees millions of farmers directly and also participate more then five percent in the economy as well. As, the industry continues to expand there is a growing need to adopt sustainable and green practices in supply chain to minimize environmental and operational impact and ensure viability. This study conducts a comparative analysis of two leading dairy firms as, Indian dairy firm Amul and French dairy firm Danone to evaluate their sustainable and green chain practices. Further, various aspects such as scale of production, technology adoption, price sensitivity, supply chain management and the role of artificial intelligence are taken key consideration for the analysis. Data has been collected from various scholarly publications such as journals, articles and reports. this study finds out that amul and danone both the firms are focusing on sustainable and green practices but danone has an advantage of technology and on the other hand amul lacks the adaptation of emerging technologies in its supply chain. Therefore, the role of artificial intelligence in improving the supply chain and firm performance by efficiently forecasting demand and product supply has not been studied with special preference to Indian dairy industry.

INTRODUCTION

The dairy industry is a significant contributor to the global economy, and it plays an important role in the food and agriculture sector. The industry involves the production, processing, and distribution of dairy products such as milk, cheese, butter, and yogurt. In terms of global milk production, the top dairy-producing countries are the India, United States, China, Brazil, and Russia (FAO, 2018). The United States is the largest producer of cow milk, while India is the largest producer of buffalo milk. In terms of dairy exports, New Zealand is a significant player, accounting for around 30% of global dairy exports. Globally production of milk has surged during the past three decades, going from 522 million tones in 1986 to 798 million tones in 2016 (53% increase) (FAO, 2018). More recently, the FAO reported that more then 6 billion people worldwide consume milk and dairy products, with the majority of them residing in developing



nations (FAO, 2019b). A period of oversupply and low prices for milk products from China has resulted from trade restrictions against Russia and the elimination of "milk quotas" inside the EU (moher et al., 2015). In spite of this, the milk sector is expanding and is projected to produce 177 million tonnes of powdered milk by 2025, growing at a rate of 1.8% each year. This rise is the result of expanding urbanisation and growing income in developing economies. (Houhou, R et al., 2021). The Food and Agriculture Organization of the United Nations' Statistics Division published information on the global dairy industry from 2000 to 2010 that lists the major milk-producing nations (Fig. 1).

Dairy Industry in India

The dairy industry is a major economic activity in India, with milk production representing the most significant agricultural activity. The sector contributes significantly to the country's economy and provides

employment opportunities to millions of people. As of 2021 (Abhirup khanna et al., 2022), The dairy market of India was valued at INR 13,174 billion and is expected to increase to INR 30,840 billion by 2027. A research by the National Dairy Development Board (NDDB) estimates that by 2023, India will produce 266.5 million metric tonnes of milk. The highest milk producers are estimated to be states like Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat, and Andhra Pradesh. In light of this research, the Indian government introduced various National Dairy Project to increase production of milk, increase cattle productivity, and ultimately improve farmer livelihoods. The sector is dominated by small-scale dairy farmers, with nearly 90 percent of milk production coming from small and marginal farmers sector (dairy cooperatives and private companies) (IBEF 2021). there is a large gap can be seen as, India produces less milk per animal than countries like the US and UK do today, despite having the most cows and a number of government programs. Despite its importance, there are mismatch between supply and demand in the industry, which lead to a number of negative impacts on the environment and economy. Therefore, misrepresented data regarding forecasting the market demand and supply of products leads to the enormous inefficiencies and resulted in poor supply chain, high inventory cost, high transportation cost and increase wastage and it also leads to wastage of resources and losses sustainability. This phenomenon is called bull whip effect and this can be observed in industries which have high velocity products such as dairy industry because milk has low durability and high velocity. Thus, The Indian dairy industry is also characterized by a high degree of fragmentation and inefficiency. This has led to a large number of farmers operating in an informal and unregulated market, with a lack of proper infrastructure and a lack of access to technology and capital.

The Indian dairy industry has had slower growth than expected for a number of reasons, including the employment of non-scientific procedures, ineffective cattle breeding, lack of transparency bad management standards, and most importantly, a lack of technological assistance which eventually leads to the information asymmetric in multilayer supply chain which hinders the sustainability. Modern sustainable development is primarily concerned with how plants and new, quickly expanding road infrastructure affect our environment (Boruszko et al., 2018). Promoting sustainable production and distribution in the food business is crucial (Govind, et al., 2014). To achieve the objectives of greater social, economic, and environmental performance, sustainability-oriented food supply chains incorporate all forward (materials procurement, manufacture, and distribution) and reverse operations (collection and return of used products). (Bloemhof and Soysal, 2017; Sgarbossa and Russo, 2017; Sharma et al., 2018a) and focused more on depending upon green energy rather than, the traditional one for the purpose of production, distribution. Green supply chain management (GSCM) refers to the process of integrating environmentally-friendly practices into all stages of the supply chain, from product design to end-of-life disposal. The goal of GSCM is to reduce the environmental impact of the supply chain while maintaining or improving its economic performance. It includes sustainable sourcing, energy-efficient transportation, waste reduction, product design and environmental performance tracking. Implementing GSCM practices can benefit companies by reducing costs, enhancing brand reputation, and complying with regulations. It can also help companies to stay competitive by meeting the increasing demand for sustainable products and services.

The present case study examines the role of artificial intelligence in the forecasting of demand and product supply and promoting sustainable and green supply chain management in Indian dairy industry by reducing wastage and adopting green methods through comparative study of Indian dairy industry and foreign dairy industry. To achieve the objective various research papers, articles and case studies have reviewed through scholarly publications such as google scholar, scopus, web of science and dimensions.

Sustainability in Dairy Supply Chain

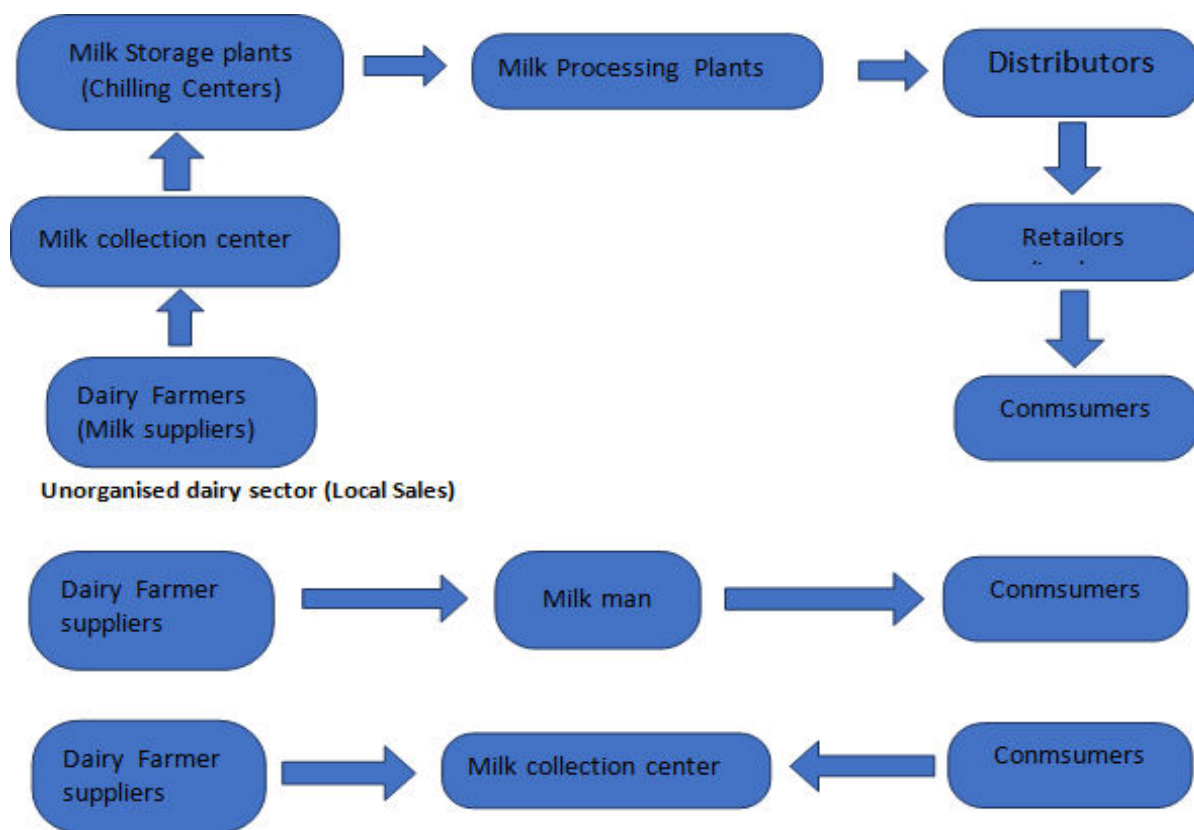
In order to meet the needs of future generations, sustainability requires a balance between ecological, social, and economical commitments (Ahmadi et al., 2017). Business organisations now have a lot of concerns about sustainability (Luthra and Mangla, 2018). Creating a chain network is a challenging task for A-FSC because of an inherent focus on product quality and requirements for environmental sustainability (Goyal et al., 2018). To reduce waste output, food organisations must concentrate on changing their sustainable operations (Pagell and Wu, 2009; Bloemhof and Soysal, 2017). Corporations are also concentrating on labelling connected to food miles, which enables the food managers to access the carbon footprint and ecological implications of the production and distribution operations, in order to improve sustainability in FSC (Saunders et al., 2006; Wilson, 2007). Dairy products have low durability and a short period of life so, there are many vehicles which runs on the daily basis on roads with the aim of delivering the products which participate more in the carbon emission in the environment therefore, due to the increasing competition in dairy industry it became very difficult for dairy industries to meet consumer demand with the high quality, quantity and fair price of products by using eco-

friendly and green methods for procurement, logistics and distribution of dairy products. Customers are now expecting more from the food industry; they are interested in how food is produced and presented due to rising concerns of food safety and security in recent years (Beske et al; 2014). When it comes to dairy industry, deviations between demand and supply needs to be fulfilled in order to improve the overall performance of firm.

Structured and Unstructured Supply Chain of Indian Dairy Industry

India is one of the world’s largest milk producer, with a production level estimated at around 164million tonnes per year. While there are many factors that contribute to this impressive figure including favourable weather conditions for the dairy industry, it can also be attributed to how milk is sourced from farmers within India’s largely unstructured supply chain system(Pandey 2020). In India, the dairy industry is a key player in the economy, with Milk being one of the most consumed products. It has traditionally been dominated by unorganized small-scale producers supplying milk directly to consumers or local aggregators (Shasidhar 2016). However, with increased demand for hygienic and quality products, there is an emergence of organized supply chains that offer cold chain infrastructure, traceability systems and efficient distribution networks. At present, producers are using both structured and unstructured supply chains for selling their products to consumers (the economics times 2018).

Dairy Chain Work Flow Model in India Organised Dairy Sector



Indian Dairy Supply Chain Model

The structured system refers to organized milk cooperative societies or private dairies that collect raw milk directly from registered members who have taken up the membership provided by them. These cooperatives operate mostly on village level collecting milk during morning time each day which subsequently goes through stringent quality testing processes before being processed and sold throughout various parts of country(Shasidhar 2016). This chain relies on intermediaries such as distributors or wholesalers to facilitate transactions between farmers/producers and retailers. Product quality control, timely delivery and other important aspects related to production-consumption linkages also depends upon such intermediaries (Abhirup khanna et al., 2022). Unlike its counterpart, this model has no formal organization associated within it; instead, independent agents (marginal milk vendors) establish individual links between buyers & sellers locally outlining informal systems operating mainly under cash basis rather than technology enabled operations. Further lacks dependable storage facilities hampering proper warehouse management leads in keeping expiry dates intact eventually forcing them into adopting alternative distribution strategies include doorstep deliveries high variable costs involved making difficult processes inaccessible sustainably(Teja Naganboyina et al., 2022). In both the supply chain, either structure or unstructured wastage and information asymmetry is a major

problem even in organized sector there is a lack of data through which demand for future can be forecast. Every day, 190 kilocalories of food are lost per person in China. While in India, over 40% of grains are lost each year due to inadequate food supply network management and this is the biggest damage to the sustainable development (Mangla et al., 2018a; Banaeian et al., 2018).

Supply Chain of Amul

The foremost dairy cooperative in India is called "Amul," standing for Anand Milk federation union limited. The structure is three-tiered, starting with a dairy co - operative society at the local or village level which will be federated within milk unions at the district level, It also falls under the State milk federation, which operates at the provincial level. Milk is collected at the village level by milk collection facilities; milk is procured and processed at the district level by milk unions; and milk and milk products are marketed by the relevant state milk federation.

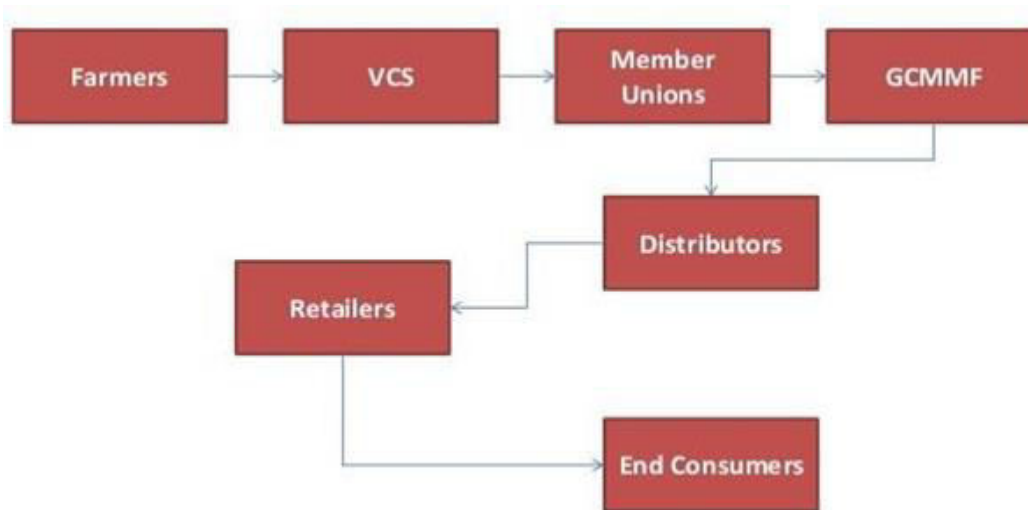


Fig.3: Amul's supply chain (InsideIIM, 2023)As, shown in the figure;

- **Milk Collection:** Amul has a network of over 18,000 village-level milk collection centers, known as Village Dairy Cooperatives (VDCs). These VDCs collect milk from local farmers, who are also members of the cooperative.
- **Milk Processing:** The collected milk is transported to processing plants, where it is pasteurized, homogenized, and packaged into various products such as milk, butter, cheese, and ice cream.
- **Distribution:** The packaged products are then distributed to various retail outlets and distributors across India. Amul has a strong distribution network, with over 3,500 distributors and 1 million retail outlets.
- **Marketing:** Amul is known for its innovative marketing campaigns, such as the "Amul girl" advertisements. These campaigns have helped the company build a strong brand image and customer loyalty.
- **Feedback:** Amul regularly collects feedback from its customers and suppliers to improve its supply chain operations. This helps the company identify areas for improvement and make necessary changes.
- Overall, Amul's supply chain management has been a key factor in its success as a dairy cooperative. By effectively managing its milk collection, processing, distribution, marketing, and feedback, Amul has been able to provide high-quality dairy products to customers across India at affordable prices.

Supply Chain of Danone

Milk powder is the main raw material of Danone Dairy Firm which it imports from New Zealand and Australia by using water transport to Malaysia. The shipment usually arrived at port KL, the material then moved by using road transportation to its production center which is situated in Nilai, Negeri Sembilan where it will be used, collectively with other raw material which is eventually sourced into manufacturing to produce its final product. After production, the commodities are either exported to other South East Asian nations, mainly Thailand, Cambodia, Vietnam, and Indonesia, or they are quality checked before being delivered within 14 days to their various locations around Malaysia. These are shipped by employing outside logistics service providers that DANONE has worked with over the course of many years in Malaysia and have trust and it also uses various technologies to track down the logistics. Customers' and retail outlets' feedback is collected, and the company's internal specialists use it to estimate the output in the future.

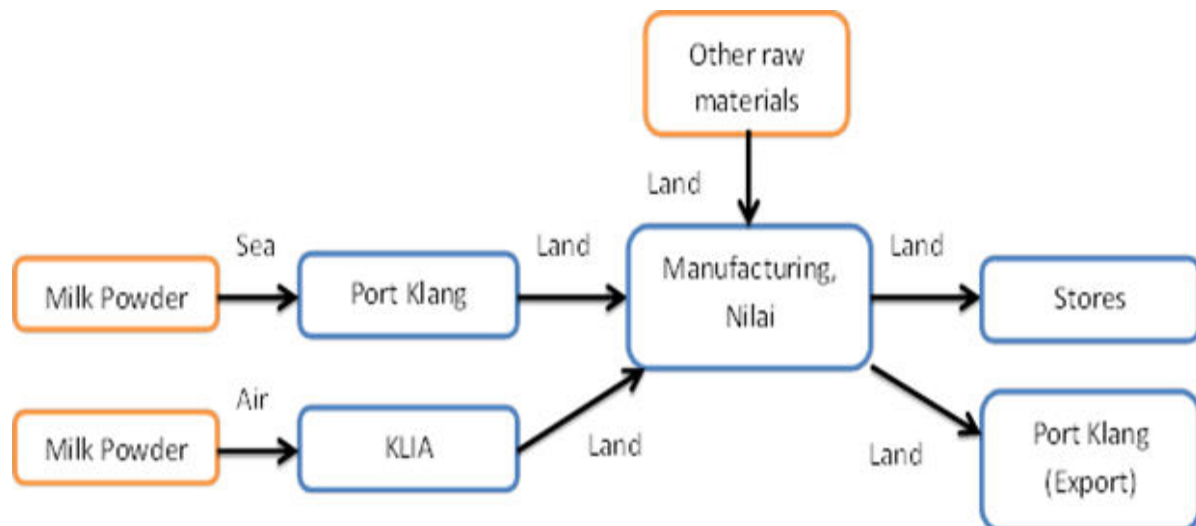


Fig.1: DANONE Dumex (Malaysia) Sdn Bhd Supply Chain (Nakaie et al.,2013)

Although milk powder, the major raw ingredient, is normally transported by using water transport, it is occasionally conveyed by air for speed in particular circumstances, sent by air for pace. The raw materials are carried by road transportation such as land trucks, usually Ten wheelers, to the production site in Nilai once they arrive in Malaysia. It takes roughly an hour and a half to travel the seventy four kilometres between the 2 distinct locations. The primary component, Milk Powder, is blended using a unique DANONE formula to produce the finished items. Employing third-party logistics companies, the finished goods are shipped to four important locations: the Northern Region, Southern Region, East Coast, and exports.

Green Supply chain in Dairy Industry

Due to increasing customer awareness and governmental regulations, corporations have to include sustainability into all of their essential systems, including operational, technical, and welfare systems (Fredriksson and Liljestr and, 2015). In recent years, academics have increasingly become concerned with the logistical and transportation elements of FSCs (Villarreal, et al., 2017). The main areas that investigators focus on include planning, routing, and scheduling of vehicles, as well as environmental concerns, financial concerns, social considerations, truck availability, and communication gaps between suppliers and recipients. (Eliyi et al., 2009; Zhang and Yun, 2009; Zhang et al., 2009; Yu et al., 2013; Zhang and Qiu, 2014; Zhang et al., 2015; Yu et al., 2015; Schiller and Kenworthy, 2017;). To save transportation expenses, owners and managers in the dairy business attempt to grow the majority of their produce nearby (Douphrate, et al., 2013). Sustainable development in the dairy industry is critically at risk since businesses do not employ eco-friendly refrigerants in their shipping trucks or cold storage facilities. Sustainable development in the dairy industry is critically at risk since businesses do not employ eco-friendly refrigerants in their shipping trucks or cold storage facilities (Khan et al. 2019). Lack of coordination between logistics, warehouses, and cold storage facilities is common in the dairy industry, which tends to raise overall carbon emissions. Organizations should use more combination modes of transportation (rail-road, road-ship and road-air) in the dairy sector (Kumar et al. 2019). To enable companies to expand their working regions, the dairy sector requires air-conditioned or insulated vehicles for the delivery of milk and milk base products to the retailers (Kumar et al. 2018b) therefore, there are no plans has been submitted which explains how dairy firms are going to control the carbon emission.

There are a number of differences between Indian and Danone's green supply chain management. This is due to a number of factors such as, Different environmental regulations in India and Europe. The environmental regulations in India are not as strict as those in Europe, which means that companies operating there have more flexibility when it comes to their green supply chain management practices and Different levels of awareness about sustainability issues among consumers in both countries. Consumers in India tend to be less aware about sustainability issues than those in Europe, which can affect how companies approach their green supply chain management strategies and Different approaches taken by each company towards sustainable sourcing and production processes. While Danone has invested heavily into developing its own sustainable sourcing and production processes, many Indian companies rely on third-party suppliers for these services instead.

Problem of Information Asymmetric in Dairy Supply Chain;

Milk is a complete food since it contains fat, protein, vitamins, lactose, and minerals (Berna 2010; Gandhi et al. 2020). Because India's milk supply chain is mostly dependant upon the unorganised sector and has a weak supply chain, it is hard to keep track of the quality and grade of the milk produced there. Considering the milk

industry's importance for India's economy and society, it faces numerous challenges. For instance, insufficient coordination among dairy industry participants results in conflicting relations, risks, and uncertainty (Brito et al., 2015a). The lack of communication with farmer cooperatives is most possibly the root of the food safety problem and also makes farmers vulnerable to external shocks (Wen, 2009). According to Gartner, existing technologies such as ERP (Enterprise resource planning) systems failed in post implementation because of various reasons and reasons due to which such technologies failed are inefficient logistics planning and the process of replenishment because of unpredictable and fluctuation in forecasting demand and supply. Thus, due to which both manufacturer and supplier suffer losses.

This happens because of number of factors, such as Poor quality or outdated data stored in databases leads to inaccurate forecasts of demand and product supply, Inaccurate forecasts result in overproduction or underproduction of products, leading to increased wastage and inefficient use of resources, Lack of real-time visibility into inventory levels makes it difficult for companies to adjust their production schedules quickly enough when needed, resulting in further waste and disruption within the supply chain, poor data storage also results in delays between ordering materials from suppliers and receiving them at warehouses, causing further disruptions within the supply chain that can lead to higher costs for businesses as well as customers alike.

Artificial intelligence in supply chain;

The primary goal of Industry 4.0 is to create a smart production network based on modernization and automated processes, or to employ more artificial intelligence (Abdirad, M., & Krishnan, K. (2020). Industry 4.0 is expected to make a substantial impact on operations, corporate structures, and supply chains, with the goal of automating supply chain management, lowering costs, and improving efficiency. Industry 4.0 has the ability to strengthen logistical procedures, which will lead to better operations planning and marketing (Santos et al., 2017). The term "supply chain digitalization" refers to a new generation of interconnected business systems ranging from solitary, localised, and single-company systems to globalised systems with intelligent implementations. When Industry 4.0 is being implemented in the supply chain frameworks, the 4 key supply chain elements such as, integration, operations, purchasing, and distribution are impacted, potentially increasing firm overall performance (Abdirad, M., & Krishnan, K. (2020).

DISCUSSION

The amount of production, the degree of technological adoption, and supply chain management procedures could all be areas where the Amul and danone dairy supply chains differs from each other.

Scale of Production: Foreign dairy supply chains typically operate on a larger scale compared to Indian dairy supply chains. This is due to the Foreign dairy farms and processing facilities are typically larger and more technologically advanced, allowing for higher yields and more efficient production processes.

Technology Adoption; Compared to Indian dairy supply chains, foreign dairy supply chains frequently employ more advanced technological methods. This involves using modern milking equipment, automatic feeding processes, and automated monitoring systems, all of which serve to boost productivity and efficiency.

Supply Chain Management: Foreign dairy supply chains often have more advanced supply chain management practices compared to Indian dairy supply chains. This includes the use of sophisticated inventory management systems, real-time tracking of product flows, and advanced logistics systems, which help to optimize the movement of products through the supply chain. As Danone employed automatic and ERP system to manage the logistics system.

Price Sensitivity: Dairy products are frequently regarded as necessities in India, where consumers are more price sensitive. Foreign customers, on the other hand, are frequently less price sensitive and are willing to pay more for high-quality dairy products.

Therefore, foreign dairy supply chains tend to be larger, more technologically advanced, and have more advanced supply chain management practices compared to Indian dairy supply chains. However, Indian dairy supply chains have their unique characteristics, including the use of traditional farming practices, cooperative societies, and a focus on milk as the primary dairy product.

As per the literature it is observed that due to distorted information regarding the market forecast leads to inefficient supply of milk thus results in more wastage of products higher inventory cost and higher transportation cost and misguided future prediction thus loses sustainability. This phenomenon is called bullwhip effect and it generally occur in high velocity commodities such as milk but with collective efforts of cooperatives, government this problem can be solved by implementing more artificial intelligence in the supply chain but implementing of such technologies we also need to analyze some variables such as ease of use,

required skills for the implementation, availability of technology and much more. Therefore, Artificial intelligence (AI) has the potential to significantly improve the supply chain of the Indian dairy industry by optimizing operations, reducing costs, improving quality, and enhancing overall firm performance.

Predictive Analytics: Dairy companies can forecast milk production, demand for dairy products, and other important variables with the aid of AI-powered predictive analytics. This can assist businesses in streamlining their production procedures, cutting waste, and ensuring a consistent supply of dairy products of the highest quality.

Quality Control: Artificial intelligence (AI) can monitor and analyse data from sensors, cameras, and other sources to find quality problems during production. By doing so, dairy companies can reduce waste and raise the quality of their products by identifying quality issues early and taking corrective action.

Route Optimization: By examining data on traffic patterns, weather, and other factors, AI can be used to optimise the transportation of dairy products. This can assist businesses in lowering transportation costs, speeding up deliveries, and preserving the quality of their goods.

Inventory Management: By examining information on demand, production capacity, and other factors, AI-powered inventory management systems can assist dairy companies in optimizing their inventory levels. This can lower inventory costs for businesses, cut down on waste, and guarantee a consistent supply of dairy products.

Supply Chain Visibility: AI has the potential to give supply chains real-time visibility, enabling dairy companies to follow the path of their products from the farm to the consumer. This can aid businesses in locating bottlenecks, speeding up deliveries, and ensuring the quality and freshness of their goods.

Overall, The efficiency, quality, and overall firm performance of dairy companies could be significantly enhanced by the application of AI in the Indian dairy supply chain. Dairy companies can optimise their operations, cut costs, raise quality, and become more competitive in the market by utilising AI-powered tools and analytics.

CONCLUSION

This case study has discussed the importance and need of sustainable and green supply chain management in Indian dairy industry. The lack of information and communication channels has lead to poor forecasting of future demand and product supply which alternatively resulted in increased wastage. the case study make an comparative analysis of Indian dairy firm Amul and french dairy firm Danone supply chain management and overall performance of the organizations. Further, various aspects such as scale of production, technology adoption, price sensitivity, supply chain management and the role of artificial intelligence are taken key consideration for the analysis. Therefore, foreign dairy supply chains tend to be larger, more technologically advanced, and have more advanced supply chain management practices compared to Indian dairy supply chains. However, Indian dairy supply chains have their unique characteristics, including the use of traditional farming practices, cooperative societies, and a focus on milk as the primary dairy product.

SCOPE OF FUTURE STUDY

After reviewing various literature it can be observed that, there are several studies available which focus on the association among supply chain activities and environmental sustainability practices. Other studies investigate the impact of SC practices on organization's financial sustainability and few studies explores the relationship between environmental sustainability and firm finance performance. However according to the literature available, there is no study focused on exploring the relationship between Green supply chain management, environmental sustainability, and use of artificial intelligence.

According to Gartner, logistics have been managed through ERP which is enterprise resource planning from a long period of time and more than seventy five percent of ERP projects failed in post operations because of various of reasons and these reasons are stem from inefficient logistic planning and process of replenishment due to unpredictable and fluctuating market demand. Excess supply of milk by farmers leads to the more wastage. While there is a lack of safe food in some rising economies and on the other hand food is also being wasted by other economies (Banaeian et al., 2018). hence, Use of artificial intelligence in improving the Indian dairy firm performance by efficiently forecasting demand and product supply has not been studied. There is a need of study by evaluating variables such as ease of use, availability of technology and skills require for the implementation

REFERENCES

- Khanna, A., Sah, A., Bolshev, V., Jasinski, M., Vinogradov, A., Leonowicz, Z., & Jasiński, M. (2021). Blockchain: Future of e-governance in smart cities. *Sustainability*, 13(21), 11840. <https://doi.org/10.3390/su132111840>
- Banaeian, N., Mobli, H., Fahimnia, B., Nielsen, I. E., & Omid, M. (2018). Green supplier selection using fuzzy group decision making methods: A case study from the agri-food industry. *Computers and Operations Research*, 89, 337–347. <https://doi.org/10.1016/j.cor.2016.02.015>
- Spink, J., Bedard, B., Keogh, J., Moyer, D. C., Scimeca, J., & Vasan, A. (2019, October). International survey of food fraud and related terminology: Preliminary results and discussion. *Journal of Food Science*, 84(10), 2705–2718. <https://doi.org/10.1111/1750-3841.14705>. Epub September 23, 2019. PubMed: 31546281
- Sadat, A., Mustajab, P., & Khan, I. A. Determining the adulteration of natural milk with synthetic milk using a.c. conductance measurement. (2006). *Journal of Food Engineering*, 77(3), 472–477. <https://doi.org/10.1016/j.jfoodeng.2005.06.062>
- Chugh, R., & Kaur, G. (2022). A Study on Milk Adulteration and methods of detection of various Chemical Adulterants qualitatively. *IOP Conference Series: Materials Science and Engineering*, 1225(1), 012046. <https://doi.org/10.1088/1757-899X/1225/1/012046>
- (2018). National milk safety and quality survey executive summary standards authority of India (FSSAI).
- Gennari, P., Rosero-Moncayo, J., & Tubiello, F. N. (2019). The FAO contribution to monitoring SDGs for food and agriculture. *Nature Plants*, 5(12), 1196–1197. <https://doi.org/10.1038/s41477-019-0564-z>
- Nakaie, M., Hau, G. Z., & Sorooshian, S. (2013). Operations analysis: A case for supply chain performance. In *Advanced in Materials Research*, 739. Trans Tech Publications Ltd. <https://doi.org/10.4028/www.scientific.net/AMR.739.742>
- Khanna, A., Jain, S., Burgio, A., Bolshev, V., & Panchenko, V. (2022). Blockchain-Enabled Supply Chain platform for Indian Dairy Industry: Safety and Traceability. *Foods*, 11(17), 2716. <https://doi.org/10.3390/foods11172716>
- Nakaie, M., Hau, G. Z., & Sorooshian, S. (2013). Operations analysis: A case for supply chain performance. In *Advanced in Materials Research*, 739. <https://doi.org/10.4028/www.scientific.net/AMR.739.742>. Trans Tech Publications, Ltd

IMPACT OF WORKPLACE BULLYING & SUPERVISOR BEHAVIOR ON EMPLOYEE RETENTION**¹Dr. Shilpa Tandon and ²Abhishek Saxena**¹Assistant Professor, Department of Management, AIMT²Department of Management, Galgotia college, Gr. Noida**INTRODUCTION**

Keeping up with the rapid advancement of technology is one of the biggest issues facing modern business. The workplace and workforce are undergoing fundamental shifts that promise to drastically alter how businesses interact with their employees. Employee retention is becoming an issue for all businesses in the current competitive labor market as we advance at an ever-increasing rate in every profession. For competent people, there are several job options available. It has been discovered that the demand for an employee's services increases with their skill level. Almost every business in every area now places a high priority on finding and keeping talented personnel. Businesses that comprehend the wants and needs of their employees and take proactive steps to meet those demands in the workplace will succeed in their respective industries. Employee retention is therefore a crucial issue that firms must address.

This study investigated the impact of workplace bullying on behavior and job satisfaction. Bullying at work is a problem and has serious organizational and social repercussions. The study demonstrated how bullying conduct impacts a target's capacity to execute their work, which can have an effect on staff morale and an organization's financial results. Because the harassment frequently occurs secretly and frequently outside the view of bosses and fellow employees, workplace bullying can be challenging to spot. The main conclusions of this study demonstrated the prevalence of workplace bullying, investigated the particular forms of victimization and harmful behavior experienced by targets, identified the physical and mental stress brought on by bullying, and demonstrated a link between workplace bullying and its impact on job satisfaction and productivity. This study was one of the first to look into the benefits of bullying and to define what constitutes bullying in addition to looking at the impacts of a toxic work environment.

Employees have always been valuable assets for any firm. They might be considered the life-blood of an organization due to their vital nature. The majority of businesses are becoming more and more technology driven as a result of technological advancement. However, because technology requires human resources to function, this circumstance does not lessen the worth of employees in an enterprise.

ORGANIZATION AND EMPLOYEES

Organization is a situation where people gather together and cooperate to accomplish a common objective. Employees are people that collaborate in a company to generate revenues as well as a living wage. Employees are a company's lifeblood and make a significant contribution to its smooth operation and financial success. If the employees are not committed to the company and are more interested in their own interests, the company cannot exist.

The working environment and job satisfaction of subordinates are influenced by the relationship between a supervisor and those who report to them. Different aspects of a supervisor's behavior toward an employee can either enhance or damage their relationship, which affects whether or not the employee is satisfied with their job. This study is concerned with how a supervisor treats a subordinate among other aspects that determine employees' job satisfaction.

2.1 LITERATURE REVIEW

The definition of workload given by Hart and Staveland (2018) is "the perceived relationship between the amount of mental processing capability or resources and the amount required by the task." Another meaning is that it depicts the interaction between a team of people or a single person and the requirements of the task. In plainer terms, it is the amount of effort required of an individual. The basic goal of workload assessment and forecasting, according to Wickens (2020), is to achieve an equally distributed, manageable workload and prevent overload or underload.

Workplace bullying is defined as a targeted, frequently ongoing assault on a coworker by another coworker using actions that are emotionally and psychologically damaging (Aryne, 2019). Any persistent, undesired, unpleasant, or humiliating activities toward a single employee or a group of employees are considered workplace bullying. According to Heather (2019), workplace bullying is fundamentally an aggressive behavior that occasionally involves small physical aggressiveness in addition to psychological violence. It is crucial to

remember that bullying can have highly dangerous and even fatal consequences. Many academics made distinctions between various forms of bullying, such as between bullying at work and bullying towards individuals. Bullying that used to be tied to the workplace involves acts like assigning unrealistic deadlines or overwhelming workloads. According to Einarsen and Hoel (2020), person-related bullying includes actions like making derogatory remarks, tease others, spreading rumors, and pulling practical jokes.

According to Eisenberger and colleagues (2020), a worker's relationship with their boss has a significant impact on how they view the company. Namie and Namie (2020) published the findings of an online survey that looked at numerous hazardous settings and discovered that workplace bullies can affect their coworkers permanently. The study revealed that targets spent between 10% and 52% of their time at work defending them and networking for support, reflecting on the circumstance, feeling worried and demotivated, and taking sick leave owing to illnesses brought on by stress. According to the Canada Safety Council (2022) and Vartia-Väänänen (2021), bullies cause their workplace to have low morale, fear, rage, and anxiety. Although occasionally aggressive or resentful employees hit the news, bullying at work is primarily a silent scourge. The actions of a bully lead other individuals to experience sadness, humiliation, and shame, which can have an impact on both their performance at work and in their personal lives.

RISE IN THE RISK OF BULLYING FACTORS

1. As a result of organizational change (large internal reorganizations, technology advancements, etc.).
2. Worker traits, such as age, gender, parental status, and position as an apprentice or trainee.
3. Relationships in the workplace, such as poor communication between organizational levels and a lack of employee input.
4. Labor Norms (such as a lack of conduct guidelines, a high volume and intensity of labor, and staff shortages)
5. Role ambiguity, organizational restrictions, interpersonal conflict, and role conflict.

OBJECTIVES

1. To assess how work performance affects employee retention.
2. To assess how supervisor behavior affects employee relations in a company
3. To quantify workplace harassment of employees in a business

RESEARCH METHODOLOGY

The Study

Sample Design: The study was causal in nature.

Sampling Area: The population of the study of working employee which were available at the time of data collection in Delhi city.

Sample Size

We have taken 100 Employee from Delhi

Sampling Technique

Non probability purposive sampling technique will be used for the Study.

Tools to be used for Data Collection

Standardized questionnaire created by own selves were used to collect primary data. We used 1 to 7 scales. Data has been collected on a likert scale, where 1 stands for strongly disagree and 7 stands for strongly agree

Tools to be used for Data Analysis

SPSS software was used to check the reliability and find out the significant factor of it.

DISCUSSION

H0: The degree to which an employee enjoys their work has no bearing on whether or not they stay with a company (H0).

Job satisfaction was used as the dependent variable in a multiple regression analysis that also included job satisfaction as an independent variable. The regression analysis showed a strong relationship between job satisfaction and employee retention, with a beta factor of 0.772 and a t value of 8. Because the t-values of 2.164 and 5.230 are significant at the 0.00 level, we reject the null hypothesis that there is no relationship between work satisfaction and performance or retention.

H1: Supervisor behavior does not significantly affect employee retention (H1).

The relationship between supervisory behavior (the independent variable) and employee retention (the dependent variable) was examined using multiple regression analyses. A beta factor of 0.597 was found to represent the effect of the independent variable "supervisor behavior" on the dependent variable "employee retention." The t-value is likewise statistically significant. Since t-values of 4.793 are significant at the 0.00 level, we reject the null hypothesis that there is no relationship between supervisor behavior and employee retention.

H2: Trustworthiness in regards to performance has no bearing on employee retention, H2.

Bullying in the workplace was used as an independent variable in a series of multiple regression analyses that also included employee retention as a dependent variable. Regression analysis shows a substantial relationship between workplace bullying and retention of employees, with a beta factor of 0.803 and a t value of 8.3. We accept the null hypothesis that there is no significant effect of trustworthiness, towards performances, on employee retention, because the values of t are -1.175, which are acceptable at the 0.243 level of significance.

CONCLUSION

Topics covered in the research included the following: supervisor behavior, workplace bullying, and employee retention. This study analyzed the relationship between employee retention and three factors: supervisor behavior, job satisfaction, and bullying in the workplace. The risk of bullying in the workplace was also investigated by looking at several contributing elements. The effect on worker retention has been analyzed using regression.

REFERENCES

- Aquino, K. 2000. Structural and individual determinants of workplace victimization: The effects of hierarchical status and conflict management style. *Journal of Management*, 26: 171–193.
- Aquino, K., Grover, S. L., Bradfield, M., & Allen, D. G. 1999. The effects of negative affectivity, hierarchical status, and self-determination on workplace victimization. *Academy of Management Journal*, 42: 260–272.
- Aryee, S., Chen, Z. X., Sun, L. Y., & Debrah Y A (2007). Antecedents and outcomes of abusive supervision: Test of a trickle-down model. *Journal of Applied Psychology*, 92: 191–201.
- Ashton, M. C., Lee, K., & Paunonen, S. V. 2002. What is the central feature of extraversion? Social attention versus reward sensitivity. *Journal of Personality and Social Psychology*, 83, 245–252.
- Baron, R. M., & Kenny, D. A. 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51: 1173–1182.
- Balliet, D., & Ferris, D. L. (2013). Ostracism and prosocial behavior: A social dilemma perspective. *Organizational Behavior and Human Decision Processes*, 120(2), 298-308.
- Bentler, P. M. 1990. Comparative fit indexes in structural models. *Psychological Bulletin*, 107: 238–246.
- Bernerth, J. B., Taylor, S. G., Walker, H. J., & Whitman, D. S. (2012). An empirical investigation of dispositional antecedents and performance-related outcomes of credit scores. *Journal of Applied Psychology*, 97, 469–478. <https://doi.org/10.1037/a0026055>.
- Berry, C. M., Carpenter, N. C., & Barratt, C. L. (2012). Do other-reports of counterproductive work behavior provide an incremental contribution over self-reports? A meta-analytic comparison. *Journal of Applied Psychology*, 97, 613–636. <https://doi.org/10.1037/a0026739>.
- Berry, C. M., Ones, D. S., & Sackett, P. R. (2007). Interpersonal deviance, organizational deviance, and their common correlates: A review and meta-analysis. *Journal of Applied Psychology*, 92, 410–424. <https://doi.org/10.1037/0021-9010.92.2.410>.
- Berry, C. M., Page, R. C., & Sackett, P. R. (2007). Effects of self-deceptive enhancement on personality-job performance relationships. *International Journal of Selection and Assessment*, 15, 94–109. <https://doi.org/10.1111/j.1468-2389.2007.00374.x>.
- Birkeland, S. A., Manson, T. M., Kisamore, J. L., Brannick, M. T., & Smith, M. A. (2006). A meta-analytic investigation of job applicant faking on personality measures. *International Journal of Selection and Assessment*, 14, 317–335. <https://doi.org/10.1111/j.1468-2389.2006.00354.x>

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- Borenstein, M., Hedges, L. V, Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to meta-analysis*. West Sussex, United Kingdom: John Wiley & Sons, Ltd.
 - Boye, M. W., & Jones, J. W. (1997). Organizational culture and employee counterproductivity. *Antisocial behavior in organizations*, 172-184.
 - Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. 2003. *Applied multiple regression/correlation analysis for the behavioral sciences*.
 - Mahwah, NJ: Lawrence Erlbaum. Cook, T. D., & Campbell, D. T. 1979. *Quasi experimentation: Design and analytical issues for field settings*.
 - Chicago, IL: Rand McNally. Coyne, I., Seigne, E., & Randall, P. 2000. Predicting workplace victim status from personality. *European Journal of Work and Organizational Psychology*, 9: 335–349.
 - Chung, Y. W. (2015). The mediating effects of organizational conflict on the relationships between workplace ostracism with in-role behavior and organizational citizenship behavior. *International Journal of Conflict Management*, 26(4), 366-385. A
 - Chung, Y. W. (2015). The mediating effects of organizational conflict on the relationships between workplace ostracism with in-role behavior and organizational citizenship behavior. *International Journal of Conflict Management*, 26(4), 366-385.
 - Curtis, L. A. 1974. Victim precipitation and violent crimes. *Social problems*, 21: 349–354.
 - DiPaula, A., & Campbell, J. D. 2002. Self-esteem and persistence in the face of failure. *Journal of Personality and Social Psychology*, 83: 711–724.
 - Dipboye, R. L. 1977. A critical review of Korman’s self-consistency theory of work motivation and occupational choice. *Organizational Behavior and Human Performance*, 18: 108–126.
 - Donnellan, M. B., Conger, R. D., & Bryant, C. M. 2004. The big five and enduring marriages. *Journal of Research in Personality*, 38: 481–504. Downey, G., & Feldman, S. I. 1996.
 - Implications of rejection sensitivity for intimate relationships. *Journal of Personality and Social Psychology*, 70(6): 1327–1343.
 - Duffy, M. K., Ganster, D. C., & Pagon, M. 2002. Social undermining in the workplace. *Academy of Management Journal*, 45: 331–351.
 - Elias, R. 1986. *The politics of victimization: Victims, victimology, and human rights*. New York: Oxford Press. Erez, A., & Judge, T. A. 2001.
 - Relationship of core self-evaluations to goal setting, motivation, and performance. *Journal of Applied Psychology*, 86: 1270–1279.
 - Eysenck, H. J. 1976. *Personality, genetics, and behavior*. New York: Praeger. Ferris, D. L., Brown, D. J., Berry, J. W., & Lian, H. 2008. The development and validation of the workplace ostracism scale. *Journal of Applied Psychology*, 93: 1348–1366.
 - Fox, S., & Stallworth, L. E. 2005. Racial/ethnic bullying: Exploring links between bullying and racism in the US workplace. *Journal of Vocational Behavior*, 66: 438–456.
 - Goldberg, L. R. 1990. An alternative “description of personality”: The Big-Five factor structure. *Journal of Personality and Social Psychology*, 59: 1216–1229.
 - Hobfoll, S. E. 1989. Conservation of resources: A new approach at conceptualizing stress. *American Psychologist*, 44: 513–524.
 - Hogan, J., & Holland, B. 2003. Using theory to evaluate personality and job-performance relations: A socioanalytic perspective. *Journal of Applied Psychology*, 88: 100–112.
 - John, O. P., & Srivastava, S. 1999. The big five trait taxonomy: history, measurement, and theoretical perspectives. In L. A. Pervin, & O. P. John (Eds.), *Handbook of personality: Dispositional Antecedents A review of theory, method, and research*. *Psychological Bulletin*, 118: 3–34.
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- Korman, A. K. 1966. Self-esteem variable in vocational choice. *Journal of Applied Psychology*, 50: 479–486.
 - Korman, A. K. 1970. Toward a hypothesis of work behavior. *Journal of Applied Psychology*, 54: 31–41.
 - LePine, J. A., & Van Dyne, L. 2001. Voice and cooperative behavior as contrasting forms of contextual performance: Evidence of differential relationships with big five personality characteristics and cognitive ability. *Journal of Applied Psychology*, 86: 326–336.
 - Liao, H., & Chuang, A. 2004. A multilevel investigation of factors influencing employee service performance and customer outcomes. *Academy of Management Journal*, 47: 41–58.
 - Major, D. A., Turner, J. E., & Fletcher, T. D. 2006. Linking proactive personality and the big five to motivation to learn and development activity. *Journal of Applied Psychology*, 91: 927–935.
 - Mathieu, J. E., & Farr, J. L. 1991. Further evidence for the discriminant validity of measures of organizational commitment, job involvement, and job satisfaction. *Journal of Applied Psychology*, 76: 127–133.
 - McCrae, R. R., & Costa, P. T. 1987. Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, 52: 81–90.
 - R. R., & John, O. P. 1992. An introduction to the five-factor model and its applications. *Journal of Personality*, 60: 175–215.
 - Miceli, M. P., & Near, J. P. 1992. *Blowing the whistle: The organizational and legal implications for companies and employees*. New York: Lexington.
 - Murray, S. L., Holmes, J. G., & Griffin, D. W. 2000. Self-esteem and the quest for felt security: How perceived regard regulates attachment processes. *Journal of Personality and Social Psychology*, 78: 478–498.
 - Murray, S. L., Holmes, J. G., MacDonald, G., & Ellsworth, P. C. 1998. Through the looking glass darkly? When self doubts turn into relationship insecurities. *Journal of Personality and Social Psychology*, 75: 1459–1480.
 - Ng, T. W. H., & Feldman, D. C. 2008. Long work hours: A social identity perspective on meta-analysis data. *Journal of Organizational Behavior*, 29: 853–880.
 - Olweus, D. 1978. *Aggression in the schools: bullies and whipping boys*. Toronto, ON: JohnWiley& Sons.
 - Podsakoff, P. M., MacKenzie, S. B., Lee, J. S., & Podsakoff, N. P. 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88: 879–903
 - Rosenberg, M., Schooler, C., Schoenbach, C., & Rosenberg, F. 1995. Global self-esteem and specific self-esteem: Different concepts, different outcomes. *American Sociological Review*, 60: 141–156.
 - Scott, B. A., & Judge, T. A. 2009. Identifying targets of counterproductive behavior: The role of personality and physical appearance. Paper present at the Academy of Management 44 Longzeng Wu, Liqun Wei, Chun Hui Annual Conference, Chicago Sedikides, C., Gaertner, L., & Toguchi, Y. 2003.
 - Sundstrom, E., McIntyre, M., Halfill, T., & Richards, H. 2000. Work groups: From the Hawthorne studies to work teams of the 1990s and beyond. *Group Dynamics: Theory, Research, and Practice*, 4: 44–67.
 - Tepper, B. J. 2000. Consequences of abusive supervision. *Academy of Management Journal*, 43: 178–190.
 - Tobin, R. M., Graziano, W. G., Vanman, E. J., & Tassinary, L. G. 2000. Personality, emotional experience, and efforts to control emotions. *Journal of personality and social psychology*, 79: 656–669
 - Williams, K. D. 2001. *Ostracism: The power of silence*. New York: Guilford Press. Williams, K. D. 2007. Ostracism. *Annual Review of Psychology*, 58: 425–452. Williams, L. J., & Anderson, S. E. 1991. Job satisfaction and organizational commitment.
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A STUDY ON MARKETING STRATEGIES ON FROZEN FOOD**¹Dr. Namita Mishra, ²Dr. Garima Singh and ³Dr. Archana Dixit**¹Professor, I.T.S School of Management, Mohan Nagar^{2,3}Assistant Professor, Tecnia Institute of Advanced Studies, GGSIPU, Rohini (110085), Delhi, India**ABSTRACT**

This study intends to approach on the various aspects of frozen food and buying behaviour. The food that can be easily and quickly prepared has existed contemplated and considered as affected form of cuisine but yes in the increasing and energy concerning times of day it has noticeably enhance a part of our lives and it has affected the consumer's buying conclusion when it meets to grocery buying. The research was attended with 50 respondents utilizing useful and inspecting sampling at market in Uttar Pradesh. Likert-scale located enquiry was developed and data was assembled using availability sampling It was found that the quickly made food has a significant impact on purchasing decision and consumer behaviour.

INTRODUCTION

Highly Effective Marketing Strategies for a Food & Beverage Business Packaging of the product. Let's glide by the previous byword, "A book is judged by its cover" within the same manner a product is judged by its packaging. One in every of the largest ingredients that promoting professionals consider is that the packaging of the merchandise. This doesn't solely embody the literal packaging. Rather, it starts with the essential emblem style of your whole to the menu card and the way it's given on the table. Typically the logos on your cutlery will have a powerful impact on your shoppers.

Make a Press Release Along with your USP

Perhaps your angel capitalist or your partner is investment in your plan as a result of there's potential in it. The largest potential that almost all investors see is that the USP or the distinctive point, which may be something from creating the most effective cream cheesecakes in city to victimization solely organic or vegetarian ingredients within the menu for your food truck. Hence, it ought to be showcased in your packaging. For instance, a whole as straightforward as Baskin & Jerome Robbins stands out as a result of it makes a trial to return up with new flavours monthly.

Blogging

Your SEO strategy starts with a web log. The most effective place to start is by having your own web log on your web site. You'll integrate this along with your different social media platforms similarly like Facebook, Instagram and Twitter in order that every post gets increased and creates an honest impact. This is often your best communicating wherever you'll produce an enormous following for your whole. You'll conjointly begin partnering with skilled food bloggers and raise them to review or author regarding your business. This manner you finish up reaching bent on additional folks and may fancy an additional dominant on-line presence.

Email Promoting

Start associate degree email promoting program and build a monthly/annual schedule in order that your posts area unit relevant and spaced out through an amount. E-mailers area unit fast and straightforward to send, and every one that you just would like area unit email listings of potential similarly as current customers. Keep causing mailers regarding your new product offerings or competitions, exciting events, discount coupons to stay customers engaged.

Social Media promoting

Do you acumen a lot of impact your twitter page header style has once it involves on-line marketing? an organization like Burger King or Hardy's is legendary these days for being thus cool and relatable with the present generation as a result of they're on all the social media platforms together with Foursquare and Reedit. Instagram is one in every of the largest platforms wherever a Food & food business will thrive through social media. Folks love clicking photos of food.

Festive and Seasonal Offers

There are unit various websites like Zomato, Food Panda, etc. on food and beverages wherever you'll list your product and menu. There are unit loads of smartphone apps and websites that enable you to use their platform as a method to sell your product by giving a marginal commission to the platform.

Target The Younger Generation

If you continue to have the recording of your mummy or pop telling you to eat your vegetables of the kid, you're not alone. The younger generations of Millennials and information have this reminder stuck in their head similarly. The younger generation is accountable for driving up the expansion once it involves contemporary and frozen vegetable consumption. Therefore, this is often the correct market once it involves your frozen foods business. The fact is that the younger generation is far additional health-conscious than several of their older colleagues. Therefore, they're additional probably to achieve for frozen fruits or vegetables as a result of they recognize they're healthier than a number of the alternatives.

Go Inexperienced Along with your Business

Today, folks care regarding wherever they pay their cash quite ever before. They require forming positive that their cash goes to be place to sensible use. If you demonstrate that your frozen foods business cares regarding the surroundings, you're getting to create inroads in precisely regarding each section of the market. For instance, you'll wish to supply packaging that's environmentally friendly. You would like to broadcast that your food has been sourced sustainably. You would like to form positive that customers perceive you're creating efforts to be carbon-neutral

Content Promoting

One of the most effective ways that retail brands will connect with their customers is thru content promoting. The expansion of the net has prompted folks to buy on-line for stuff, together with food and beverages. Why not make the most of this trend to attractiveness to those shoppers? The correct content can inform consumers regarding your whole. Content ought to be central to your promoting strategy. You'll share relevant content looking on the season, because it can increase your visibility. Content will vary from product guides to info that may solve consumers' potential dilemmas. Whereas obtaining profit is arguably the most goal, price creation can increase your business longevity.

Maintain Quality and Guarantee Compliance

Mostly, potential on-line patron's area unit skeptical regarding foods thanks to quality problems. Your on-line food and food offerings ought to go with relevant rules in your state. You'll gain authority within the trade whereas avoiding product remembers which may cause losses. The food safety and modernization Act within the Bharat. Is one in every of the rules established to make sure that makers don't give contaminated food items? The regulation has prompted makers to enhance however they acquire material and style food merchandise.

Print Media Promoting

Print media is a vital part that ought to be intercalary to your promoting strategy while not an afterthought. Once medium is mentioned in an exceedingly statement, the 2 most reliable advertising mediums – newspapers and magazines occupy the most image. We've got to explore each these objects for your own sensible and it's best to induce your advertisements revealed in them.

Pamphlet Distribution Set Up

Pamphlets area unit straightforward carriers of elaborated info regarding your business. The value that you just could ought to face whereas obtaining correct pamphlets created for your pre-packed frozen foods business might not be one thing out of your budget. That is why we will think about a large promoting reach with an easy pamphlet style. Thank the purchasers for his or her word of mouth promoting word of mouth promoting takes away tons of energy and time of the purchasers. That's why it's necessary that you just seem grateful by taking applicable actions. Rewards and special offers for the purchasers will increase their trust in you and you'll expect nice future relationships with them.

Unique Emblem

Logo forms a vital a part of your stigmatization and for your company to induce detected particularly once it's a food item. The brand ought to match with the corporate values. It ought to be able to specific tons of things regarding the corporate. The brand ought to be created when tons of thought, like keeping the color in mind, the design, shape, etc. Also, {the logo the whole the emblem} ought to be distinctive and may not match or look the same as the brand of the other brand.

Use the proper Hash tags

Who knew that hash tags may play such a vital role in promoting your business properly? Typically, folks don't perceive the utilization of correct hash tags for his or her posts. However, if the proper hash tags area unit used, they assist to drive additional traffic to your posts. The traffic with hash tag drive area unit all they have an interest in such merchandise. Take part within the native events throughout the year. There are unit events that keep happening. Folks simply would like an event to celebrate, and therefore the celebration seems to be an

occurrence. Days like Father's Day, Mother's Day, Valentine's Day, Food Day or summer competition, winter competition, etc. Keep a note of such events and do some fun activities or giveaways. Events are the most effective times after you catch hold of most folks along.

SCOPE OF THE STUDY

The objective of the report is to seek out prospective selling ways of the corporate and additionally offer key data client perception and preference.

The study additionally offer obtaining data concerning the selling and sales performance of the corporate and why area unit folks area unit selecting frozen product and pre-packed juices. In addition to the current, it helps to find out the issues whereas doing sales.

Extensive survey on client preferences can offer a great deal of valuable data concerning the whole information/awareness of the merchandise and it'll be straightforward to seek out the likes and dislikes of the merchandise. For company, it'll data concerning client preferences compared with different market product and counsel valuable direction of current market trend. It will offer a great deal of data concerning market trends and customers preferences concerning the merchandise.

The study of client preferences can offer ME a great deal of data on: however, client profile differs across the user segments? Study includes an in-depth survey over a hundred customers World Health Organization traditional uses the services.

This study can determine modern-day expectations of shoppers. It'll confirm what consumers need from frozen food product and the way they have an effect on their shopping for selections and behaviour.

LITERATURE REVIEW

Literature and analysis in line with film maker and Ewart (1999) shows that anti-freeze proteins or by artificial means increased proteins square measure inhibited into frozen foods that modify and enhance the expansion of ice and stabilization of ice crystals in controlled surroundings. Once dozens of researches concerning the health hazards and chemical manipulation of ice are leaked it's been seen that the lot of aware and educated patrons can hesitate in getting frozen foods for daily preparation functions. Though these anti-freeze proteins might improve the standard of food and maintain a swish texture, upon digestion of those foods with chemicals indestructible anti-freeze parts led to cellular injury. The question currently arises that do the purchasers wish to pay a lot of for frozen foods.

This study provides an empirical analysis of food market looking behaviour and costs across middle or residential area among cities of America (Myers, Samuel 2005). A comparison is drawn to point that the largest issue conducive to purchasing behaviour in grocery stores was the value and convenience of frozen foods that were most popular over ancient varieties of grocery purchase. Even if wherever costs were lower in those neighborhood folks would tend to shop for frozen foods on the convenience of preparation and handling of the merchandise. once seeing amendment this alteration this modification this variation this transformation} in shopping for behaviour a theoretical model to establish conditions below that value and packaging changes square measure largely to change the shopping for intention was developed (Tyner 2007). Though it's intuitive that raising {the value the worth the value} of frozen foods folks would still tend to shop for them as of the convenience and convenience of packaged foods that isn't littered with price and different political economy factors.

(Kisser 2005) The food product business is undergoing fast and exponential enlargement. Retail grocery stores and food product suppliers have an interest in promoting frozen foods instead of main stream groceries. The aim of the study was to see if purpose of purchase choices of the client were created thanks to the supply of frozen foods over main-stream groceries. AN experimental study was developed and designed during which management levels of frozen foods and main-stream groceries were located in numerous space of the shop and what was determined was that out of all the purchasers that went into the shop. That customers bought which type of product (whether frozen foods or thought groceries) from the look. it had been determined that younger folks, girls and people having smaller households would purchase frozen foods thanks to the straightforward of handling frozen foods as well as their preparation trouble was shriveled.

(Sally 2005) At an equivalent time, their healthful packaging and connected costs saw price for cash for these food product packs. what is more the explanation for patrons getting were conjointly personal factors like style and quality of the foods as per their personal selection was conjointly desired for them after they were shopping for frozen foods or groceries.

Previous analysis has evidenced and conjointly given suggestions that foods that square measure beneficial to one's health can perpetually be most popular once shopping for groceries or any type of family product. Though they will be dearer, less in amount and harder to get, analysis has evidenced that folks WHO adhere to correct healthy intake tips systematically reported to look a lot of for healthful frozen foods than thought groceries. On investigation in this analysis it was seen that look kind and location as well as bigger handiness and costs were conjointly inhibiting factors to the shopping for call of groceries.

With frozen foods having discounts and packaged in healthful settings. Frozen foods were seen to be purchased a lot of despite value and amount thanks to the actual fact that they were packaged and had the style that customers needed along side the healthy food issue. In line with Schroter (2006) he developed a theoretical model to spot conditions below that value and financial gain would have an effect on shopping for behaviour of groceries. though it's was terribly predictable that costs of high-calorie foods can decrease the consumption of quick foods and folks would revert to getting frozen foods regardless of their value and amount as customers were a lot of involved regarding the health-risks that were related to quick foods and also the health advantages that were related to organic food product.

A Scottish study by Cummins (2002) settled that foods that were helpful to health could also be dearer and harder to get however customers would still choose to purchase them as the risk compared to value was relatively value it. In this paper there was investigation on the value of frozen foods and bigger handiness each was extremely found in multiple grocery stores. Though, costs didn't vary that abundant however the supply did. Wherever handiness was high for frozen foods thought groceries tend to lose their price despite their low-cost price. All this was thanks to the health consequences that individuals were currently awake to main-stream groceries as health problems related to poisoning that had occurred in some components of Scotland and also the UK. Another condition once it involves purchase behaviour and higher cognitive process is impulse

According to Rook (1995) shopper researchers have determined and investigated impulse shopping for a lot of than five decades, nearly no analysis has ended or by trial and error examined impulse buying's normative aspects. Rook (1995) presents abstract as well as applied math proof that buyers have normative evaluations and their judgments regarding the product whereas partaking in impulse shopping for behaviour. Specifically the relationship between thoughtlessness attribute and connected shopping for habits is found solely once customers believe that action on impulse is valid or applicable.

Once exploring shopper behaviour more Baumgartner (1995) projected a 2-issue thought. Of alpha shopper behaviour whereas shopping for frozen foods still as different grocery things. A scale of 1-5 is taken and respondents knowledge is regressed to check whether or not the consumer's tendencies to have interaction product is based mostly on alpha nature or is it based on conceptualization and different personal factors. The results of six studies with subjects were conjointly accounted for during this analysis to prove that shopper behaviour is affected whereas shopping for frozen foods that these results square measure backed by theoretical explanations. Environmental concern has conjointly affected purchase behaviour and shopper analysis.

In line with Margareta (1997), a study within the Norwegian or Scandinavian region of Europe was chosen for investigation of shopper analysis of frozen foods like vegetables, fruits, meat and different spoilable. The response was prioritized on freshness, style and biological process price. On with the different factors were packaging value and different personal factors were conjointly accounted for within the analysis. Through multi-linear regression techniques it had been shown that ladies were a lot of doubtless to grade environmental and personal aspects in their personal analysis of quality and that they were conjointly a lot of doubtless to shop for that product than men. There was conjointly geographical distinction wherever as folks within the north of Norge towards the colder facet of the country had no freelance result of financial gain, occupation or personal factors touching the shopping for call. The youngest cohort within the study based mostly their choices relating window shop on concerns associated with surroundings factors and health risks related to un-treated and un-claimed flighty thought groceries in comparison to frozen product.

Myers (1968) talks regarding that attitude square measure associated with getting decisions? Article the Myers argues regarding what percentage attitudes will verify or impact shopping for behaviour. When it involves food product. He argues that out of the many potential attitudes solely some extremely relate to or "determine" shopping for behaviour. These attitudes square measure outlined during this article and ways of menstruation them square measure mentioned via correlation techniques and multivariate analysis.

Johnson (1982) Compulsive patrons square measure people WHO expertise and habitually act Powerful, uncontrollable urges to buy. The relationships that existed between compulsive shopping for behaviour and perceived social station related to shopping for, materialism, shallowness, and apparel-product

involvement for adults between the ages of eighteen and twenty four were investigated. This age vary was elite as a result of it is the average onset age of compulsive shopping for behaviour. A convenience sample of 305 undergraduates completed a form that contained measures of compulsive shopping for, perceived social standing associated with shopping for, materialism, shallowness, and apparel-product involvement. Multiple statistical regression analysis was accustomed analyse the info. The total regression model and also the regression coefficients for all four of the predictor variables were statistically important. The compulsive shopping for behaviour of participants was negatively associated with shallowness and completely associated with perceived social station related to shopping for, materialism, and apparel-product involvement.

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According to Rook (1995) shopper researchers have determined and investigated impulse shopping for a lot of than five decades, nearly no analysis has ended or by trial-and-error applied math proof that buyers have normative evaluations and their judgments regarding the product whereas partaking in impulse shopping for behaviour. Specifically the relationship between thoughtlessness attribute and connected shopping for habits is found solely once customers believe that action on impulse is valid or applicable.

In keeping with Rook (1995) client researchers have discovered and investigated Impulse shopping for quite five decades, virtually no analysis has conclude or through empirical observation Examined impulse buying's normative aspects. Rook (1995) presents abstract as well as applied mathematics proof that customers have normative evaluations and their judgments concerning the merchandise whereas participating in impulse shopping for behaviour.

RESEARCH METHODOLOGY

Objectives of the Study

- To study selling read of the corporate
- To study the selling ways of the corporate
- To study the a way to build effective selling ways
- To study the client preference and perception concerning the corporate
- To check the valuation perception of shoppers
- To study a good and higher perceive of the buyer behaviour towards grocery purchase.
- To analyze the benefits and drawbacks of frozen foods

RESEARCH STATEMENT

The topic of food product and client behaviour includes of assorted subtopics and is of terribly immense nature. In a very shell to', the statement being researched during this thesis is as follows: —The increasing trend of frozen foods has modified the shopping for behaviour of consumers.

HYPOTHESES

H1= Frozen foods incorporates a important impact on shopping for behaviour H1a= Frozen foods has insignificant impact on shopping for behaviour

The higher than Hypotheses are going to be tested for via regression and correlation on the information set that may be obtained by form assortment. On basis of results the hypotheses mentioned higher than can either be rejected or accepted.

Population & Sampling

The frame of reference for the study is restricted to the grocery client market of province. The analysis was conducted with one hundred respondents’ mistreatment convenience sampling from completely different super markets in defence.

Research Instrument- Primary information was collected through form Sample size: 100

Sample Area: national capital Sample technique: sampling method

Data Assortment

This report is predicated on primary additionally secondary information, but primary information assortment was given additional importance since its overhearing think about angle studies. One amongst analysis methodology is that it helps in distinguishing the matter, grouping and analyzing the specified info and providing an alternate answer to the matter. It additionally helps in grouping the very important info that’s needed the centre management to help them fir the higher cognitive process each day today call and demanding ones.

Sampling

- **Sampling Procedure:** the sample was selected of them World Health Organization is the customers/viewers of the corporate. It was additionally collected through personal visits to persons, by informal talks and thru filing from questionnaires ready and formal talks additionally. The information has analyzed by mistreatment applied mathematics tools
- **Sample Size:** the sample size of my project is restricted to 100 individuals solely. Out of those 10 individuals has endowed in tally. People didn’t have endowed in it.
- **Sample Design:** information has been conferred with the assistance of bar graphs, pie charts, line graphs etc. the subsequent are the questionnaires that are dole out at the time survey.

Contact Technique

Mailed Questionnaire- additional individuals is also reached by paper surveys than the other technique, though up so far mailing lists is also troublesome to come back by and postage will be costly.

Mailed questionnaires offer individuals time to believe their responses and to use resources reception or at work once responding. There is, of course, no probability to raise searching queries or clarify info.

Online Questionnaire- the utilization of on-line questionnaires is incredibly well-liked. On-line questionnaires are the smallest amount costly thanks to reach the best variety of individuals – globally. Though not everybody incorporates a laptop, tablet, or good phone, computers are obtainable at public libraries and community agencies.

TOOLS FOR ANALYSIS

Linear Regression

To prove out hypotheses linear regression can be used on information obtained from the Questionnaires and also the results are going to be analysed among the 2 variables to work out whether or not. There is a bearing of frozen foods or not.

Correlation

Further take a look acting for significance as well as proving the hypotheses are going to be done through Karl Pearson’s correlation test wherever testing for correlation between shopping for behaviour and frozen foods are going to be done to watch whether not the projected relation exists or not

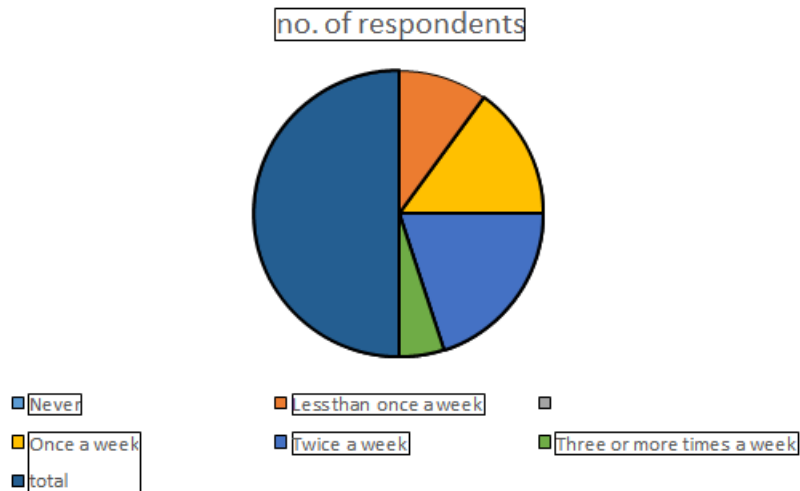
DATA ANALYSIS AND INTERPRETATION

Q1. How many times people buy frozen products from groceries shops?

Table no.1

Option	No. of Respondents	Percentage
Never	0	0%
Less than once a week	10	20%
Once a week	15	30%
Twice a week	20	40%
Three or more times a week	5	10%
Total	50	100%

Figure no.1



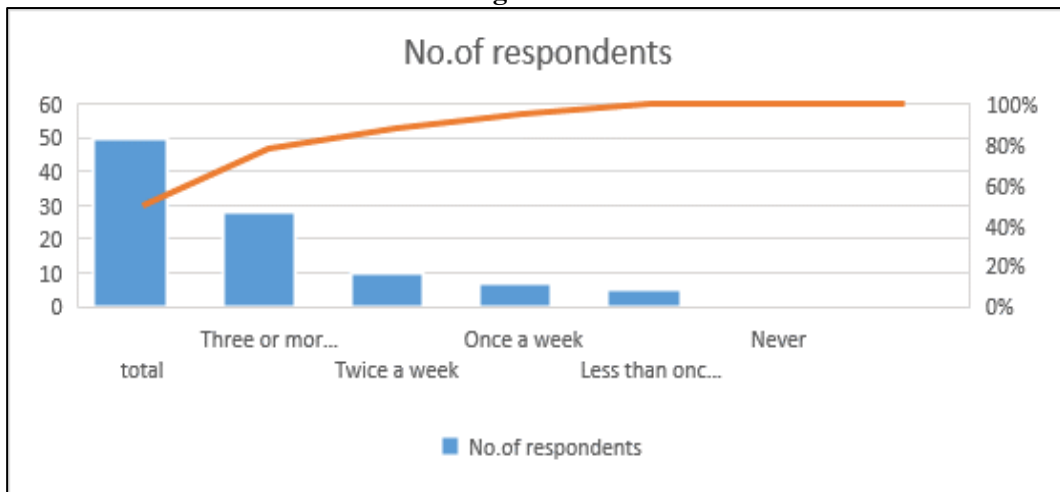
Interpretation – people are not very often buying frozen products. They are going once or twice in and buying sufficient frozen products from groceries shops.

Q2. About how many times a week do you, yourself, prepare evening meals at home? Include preparing fresh foods and packaged products, like frozen dinners and canned or boxed foods.

Table no.2

Option	No. of Respondents	Percentage
Never	0	0
Less than once a week	5	10%
Once a week	7	14%
Twice a week	10	20%
Three or more times a week	28	56%
total	50	100%

Figure no.2



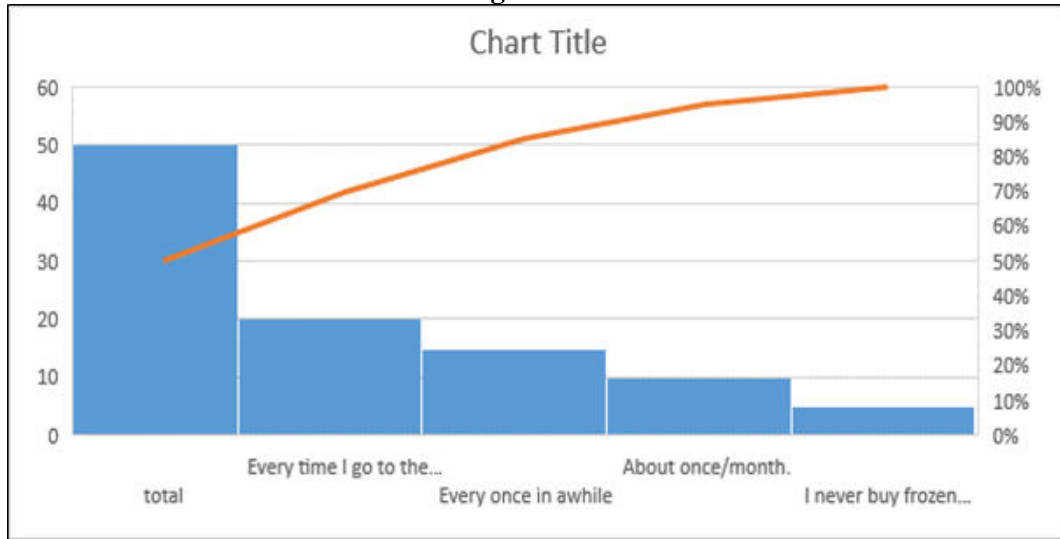
Interpretation- customers are mostly preparing meals at home. They are not too fond of going outside and have dining.

Q3. How often do you purchase frozen dinners?

Table no. 3

Option	No. of Respondents	Percentage
Every time I go to the grocery store.	20	40%
About once/month.	10	20%
Every once in awhile	15	30%
I never buy frozen dinners	5	10%
Total	50	100

Figure No.3



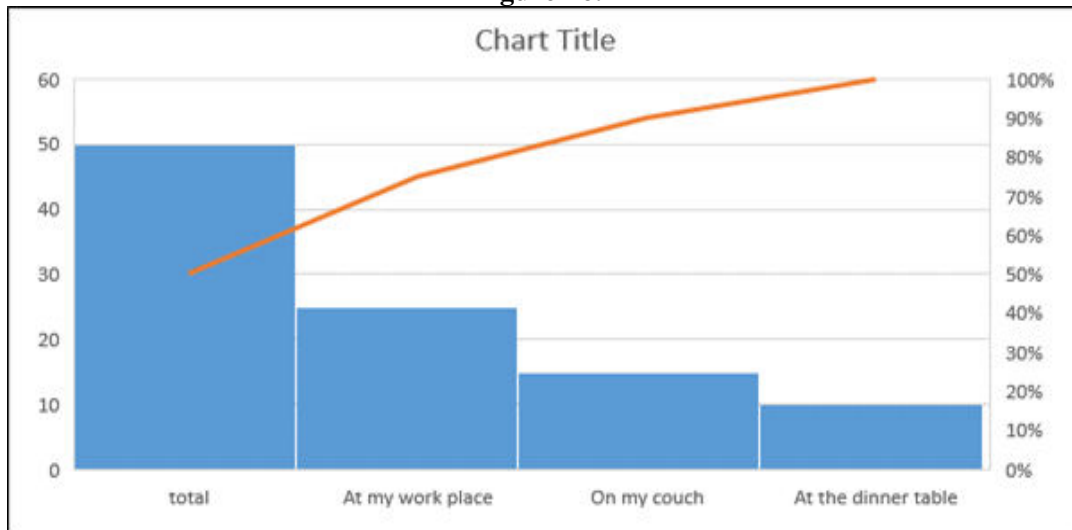
Interpretation- customers are buying frozen food mostly when they going for shopping.

Q4. . In which of the following situations do you tend to eat frozen dinners?

Table no. 4

Option	No. of Respondents	Percentage
At the dinner table	10	20%
At my work place	25	50%
On my couch	15	30%
total	50	100

Figure no.4



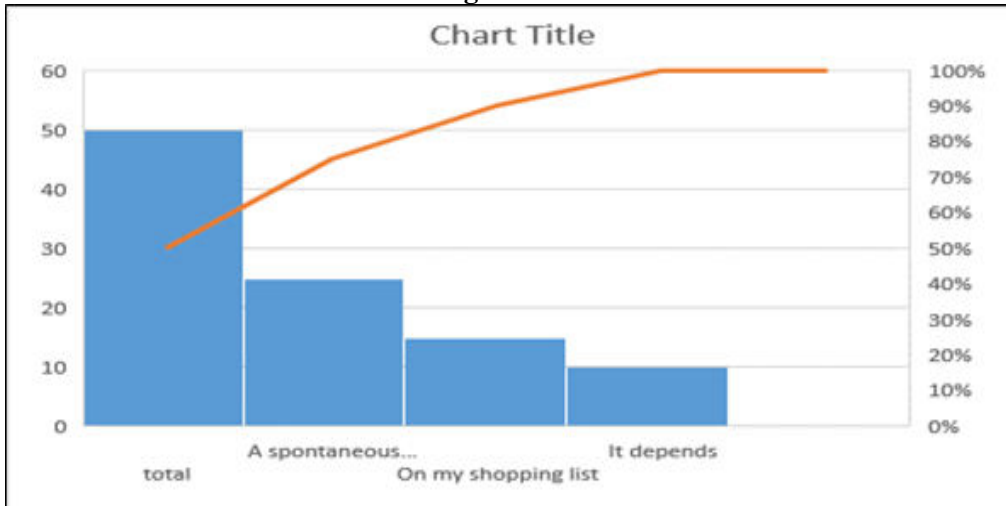
Interpretation- people are eating frozen food generally when they are in work place.

Q5. When I purchase frozen dinners, they are:

Table no.5

Option	No. of Respondents	Percentage
On my shopping list	15	30%
A spontaneous decision	25	50%
It depends	10	20%
total	50	100

Figure no. 5



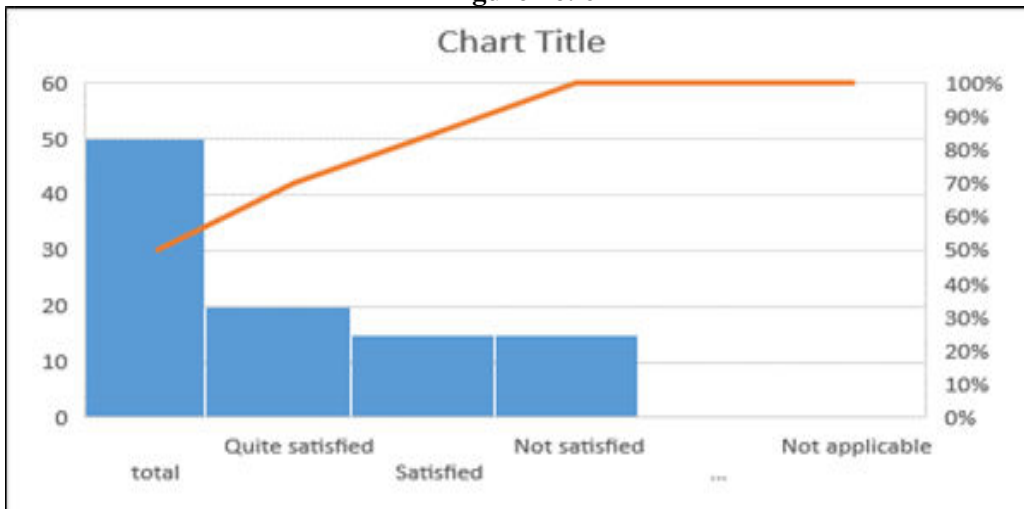
Interpretation- when people are purchasing food when they have spontaneous decision to eat frozen food.

Q6. Were you are satisfied with pricing policies of the company?

Table no. 6

Option	No. of Respondents	Percentage
Satisfied	15	30%
Quite satisfied	20	40%
Not satisfied	15	30%
Not applicable	0	0
total	50	100

Figure no. 6



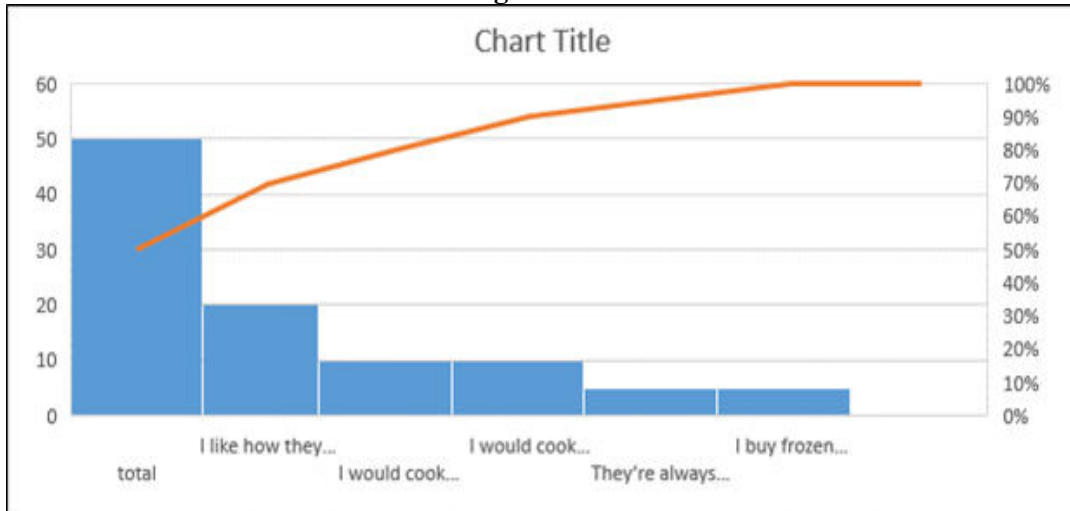
Interpretation – people are quite satisfied the pricing policies of the company.

Q7. Which statement best reflects why you purchase frozen dinners?

Table no. 7

Option	No. of Respondents	Percentage
They're always a back-upoption.	5	10%
I like how they taste	20	40%
I buy frozen dinners fordietary reasons.	5	10%
I would cook better meals,but I don't have time.	10	20%
I would cook better meals,but I'm not a great cook.	10	20%
Total	50	100

Figure no. 7



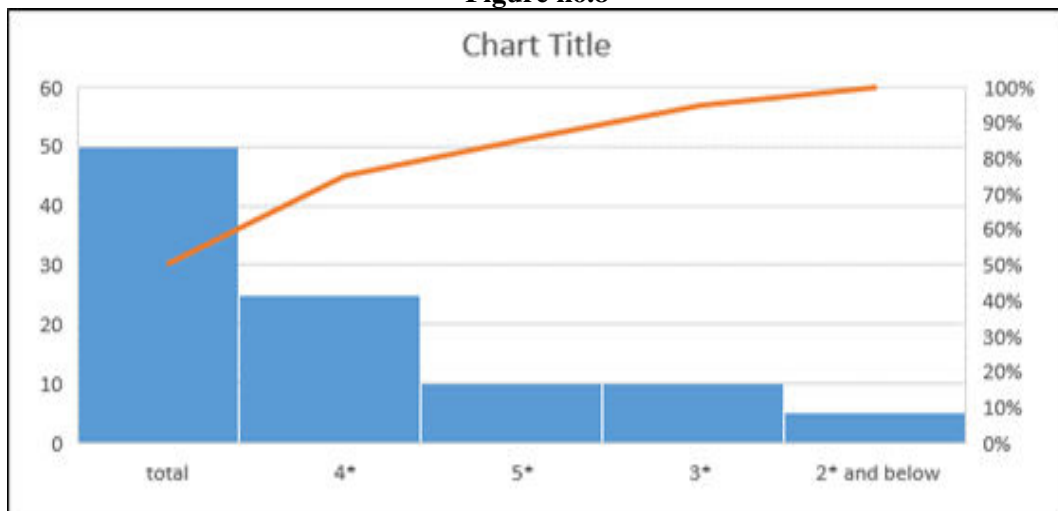
Interpretation – people purchase food according to the taste of the product.

Q8 How do you rate the quality of the product?

Table no. 8

Option	No. of Respondents	Percentage
5*	10	20%
4*	25	50%
3*	10	20%
2* and below	5	10%
Total	50	100

Figure no.8



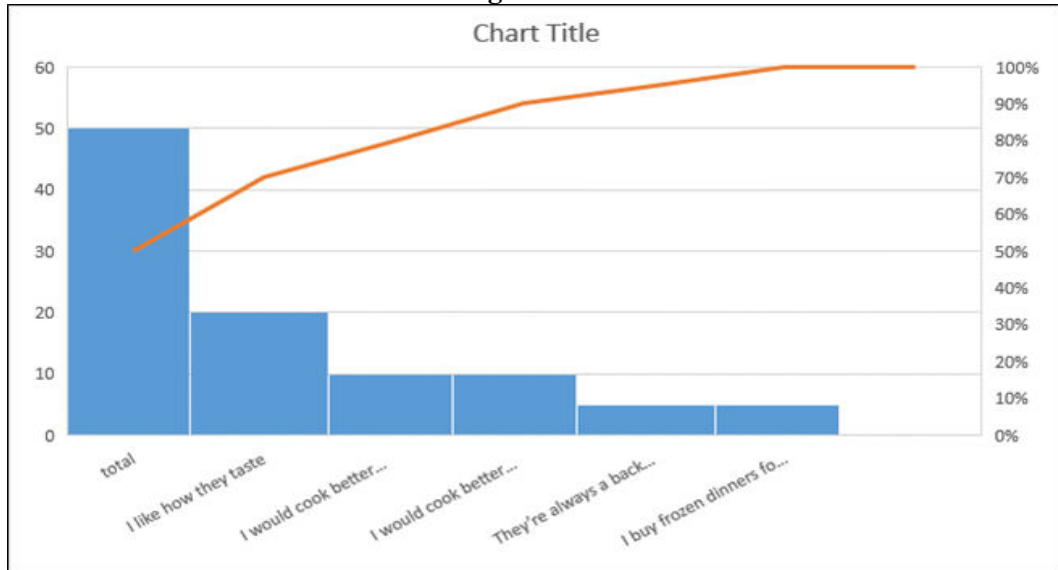
Interpretation- mostly of the people are satisfied with the company product. As they are often buying it.

Q9 were you satisfied with the product?

Table no. 9

Option	No. of Respondents	Percentage
Fully	25	50%
Not fully	15	30%
Not satisfied	10	20%
total	50	100

Figure no. 9



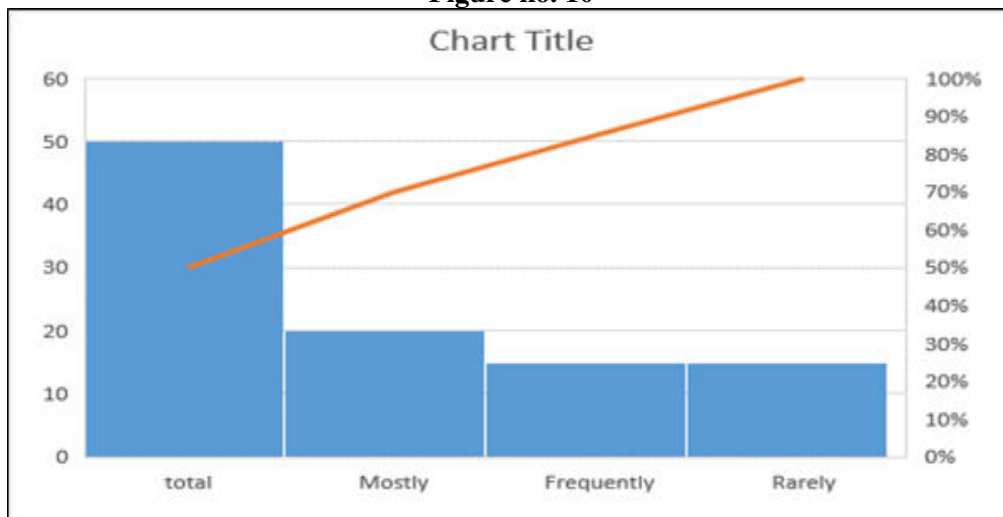
Interpretation- people are very satisfied with the product.

Q10. . Do you buy frozen products in large quantities?

Table no. 10

Option	No. of Respondents	Percentage
Mostly	20	40%
Frequently	15	30%
Rarely	15	30%
total	50	100

Figure no. 10



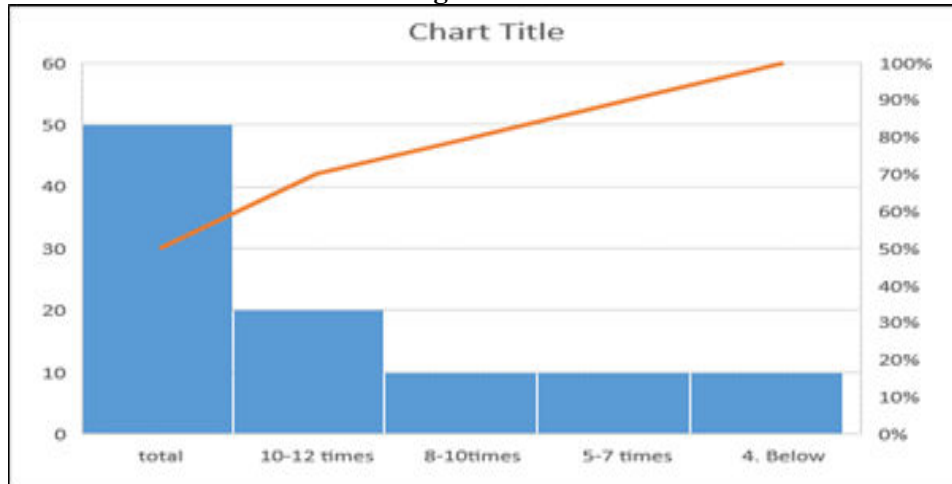
Interpretation- people are buying frozen products in large quantities as they looks so goodand taste so good.

Q11. How many times do you drink packaged juice in a week?

Table no.11

Option	No. of respondents	Percentage
10-12 times	20	40%
8-10times	10	20%
5-7 times	10	20%
4. Below	10	20%
Total	50	100

Figure no.11



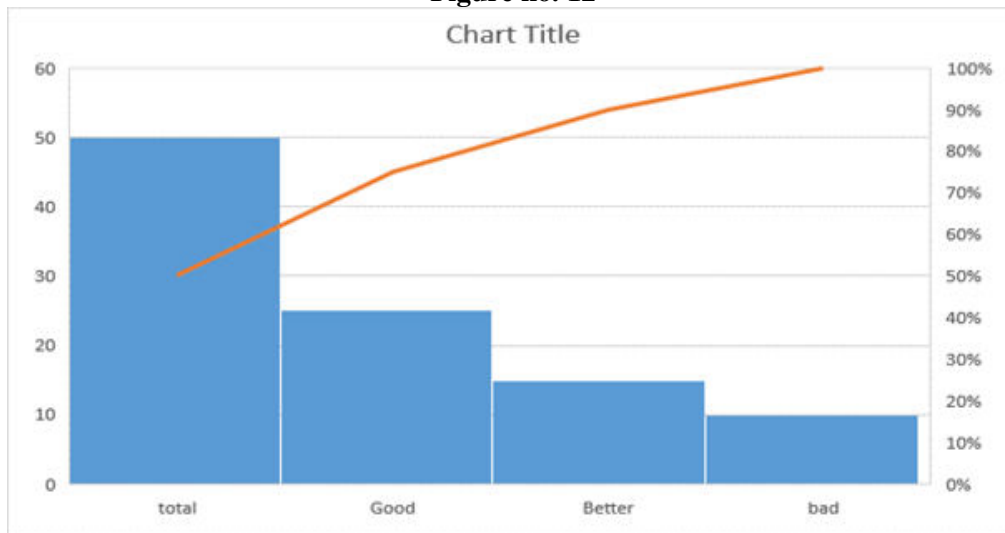
Interpretation- mostly of the people drinks packaging juices often as they are of no handcontact and the flavor taste so good.

Q12. What is the feedback of company product?

Table no. 12

Option	No. of Respondents	Percentage
Good	25	50%
Better	15	30%
Bad	10	20%
Total	50	100

Figure no. 12



Interpretation- the feedback of the company is really good as people like the products of the company as the taste of the products so good and packaging is impressive

FINDINGS, SUGGESTIONS AND CONCLUSION

FINDINGS

From the responses of fifty customers the findings are listed below:

- As per the findings, majority of the individuals are attentive to frozen merchandise.
- The customers World Health Organization are in the main age bracket of 25-30 yrs. are buying the merchandise.
- It has been realized that the bulk of the shoppers understand the merchandise through family and friends.
- As per the findings majority of the shoppers purchase the merchandise throughout snacktime.

- As per the findings concerning all individuals just like the take a look at and quality of the merchandise.
- It has been found that every one individuals like services of the corporate.
- It has been found that eightieth individual's are glad with facility of the corporate.
- It has found that some individuals aren't privy to varied schemes of the corporate.
- Majority of the individuals say value are affordable however additionally V-J Day individuals say costs are medium and five-hitter individuals say costs are high.
- It has been found that folk's are glad by the merchandise.

LIMITATIONS

- Suggestion is predicated on the given info
- Due to massive no.of worker it absolutely was uphill to gather all info from every.
- The period was restricted to grasp the entire method.
- Can't draw effective conclusion because it may be a continuous method.
- The space of survey was restricted to some specific areas.

SUGGESTIONS

- The company should select some promotional activities like TV, advertisements, hoardings and newspapers.
- The company should advertise concerning their schemes to aware customers.
- The company must conduct the periodical conferences with customers and take valuable suggestions.
- The company might adopt the policy of discounts cards and gifts to customers whereas buying the merchandise.
- Innovative strategies to be launched to boost the position through higher selling ways.
- Innovative packaging additionally facilitate company to possess a plus against its competitors.
- Company ought to increase its selling ways for increase sales ration and client awareness.
- Company should improve their quality and take a look at for satisfy those customers World Health Organization displease nowadays.
- Distribution, sturdiness and worth will be inflated.
- Give adequate offers to extend sales.
- Have to extend the notice level within the patrons through medium and promotion channels.
- Quality and brand are to special issue, thence corporations have tried to create and maintain name and their goodwill within the market.
- Focus on native market so try and capture the entire.

CONCLUSION

When conducting survey, It is concluded that client behaviour has been thought of because the most important and indispensable tools of the corporate. Main purpose of this study is to work out the selling ways of the corporate and why individuals are mistreatment food product and beverages of the corporate. About eightieth individuals are glad with services of the corporate. As per the findings of the company's selling policy is predicated on family and friends recommendations and additionally social media. Thus we are able to say that lepidopteron promotional material is principally applicable here. However company got to reconstruct their selling policies to extend their sales.

REFERENCES

- The Economics and Conveniences of Modern-Day Living: Frozen Foods and Mass Marketing, Shane Hamilton
- Ready-to-cook idlis, vegetarian sausages lead India's frozen food revolution, Sarah Jacob, ET Bureau Sep 12, 2011

-
-
- Food Processing in India, report by CCI
 - The 2009-2014 Outlook for Chilled Food in India-/,
 - Sahu Khan Chand Foods - Wholesale provider from Budaun Road, Chandausi, Bharat | regarding North American country (indiamart.com)
 - Highly Effective selling methods for a Food & potable Business (designhill.com)
 - What area unit the seven annotation of marketing? - Assemblo(PDF) Food Industry: associate Introduction (researchgate.net)
 - Summer situation report totally different quality testing (foodtechnology) | aishwarya dominion - world.edu
 - IMPACT of recent innovations in food and potable industry (researchgate.net)
 - Food & potable marketing research Reports & Food & potable trade Analysis |MarketResearch.com
 - Food And Beverages marketing research Coverage (thebusinessresearchcompany.com)
 - Marketing - The selling method | Britannica
 - Investopedia- selling Strategy Definition (investopedia.com)Books
 - Magazines

RESEARCH PUBLICATIONS AND ETHICAL PRACTICES**ACS Jyoti Mahajan**

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ABSTRACT

A set of norms and standards known as "ethics in publication writing" direct writers and publishers in the creation and distribution of scholarly and research-based content. These values include truthfulness, decency, correctness, justice, and openness. When it comes to publishing writing ethics, there are certain important things to keep in mind, such as plagiarism, which is the act of passing off someone else's words or ideas as your own. It is a significant ethical transgression that may have dire repercussions. Other aspects include Falsification of data refers to the purposeful generation of incorrect or misleading data, whereas fabrication of data refers to the modification of data to achieve the author's intended result. Both of these actions are seen as immoral and may have major repercussions, such as the retracting of published works legal action, and loss of reputation. Authorship should be based on significant contributions to the study or publication as another consideration. This essay sheds light on the importance of ethical publication writing for preserving the validity of academic labour and research.

Keywords: Ethics, Fabrications, Plagiarism, Transparency, Integrity, Publications.

1.1 ETHICS AND RESEARCH

Ethics in science refers to the set of moral principles and values that guide the conduct of scientific research. The goal of ethics in science is to ensure that research is conducted in a responsible and transparent manner, with respect for human and animal rights, and with a commitment to minimizing harm to the environment. One of the fundamental principles of ethics in science is the principle of scientific integrity (1). This principle demands that scientific research be conducted with honesty and transparency, and that results be reported accurately and without bias. This means that scientists should not manipulate data or results to achieve a desired outcome, and should not withhold information that could be relevant to the understanding of the research findings.

Another key principle of ethics in science is the principle of respect for human and animal rights. This principle requires that scientific research be conducted in a way that respects the dignity, privacy, and autonomy of human subjects, and that animals used in research be treated humanely and with the least possible suffering. Informed consent is an essential aspect of this principle, as it ensures that research subjects are fully informed of the risks and benefits of their participation in research and have given their voluntary and informed consent. Ethics in science also requires that scientists consider the potential impact of their research on the environment and on future generations. This means that scientists should consider the potential risks and benefits of their research and should work to minimize any negative impact on the environment and on future generations (2).

To ensure that scientific research is conducted ethically, many scientific institutions and organizations have established codes of conduct and ethical guidelines for researchers. These guidelines typically address issues such as the protection of human and animal subjects, scientific integrity, conflicts of interest, and the responsible conduct of research. In addition to these guidelines, there are several regulatory bodies that oversee scientific research and ensure that it is conducted ethically. These include institutional review boards, which review research proposals to ensure that they meet ethical standards, and government agencies such as the National Institutes of Health, which fund and oversee research and ensure that it is conducted in an ethical and responsible manner.

As the primary objective of scientific inquiry is the pursuit of truth and dependable outcomes, ethics in scientific research has gained greater attention. Nobel laureate William Lipscomb remarks that he withholds his most innovative ideas from his research proposals to prevent others from exploiting them. Some fundamental ethical principles in scientific research and publication are honesty, objectivity, integrity, attentiveness, transparency, respect for intellectual property, confidentiality, responsible publication, responsible mentoring, respect for colleagues, social responsibility, non-discrimination, competence, legality, animal welfare, and protection of human subjects. Adhering to ethical norms in research is critical for several reasons, including promoting research objectives such as knowledge and truth, fostering various moral and societal values, and gaining public support for research. However, unethical practices are still prevalent in research, such as putting patients at risk, engaging in fraud, producing or falsifying scientific findings, fabricating consent forms, and plagiarism. There is no one-size-fits-all solution to achieving ethical scientific research. Studies show that research misconduct is directly linked to increased academic expectations and a greater desire for publication, personal ambition,

vanity, and a desire for fame, predilection, greed, which is associated with financial gain, and a lack of moral judgment to differentiate between right and wrong.

According to studies, the following factors are directly related to the misconduct (1):

- Raised standards for academic performance and a stronger drive to publish papers;
- Individual aspirations for fame, conceit, and ambition;
- Favoritism;
- Greed, which is correlated with monetary gain;
- Inability to morally distinguish between right and wrong.

In regard to the above-listed values, it is to be expected that the behavior that we are talking about can only become more pronounced over time, and, as such, it may leave many consequences to science in general. Because of this, it is very important to take precautions that will make these unethical actions much harder to do. As a rule of thumb, the following preventive measures should be taken:

- Make ethical expectations for all researcher's crystal clear;
- Supply all researchers with instruction and training;
- Describe in detail how such behavior will be punished;
- Implement more stringent regulations for sponsored research.

1.2 FORMS OF UNETHICAL BEHAVIOR IN RESEARCH ARTICLES

Research is a fundamental part of the scientific process, aiming to create new knowledge or to advance existing knowledge. Ethical research requires researchers to follow specific guidelines and principles to protect the welfare of the participants, maintain scientific integrity, and ensure transparency. However, unethical behavior in research articles can harm the credibility and validity of research findings. This article will explore the different forms of unethical behavior in research articles (2-3).

Plagiarism: Plagiarism is the act of using someone else's ideas or work without giving them credit. This includes copying and pasting parts of other authors' work, submitting someone else's work as one's own, or paraphrasing someone else's work without proper attribution. Plagiarism is considered unethical because it undermines the intellectual property rights of the original authors and violates academic standards.

Fabrication of Data: Fabrication of data refers to the creation of false data or results, which are presented as genuine. Fabricating data is unethical because it can lead to false conclusions and harm the scientific process. It can also harm the reputation of the researcher and the institution they represent.

Falsification of Data: Falsification of data involves altering or manipulating data to fit a particular hypothesis or result. This can be done by removing or adding data points, changing statistical methods or calculations, or altering images or graphs. Falsification of data is unethical because it can lead to false conclusions and undermine the integrity of the scientific process.

Misleading Reporting: Misleading reporting refers to the presentation of results in a way that exaggerates or misrepresents the findings. This can be done by highlighting only positive results while ignoring negative results, or by manipulating language to suggest that the findings are more conclusive than they actually are. Misleading reporting is unethical because it can lead to misinterpretation of the results and harm the scientific process.

Conflict of Interest: Conflict of interest occurs when a researcher has a personal or financial interest that could influence their research findings or conclusions. This could include a researcher who has a financial interest in a particular product or company, which could bias their research findings. Conflict of interest is considered unethical because it can lead to biased research findings and harm the integrity of the scientific process.

Undisclosed Funding: Undisclosed funding occurs when researchers do not disclose the source of their funding or any conflicts of interest that could influence their research findings. This is considered unethical because it undermines transparency and the integrity of the scientific process.

Inadequate Sample Size: Inadequate sample size refers to using too few participants in a study to draw meaningful conclusions. This is considered unethical because it can lead to false conclusions and harm the scientific process.

Failure To Obtain Informed Consent: Informed consent is a critical component of ethical research, and failure to obtain informed consent from study participants is considered unethical. Informed consent means that participants are fully informed about the study, its purpose, and any risks involved, and have given their consent to participate voluntarily.

Failure To Maintain Confidentiality: Confidentiality is an essential component of ethical research, and failure to maintain confidentiality can harm participants and violate their rights. Researchers have a responsibility to protect the privacy and confidentiality of their participants and must ensure that any data collected is kept confidential.

Dual Submission: Dual submission occurs when a researcher submits the same manuscript to multiple journals simultaneously. This is considered unethical because it violates the policies of most journals and can lead to duplicate publication.

2.1 OBJECTIVES OF STUDY

- To provide insights about unethical practices involved in research publications.
- To create awareness amongst young researchers about unethical practices.
- To provide ways on how to avoid unethical practices and conduct healthy research.

3.1 GHOST AUTHORSHIP

Ghost authorship is the practice of omitting the name of an individual who has made substantial contributions to a research project or manuscript from the list of authors. This is a common practice in academia and has been a topic of controversy and debate for many years. In this Section, we will explore the concept of ghost authorship, its potential implications, and ways to prevent it.

Ghost authorship can occur for various reasons, such as to boost the reputation or career of a senior researcher, to increase the chances of publication in high impact journals, or to hide conflicts of interest. This practice is unethical as it can lead to unfair credit allocation, misrepresentation of research contributions, and ultimately undermine the integrity and credibility of scientific publications.

The impact of ghost authorship can be significant as it can skew the perceptions of readers, reviewers, and editors regarding the quality and legitimacy of research. Ghost authorship can also prevent the recognition of the contributions of junior researchers or students who may have played a significant role in the research project. Moreover, ghost authorship can create bias in the scientific literature by promoting certain research findings and suppressing others, thereby compromising the objectivity of the scientific enterprise.

To prevent ghost authorship, it is essential to establish clear criteria for authorship and ensure that all contributors are acknowledged appropriately. Most scientific journals require authors to disclose their contributions explicitly, including data collection, analysis, writing, and funding sources. However, this is not enough to prevent ghost authorship. It is also important to create a culture of transparency and accountability in scientific research, where all contributors are recognized for their work, regardless of their position or seniority.

One way to prevent ghost authorship is to adopt open science practices, such as preregistration, data sharing, and peer review. Preregistration involves registering the research design and hypotheses before conducting the study, which can reduce the likelihood of selective reporting or data manipulation. Data sharing enables other researchers to verify the findings independently and promotes transparency in research. Peer review provides an opportunity for independent experts to evaluate the quality and rigor of the research, which can help identify and address any ghost authorship or conflicts of interest.

3.2 GHOST AUTHORSHIP RAISES MANY ETHICAL QUESTIONS

Ghost authorship raises many ethical questions in scientific research. The practice of omitting the name of an individual who has made significant contributions to a research project or manuscript can be seen as a form of academic dishonesty, which undermines the integrity and transparency of scientific research. One of the main ethical concerns with ghost authorship is the issue of fair credit allocation. All individuals who have made significant contributions to a research project should be acknowledged and credited for their work. When "ghost authorship" occurs, individuals who have contributed to the research are not given the recognition they deserve, which can result in unfair credit allocation and career advancement (3).

Another ethical concern with ghost authorship is the issue of transparency. Scientific research is built on the principle of transparency, where all research methods, data, and findings are open to scrutiny and replication. Ghost authorship can compromise this transparency by hiding the contributions of individuals who have

participated in the research project, which can result in an incomplete and potentially biased scientific record. Ghost authorship can also raise concerns about conflicts of interest. When an individual who has made significant contributions to a research project is not listed as an author, it can be difficult to identify any potential conflicts of interest that they may have with the research findings. This lack of transparency can undermine the trust and credibility of the research, and ultimately, the scientific enterprise as a whole.

Finally, ghost authorship can raise concerns about academic integrity. Academic integrity is a fundamental principle of scientific research that includes honesty, fairness, and responsibility. Ghost authorship can be seen as a violation of these principles and can result in a lack of trust and confidence in the scientific community.

4.1 REDUNDANT OR REPETITIVE PUBLICATION

Redundant or repetitive publication is the practice of submitting multiple publications that contain the same or substantially similar data or findings. This practice is unethical and can have negative implications on the scientific community. In this section, we will discuss the concept of redundant publication, its potential implications, and ways to prevent it. Redundant publication can occur for various reasons, such as to increase the number of publications, to enhance the author's reputation, or to secure funding. This practice can be harmful to the scientific community as it can lead to the duplication of efforts, waste of resources, and can create bias in the scientific literature. Moreover, redundant publication can undermine the trust and credibility of the scientific community, and can result in a waste of resources (3-5).

The impact of redundant publication can be significant, as it can skew the perceptions of readers, reviewers, and editors regarding the quality and novelty of research. Redundant publication can also reduce the efficiency of scientific research by wasting resources that could be used to fund new and innovative research projects. Furthermore, redundant publication can create confusion in the scientific literature by promoting certain research findings and suppressing others, thereby compromising the objectivity of the scientific enterprise. To prevent redundant publication, it is essential to establish clear guidelines and ethical standards for authors and publishers. Most scientific journals require authors to disclose their contributions explicitly, including data collection, analysis, writing, and funding sources. However, this is not enough to prevent redundant publication. It is also important to create a culture of transparency and accountability in scientific research, where all contributors are recognized for their work, regardless of their position or seniority.

One way to prevent redundant publication is to adopt open science practices, such as data sharing and pre-registration. Data sharing enables other researchers to verify the findings independently and promotes transparency in research. Pre-registration involves registering the research design and hypotheses before conducting the study, which can reduce the likelihood of selective reporting or data manipulation.

5.1 CONFLICT OF INTEREST

Conflict of interest (COI) occurs when an individual or an organization has financial or personal interests that could influence their objectivity or judgment in a particular situation. In scientific research, COI can arise when authors have personal or financial ties to companies or organizations that have a vested interest in the research findings. In this section, we will discuss the concept of COI, its potential implications, and ways to prevent it (5-7).

COI in scientific research can have significant implications on the validity and credibility of the research findings. COI can influence the study design, data collection, analysis, interpretation, and dissemination of the research findings. Moreover, COI can undermine the public's trust in the scientific enterprise and can create a bias in the scientific literature.

COI can occur in various forms, such as financial interests, employment, consulting agreements, and personal relationships. In scientific research, COI can arise when authors receive funding from industry sponsors or have financial ties to companies that produce products related to the research findings. COI can also occur when authors have personal relationships with individuals or organizations that have a vested interest in the research findings.

To prevent COI, it is essential to establish clear guidelines and ethical standards for authors and publishers. Most scientific journals require authors to disclose their COI explicitly, including financial ties, employment, consulting agreements, and personal relationships. This disclosure allows reviewers and editors to evaluate the potential COI and its impact on the research findings.

Moreover, journals can establish policies that require authors to disclose their COI before the research is conducted. This pre-registration process can reduce the likelihood of selective reporting or data manipulation and promote transparency in research.

In conclusion, COI is a serious ethical issue in scientific research that can undermine the validity, credibility, and public trust in the scientific enterprise. To prevent COI, it is essential to establish clear guidelines and ethical standards for authors and publishers, require disclosure of COI, and adopt policies that promote transparency and accountability in scientific research. By promoting transparency and inclusivity in scientific research, we can enhance the quality and objectivity of the scientific enterprise and ultimately benefit society as a whole.

6.1 AUTHORSHIP IN RESEARCH ARTICLES

Authorship is an essential component of scientific research, and it serves as a critical metric of researchers' contributions to the scientific community. Authorship refers to the practice of recognizing individuals who have contributed significantly to the conception, design, execution, analysis, interpretation, and writing of a research study. In this section, we will discuss the concept of authorship, its potential implications, and guidelines for determining authorship. Authorship has several potential implications for the scientific community, such as recognition, funding, reputation, and academic promotion. Authorship serves as a metric of research productivity, and it influences researchers' ability to secure funding, academic positions, and career advancement. Moreover, authorship can influence the visibility and impact of the research, as it determines who receives credit for the research findings (6-8).

Determining authorship can be challenging, as research studies often involve multiple contributors with different levels of involvement and expertise. To address this issue, several guidelines have been established to provide a framework for determining authorship. The International Committee of Medical Journal Editors (ICMJE) and the Council of Science Editors (CSE) have established guidelines for determining authorship, which include the following criteria:

Substantial contributions to the conception or design of the work, or the acquisition, analysis, or interpretation of data.

Drafting the work or revising it critically for important intellectual content. Final approval of the version to be published.

Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

In addition to these criteria, other factors should be considered when determining authorship, such as the degree of contribution, the level of expertise, and the order of authorship. The order of authorship can vary based on the degree of contribution, the level of expertise, or the convention of the field.

To promote transparency and accountability in authorship, it is essential to establish clear guidelines and ethical standards for authors and publishers. Authors should disclose their contributions explicitly, including data collection, analysis, writing, and funding sources. Moreover, publishers should establish policies that require authors to disclose their contributions and require written agreements from all authors, stating that they meet the criteria for authorship.

7.1 FABRICATION AND FALSIFICATION OF DATA IN RESEARCH ARTICLES

Fabrication and falsification of data are serious ethical violations in scientific research. Fabrication refers to the deliberate creation of data that was never collected, while falsification refers to the manipulation of data to create false or misleading results. In this section, we will discuss the concept of fabrication and falsification, its potential implications, and ways to prevent it (5-8).

Fabrication and falsification of data can have severe implications for the validity, credibility, and public trust in the scientific enterprise. Fabricated or falsified data can lead to incorrect conclusions, misdirect research efforts, waste resources, and undermine the integrity of the scientific literature. Moreover, fabrication and falsification can have legal and professional consequences for researchers, including loss of funding, suspension of research privileges, or termination of employment.

To prevent fabrication and falsification of data, it is essential to establish clear guidelines and ethical standards for researchers and publishers. Researchers should follow established protocols for data collection, analysis, and interpretation, and ensure that the data are accurately and honestly reported. Moreover, researchers should be trained in ethical conduct and research integrity, and they should be aware of the consequences of misconduct.

Publishers can also play a significant role in preventing fabrication and falsification of data by establishing policies that promote transparency and accountability in research. Publishers should require authors to disclose all sources of funding and potential conflicts of interest, and they should require access to the original data and methods used in the research. Additionally, publishers should implement a rigorous peer-review process to ensure the accuracy and validity of the research findings.

In conclusion, fabrication and falsification of data are serious ethical violations in scientific research that can have severe implications for the validity, credibility, and public trust in the scientific enterprise. To prevent fabrication and falsification of data, it is essential to establish clear guidelines and ethical standards for researchers and publishers, provide training in ethical conduct and research integrity, and implement policies that promote transparency and accountability in research. By promoting transparency and accountability in research, we can enhance the quality and objectivity of the scientific enterprise and ultimately benefit society as a whole.

8.1 CONCLUSION

Research should be of high quality, innovative and reliable. In order to maintain the high-quality research compliance with the principles for good scientific research is must. Unethical practices defy the integral meaning and purpose of research. So in order to ensure the high quality scientific publications principles need to be kept in mind by the researcher and must conduct the research in ethical manner without following any unethical practices. To maintain quality of research it is essential to establish clear guidelines and ethical standards for researchers and publishers, provide training in ethical conduct and research integrity, and implement policies that promote transparency and accountability. By promoting transparency and inclusivity in scientific research, we can enhance the quality and objectivity of the scientific research and ultimately benefit society as a whole.

REFERENCES

1. Beauchamp T, Childress J. Principles of Biomedical Ethics (7th edition). New York: Oxford University Press, 2013.
2. Benos DJ, Fabres J, Farmer J, Gutierrez JP, Hennessy K, Kosek D. Ethics and scientific publication. *Adv Physiol Educ* 2005;29:59-74.
3. Ngai S, Gold JL, Gill SS, Rochon PA. Haunted manuscripts: Ghost authorship in the medical literature. *Account Res* 2005;12:103-14.
4. Koppelman-White E. Research misconduct and scientific process: Continuing quality improvement. *Account Res* 2006;13:225-46.
5. Breen KJ. Misconduct in medical research: whose responsibility? *Intern Med J* 2003;33:186-91.
6. Masic I. Plagiarism in Scientific Publishing. *Acta Inform Med* 2012;20:208-13. DOI: 10.5455/aim.2012.20.208-213.
7. Cameron C, McHugh MK. Publication Ethics and the Emerging Scientific Workforce: Understanding 'Plagiarism' in a Global Context. *Acad Med* 2012;87:51-4. DOI: 10.1097/ACM.0b013e31823aad7.
8. Masic I. The Importance of Proper Citation of References in Biomedical Articles. *Acta Inform Med* 2013;21:148-55. DOI: 10.5455/aim.2013.21.148-155.

ROLE OF CENTRAL PUBLIC SECTOR ENTERPRISES IN THE INDIAN ECONOMY

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ABSTRACT

Central Public Sector enterprises (CPSEs) are playing pivotal role in economic development of the India. The CPSEs contributed to the growth in the country. They were regarded as one of the key generators of remunerative employment in the formal sector, providing safe and secure jobs, while tending to the overall welfare of an employee. They have also been successful in addressing the social development because of their social penetration on many accounts.

Keywords: CPSEs, SPSUs, Public Enterprises, Operating CPSEs

INTRODUCTION

Central Public Sector Enterprises (CPSEs) have played a vital role in the development of the Indian economy since independence via providing industrial growth and fulfilling social responsibilities such as implementing government 's flagship programs and providing last mile connectivity and public utilities even in the hinterlands. The CPSEs also generate employment opportunities and act as a vital extension of the Central Government in implementing critical infrastructure and development projects.

Apart from the direct contribution to the economic output of the country, the products and services offered by the CPSEs help in creating a significant downstream impact in the form of generating MSME growth opportunities, creating direct / indirect employment, driving Government 's strategic agenda, contributing to the Central Exchequer, technological progress and innovation, etc. Most CPSEs were established in the post-independence era when the private players were neither forthcoming nor had the capacity for large capital-intensive enterprises.

Growth of CPSEs

There were only five CPSEs in 1951 but by 1969, the number grew to 84. The number of CPSEs tripled to 260 in FY 2011-12, and increased to 389 in FY 2021-22. The trend in total number of CPSEs over the last five years along with the number of listed CPSEs may be seen in the following table-1.

Table-1

SN	Particulars	2017-18	2018-19	2019-20	2020-21	2021-22
1	Total number of CPSEs	339	348	366	389	389
2	Number of operating CPSEs	249	249	256	255	248
3	CPSEs Under Construction	81	86	96	108	95
4	CPSEs under closure/liquidation/ non-operating	9	13	14	26	46
5	Number of listed CPSEs	52	56	58	61	62

Source: GoI, Public Enterprises Survey 2021-22

Out of 389 CPSEs, 248 are operating CPSEs with a total operating income (Gross Turnover) of ₹31.95 lakh crore. The total Financial Investment and Gross Block of all CPSEs stood at ₹22.81 lakh crore & ₹28.11 lakh crore respectively. Further, the increasing role of CPSEs is also visible especially in areas such as Power, Defence & Construction of Highways/ Expressways.

As many as 23 CPSEs newly added in 2021-22 under these areas, of which 7 CPSEs are in Defence, 9 CPSEs are under Power and 7 CPSEs added in Construction. The newly added 7 CPSEs in Defence were earlier functioning as —Department run Public Enterprises' and now converted into CPSEs. In the newly added segments, the Government has also given focus on renewable sources of power. Further, thrust has also been given to the construction sector wherein 7 new CPSEs have been formed for construction of Highways & Expressways.

Gross Domestic Products (GDP) vs Investment/Gross Block of CPSEs

According to National Accounts Statistics 2022, the GDP estimated at current prices grew by 19.51 % growth and stood at ₹236.65 lakh crore in FY 2021-22 against ₹198.01 lakh crore in FY 2020-21. The estimated Gross Value Added (GVA) at current price grew by 18.23% and stood at ₹213.49 lakh crore in FY 2021-22 against ₹180.58 lakh crore in FY 2020-21.

Despite the slow-down during the Covid-19 pandemic, the CPSEs continued to support the growth in the economy by scaling up investments. The Financial Investments in CPSEs also increased by ₹1.23 lakh crore during the year, from ₹21.58 lakh crore in FY 2020-21 to ₹22.81 lakh crore in FY 2021-22. The increase in Financial Investments was largely driven by paid up capital which comprises 14.83 % of overall Financial Investment.

The highest increase in Financial Investments was seen in the Financial Services cognate group (which contributed to 53.65% of the overall increase in Financial Investments), followed by Heavy & Medium Engineering which is 0.91%. The total Gross Block of all CPSEs increased by ₹2.41 lakh crore during the year, from ₹25.70 lakh crore in FY 2020-21 to ₹28.11 lakh crore in FY 2021-22. The largest increase in Gross Block was reported by Indian Oil Corporation Ltd, followed by ONGC Ltd. and NTPC Ltd.

CPSEs Sectoral Trends

According to the Public Enterprise Survey 2021-22, the Operating CPSEs are classified under four sectors namely Agriculture, Mining & Exploration, Manufacturing, Processing & Generation, and Services sector. Table 3 shows the percentage of sectoral contribution in India's GVA vs. Gross Block of CPSEs.

Table 2: Sectoral Contribution in India's GVAVs. CPSEs Gross Block (FY 2021-22)

SN	Parameters	Percentage in India's	
		GVA	Gross Block
1	Agriculture Sector	18.64	0.04
2	Mining & Exploration Sector	2.40	20.65
3	Manufacturing, Processing & Generation Sector	15.49	50.05
4	Service Sector	63.46	29.26

Source: GoI, Public Enterprises Survey 2021-22

Key Trends in Agriculture CPSEs

Agriculture and its allied sectors remain an important sector in the Indian economy as they play a crucial role in employment and income and in ensuring national food security. As per the National Accounts Statistics 2022, the GVA by economic activity (at current prices) of the Agriculture sector was ₹39.80 lakh crore in FY 2021-22, forming 18.64% of the overall GVA. The GVA of Agriculture sector showed a growth of 10.27% in FY 2021-22 over the FY 2020-21. The aggregate Gross Block of two CPSEs under the Agriculture sector increased by ₹18.99 crore in FY 2021-22, growing at 1.84% over FY 2020-21. 62.19% of the Gross Block in the sector is attributed to HPCL Biofuels Ltd.

Key Trends in Mining & Exploration CPSEs

India has abundant mineral resources distributed in different geographical locations of the country. The country continues to be largely self-sufficient in various minerals which are used as raw materials in industries such as iron & steel, aluminium, cement, various types of refractories, clay-based ceramics, glass, etc.

As per the National Accounts Statistics 2022, the GVA by economic activity (at current prices) of the Mining sector was ₹5.13 lakh crore in FY 2021-22, forming 2.40% of overall GVA. The GVA of the Mining sector showed a growth of 57.88% in FY 2021-22 over the FY 2020-21. The aggregate Gross Block of all 23 operating CPSEs in the sector increased by ₹0.42 lakh crore in FY 2021-22, growing at 8.12% over FY 2020-21. About 78.23% of Gross Block has been in the Crude Oil cognate group. Among the CPSEs, ONGC (under the Crude Oil cognate group) has the highest increase in Gross Block (increase of ₹0.22 lakh crore) in FY 2021-22.

The financial investments increased by ₹0.05 lakh crore from ₹1.06 lakh crore in FY 2020-21 to ₹1.11 lakh crore in 2021-22. The increase in financial investments was supported by the rise in paid-up capital (comprising about 47.92% of financial investments) and long-term loans (comprising 52.08% of financial investments).

Key Trends in Manufacturing, Processing & Generation CPSEs

Manufacturing sector is not only a vital sector for job creation but its performance is essential for achieving the goal of making India a robust economy. The Government of India has taken a slew of measures to strengthen the sector including the 'Make in India' initiative and the Production-Linked Incentive (PLI) scheme. As per the National Accounts Statistics 2022, the GVA by economic activity (at current prices) of Manufacturing sector was ₹33.07 lakh crore in FY 2021-22 forming 15.49% of overall GVA. The GVA of Manufacturing sector showed an increase of 22.07%, over the FY 2020-21.

The aggregate Gross Block of all 85 operating CPSEs in the sector increased by ₹1.33 lakh crore in FY 2021-22, growing at 10.80% over the FY 2020-21. Nearly, 81% of the Gross Block in the sector is attributable to two cognate groups – Power Generation and Petroleum (Refinery & Marketing). In the case of the Power Generation

cognate group, the top two CPSEs driving the increase in Gross Block were NTPC Ltd. and Nuclear Power Corporation of India Ltd. Similarly, in the Petroleum (Refinery & Marketing) cognate group the top CPSEs driving the increased Gross Block include IOCL, HPCL and BPCL. During the same period, the financial investment increased by ₹0.08 lakh crore from ₹5.37 lakh crore in FY 2020-21 to ₹5.45 lakh crore in 2021-22. The increase in financial investments was largely through share application money pending allotment.

Key Trends in Service CPSEs

Services have been the largest contributor to India's growth story in the past decade and will continue to evolve in the years to come. Some of the key sub-sectors within Services cognate group are trade, hotels and tourism, transport, logistics and communication, financing, insurance, real estate, business services, social and personal services, and services associated with construction. As per the National Accounts Statistics 2022, the GVA by economic activity (at current prices) of other sectors (excluding Agriculture, Mining and Manufacturing) was ₹135.49 lakh crore in FY 2021-22, forming 63.46% of overall GVA. The GVA of the sector showed a growth of 18.71% in FY 2021-22 over the FY 2020-21.

The aggregate Gross Block of all 138 operating CPSEs in the sector increased by ₹0.38 lakh crore in FY 2021-22, growing at 5.04% over FY 2020-21. A major share of the incremental Gross Block in the sector is attributed to the Transport & Logistics cognate group. The Gross Block increase can be largely attributed to Dedicated Freight Corridor Corporation of India Ltd under Transport & Logistics cognate group.

During the same period, the financial investments increased by ₹0.95 Lakh crore from ₹14.58 Lakh crore in FY 2020-21 to ₹15.53 Lakh crore in 2021-22. The increase in financial investments was largely through paid up capital which contributed to 12.33% of total financial investment in the Services Sector during the year, followed by long term loans.

Key Contributions of CPSEs in Central Exchequer

CPSEs play an important role in its contribution to Central Exchequer by way of excise duty, custom duty, GST, corporate tax, interest on Central Government loans, dividend, and other duties and taxes. A cumulative total of ₹21.09 lakh crores has been contributed by CPSEs in the past 5 years. In FY 2021-22, CPSEs contributed ₹5.07 lakh crores in Central Exchequer. Top five CPSEs contributing to Central Exchequer are Indian Oil Corporation Ltd, Bharat Petroleum Corporation Ltd, Hindustan Petroleum Corporation Ltd, Bharat Oman Refineries Ltd & Chennai Petroleum Corporation Ltd.

CONCLUSION

CPSEs have played a versatile role in the development of India. It has led to a strong foundation for industrial development. With their focus on infrastructure development and expansion, these corporations have led to economic growth. These firms have created job opportunities for many people.

REFERENCES

- Srivastava, Vinay K (2007), Privatisation of Public Enterprises, Kitab Mahal, Allahabad
- Rao, Nageshwar and Srivastava, Vinay K (2014), Public Enterprises and Changing Scenario, Research India Press, New Delhi
- Sinha, Yashwant and Srivastava, Vinay K (2017), The Future Of Indian Economy: Past Reforms And Challenges Ahead, Rupa Inda, New Delhi

IMPACT OF DEMOGRAPHIC PROFILE OF CONSUMERS ON BUYING BEHAVIOR FOR GREEN PRODUCTS

¹Dr. V. N. Bajpai, ²Dr. Satish Kumar and ³Dr. Ashish Kumar Jha,¹Professor, I.T.S Ghaziabad²Professor, I.T.S School of Management, Ghaziabad³Assistant Professor, I.T.S Ghaziabad**ABSTRACT**

This research paper examines the influence of the demographic profile of consumers on their buying behavior for eco-friendly products. The study aims to determine whether demographic factors such as age, gender, income, and education level have a significant impact on consumers' willingness to purchase eco-friendly products. A survey was conducted among 500 respondents in various age groups, genders, income levels, and education backgrounds. The results indicate that there is a significant correlation between demographic factors and consumers' buying behavior for eco-friendly products. Age, income, and education level were found to be the most influential factors. The study recommends that marketers should consider the demographic profile of their target audience when developing marketing strategies for eco-friendly products.

Keywords: Demographic, Buying Behaviour, Competitive advantage, Marketing strategies, Environmental consideration.

1. INTRODUCTION

The concept of sustainability has gained significant attention in recent years due to increasing environmental concerns. Consumers are becoming more conscious of their impact on the environment and are actively seeking eco-friendly products. This trend has led to an increase in the production and availability of environmentally friendly products. The purpose of this study is to investigate the influence of the demographic profile of consumers on their buying behavior for eco-friendly products. Understanding the relationship between demographic factors and buying behavior can assist marketers in developing effective marketing strategies for eco-friendly products.

As consumers are more willing to buy eco-friendly products now days with reliable information, companies must bear in mind that consumers are unlikely to compromise on product attributes such as value, quality, price, and performance. As a result, companies have started to identify the factors affecting the buying behaviour of consumers for eco-friendly products to provide valuable products to various segments of consumers. Environment-friendly consumers are responsive towards the environmental effects when they buy products and are actively involved in the conservation of energy and eco-friendly behaviour.

At present, consumers are becoming fairly educated about their environmental responsibility and the gravity of environmental problems and are willing to choose eco-friendly products over traditional products. Given the changes in consumer buying criteria toward environmental responsibility, companies should concentrate on this segment because it provides a competitive advantage in the future.

2. STATEMENT OF THE PROBLEM

Nowadays, the environment is emerging as a significant issue for business, society, government. Its importance emerges from increasing environmental deprivation namely ozone depletion, solid wastes, pollution, global warming, and climate change. It is detected that different activities of companies such as sourcing, producing, distributing and marketing have an unpleasant effect on the environment and are also believed to be the main source of almost all the environment-related issues.

To tackle environmental problems, consumers believe that eco-friendly is the way to integrate into their buying behaviour that can protect the environment. The result of this attitude is that an increasing number of companies are accepting their responsibility towards the environment. To react to these environmental demands, companies must develop innovative strategies that can assure to meet with these eco-friendly alternatives.

With growing environmental realization, companies need to understand not only product categories and brands preferred by consumers but also the factors that affect the buying behaviour of consumers for eco-friendly products. At the same time, their demographic variables, cultural, social, personal values are influencing the buying behaviour of consumers for eco-friendly products. This will not only assist the marketers in segmenting the market properly and developing production and marketing strategies to meet the needs of consumers but also the policymakers in impose sustainability in the marketing of products and services.

3. OBJECTIVES AND HYPOTHESIS OF THE STUDY

The objectives of the study is -

1. To examine the influence of the demographic profile of the consumer's on their buying behaviour towards eco-friendly products.

Hypotheses have been developed because of the research problem and objectives of the research. Null hypothesis have been mentioned below:-

The hypotheses of the study are:

Ho. Demographic factors do not have any influence on their buying behaviour towards eco-friendly products.

4. RESEARCH METHODOLOGY

The descriptive research design is used for the present study. Delhi NCR is selected for the study. The consumers of eco-friendly products are selected by using convenience sampling method. The data are collected from 711 consumers of eco-friendly products through a structured questionnaire.

5. DATA ANALYSIS AND INTERPRETATION

Percentages are used to examine the demographic profile of consumers and particulars about eco-friendly products. Male constitute 382 numbers whereas female 329 in numbers.

ANOVA test and t-test are employed to find the difference between the demographic profile of consumers and their buying behaviour towards eco-friendly products

The relation between the demographic profile of consumers and the factors affecting buying behaviour for eco-friendly products is given below.

5.1 Gender and Factors Affecting Buying Behaviour for Eco-Friendly Products

The relation between gender of consumers and factors affecting buying behaviour for eco-friendly products is given in Table 5.1

Table 5.1 Gender and Factors Affecting Buying Behaviour for Eco-Friendly Products

Sl. No.	Gender	N	Mean	Standard Deviation	t-value	Sig.
1.	Male	382	49.88	6.71	.182 ^{NS}	.855
2.	Female	329	49.79	6.77		

^{NS} Non-Significant
Source – SPSS Output

Ho: Gender does not have any influence on buying behaviour of respondent of eco-friendly products.

Interpretation: Independent sample t-test was conducted to find whether significant difference exists with gender of the respondents on their buying behaviour towards eco-friendly products. It was found from the table that, the t-value 0.182 is not significant at 5% level of significance (p=0.855). Hence the null hypothesis is accepted stating that "The buying behaviour of respondents does not differ based on their gender in deciding the buying behaviour of eco-friendly product."

5.2 Age and Factors Affecting Buying Behaviour for Eco-Friendly Products

The relation between age of consumers and factors affecting buying behaviour for eco-friendly products is given in Table 5.2

Table 5.2: Age and Factors Affecting Buying Behaviour for Eco-Friendly Products

Sl. No.	Age	N	Mean	Standard Deviation	F-value	Sig.
1.	Below 25 years	106	49.93	6.57	.528 ^{NS}	.715
2.	26 – 35 years	273	50.08	6.63		
3.	36 – 45 years	188	49.92	7.12		
4.	46 – 55 years	87	49.52	6.66		
5.	Above 55 years	57	48.74	6.43		

^{NS} Non-Significant
Source – SPSS Output

Ho: Age does not have any influence on buying behaviour of respondent of eco-friendly products.

Interpretation: F-test was conducted to find whether significant difference exists with age of the respondents on their buying behaviour towards eco-friendly products. It was found from the table that, the F-value 0.528 is not significant at 5% level of significance (p=0.715). Hence the null hypothesis is accepted stating that "The buying behaviour of respondents does not differ based on their age in deciding the buying behaviour of eco-friendly product."

5.3. Education and Factors Affecting Buying Behaviour for Eco-Friendly Products

The relation between the education of consumers and the factors affecting buying behaviour for eco-friendly products is given in Table 6.3

Table 5.3 Education and Factors Affecting Buying Behaviour for Eco-Friendly Products

Sl. No.	Education	N	Mean	Standard Deviation	F-value	Sig.
1.	Secondary	35	48.63	7.36	0 1.047 ^{NS}	.382
2.	Higher Secondary	66	49.79	6.44		
3.	Diploma	71	49.32	6.62		
4.	Graduation	297	49.59	6.63		
5.	Post Graduation	242	50.48	6.87		

^{NS} Non-Significant

Source – SPSS Output

Ho: Education does not have any influence on buying behaviour of respondent of eco-friendly products.

Interpretation: F-test was conducted to find whether significant difference exists with education of the respondents on their buying behaviour towards eco-friendly products. It was found from the table that, the F-value 1.047 is not significant at 5% level of significance (p=0.382). Hence the null hypothesis is accepted stating that “The buying behaviour of respondents does not differ based on their education in deciding the buying behaviour of eco-friendly product.”

5.4 Occupation and Factors Affecting Buying Behaviour for Eco-Friendly Products

The relation between the occupation of consumers and the factors affecting buying behaviour for eco-friendly products is given in Table 5.4

Table 5.4 Occupation and Factors Affecting Buying Behaviour for Eco-Friendly Products

Sl. No.	Occupation	N	Mean	Standard Deviation	F-value	Sig.
1.	Business	61	49.13	7.42	1.878 ^{NS}	.112
2.	Government Sector	199	49.51	6.28		
3.	Private Sector	289	49.80	6.99		
4.	Professional	91	51.55	6.50		
5.	Retired	71	49.31	6.38		

^{NS} Non-Significant

Source – SPSS Output

Ho: Occupation does not have any influence on buying behaviour of respondent of eco-friendly products.

Interpretation: F-test was conducted to find whether significant difference exists with occupation of the respondents on their buying behaviour towards eco-friendly products. It was found from the table that, the F-value 1.878 is not significant at 5% level of significance (p=0.112). Hence the null hypothesis is accepted stating that “The buying behaviour of respondents does not differ based on their occupation in deciding the buying behaviour of eco-friendly product.”

5.5 Working Experience and Factors Affecting Buying Behaviour for Eco-Friendly Products

The relation between the working experience of consumers and the factors affecting buying behaviour for eco-friendly products is given in Table 5.5

Table 5.5 Working Experience and Factors Affecting Buying Behaviour for Eco-Friendly Products

Sl. No.	Working Experience	N	Mean	Standard Deviation	F-value	Sig.
1.	Below 5 years	63	50.37	6.95	1.218 ^{NS}	.302
2.	6 – 10 years	145	49.90	6.97		
3.	11 – 15 years	276	49.86	6.32		
4.	16 – 20 years	141	50.33	7.13		
5.	Above 20 years	86	48.44	6.77		

^{NS} Non-Significant

Source – SPSS Output

Ho: Working experience does not have any influence on buying behaviour of respondent of eco-friendly products.

Interpretation: F-test was conducted to find whether significant difference exists with working experience of the respondents on their buying behaviour towards eco-friendly products. It was found from the table that, the F-value 1.218 is not significant at 5% level of significance (p=0.302). Hence the null hypothesis is accepted

stating that “The buying behaviour of respondents does not differ based on their working experience in deciding the buying behaviour of eco-friendly product.”

5.6 Monthly Income and Factors Affecting Buying Behaviour for Eco-Friendly Products

The relation between the monthly income of consumers and the factors affecting buying behaviour for eco-friendly products is given in Table 5.6

Table 5.6: Monthly Income and Factors Affecting Buying Behaviour for Eco-Friendly Products

Sl. No.	Monthly Income	N	Mean	Standard Deviation	F-value	Sig.
1.	Less than Rs.20,000	130	49.60	6.47	.489 ^{NS}	.744
2.	Rs.20,001 – Rs.30,000	177	50.42	7.20		
3.	Rs.30,001 – Rs.40,000	265	49.75	6.72		
4.	Rs.40,001 – Rs.50,000	91	49.42	5.99		
5.	More than Rs.50,000	48	49.61	7.20		

^{NS} Non-Significant

Source – SPSS Output

Ho: Monthly income does not have any influence on buying behaviour of respondent of eco-friendly products.

Interpretation: F-test was conducted to find whether significant difference exists with monthly income of the respondents on their buying behaviour towards eco-friendly products. It was found from the table that, the F-value 0.489 is not significant at 5% level of significance (p=0.774). Hence the null hypothesis is accepted stating that “The buying behaviour of respondents does not differ based on their monthly income in deciding the buying behaviour of eco-friendly product.”

5.7 Marital Status and Factors Affecting Buying Behaviour for Eco-Friendly Products

The relation between marital status of consumers and factors affecting buying behaviour for eco-friendly products is given in Table 5.7

Table 5.7: Marital Status and Factors Affecting Buying Behaviour for Eco-Friendly Products

Sl. No.	Marital Status	N	Mean	Standard Deviation	t-value	Sig.
1.	Married	552	49.86	6.84	.134 ^{NS}	.258
2.	Unmarried	159	49.77	6.38		

^{NS} Non-Significant

Source – SPSS Output

Ho: Marital status does not have any influence on buying behaviour of respondent of eco-friendly products.

Interpretation: Independent t-test was conducted to find whether significant difference exists with marital status of the respondents on their buying behaviour towards eco-friendly products. It was found from the table that, the t-value 0.134 is not significant at 5% level of significance (p=0.258). Hence the null hypothesis is accepted stating that “The buying behaviour of respondents does not differ based on their marital status in deciding the buying behaviour of eco-friendly product.”

5.8. Type of Family and Factors Affecting Buying Behaviour for Eco-Friendly Products

The relation between the type of family of consumers and the factors affecting buying behaviour for eco-friendly products is given in Table 5.8

Table 5.8 Type of Family and Factors Affecting Buying Behaviour towards Eco-Friendly Products

Sl. No.	Type of Family	N	Mean	Standard Deviation	t-value	Sig.
1.	Nuclear Family	440	50.03	6.77	.961 ^{NS}	.337
2.	Joint Family	271	49.53	6.68		

^{NS} Non-Significant

Source – SPSS Output

Ho: Type of family does not have any influence on buying behaviour of respondent of eco-friendly products.

Interpretation: Independent t-test was conducted to find whether significant difference exists with type of family of the respondents on their buying behaviour towards eco-friendly products. It was found from the table that, the t-value 0.961 is not significant at 5% level of significance (p=0.337). Hence the null hypothesis is accepted stating that “The buying behaviour of respondents does not differ based on their type of family in deciding the buying behaviour of eco-friendly product.”

5.9 Size of Family and Factors Affecting Buying Behaviour for Eco-Friendly Products

The relation between the size of the family of consumers and the factors affecting buying behaviour for eco-friendly products is given in Table 5.9

Table 5.9: Size of Family and Factors Affecting Buying Behaviour For Eco-Friendly Products

Sl. No.	Size of Family	N	Mean	Standard Deviation	F-value	Sig.
1.	2 – 3 members	289	50.19	6.87	.923 ^{NS}	.337
2.	4 – 6 members	305	49.63	6.44		
3.	Above 6 members	117	49.51	7.14		

^{NS} Non-Significant

Source – SPSS Output

Ho: Size of family does not have any influence on buying behaviour of respondent of eco-friendly products.

Interpretation: F-test was conducted to find whether significant difference exists with size of family of the respondents on their buying behaviour towards eco-friendly products. It was found from the table that, the F-value 0.923 is not significant at 5% level of significance ($p=0.337$). Hence the null hypothesis is accepted stating that “The buying behaviour of respondents does not differ based on their size of family in deciding the buying behaviour of eco-friendly product.”

6. CONCLUSION

The results indicate that there is a significant correlation between demographic factors and consumers' buying behavior for eco-friendly products. Age, income, and education level were found to be the most influential factors. Younger consumers were found to be more likely to purchase eco-friendly products than older

Hence, the Null hypothesis those demographic factors do not have any influence on their buying behaviour towards eco-friendly products proved to be right.

It is conclusively evident from the analysis that no significant difference prevails between the demographic profile of consumers such as gender, age, occupation, income, education, size of family and type of family and factors affecting buying behaviour for eco-friendly products.

While doing market segmentation based on demographics for analyzing buying behaviour of eco-friendly products, manufactures need not stick to this particular analysis. Instead, they can concentrate on measuring customer's perception and attitude towards eco-friendly products for a better understanding and devise strategies based on the outcome.

7. REFERENCES

- 1) Park, H., & Oh, S. (2005). The influence of materialism and environment consciousness on recycling attitude and behavior of clothing. *Journal of the Korean Home Economics Association*, 43(10), 167-177.
- 2) Peattie, K. (1995). *Environmental marketing management*. London: Pitman. Picket-Baker, J., & Ozaki, R. (2008). Pro-environmental products: marketing influence on the consumer purchase decision. *Journal of Consumer Marketing*, 25(5), 281-293.
- 3) Prabusankar, R. (2016). A study on consumer's perception and purchase intentions towards eco-friendly products. *Asian Journal of Research in Social Sciences and Humanities*, 6(8), 1794-1802.
- 4) Sruthiya, V.N. (2017). Impact of purchasing decisions on eco-friendly products in the fast-moving consumer goods sector with special reference to Calicut district, Kerala. *Journal of Internet Banking and Commerce*, 22(S8), 1-6.
- 5) Straughan Robert D., & James A Roberts. (1999). Environmental segmentation alternatives: A look at green consumer behavior in the new millennium. *Journal of Consumer Marketing*, 16(6), 558-575.
- 6) Subooh Yusuf, & Zeenat Fatima. (2015). Consumer attitude and perception towards green products. *The International Journal of Indian Psychology*, 2(3), 140-146.
- 7) Sudhir Sachdev. (2011). Eco-friendly products and consumer perception. *ZENITH International Journal of Multidisciplinary Research*, 1(5), 279-287.
- 8) Suganya, D., & Kavitha, S. (2017). A study on consumer awareness towards eco-friendly products at Coimbatore. *International Journal of Current Research and Modern Education*, 2(1), 237-241.
- 9) Vidhyakala, K. (2019). A Study on factors influencing of ideology decision making towards eco- friendly fast-moving consumer goods (FMCG). *IOSR Journal of Humanities and Social Science*, 24(3), 59-66.
- 10) Welford, R. (2000). *Hijacking environmentalism*. London: Earthscan.
- 11) Yam-Tang, E. P. Y., & Chan, R. Y. K. (1998). Purchasing behaviours and perceptions of environmentally harmful products. *Marketing Intelligence & Planning*, 16(6), 356-362.

A STUDY ON CONSUMER EXPECTATION AND SATISFACTION OF BUDGET HOTELS IN INDIA**¹Dr. Ashish Kumar Jha and ²Dr. Satish Kumar**¹Assistant Professor, I.T.S Mohan Nagar, Ghaziabad²Professor, I.T.S School of Management, Mohan Nagar, Ghaziabad**ABSTRACT**

In India's economic growth tourism has become one of the major contributors; it has contributed towards GDP, employment opportunity and improving Forex Reserves. Increased domestic and foreign tourist arrivals have contributed significantly towards growth of the Indian tourism industry and subsequently the hospitality industry, which is contrary to the world tourism trends.

With the increase in young and business travellers the demand for economical and hygienic lodging has increased. This study aimed at identifying the expectation of such travellers from budget hotels. A sample of 74 customers was interviewed using questionnaire. It was concluded that price, physical product and promotions does not affect the decision of the customer while making the choice but it is the service quality, connectivity of the hotel and its network that are considered as important parameters before deciding the hotel.

Keywords: Indian tourism industry, Impact on economy, Indian hotel industry, budget hotels, consumer expectation.

I. INTRODUCTION**1.1 Background**

Locations that were an attraction to the British and Indian aristocracy witnessed hotel development in India before World War II. Hotels were a result of collaboration in between British individuals and Indian entrepreneurs who wanted to spend their holidays in peaceful locations. There were only a few companies owning hotels in India.

Some of the significant hotels operating during the British rule were The Rugby, Matheran (1876); The Taj Mahal Hotel, Mumbai (1900), The Grand, Calcutta (1930); The Cecil Hotels, Shimla and Muree (1935); The Savoy, Mussoorie (1936).

In the year 1956 Pt. Jawaharlal Nehru realised that the economic growth of the country could be accelerated through the tourism industry. He emphasized on building quality hotels for the foreign dignitaries visiting India. Ashoka Hotel in New Delhi was the first ever government investment in the hotel industry. Year 1966 was a breakthrough year as ITDC (Indian tourism Development Corporation) was setup under the Indian Companies Act 1956. ITDC was a merger in between Janpath Hotel India Ltd and Indian Tourism Transport Undertaking Ltd.

Ministry of Tourism and Civil Aviation was incorporated in the year 1956 that gave the tourism industry another push. 1970 saw a new trend of franchising, M. S. Oberoi, Chairman of East India Hotels Ltd., was expanding his empire by constructing New Delhi's first modern multi-story hotel, which was franchised to U.S.-based Inter-Continental Hotels. Sheraton, Holiday Inn, Inter Continental were some of the international brands that paved their way into the Indian tourism industry through the route of franchising.

India was host to Asian Games in the year 1982 and this gave way to the National Policy on Tourism outlining the country's tourism development objectives. Licenses for building hotels in New Delhi (Venue for the games) was given to ITDC – Lodhi Hotel, The Taj – Taj Palace, Asian Hotels – Hyatt Regency, Samrat Hotel, Kanishka, Surya Hotel, Le Meridian with a clause that it should be completed before the games. This move further strengthened the First class and 5-star category hotels in India.

Officially GOI, in the year 1986 recognized tourism as an "industry" and thus it became eligible for several government incentives like tax incentives, subsidies, priorities in loans, availability of land at reasonable prices etc. Until this period the hotels focused only on the rich and foreign tourists. It was only in the year 1987 that the government realized the potential of the industry and permitted Indian firms to franchise in 3 star and 4-star hotels. With the aim of attracting tourists to India for exploring new destinations franchising permission was extended to tier II cities. FDI was allowed to the tune of 51% by the foreign investor in the year 1991 making tourism a priority sector.

"Export House" status was given to the tourism industry by the government that made travel agents, tour operators and tourist transport operators eligible for various government incentives. These transformations encouraged entry of several major international hotel chains into India **Devendra (2001)**.

1.2 The Transformation – Luxury to Budget Hotels

For a long time the Indian Hotel segment has been dominated by the premium luxury hotels. However, recently there has been a boom in the mid market and a distinct segment of budget hotels has emerged attracting both domestic and international players in the market.

Tier II and Tier III cities along with the destinations of pilgrimage serve as an attractive segment for these hoteliers. There exists a gap in the mid market segment and many hoteliers entered into a joint venture with Intercontinental Hotel Chain for developing “branded hotels” in the key Indian metro cities. There also exists a gap in supply of 3- and 4-star business hotels and investors are focusing to cater to this segment need. Feasibility of hotel investment is primarily determined by the entry price and market. There has been an increase in both domestic and foreign travelers traveling for the purpose of business and leisure **WTTC (2015)**

1.3 Tourism Industry in India and Its Impact on Economy

The Indian service sector has been witnessing a boost and one of the key drivers for the same is hospitality industry. Both hospitality and tourism industry are two sides of the same coin and both act as a catalyst and drivers in the growth of the industry. Contrary to the world tourism trends, the Indian hospitality industry emerged as a significant player in the world market due to increased Foreign Tourist Arrival and indigenous growth propelled by domestic travellers.

The changing demographic profile of the traveller has also changed the dynamics of the industry. The world estimate of travellers above the age of 60 years is expected to rise from 900 million in 2010 to approximately 1.4 billion by 2030. These travellers want higher quality standards and sophistication. The younger travellers on the other hand are willing to explore new destinations rather than engaging in luxury **World Youth Survey & Educational Travel Confederation (2014)**

GDP growth was recorded at 7.4% in 2014-15 and the service sector growth was registered at 10.6%. The hotel and restaurants sector registered a 8.4% growth rate. Campaigns like “Incredible India”, “Atithi Devo Bhavah (ADB)”, “Make in India”, “Digital India” have helped in the growth of tourism sector in India. **Economic survey of India (2015)**

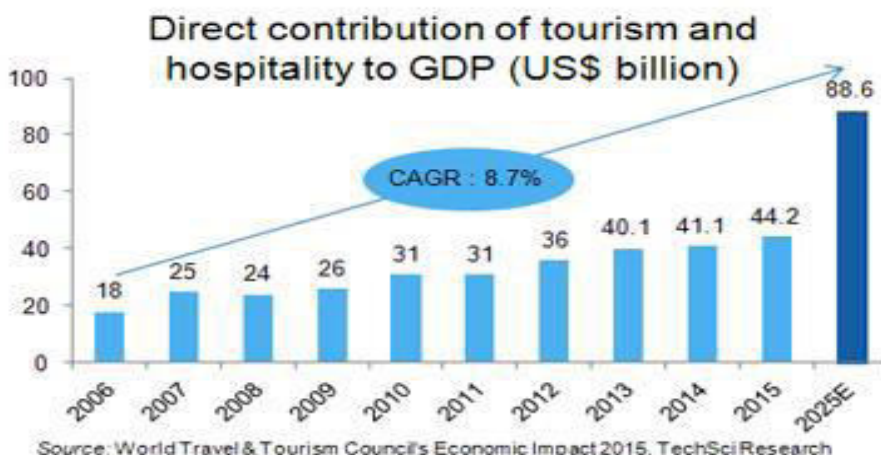
1.3.1 Government Initiatives and Growth Drivers

The foreign tourist arrival (FTA) has taken a sharp upward trend due to varied purpose of visit ranging from holidays, medical tourism, meditation, pilgrimage, spas, meetings, business, adventure etc. **WTO (2009)**

The extension of E-Tourist Visa (E-TV) to 155 countries has led to an increase in foreign tourist arrival in India. This number grew by 202.3% year on year taking the total number of tourist visiting India to 7.8 lakhs during the FY 2016-17 **WTTC (2015)**.

An increase in the women workforce has positively changed the spending pattern of the Indian consumers. Outbound and domestic tourism has seen an unprecedented growth due to increase in disposable income. A growth of 8.7% was recorded in outbound tourism taking the figure to 19.9 million in 2015. During 2010-15 the inbound tourist volume was recorded at a CAGR of 6.8%. **ICRA (2015)**

Due to world class facilities in the medical field, Medical tourism in India has seen a robust growth. The number of people who visited India for medical purposes reached half million mark by end of 2015, implying an annual growth rate of 30%.





“Incredible India Tourism Investment 2016”, “Swadesh Darshan”, “Adarsh Smarak”, project PRASAD are some of the initiatives taken by the government to boost the tourism sector in India.

1.4 Hotel Industry in India

Indian hotel industry has seen intensification due to the growing service sector that has significant contribution from the tourism industry which has further fuelled growth in the hospitality industry. The world economy is growing moderately but India has managed to outpace the rest of the countries and risen as a star. **Fragile Five** has been finely escaped and India has also managed to register itself as fastest growing economy amongst **BRICS** nations in the year 2015 **Morgan Stanley (2015)**.

In order to serve to the needs of different classes of customers, based on their perceptions the hotels have classified themselves on their basis on location and the extent of services they offered. **Anawade (2016)** in his research paper classified hotels into four distinct categories namely Heritage, Luxury, Budget and Resorts. The market share of unclassified and unbranded hotels is the largest at 65%. The next big segment is the 3 star hotels with 13% market share followed by 5 star deluxe, 5 star and 4 star having a market share of 6% each. Heritage and 2 star hotels have a meagre share of 2% each. **FHRAI (2014)**.

II. LITERATURE REVIEW

The credit of evolution of budget hotels can be given to the development of economic and social development. A full service hotel targets the upper class where as a budget hotel focuses on general population who demand basic amenities for lodging. **Andrade (2000)** identified five important parameters that are an important characteristic of budget hotels namely location, size & diversity, lobby, guest rooms and parking.

Concept of budget hotels is not only complex but also difficult. However, there are several operational characteristics that are generic like the brand, geographical coverage, easy accessibility, centralized reservation systems, standard layouts, competitive room rates, relatively limited services and above all high monetary value **Bortherton (2004)**.

Budget hotels have made a significant change in their infrastructure, food & beverage, environment, atmosphere, accommodation, facility & services etc, which has led to greater acceptance and demand **Sunday Business (2005)**.

Whitbread budget hotels ventured into India due to the fact that it identified that there was a huge supply of 4- & 5-star hotels but there was an unaddressed need for cheap, comfortable and value for money accommodation **Parker (2007)**.

Budget hotels have been on the rise and their demand has been constantly increasing. **Wen Hua (2009)** identified the Critical Success Factors in budget hotels operating in China. The researcher concluded that price was no longer the decisive factor among guest who would choose and could afford to stay at a budget hotel. It brought out that the Chinese customer valued customer service and respect the most amongst any other parameter. Factor analysis was used to conclude the research.

Kuldeep (2015) examined that both domestic and international hotel chains are interested in the mid market segment due to its growing demand. Luxury hotel segment has demand of its own and will not be affected by the budget hotel segment. The increase in business travelers (mid segment) and weekend leisure traveler looking for comfortable and value for money stay are the driving forces behind the budget hotel segment.

Quality service is represented through the expectations of the customer from the hotel industry that it needs to provide along with the perceived service and performance (**Parasuraman et al., 1988**). Researchers have in the past established relationships in between quality and cost **Crosby (1979)**, customer satisfaction **Cronin and Taylor (1992)**, word of mouth marketing **Caruana (2002)** and profitability **Santos (2003)**. Competitiveness of service industries is highly dependent upon the service quality **Lewis (1989)**. Customer expectations and subsequent performance by the hoteliers determine the satisfaction level of customers. The five dimensions that the budget hoteliers should look into are the product offered, level and kind of service, pricing, promotions used and finally the location of the budget hotel (**Andrade et.al. 2000**)

III. OBJECTIVES & HYPOTHESIS

- To study the growth & emergence of Indian tourism and hospitality industry and its effect on Indian economy
- To identify the growth drivers of both tourism and hospitality industry
- To study the satisfaction parameters of consumers from budget hotels

HYPOTHESIS

H01: Customer satisfaction is affected by physical attributes of budget hotels.

H02: Customer satisfaction is affected by service quality of budget hotels.

H03: Customer satisfaction is affected by price offering of budget hotels.

H04: Customer satisfaction is affected by Promotion of budget hotels.

H05: Customer satisfaction is affected by location of budget hotels.

IV. RESEARCH METHODOLOGY

Research Design

This study made use of a non-experimental quantitative research design. A self-report questionnaire was administered at a single point of time. The present study was articulated in a way to examine the customer expectations from budget hotels and how does it subsequently affect customer satisfaction. Physical product, service quality, price, location and promotion were the independent variables whereas customer satisfaction was the dependent variable. This study was aimed to explore and if possible then to describe the degree of relationship between dependent and independent variables in descriptive as well as quantitative terms.

Participants

Participants engaged in study were 74 individuals who were either working as professionals, businessmen (small and medium size) or students. Majority of respondents were Middle level executives (41.7%), Males (52.4%), and belong to 25-35 years (48.8%) age bracket. Talking about the segmentation of demographics, Age group variable was divided into three brackets 16-25 years, 26-35 years and 36 years and above years. Occupation was divided in a way to cover all the major facets of Indian service industry, broadly into 3 categories namely Business man, Office executives and Managers, students.

Procedure

Respondents were selected randomly from the region of Delhi NCR. In total 130 questionnaires were distributed. Out of these questionnaires, 74 questionnaires were received back over a period of 40 days of distribution. Regular follow up through calls and personal visits made the response rate of participants as 57%. To maintain the genuineness of responses all the respondents were assured that their questionnaires will be kept anonymous and confidential.

V. RESULTS AND DISCUSSIONS

Based on the literature review the following variables were studied to understand the customer expectations vis-à-vis budget hotels and what are the drivers of satisfaction.

Summary of the Content of Questionnaire

Question Subject	Details about the question
Physical Product	* Hotel design * Size of the room * Restaurant facility * Room comfort * Parking area * Exteriors of hotel * Breakfast quality
Service Quality	* Responsiveness * Speed of service * Efficiency of guest service * Hygiene and cleanliness * Guest safety * Warmth of service * Consistency of service
Price	* Steady pricing policy * Value for money accommodation
Promotion	* Corporate discounts and deals * Members loyalty programs * Campaigns and advertisements
Location	* Hotel network * Reservation * Convenient Locations * Transportation services

Multiple Stepwise linear regression (Customer satisfaction)

	Unstandardized	Coefficients	Standardized	coefficients	
	B	Std. Error	Beta	T	Sig
(Constant)	1.363	.133		2.647	.0001
Physical attributes	.411	.037	.386	3.001	.0001
Service quality	.473	.072	.474	4.645	.007
Price	.443	.059	.397	4.995	.011
Promotion	.391	.055	.383	4.093	.006
Location	.483	.063	.401	5.132	.0001

*Note: R=0.412; R²=0.170; Adj. R²=0.164; F = 6.937; p=0.013

To test the hypotheses concerning the impact of various independent variables on overall customer satisfaction, multiple stepwise linear regression was administered (See Table 1). The significant contributions were registered towards customer satisfaction from all five independent variables i.e. physical attributes ($\beta = 0.386$, $t = 3.001$; $p = 0.001$), service quality ($\beta = 0.473$, $t = 4.645$; $p = 0.007$), price ($\beta = 0.443$, $t = 4.995$; $p = 0.011$), promotion ($\beta = 0.391$, $t = 4.093$; $p = 0.006$), and location ($\beta = 0.483$, $t = 5.132$; $p = 0.001$). On the basis of data interpretation it can be further concluded here that ‘service quality’ and ‘location’ because of their high beta values contribute more to customer satisfaction than other variables.

VI. CONCLUSION

The concept of budget hotels is to provide basic lodging facility at an affordable price, however service quality is considered as an important parameter by the customers in enhancing their satisfaction. Another differentiating parameter that contributes to customer satisfaction for budget hotels is the location (closer to entry and exit points, connectivity to the city) and network. Promotion, price and physical product are important parameters contributing to customer satisfaction but are not considered critical from the customer’s point of view while deciding where to stay.

REFERENCES

RESEARCH PAPERS

1. Andrade et al., (2000), Hotel: Project Planning and Project
2. Bapat Harish B, Soni Vishal, Khasgiwala Vishal (2015), “A Study of Customer Satisfaction & Service Quality of Indian Hotels (A Comparative Study in Indore Region)” IOSR Journal of Business and Management (IOSR-JBM) e-ISSN: 2278-487X, p-ISSN: 2319-7668. Volume 17, Issue 2.Ver. II (Feb. 2015), PP 53-60

3. Batra Manika (2014), "Analysing Service Quality of Five Star Hotels in National Capital Region from Customers Perspective", *Apeejay - Journal of Management Sciences and Technology* 3 (1), June- 2014 (ISSN -2347-5005)
4. Biswal Saroj Kant, Mishra Bikash Kumar (2010), "Emergence of Budget Hotels and Metamorphosis of Small sized Commercial Hotels in India", *South Asian Journal of Tourism and Heritage* (2010), Vol. 3, Number 2
5. Caruana Albert (2002) "Service loyalty: The effects of service quality and the mediating role of customer satisfaction", *European Journal of Marketing*, Vol. 36 Iss: 7/8, pp.811 – 828
6. Cronin, J. J., Jr., & Taylor, S. A. (1994). "SERVPERF vs. SERVQUAL: Reconciling performance-based and perceptions-minus-expectations measurement of service quality." *Journal of Marketing*, 58, 125-131.
7. Chris cooper, John Fletcher, Alan Fyall, David Gilbert and Stephen Wanhill (2005) 'Tourism-Principles and Practice'. Pearson Education Ltd. U.K. 3rd ed. pp 84-94.
8. Devendra, Amitabh (2001) "The Hotel Industry in India-The Past and the Present," *Journal of Hospitality Financial Management: Vol. 9.*
9. Gunasekaran.N, Victor Anandkumar (2012), "Factors of influence in choosing alternative accommodation: A study with reference to Pondicherry, a coastal heritage town", *Procedia - Social and Behavioral Sciences* 62 (2012) 1127 – 1132
10. P.A Anawade and Prof. Dr. Shilpa k. Bendale, Customer Satisfaction with Reference to Individual Spending Pattern on Hotel Industry: A Case Study for Hotel Silver Palace. *International Journal of Management*, 7(7), 2016, pp. 336–343.
11. Rooma Roshnee Ramsaran-Fowdar (2007), "Developing a Service Quality Questionnaire for the Hotel Industry in Mauritius", *Journal of Vacation Marketing*; Jan. 2007, Vol.13, No.1.
12. SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. Parasuraman, A.; Zeithaml, Valerie A.; Berry, Leonard L. *Journal of Retailing*, Vol 64(1), 1988
13. Sharma Nitya, Kalotra Anil (2016), "Hospitality Industry in India: A Big Contributor to India's Growth" *International Journal of Emerging Research in Management & Technology* ISSN: 2278-9359, June 2016 (Volume-5, Issue-6)
14. Teng, F. (2010). Loyalty Card Promotional Activity in Budget Hotel. Retrieved December 30, 2016, from: <http://kau.diva-portal.org/smash/record>. The Analysis of Budget Hotel (2012).
15. Wen Hua , Andrew Chan & Zhenxing Mao (2009) Critical Success Factors and Customer Expectation in Budget Hotel Segment — A Case Study of China, *Journal of Quality Assurance in Hospitality & Tourism*, 10:1, 59-74
16. Xiao, Y. J., Yan, M. H., & Kang, J. H. (2012). The investment analysis and forward-looking statement of budget hotel industry in China in 2012-2016

REPORTS

1. Economic survey of India. (2015), New Delhi
2. Emergence of online travel agents: Report by ICRA, 2015
3. Hospitality insights from the Indian CEO's Desk, CII February 2012.
4. Ministry of tourism and Department of Industrial policy and promotion- Achievement report 2016
5. World Youth Survey & Educational Travel Confederation, 2015
6. WTO 2009: UNWTO technical manual
7. World Travel & Tourism Council: Economic Impact 2015, Tech Science research
8. WTTC, Ministry of Finance 2015, Tech Sci Research
9. ICRA. (2015). New Delhi.
10. Budget hotel (2012). Retrieved January 18, 2017, from: http://wiki.mbalib.com/wiki/Budget_hotel

A STUDY ON STATISTICAL ARBITRAGE OPPORTUNITIES BETWEEN NIFTY AND BANKNIFTY**Dr. Puneet Kumar and Dr. Surendra Tiwari**

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ABSTRACT

The world of stocks and securities is filled with uncertainties and risks. However, many investors see potential to make profits in this stock market with gathered information and strategies. While some investors buy stocks based on information regarding particular companies, others utilize strategies that try to profit based on understanding of the stock market and its behaviours in general. One of such strategies in stock trades is pairs trading.

In pairs trading, investors select two correlated stocks or other comparable equities and trade only those two stocks based on their performance relative to each other. The investors would find a mean ratio for the prices of the two stock selections, buy the stock that is calculated to be underpriced, and sell the stock that is overpriced. The idea is that in the long run, the price ratio between two stocks fluctuates less than stocks themselves. So when the price of a particular stock deviates too much from the calculated mean, there is an opportunity for profits as the price will eventually go back to the mean ratio. This paper intends to explore the modern implications of such strategy in Indian markets.

Keywords: Asset pricing, return predictability, limits of arbitrage

INTRODUCTION

The world of stocks and securities is filled with uncertainties and risks. However, many investors see potential to make profits in this stock market with gathered information and strategies. While some investors buy stocks based on information regarding particular companies, others utilize strategies that try to profit based on understanding of the stock market and its behaviours in general. One of such strategies in stock trades is pairs trading.

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So when the price of a particular stock deviates too much from the calculated mean, there is an opportunity for profits as the price will eventually go back to the mean ratio.

In the following research, we will look into pairs trading in more details, explore the modern implications of such strategy, and conduct a simulation study to explore possible relationship and connection between profit and different variables

EVOLUTION OF THE STRATEGY

Pairs trading, sometimes referred to as statistical arbitrage, was first developed and used by Nunzio Tartaglia in the 1980s. He led a team of mathematicians, physicists, and computer scientists in Morgan Stanley that aimed to develop automated trading systems that could take advantage of mispricing in the financial market (Vidyamurthy, 2004). These arbitrage opportunities are often times hard to spot since the true values of securities are unknown. Pairs trading uses the relative values between stocks to find “mispricing” and successfully refrains from relying on true security values. This strategy was highly profitable when it was first developed and implemented. However, as knowledge spread, profit from pairs trading was said by some to have diminished while the risk involved shot up.

Contrary to common belief, there exists more than one pairs-trading methods. The three main ones include the distance method, the co-integration method, and the stochastic spread method (Do, 2006). However, we will focus on the widely-used distance method due to its straight-forward structure.

The distance method, as implied in its name, keeps track of the sum of squared differences (a.k.a. distance) between two normalized stock prices. Stock volatility is estimated from historical data and a trading trigger is determined, usually to be two standard deviations from the mean. When the thresholds are met, the stocks are assumed to be mispriced in terms of their relative value with each other. Investors buy the underpriced one and short the overpriced one. Investors will profit in the long run if the relative price levels of the stocks revert back to the mean.

The distance method is non-parametric and does not assume the stock prices to follow certain models. Therefore it is not subject to the assumptions of established parametrized models or potential errors resulting from stock behavior's deviation from such models. Also, the utilization of relative price in general eliminates the volatility from co-funding variables inherent to all stock prices including but not limited to inflation rate.

However, it has a critical underlying assumption of a static price level distance between two stocks. This assumption renders the method vulnerable to price-level divergence, which could lead to sizeable losses to the investors, especially if a stop-loss method is not implemented. Another downsides of this non-parametric method is its lack of "forecasting ability regarding the convergence time or expected holding period", as summarized by Binh Do (2006).

One of the major concerns as pairs trading becomes more popular is its profitability. As mentioned earlier, many believe that pairs trading only allowed the first users to take advantage of the arbitrage opportunities or market inefficiencies that it could catch. They argue that as knowledge spread, these market inefficiencies would be eliminated in no time. Others had supporting evidence of the opposite and argue that "the public dissemination of the results has apparently not affected the general risk and return characteristics of the strategy, despite curiosity from the professional sector" (Gatev et al. 2006).

LITERATURE REVIEW

Researchers have proposed different methodologies and techniques. The pioneer paper of Gatev et al. (GGR) [1] introduced the most popular methodology, the distance method, lately used by Do and Faff ([2, 3]). Chen et al. [4] also used this methodology but introduced the Pearson correlation on return level for identifying pairs and constructing an empirical metric to quantify return divergence of the pair.

Vidyamurthy [5] introduced the co-integration approach. This approach has a higher potential of identifying true long-term equilibrium relationships between assets. Lin et al. [6] introduced a minimum profit condition for a pair of securities that is co-integrated over a time horizon. Later, Puspaningrum et al. [7] fitted an AR(1)-process to the spread of two co-integrated stocks. The authors proposed an integral equation approach to numerically evaluate the estimated number of trades for any given trading threshold or minimum profit per trade to optimize the total profit. Law et al. [8] presented an alternative implementation of the co-integration approach by introducing a statistic, which combines return maximization and risk minimization simultaneously. Clegg et al. [9] use partial co-integration as a means of identifying pairs to develop the Pairs Trading strategy, using the components of the S&P 500 over the period 1990 to 2015, where they obtain annualized returns in excess of 12% after transaction costs.

Dunis and Ho [10] introduced the Multivariate Co-integration Approach. The authors used co-integration relationships to construct index tracking portfolios by considering different subsets of the index components and estimate the joint co-integration vector for these subsets and the index. Galenko et al. [11] used a multivariate cointegration framework by performing extensive data mining. The authors used different frequencies and also took different duration of the formation period to estimate the co-integration vector. Finally, the recent work of Yiyun and Law [12] proposed dynamic parameterization (ADF-threshold, adjusted ASR-threshold, and conditional co-integration coefficients) to accommodate different market conditions.

Elliot et al. [13] introduced the time series approach by describing the spread with a mean-reverting Gaussian Markov chain. Do et al. [14] employed theoretical pricing methods at the return instead of the price level, and Jure and Yang [15], the stochastic control approach. Bertram [16] and Cummins et al. [17] assumed that the spread follows a zero-mean symmetric Ornstein-Uhlenbeck Process. Bock and Mestel [18] used a Markov switching model to develop a pairs trading model, Chen et al. [19] constructed a pairs trading strategy with three-regime threshold autoregressive models with GARCH effects, and Göncü and Akyildirim [20] introduced an Ornstein-Uhlenbeck process for the dispersion of the different assets.

Jurek and Yang [15] did the pioneer paper where the Stochastic Control Approach is used. In this paper, the authors derived the Hamilton-Jacobi-Bellmann (HJB) equation to find closed-form solutions for the value and policy functions. Following this line, Liu and Timmermann [21] derived optimal portfolio holdings for convergence trades under diverse arbitrage opportunities. The portfolio incorporates the arbitrage opportunity and the diversification benefits. Huck [22, 23] proposed a three-stage methodology: forecasting, outranking, and trading by building and combining an artificial neural networks and a multicriteria decision method.

Considering the returns negative skewness and excess kurtosis, recent contributions are based in Copula Approach. Ferreira [24], Liew and Wu [25], Stander et al. [26], Xie and Wu [27], Krauss and Stubinger [28], or Rad et al. [29] are the most representative papers of the copula methods based on parametric and nonparametric approaches. However, only Krauss and Stubinger [28] used a Copula Method for pairs selection and trading. The rest of papers used the Distance or the Co-integration approach for pairs selection.

This research is based on two previous lines. The first one is the new approach introduced by Ramos-Requena et al. [30, 31] as an alternative methodology to correlation and co-integration, which is based on Hurst Exponent. The second one is based on the works of López-García et al. [32, 33] where a new measure of the assets co-movement based on physical particles dynamics is introduced. The novelty of this contribution to pairs trading literature is the introduction of a pre-selection procedure of the stocks universe, where the pairs are selected. This pre-selection is based on the degree of co-movement among the stocks of a specific market or index.

METHODOLOGY

The methodology of this paper is based on the methodology of GGR. We try to replicate the methodology of GGR as much as possible. However, GGR are not always specific enough to replicate the methodology one-one. Wherever GGR are not perfectly clear we use our own interpretation. Inevitably, this leads to some differences between our methodology and that of GGR.

FORMATION PERIOD

At the beginning of every cycle we normalize the NIFTY 500 stocks by assigning them the value '1'. We then construct a normalized price series by chain linking the daily returns. Note that we only normalize the prices by setting the starting values to 1, we do not make any volatility adjustments. The normalized price of a stock at any point in time is given by:

$$NP_t = (1 + r_t) \times NP_{t-1} \quad (1)$$

Where NP_t is the normalized price of a stock at time t , r_t is the return of the stock at time t and NP_{t-1} is the normalized price at time $t-1$. The constructed series is a cumulative total return index15 starting at the beginning of every formation period and ending at the end of the trading period. Pairs are formed based on the 'sum of squared deviation' (SSD) criterion. For every potential pair we calculate the SSD of the normalized price series during the formation period. This is an exhaustive process as the NIFTY 500 for instance, has large number of potential pairs. The first pair (NIFTY and BANK Nifty) consists of the two index that have the lowest SSD of all potential pairs. Once a stock is matched into a pair, it cannot be used in another pair, so every stock is used only once . The second pair consists of the two stocks that have the lowest SSD of the remaining potential pairs. We take three different approaches when matching the pairs. First, we match the 10 stocks that form the 5 pairs with the lowest SSD, this is our 'top-5 portfolio'. Second, we construct a 'top-20' portfolio of the 40 stocks that form the pairs with the 20 lowest SSD. Third, we match up all stocks in pairs, calling this the 'all-portfolio'. We do this to compare return and pair statistics between the different portfolios. We expect the returns of the all-portfolio to be lower than those of the top-5 and top-20, since the all-portfolio also contain the 'left-over' pairs. These pairs might have a high SSD, but are still matched into a pair just because these are the stocks that are left over.

RETURN CALCULATION

We open a pair when the spread diverges by more than two historical standard deviations. We close the pair again when the spread converges back to the historical average. This means that during our trading period pairs might open and close multiple times, generating multiple cash flows. Pair returns are calculated on a daily basis and are marked-to-market daily. For each pair we calculate the return of both the long and short position separately and add them to get the total pair return.

At the day we get the two standard deviation signal we give the return series of both the long and short position value 1. This is done to be able to chain link the returns. We enter the trade the day after the signal. First we calculate the daily stock returns of the normalized price series. For stock A of pair N, we chain link the returns in the following way:

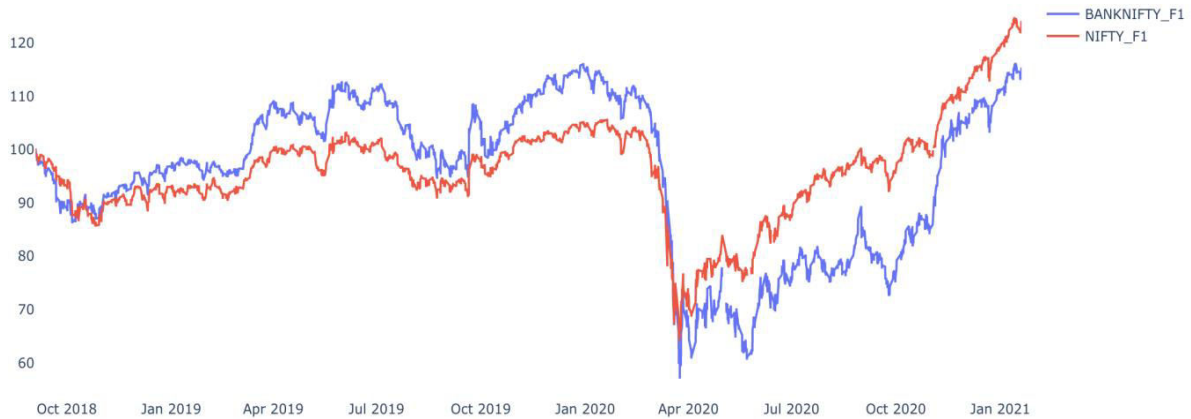
$$NPP_{at} = (1+r_{at}) \times NPP_{at-1} \quad (2)$$

NPP_{at} is the normalized price of stock A at time t , r_{at} is the return of stock A at time t and NPP_{at-1} is the normalized price of stock A at time $t-1$. We now get a cumulative chain linked return for both sides of the pair. We subtract one from both series to get the cumulative returns. Daily returns are calculated by subtracting the cumulative return of the day before from the cumulative return today. For each pair we now have two series of daily returns. By adding those two daily returns series together we get the daily returns of the pair. When the pair closes, we set the chain link series of each stock back to zero. Since pairs can open and close again several times, note that we enter each pair trade with one dollar every time it opens. So we do not continue with the previously generated return of that pair.

EMPIRICAL RESULT - CORRELATION & CO-INTEGRATION

We start off by correlation between the price data of the two indices starting Oct 2018 to Jan 2021.

Table 1: Correlation Between the Price Data of NIFTY and BNAKNIFTY



As the charts show, the two series are almost 80% correlated. But you not just want to look at the correlation but also at a statistic called co-integration before you take a pairs trade. A Co-integration test is used to establish a correlation between the time series in the long term.

A famous test for co-integration, the Engle-Granger method starts by creating residuals based on the static regression and then testing the residuals for unit-roots presence. It uses the Augmented Dickey-Fuller Test (ADF) or other tests to test stationarity in time series.

STATIONARITY & MEAN REVERSION

We used a standard co-integration using stat-models in python and saw that the two series are co-integrated. The next step is to find the stationary relation based on which we can take the pair trade.

A time series is stationary if its mean and variance are constant over time. Finding a stationary time series is critical to model mean reversion. Only with a stationary process can you confidently say that the values will return to their mean, and fluctuations around the mean will have roughly equal amplitudes.

If you look at the spread between the two time-series, just looking at it, you can confidently say that it is not mean-reverting or stationary.

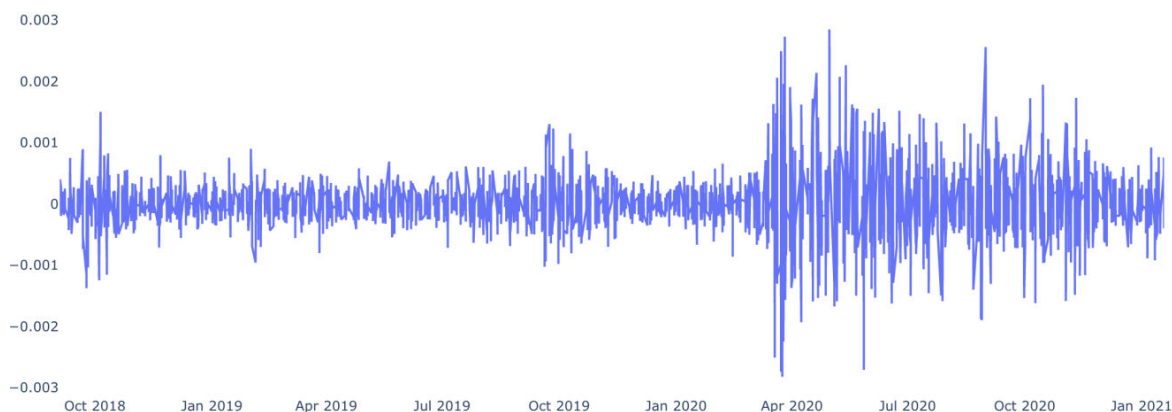
Table 2 : Spread Between NIFTY and BANKNIFTY



We, therefore, now need to work on our two time-series to a stationary relation based on which we can trade. We find that while the spread or the ratio of values is not stationary, the regression residuals between the two time-series are stationary.

The plot below the regression residuals between the two time-series can be easily recognized as a stationary relation. The Augmented Dickey-Fuller test for stationarity also detects stationarity in the residuals.

Table 3: Regression Residuals between NIFTY and BANKNIFTY

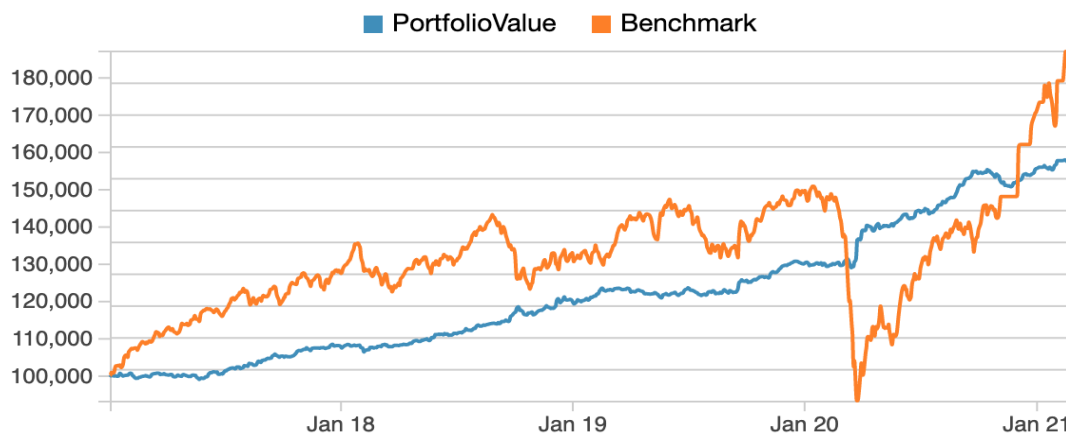


Having detected this stationary relation, we can confidently say that if the residual goes above or below a certain value, we can expect it to revert back to the mean.

STRATEGY PERFORMANCE

Now is the time for the results. Our implementation gave a fairly decent performance on the Quantra platform. We see that the returns using a leverage of 3.5 are 59% in the 3 year period and the Sharpe Ratio is 2.28. The drawdown is also quite low at -3%

RETURNS	ALPHA	BETA	SHARPE	DRAWDOWN
58.74%	0.11	0.01	2.28	-3.07%



CONCLUSION

This article examines pairs-trading in Indian markets. Using the same pairs-trading algorithm as Gatev, Goetzmann and Rouwenhorst (2006) and by Do and Faff (2010). We show that pairs-trading in yields a fair return over the period. Continuing on the conclusion of Do and Faff that pairs-trading is especially profitable during market turmoil which is clearly visible in the table above. Pairs-traders exploit statistical arbitrage opportunities that arise when there is a discrepancy in the relative pricing of two stocks. This discrepancy is caused by irrational behaviour of certain investors.

The proxies we used for market inefficiency: price dispersion in the stock market, SSD and the 20-day volatility of the stock market, do explain some of the pairs-trading profits. We showed that using these proxies as a timing instrument do sometimes increase performance. However, this performance may not be consistent for every market.

REFERENCES

1. E. G. Gatev, W. N. Goetzmann, and K. G. Rouwenhorst, "Pairs trading: performance of a relative average arbitrage rule," *Review of Financial Studies*, vol. 19, 1999. View at: [Google Scholar](#)
2. B. Do and R. Faff, "Does simple pairs trading still work?" *Financial Analysts Journal*, vol. 66, no. 4, pp. 83–95, 2010. View at: [Publisher Site](#) | [Google Scholar](#)

3. B. Do and R. Faff, "Are pairs trading profits robust to trading costs?" *Journal of Financial Research*, vol. 35, no. 2, pp. 261–287, 2012. View at: [Publisher Site](#) | [Google Scholar](#)
4. H. J. Chen, S. Chen, and Z. ChenF. Li, "Empirical investigation of an equity pairs trading strategy," *Management Science*, vol. 65, no. 1, pp. 370–389, 2017. View at: [Publisher Site](#) | [Google Scholar](#)
5. G. Vidyamurthy, *Pairs Trading: Quantitative Methods and Analysis*, John Wiley & Sons, Hoboken, NJ, USA, 2004.
6. Y.-X. Lin, M. McCrae, and C. Gulati, "Loss protection in pairs trading through minimum profit bounds: a cointegration approach," *Journal of Applied Mathematics and Decision Sciences*, vol. 2006, pp. 1–14, 2006. View at: [Publisher Site](#) | [Google Scholar](#)
7. H. Huspaningrum, Y. X. Lin, and C. M. Gulati, "Finding the optimal pre-set boundaries for pairs trading strategy based on cointegration technique," *Journal of Statistical Theory and Practice*, vol. 4, no. 3, pp. 391–419, 2010. View at: [Google Scholar](#)
8. K. F. Law, W. K. Li, and P. L. H. Yu, "A single-stage approach for cointegration-based pairs trading," *Finance Research Letters*, vol. 26, pp. 177–184, 2018. View at: [Publisher Site](#) | [Google Scholar](#)
9. M. Clegg and C. Krauss, "Pairs trading with partial cointegration," *Quantitative Finance*, vol. 18, no. 1, pp. 121–138, 2018. View at: [Publisher Site](#) | [Google Scholar](#)
10. C. L. DunisR. Ho and R. Ho, "Cointegration portfolios of European equities for index tracking and market neutral strategies," *Journal of Asset Management*, vol. 6, no. 1, pp. 33–52, 2005. View at: [Publisher Site](#) | [Google Scholar](#)
11. A. Galenko, E. Popova, and I. Popova, "Trading in the presence of cointegration," *Journal of Alternative Investments*, vol. 15, no. 1, pp. 85–97, 2012. View at: [Publisher Site](#) | [Google Scholar](#)
12. L. Yiyun and K. F. Law, "Systematic risk in pairs trading and dynamic parameterization," *Economics Letters*, vol. 202, Article ID 109842, 2021. View at: [Google Scholar](#)
13. R. J. Elliott, J. Van Der Hoek, and W. P. Malcolm, "Pairs trading," *Quantitative Finance*, vol. 5, no. 3, pp. 271–276, 2005. View at: [Publisher Site](#) | [Google Scholar](#)
14. B. Do, R. Faff, and K. Hamza, "A new approach to modeling and estimation for pairs trading," in *Proceedings of the 2006 Financial Management Association European Conference*, pp. 87–99, Capri, Italy, June 2006. View at: [Google Scholar](#)
15. J. W. Jurek and H. Yang, *Dynamic Portfolio Selection in Arbitrage*. Working Paper, Harvard University, Cambridge, MA, USA, 2007.
16. W. K. Bertram, "Analytic solutions for optimal statistical arbitrage trading," *Physica A: Statistical Mechanics and Its Applications*, vol. 389, no. 11, pp. 2234–2243, 2010. View at: [Publisher Site](#) | [Google Scholar](#)
17. M. Cummins and A. Bucca, "Quantitative spread trading on crude oil and refined products markets," *Quantitative Finance*, vol. 12, no. 12, pp. 1857–1875, 2012. View at: [Publisher Site](#) | [Google Scholar](#)
18. M. Bock and R. Mestel, "A regime-switching relative value arbitrage rule," *Operations Research Proceedings*, vol. 14, 2008. View at: [Google Scholar](#)
19. C. W. S. Chen, M. Chen, and S. Y. Chen, "Pairs TIn: huynh VN," in *Modeling Dependence in Econometrics. Advances in Intelligent Systems and Computing*, vol. 251, Springer, Berlin, Germany, 2020. View at: [Google Scholar](#)
20. A. Göncü and E. Akyıldırım, "Statistical arbitrage with pairs trading," *International Review of Finance*, vol. 16, no. 2, pp. 307–319, 2016. View at: [Publisher Site](#) | [Google Scholar](#)
21. J. Liu and A. Timmermann, "Optimal convergence trade strategies," *Review of Financial Studies*, vol. 26, no. 4, pp. 1048–1086, 2013. View at: [Publisher Site](#) | [Google Scholar](#)
22. N. Huck, "Pairs selection and outranking: an application to the S&P 100 index," *European Journal of Operational Research*, vol. 196, no. 2, pp. 819–825, 2009. View at: [Publisher Site](#) | [Google Scholar](#)
23. N. Huck, "Pairs trading and outranking: the multi-step-ahead forecasting case," *European Journal of Operational Research*, vol. 207, no. 3, pp. 1702–1716, 2010. View at: [Publisher Site](#) | [Google Scholar](#)

-
-
- 24.L. Ferreira, “New tools for spread trading. Futures: news, analysis & strategies for futures,” *Options & Derivatives Traders*, vol. 37, no. 12, pp. 38–41, 2008. View at: [Google Scholar](#)
 - 25.R. Q. Liew and Y. Wu, “Pairs trading: a copula approach,” *Journal of Derivatives and Hedge Funds*, vol. 19, no. 1, pp. 12–30, 2013. View at: [Publisher Site](#) | [Google Scholar](#)
 - 26.Y. Stander, D. Marais, and I. Botha, “Trading strategies with copulas,” *Journal of Economic and Financial Studies*, vol. 6, no. 1, pp. 83–108, 2013. View at: [Publisher Site](#) | [Google Scholar](#)
 - 27.W. Xie and Y. Wu, “Copula-based pairs trading strategy,” *Asian Finance Association (AsFA)*, 2013. View at: [Publisher Site](#) | [Google Scholar](#)
 - 28.C. Krauss and J. Stubinger, *Nonlinear Dependence Modeling with Bivariate Copulas: Statistical Arbitrage Pairs Trading on the S&P100*, IWQW Discussion Paper Series, University of Erlangen-Nurnberg, Nurnberg, Germany, 2015.
 - 29.H. Rad, R. K. Y. Low, and R. W. Faff, *The Profitability of Pairs Trading Strategies: Distance, Cointegration, and Copula methods*. Working Paper, University of Queensland, Brisbane, Australia, 2015.
 - 30.J. P. Ramos-Requena, J. E. Trinidad-Segovia, and M. A. Sánchez-Granero, “Introducing Hurst exponent in pair trading,” *Physica A: Statistical Mechanics and Its Applications*, vol. 488, pp. 39–45, 2017. View at: [Publisher Site](#) | [Google Scholar](#)
 - 31.J. P. Ramos-Requena and J. E. Trinidad-Segovia, M. A. Sánchez Granero and M. Á. Sánchez-Granero, “An alternative approach to measure co-movement between two time series,” *Mathematics*, vol. 8, no. 2, p. 261, 2020. View at: [Publisher Site](#) | [Google Scholar](#)
 - 32.M. López-García, M. Sánchez-Granero, J. Trinidad-Segovia, A. Puertas, and F. Nieves, “A new look on financial markets Co-movement through cooperative dynamics in many-body physics,” *Entropy*, vol. 22, no. 9, p. 954, 2020. View at: [Publisher Site](#) | [Google Scholar](#)

REWARDS AND EMPLOYEE MOTIVATION: AN EMPIRICAL STUDY ON PRIVATE MANAGEMENT INSTITUTIONS IN MADHYA PRADESH**Dr. Annu Tomar**

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ABSTRACT

To create sure competitive advantage, people who are ready for the friendship should be motivated by given that an in amount reward and benefit system. Imbursement friendship progress covers up both financial and non-financial plunder. The awareness of the psychological conference is at least as inner in caring and involvement motivation as the industrial rudiments of the finances and contact aspect of return. Hence, in this paper, we unearth out the job of encouragement in moving people and advocate the relatives to make inappropriate amendment in their prize scheme. The reason of this learns is to show the association between the a variety of prizes and associate of staff inducement and also to be recognizable with that to what degree a variety of rewards or incentives are use in the confidential friendship to inspire the human resources. Inducement or prize is any denotes that makes an member of staff desire to do enhanced, try harder and use up more power. Connections should think for a more prepared payment arrangement that believe both basic and extrinsic payments which in turn prospers high concert traditions in the Management institution in Madhya Pradesh.

Keywords: Incentives, Employees Motivation, Satisfaction, Performance.

INTRODUCTION

Human resource is cautious as the majority important benefit of every friendship. In the age of global rivalry, obtain right labor force and retaining it turns out to be the most significant confront of all friendship. Inspiration is derived from the term “motive” which means “to move”. While a motive is energizer of action, motivating is the channelization and activation of motives, inspiration is the work performance itself. Inspiration depends on reason and inspiring, therefore, it develop into a composite development.

For example, Dubin has distinct incentive as follows: Incentive is the multifaceted power preliminary and custody a being at labor in a friendship. Incentive is amazing that moves a being to action, and continues him in the route of action by now started.

“Motivation is the act of suggest somebody or oneself to get a preferred track of achievement, to press on the wrong switch to get much loved consequences”.

- Michel J. Jucius

“Motivation can be distinct as a readiness to use power to attain an objective orprize”.

- Dale Beach

“Inducement” may be defined as a incentive or support for grater act. When second-hand in term of earnings strategies, it frequently refers to extra wage paid to a worker, if the job units fashioned by him go above a traditional usual. Incentives are to be had to human resources to persuade them to superior shot in invention than would more often than not be anticipated. From time-to-time inducement plays that vital role to inspire the employees which cannot be achieving by any other ways.

II. LITERATURE REVIEW

Human resource is the most valuable asset of every association. In the age of globalization, the workplace realities of previous years no longer exist. The change has been observed on the workplace realities in today’s associations. It is necessary to revise carefully as well as meet and introduce new motivational tools to enhance employee motivation if we want these resources to retain and give their best. Before identifying the rewards that motivate the human resources, we must understand what motivation is.

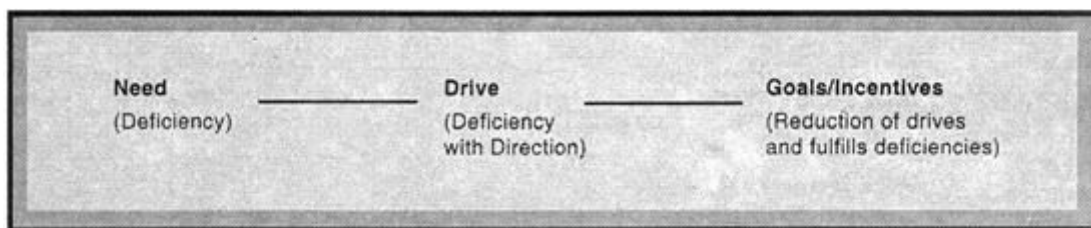
Motivation: The term motive is derived from the Latin word ‘movere.’ which means ‘to move.’ ‘Motive’ is defined as an inner state that energizes, activates (or moves) and directs (or channels) the behavior of individuals towards certain goals. Motives are certain important needs of human beings. These needs have different degrees of potency or strength.

The strong need or motive creates high tension or disequilibrium in a person and makes him restless until the need is fulfilled. For example, the need for professional recognition makes the doctor restless until the co-doctors and patients recognize him as an efficient doctor. In order to reduce the tension, the doctor treats the critical cases. Motives persuade the individuals to channel their performance in the direction of that action which would decrease the disequilibrium. Thus, motives are drives which invigorate person to an action with a way. For example, the physically powerful reason of earn large sums of cash directs the students to take up the act of studying route which have quick earnings.

Inspiration is derived from the word object. "A cause situation that energizes, set in motion or moves, and directs or strait achievements towards goals."

"Stimulus represents a disappointed have to which craft a shape of pressure or disequilibrium, causing the person to go in a objective heading for prototype in the direction of restoring a state of balance by pleasing the require." According to the Encyclopedia of Management, "Incentive refers to the amount of readiness of a friendship to follow some chosen objective and implies the strength of mind of the natural world and locus of the powers, counting the amount of willingness."

Incentive is a procedure that starts with a physiological or mental lack or need that activate performance or a force that is meant at a goal or 'inducement, thus, the procedure of incentive lies in the sense of and association in the middle of wants, drives and incentives .



Need: Need is lack. Needs are shaped when there is a physiological or mental inequity.

Drive: Force is a lack with way. They are action-oriented and give an up-and-coming push towards goal achievement.

Incentives: Incentive is no matter which that will ease a want to diminish a coerce.

Incentives/Rewards are usually renowned that natives may collect two most important categories of prizes from labor. One is inherent recompensed, which are plunder that are interior to employees and which they give themselves. Inherent rewards comprise self-esteem, a intelligence of achievement, and a feeling of growth or development of special skills and talents. Many of these rewards are preferred from the labor itself. Inherent rewards are connected to the worker’s insight of the work and, therefore, are exaggerated by job plan; inherent prize may be called as “non-financial/non- financial rewards.

Monetary motivators may be in the shape of additional salary and salaries, bonuses, profit-sharing (ESOPs), leave with pay, medical reimbursements, company-paid insurance or any of the other things that may be agreed to employees for performance. The economists and most managers judge change and monetary motivation as central motivator. Behavioral scientists, on the further tender, tend to position them low. Neither view is perhaps right.

Monetary incentives are second-hand to inspire the employees for firm work. However individuals have dissimilar needs to please while operational in the friendship. People generally at senior levels need more socio-psychological incentive to please the needs which cannot be satisfied by the money alone. Thus organization in adding up to the monetary incentives provides non- monetary motivation also to encourage the employees. For example if an personality gets support in the organization so it gratify him more expressively that is he gets better category, more tough job, weight, etc. the economically he gets other pay also by sponsorship.

Impact of Rewards on Employees’ Motivation (Empirical Review)

Motivation is the economical stimulus that causes us to act. The stimulus may be a need or a drive that energizes certain behaviours. At work, enthusiasm is an amalgamation of all factors in our effective setting that lead to activist or negative efforts. If we be aware of what induces us, we are more likely to attain our individual and expert goals.

Likewise, if association knows how to inspire employee, they can add to output. This aptitude to increase manufacture is more and more important as companionship fight in the worldwide market. While all companies create some attempt to inspire employees, a increasing figure of associations are introduce new strategies counting diverse return packages, as a means of inspiring today's workers (Dalton, Hoyle and Watts, 2003)¹⁰. Thus payment and enthusiasm are consistent.

Wealth as a main inspiring aspect was allowed by Taylor (1947)¹¹, the organizer of logical management. Natives were seen to be annoyed by self-interest and were keen to understand the confront to make the most of their profits. The "economic man" school of consideration gave way to the person relations viewpoint explained by Mayo (1949)¹². Next a series of research on the social and ecological circumstances at labor, the significance of credit and high-quality social association at labor as motivational factors causal to confidence and output was a lot underscore.

Herzberg¹³ stated that cash is a so called "cleanliness factor" which serve up as a latent dissatisfies if not at hand in proper amounts, but not as a likely satisfier or encouraging impetus.

Lawler and Porter (1967)¹⁴ optional that concert raise satisfactions throughout the intermediary result of rewards. In arrange to inspire employees for improved associational presentation, it would be essential to give incentives and situational factors in such a way that their individual needs are included with associational goals.

The strength of incentive varies depending on the variables such as reason, expectation and incentives which can be exposed in the following equation (Atkinson, 1958)¹⁵.

Motivation = f (motive X expectancy X incentives)

From the more than equation, the charge of anticipation and incentives are by and large based on the past knowledge of the person worried. The biased appraisal of these factors is so, more significant in formative incentive of a being than the principles that may be assigned to these factors from side to side object dimensions.

Equity theory (Adams) ¹⁶ exposed that approval with reimburse is connected to perceptions about the ratio between what one receives from the job (outcomes in the from of pay) to what one puts into it (inputs in the form of efforts and skill) compounded with the ratios obtained by others.

Argyris (1957)¹⁷ and McGregor (1960)¹⁸ indicated that a man is determined for self actualization from side to side labor. The stress shift from extrinsic rewards through accomplishment, use of creativity and other potentialities at labor. Behaviorist theories of incentive are characterized as more correctly an anxiety with mental incentives managements in its present socio- historic institutionalized form as a procedure of communal power and work as a social knowledge of power (Jackson, Vincent, 1986)¹⁹. But financial incentive increase employee output and in a straight line rational to the achievements of the output objective of associations (Dehigama Nayana 1996). Thus monetary and non-monetary incentive procedure has an evenly significant division to play in recompense organization.

RESEARCH DESIGN AND METHODOLOGY

Study and Survey Design

Primary data was together from beginning to end the survey and substandard data from journals and book, etc. Random sampling practice was adopted to select sample association. Thus 30 Private sector relations, located in Madhya Pradesh were picked for the point of the learn.

Recompense and incentive in the in attendance study were measured by a survey which consist of 15 declarations for payment, and 20 report for incentive. These statements were to be responded to on a seven point scale ranging from "strongly agree" to "strongly disagree". The number of questionnaires issued to dissimilar organizations was 600 and only 316 (59%) were conventional in the state of usage.

OBJECTIVES OF THE STUDY

The chief aim is to observe the affiliation stuck between the payments and member of staff enthusiasm in classified sector Institutions based in Madhya Pradesh. The definite objectives of the revision are:

- i) To judge the stimulus of member of staff masculinity wise.
- ii) To question the alliance between the economic and non-economic incentives of employees in personal association in Madhya Pradesh.
- iii) To propose the connection to create appropriate alterations or take remedial act in their prize scheme.
- iv) To recognize the association of incentive sexual category shrewd.

HYPOTHESIS OF THE STUDY

The succeeding supposition has been in use for the learning:

1. There is no association flanked by recompensed and member of staff incentive in confidential division relationship.
2. There is no association between financial rewards and inferior height needs.
3. An association can be experiential between financial rewards and employee’s sexual category.
4. Important dissimilarity can be noticed between financial rewards and non-financial recompenses.

Table 1: Examination of feature wants to get better concerning incentive as per gender wise

In this query, study of 500 respondents counting the male and female has been in use and attempt to be acquainted with the inspiration issue that needs to get better in the association as per gender group. The result was as follows:

Crosstabs

/Tables=Gender By Factor For Improvement

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Table 1.18 Case Processing Summary

Gender * Factor For Improvement	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
	500	100.00%	0	0.00%	500	100.00%

Table 1.18.1 Gender * factor for improvement Cross tabulation

		Factor For Improvement					Total
			style of management	Flexibility	salary and rewards	organization goodwill	
Gender	Male	Count	10	75	110	5	200
		Expected Count	12	72	108	8	200
	Female	Count	20	105	160	10	295
		Expected Count	17.7	106.2	159.3	11.8	295
	4	Count	0	0	0	5	5
		Expected Count	0.3	1.8	2.7	0.2	5
Total		Count	30	180	270	20	500
		Expected Count	30	180	270	20	500

Table 1.18 .2 Chi-Square Tests

	Value	Df	Asymp.Sig. (2-Sided)
Pearson Chi-Square	1.222E2 ^a	6	0
Likelihood Ratio	34.595	6	0
Linear-By-Linear Association	4.068	1	0.044
N Of Valid Cases	500		
a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is .20.			

In table 1.18, it is experiential that present is no particular favorite to any one issue to get better to inspire the human resources in the association. Table 1.18.1 showed that most of the employees felt that pay and rewards were vital to improve the incentive height of the employee. In the table 1.18.1, the chi - square value is .000 which is less than the tabulated value. Hence the null suggestions is accepted and substitute suppositions is rejected.

Table 2: Z-test for financial and non-financial rewards on the perception of employees in Private sector

Variables	No. of sample	Mean	S.D	Z-Value
Financial Rewards	316	4.66	12.69	27.74
Non-Financial Rewards	316	24.14	8.18	

Source: Computed data:

The table shows the Z value of 27.74 which is important at 0.05 levels. Hence, there is a significant dissimilarity between monetary and non-monetary rewards on the insight of employees. It discloses that the employees in personal subdivision gave much meaning to monetary rewards than non-financial rewards.

The dissimilarity between fiscal and non fiscal prize may vary with the worker rank which mean, lower level, middle level and high level. Here lower level and middle level employee give much meaning to monetary rewards where as high level managerial stress non-financial rewards. It reveals that nearly 83% of the employees try to assemble their economic rewards and rest 17% meet non-economic rewards.

Following the above psychiatry, the issue of rewards and employees incentive had been recognized. A list of somewhat items has ready and ask the employees to score arrange them in terms of their accessibility and significance to employees. Their position are given below. 1 indicates the uppermost rank and 9 the lower rank.

Table 3: Relationship between rewards and motivation in Private sector

X Y	Low	Average	High	Total
Low	36	04	-	40
Average	02	32	11	45
High	-	73	158	231
Total	38	109	169	316

Source: Computed data X - Level of motivation Y - Level of rewards.

From the above table, Bi-variate association was compute to find out the relations between plunder and incentive. Correlation value, $r = 0.745$ in Private sector and it shows that there is a shut association between prize and incentive.

Hence, the main purpose and premise is established. The learn of drive is based on Maslow’s hierarchy needs theory. Needs can be separated into two groups, such as lower level needs, and higher level needs. Here, lower level needs are content by monetary rewards and higher level needs are content by non monetary rewards.

In arrange to find out the acquaintance between financial rewards and lower level needs the following table has been presented.

Table 4: Monetary rewards and lower level needs in Private sector

Y X		Physiological needs		Security Needs		Total
		4-20	20 >	4-20	20 >	
Straight Reward	5-20	15	07	14	12	48
	20 >	12	45	07	45	109
Indirect Reward	5-20	14	05	15	03	50
	20 >	14	47	12	49	122
Total		55	104	48	109	316

Source: - computer data X - Monetary rewards Y - Lower level needs

From the table 6, X 2 technique was used to test the organization between fiscal remuneration and lower level needs. $XO 2 = 74.33$ which is important at 0.05 levels. Hence, there is very lock involvement between financial recompense and lower level needs in confidential Sector.

Following the hard of connection between fiscal rewards and lower level needs, the connection stuck between non-monetary plunder and superior level needs is analyzed.

CONCLUSION

From the results obtained starting the revision, it is perceptible that, the alleged point of rewards and incentive have important association in the middle of the Private Institutions staff and the financial plunder have a significant effect on employee enthusiasm than the non monetary rewards.

SUGGESTIONS

Foundation on the learning, the next proposition is complete to the association. An relationship should make out the majority important factors which is apparent by the employees, then should disturbed with these factors and the relations should present a realistic and highest salaries /wages to the workers, because wages and salaries are the most momentous cause in inspiring employees.

The member of staff should be known greater legal responsibility for the procedure of the chore allocate to them. This would improve the employee's drive. The involvements should distinguish the kind of needs in pecking order favored by the workers and then should be take on suitable rewards organization. For example, fiscal rewards may be valid to lower level employees, where as non-monetary rewards related to high level administrative.

Since, employees be supposed to also be responsible to their concert which enlarge their sagacity of consciousness and participation in their job, it is improved to give the presentation related pay which will lead to prompt them, for this reason, the organization must occasionally evaluation their level of presentation and they should be recognized and documented on the foundation of their presentation.

REFERENCES

1. Varma and Agarwal (1994) personal management; A human resource systems approach, New Delhi: forward book dept educational Privateations.
2. Kapur, S.K. and punia B.K. (1996) Personel management and industrial relations, New Delhi: S.K. Publishers.
3. Criffeth, R.W. and Hom. P.W. (2001) Compensation and rewards: retaining valued employees, London International (eduaitonal) professional publishers.
4. Gomez-mejia, L.R. and Balkin, D.B. (1992) Compensation, organisational strategy, and firm performance, cincinnati, OH; south- western publishing.
5. Milkovich, G.T. and Newman, J.M. (1993) Compensation, Homewood, IL; Richard D. Irwin.
6. Dilworth, J.B. (1996) Operations management, New York: Mc Graw Hill companies Inc.
7. Henderson, R.J. (1994) Compensation management: Rewarding performance, Englewood cliffs; Nj; prentice – Hall.
8. Maslow, A.H. (1951) Motivation and personality, New York; Harper and row Privatehers, Inc.
9. Gangadhar, S.M. and Keswarni, M (2002) Reward Management: realising business strategy through people, journal of human capital, 6(4): 38-44.
10. Dalton M, Hoyle, D.G.and watts, M.W (2003) Human relations, Australia: South – Western educaitional publishing.
11. Taylor, F.W. (1947) Scientific management, New York: Harper and row.
12. Mayo, E (1949) The social problems of an industrial civilzatin, London: Routledge and Kegan paul.
13. Herzbeg, F (1992) One more time: How do you motivate employees? In strage, M.H. (eds.) Milestones in management, PP. 115-133, mckinsey and company.
14. Lawler, E.E and Porter, L.W. (1967) Antecedent attitudes of effectivness, vol-11 : PP.122- 142.
15. Atkinson, J.W (1958) Motives in Fantasy. Action and society, New york, D.van Nostrand.
16. Adams, J (1998) Injustice in social exchange. In Armstrong M , and Murlis H(eds). Reward management, PP 34-45, London: Kogan page.
17. Argyris, C (1957) Personality and organisation: The conflict between system and the individual, New york: Harper and row publishers, Inc.
18. Mc Gregor, D (1960) The human side of enterprises, New York Mc Graw – Hill.
19. Jackson, vincent N, (1986) Motivation and the gift relationship, international abstract, 9(1), UMI Privateation.
20. Dehigama Nayana, D.P. (1996) Relations between monetaryincentives, employee satisfaction, and employee productivitiy, Sri Lanka PIM.

LEAN SIX SIGMA FOR A DIGITAL TRANSFORMATION STRATEGY IN BPO/KPO AFTER COVID-19 BREAKOUT**Rahul Srivastava**

Senior Manager, Business Transformation, HCL Technologies Ltd

INTRODUCTION**LEAN SIX Sigma**

Lean Six Sigma is a combination of Lean methodology and Six Sigma strategy. Lean methodology was established by Japanese automaker Toyota in the 1940s. Its purpose was to remove non-value-adding activities from the production process. Six Sigma, on the other hand, was established in the 1980s by an engineer at U.S. telecommunications company Motorola who was inspired by Japan's Kaizen model. It was trademarked by the company in 1993. Its method seeks to identify and reduce defects in the production process. It also strives to streamline the variability of the production process. Lean Six Sigma emerged in the 1990s as large U.S. manufacturers attempted to compete with Japan's better-made products.

The lean concept of management focuses on the reduction and elimination of eight kinds of waste known as DOWNTIME, an acronym formed by the word defect, overproduction, waiting, non-utilized talent, transportation, inventory, motion, and extra-processing. Lean refers to any method, measure, or tool that helps in the identification and elimination of waste. The term Six Sigma refers to tools and techniques that are used to improve manufacturing processes. The strategy attempts to identify and eliminate the causes of defects and variations in business and manufacturing processes. Six Sigma's DMAIC phases are utilized in Lean Six Sigma. The acronym stands for define, measure, analyze, improve, and control. It refers to the data-driven five-step method for improving, optimizing, and stabilizing business and manufacturing processes.

A Lean Six Sigma approach that combines Lean strategy and Six Sigma's tools and techniques highlights processes that are prone to waste, defects, and variation and then reduces them to ensure improvement in a company's operational processes.

DIGITAL TRANSFORMATION

Digital transformation process leads to the creation of new business models. Business processes are the core of every organization, and therefore, their management is of great importance in practice. However, changes that are happening on the global market also influence changes within the organizations that must adapt to new conditions as quickly as possible in order to prosper in the market. One of the ways they can follow the global trends is to make changes to their business processes. Radical technological innovation involves creating new-to-the-world technology that brings about revolutionary changes. It often creates new industry or market structures or involves dramatic changes to the existing ones which often requires organisation to be on the top of all innovations happening in the market so that their customer do not take decision to move out to use product and services of their competitive organisations who are flexible to adopt to new technology in a shorter span of time. Rapid development of technology as well as many changes in the global market today, has led to the emergence of digital transformation which refers to the change of existing business models along with creation of new ones by implementing and using digital technologies.

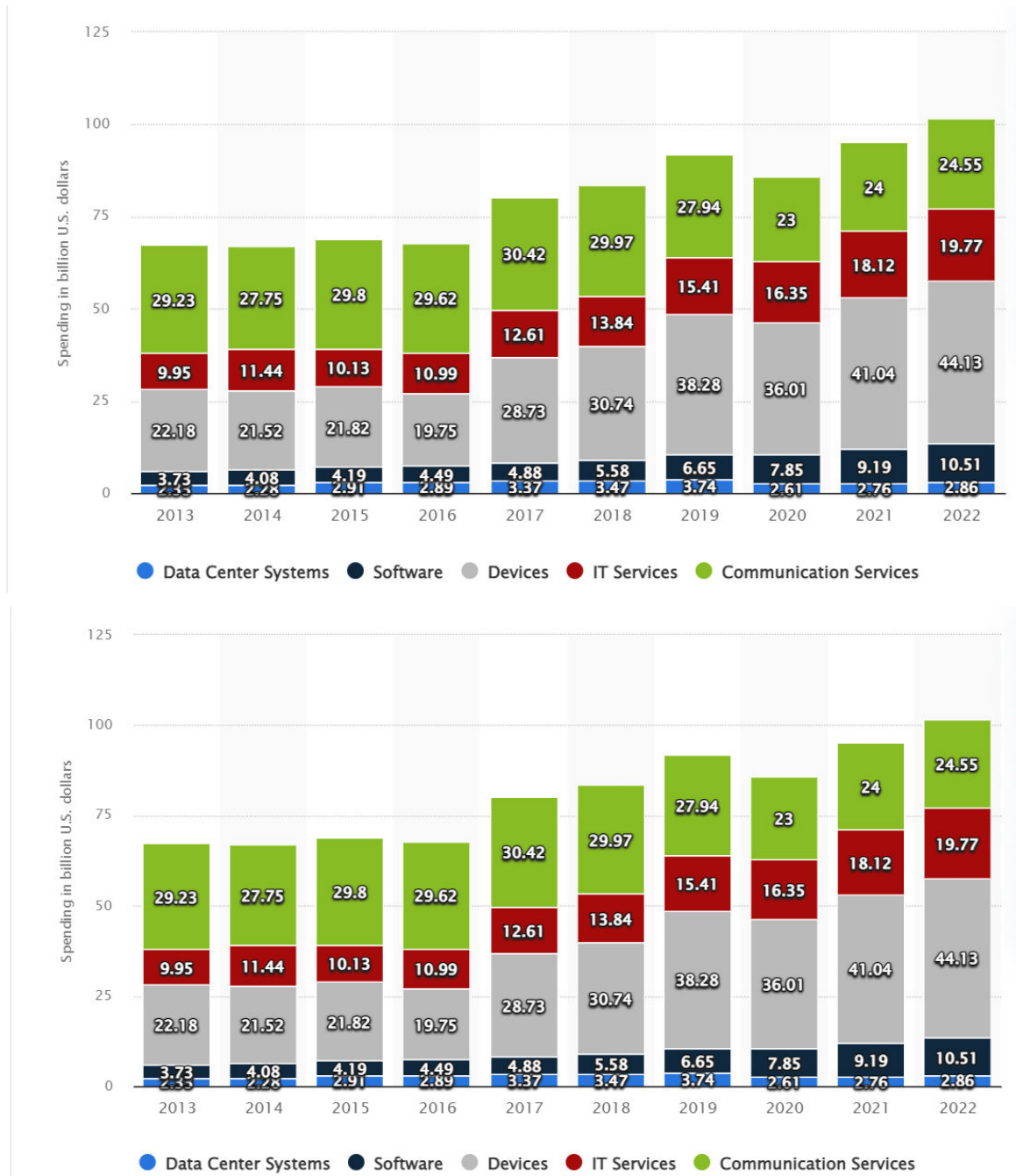
Example

Digital Currency substituting physical currency in INDIA is one of the best example of Digital Transformation, This transformation was a result of demonetization of currency in year 2016 by Modi government revolutionized the movement towards usage of digital payment methods in India. people adopted digital mode of payments in short span of time. The adoption of digital methods for payments is facilitated by phenomenal increase in ownership of smart phones and presence of user-friendly payment modes like PAYTM and BHIM UPI. Though, initially people in India were reluctant to use digital system, but it has come to stay largely due to its prevalence in many developed countries of the world and ease of use. Over the years, focused effort has been made to develop national payment infrastructure and technological platforms through Immediate Payment Service (IMPS), Unified Payments interface (UPI), Bharat interface for money (BHIM), Bharat bill Pay system (BBPS) or Aadhaar enabled payment system (AEPS). As a result, there is substantial increase in retail electronic payments.

RESEARCH METHODOLOGY

Data has been collected from secondary sources i.e. from STATISTA, an online platform specialized in market and consumer data, which offers statistics and reports, market, consumer and company insights, Information has also been collected from Accenture Research and Oxford Economics Intelligent Operation Survey, 2020

Lean, Six Sigma which was the best method to Improve process for reducing costs and increasing revenue through customer satisfaction in in past years. However, Digital Transformation adopting to Radical technological innovations has been the only alternative for every organisation to deliver their product or service for the satisfaction of customer in a shorter period without leveraging the lean six sigma techniques in transforming business. It is notable to observe the growth of IT companies in last 10 years



In all 5 types of services in IT Market has shown a rapid growth in last 3 years predominantly due to dependency on Technology which is a result of COVID outbreak leading to lockdown across the world.

At the same time organisations who are investing huge amount of money in new technologies and associated services are besieged with the cost of deployment and having benefits/outcome as estimated by Project Management professionals with a doctrine “that without using the new technologies it would be difficult to sustain in any industry” created in the market by the IT companies for increasing the sale of their product and services. The measurement of Cost and Benefit associated with deployment of new technology becomes significant to decide whether to go with the trend in the market or not. LEAN, Six Sigma is the only methodology by which an accurate cost and benefit analysis can be done along with the measurement of Process Re-engineering impact on Business Outcome Indicator before deployment of new technology in any business process

Establishing relationship between Lean, Six Sigma and Digital Transformation. Lean focuses on value through the elimination of waste by removing non-value-added steps. Six Sigma refers to a methodology that is driven by data and statistics. It is used by businesses to eliminate defects and improve any of their processes to boost their profits. Lean Six Sigma and digital transformation are not mutually exclusive. Given that the incorporation of new innovations into business function requires efficient operational process as a foundation, Lean Sigma is an obvious platform

Lean Six Sigma can drive your technology and really allow the dog to wag the tail rather than the tail wagging the dog, is that by focusing on value stream mapping, optimizing your processes, and defining what you want your processes to be in the future. This gives you a clear set of criteria to evaluate potential technology options. It also provides a foundation to identify where the technology you might be deploying is deficient. No technology is perfect, and every system we might deploy is going to have deficiencies and weaknesses that need to be addressed. It is important to have that clear vision through value stream mapping within a Lean Six Sigma framework. With these exercises, you're going to have a much better sense of which technology can best fit your organization, how you can best deploy that technology, and how to fill any gaps. Another important benefit of Lean Six Sigma is that it focuses on metrics. It's a very quantitative-driven framework that is almost obsessed with measuring what's happening throughout your operations. In fact, Six Sigma focuses so much on analysing data and identify optimization tactics that it can really benefit any transformation initiative, these metrics can then be used, not only for your implementation and setting the goals for what you want to get out of your implementation but also from the perspective of continuous improvement post-implementation as well.

Anytime you're starting a process improvement project, it's essential to have a clear and concise initial problem statement. When teams are unable to focus on the real issue, they lose valuable problem-solving time. Team members become disenfranchised from the process since they seem to be going in circles without making any progress. After defining the problem statement measurement is required which can be done through Lean and Six Sigma Methodology, VSM (Value Stream Mapping) as one of the most important methods of Lean helps to determine the cycle time, delay time and Process Lead time. Process Lead time is attributable to 3 below mentioned metrics which are measured through VSM

- 1) Cycle time at different Steps
- 2) Delay time (waiting time between steps)
- 3) FPY's (First Pass Yield at validations in the process)

When Processing Time is the biggest pain area in the process, measurement of above metrics through VSM becomes significant so that the opportunity areas are evident. Prioritizing those opportunity areas that will yield maximum reduction in Process lead time is the next focus area in any process improvement projects, solutions to be scrutinised through brainstorming sessions conducted with all stakeholders can be categorized as mentioned below:

- Better governance to reduce the delays in taking decision
- System controls at the point of input submission to eliminate validations and routing the request upon validation failure at multiples points in the process.
- Automation of manual and repetitive process to reduce cycle time significantly.

OR

Deployment of workflow with inbuilt system controls through integration with ERP's

Deployment of workflow is the enduring solution to bring down the process lead time significantly which can drive better governance, System controls and automate the manual repetitive process

Such a data driven approach facilitated by Lean methodology help management to opt best option which might lead to reduce the money investment in tools and technologies as suggested and recommended by IT Companies for their outsourcing business customer. All IT companies operating in INDIA develops the tools and sell to their outsourcing business customers with a commitment to solve their process related problems

Finance and Accounts Process outsourced by Companies from various industries across the world to IT Companies operating in INDIA (i.e. Accenture, Infosys, TCS, IBM and HCL etc..) with a clear defined YoY cost reduction target. IT companies operating in INDIA clutching such opportunity by selling inhouse/third party developed tools to the clients in order to achieve target of full time production employees reduction. Apart from cost reduction outsourcing partner also focus on the improvement in the Process Key Performance Metrics. Few examples of such metrics are mentioned as below.

*“Duplicate Payment”, “first pass yield” and “paid on time” for a PTP process

* Aged Debts, DSO and Payment Allocation for an OTC Process

* Accuracy of Journal Posting, Period Close workday in a RTR Process

* Material Ledger Close in a Costing Process

Process Lead time is the biggest pain area in any process (i.e. PTP, OTC, RTR and Costing. Etc) which must be addressed through Lean and Six Sigma methodology so that any Standard tool developed by IT companies are customised as per the requirement of the specific process instead of selling the tool in its original shape and asking for a large amount of investment from the customer already incurred huge cost due to high Process Lead time in the process through paying Penalty for the invoice being paid late, making payment twice to a vendor which is not recovered sometimes and inviting operation cost for a low First Pass yield in a PTP process. Similarly, in OTC inability to receive payment from customers even after 60 days of invoice due date impacts the liquidity Ratio adversely if Collection lead time is not reduced. But at the same time Digital Transformation of business processes to get revenue on time, paid on time requires huge amount of investment which most of the time do not yield maximum benefits.

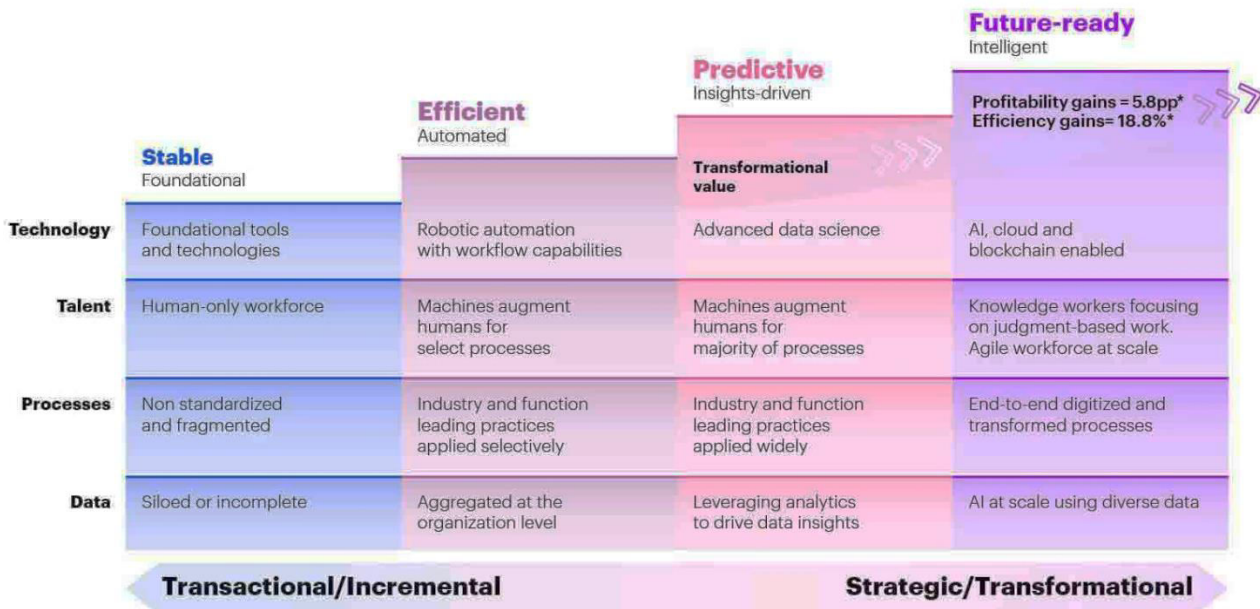
Now there is focus area that Digital Transformation Strategy to be in place to deliver best results in terms of Productivity and best in class process SLA's, KPI and BOI scores in the industry so that end customers feel satisfied. Independent of the industry or firm, digital transformation strategies have certain elements in common. These elements can be ascribed to **four dimensions**: use of technologies, changes in value creation, structural changes, and financial aspects. We will outline these four cornerstones of a digital transformation strategy are explained in some detail. The use of technologies addresses a company's attitudes towards new technologies as well as its ability to exploit these technologies. It therefore contains the strategic role of IT for a company and its future technological ambition. A firm needs to decide whether it wants to become a market leader in terms of technology usage with the ability to create own technological standards, or whether it will resort to already established standards and sees technologies as means to fulfil business operations. While being a technological market leader can lead to competitive advantages and can create the opportunity of other firms becoming dependent on one's technological standards, it might be riskier and requires certain technological competences. From a business perspective, the use of new technologies often implies changes in value creation. These new digital activities deviate from the classical – often still analogy – core business. While further deviations offer opportunities to expand and enrich the current products and services portfolio, they are often accompanied by a stronger need for different technological and product-related competencies and higher risks owing to less experience in the new field. The digitization of products or services can require or enable different forms of monetization, or even addressed. With different technologies in use and different forms of value creation, structural changes are often needed to provide an adequate basis for the new operations. Structural changes include variations in a firm's organizational setup, especially concerning the placement of the new digital activities within the corporate structures, but also whether it is mainly products, processes, or skills that are affected most by these changes. If the extent of the changes is fairly small, it might be more reasonable to integrate the new operations into existing corporate structures, while for more substantial changes, it might be better to create a separate subsidiary within the firm. However, the former three dimensions can only be transformed after considering financial aspects. These constitute both a firm's urgency to act owing to a diminishing core business and its ability to finance a digital transformation endeavour; financial aspects are both a driver of and a bounding force of the transformation.

Accenture is the only organization which has structured approach for deploying Digital Transformation Strategy through transforming People, Process and Technology using Lean Six Sigma techniques (i.e. Value stream Mapping, 5S, Visual Controls, Control Charts, Pareto and Correlation/Regression etc...) the scope areas for Standardization are identified and measured with the help of BOI's, Key Metrics and SAL + Metrics performance for different Process (i.e. Collection, Order Management, Billing Support, Procurement, Accounts Payable, Treasury, RTR and FP&A etc..)

At Accenture Top Management wanted to understand the connection between business operations maturity and performance. So in 2020, it surveyed more than 1,100 C-suite and VP-level executives across 11 countries and 13 industries. using survey responses and external data, they identified four levels of operations maturity: stable, efficient, predictive and future-ready. Each of the four levels is underpinned by technologies that drive efficiency, insights and increasing capabilities, moving up just one level — from predictive to future-ready — yields a profitability increase of 5.8 percentage points and efficiency gains of 18.8%.

This analysis also included an assessment of what we call transformational value. It characterizes the future-ready state. It explains how future-ready organizations are primed to capture performance gains and deliver excellent customer and employee experiences, our experience working with more than 400 leading organizations across 20 countries and 18 industries attests to productivity and efficiency gains up to 30%.

Where transformational value intersects with intelligent operations (refer to the figure below)



*Accenture Research and Oxford Economics Intelligent Operations Survey, 2020
 Accenture experience shows that additional productivity and efficiency gains up to 50% can be seen in organizations displaying future-ready characteristics

Figure 1.1: Adjustments to firms’ business scope, since other markets or new customer segments are now cern the impact of digital transformation strategies on firms’ value chains, i.e. how far the

Intelligent Operations is the extreme goal of any organisations where all business processes are AI enabled deploying all new technologies through Digital Transformation. Intelligent Operations means applying a strategic approach to advance the operating model. It’s about transforming the business through technology, processes, and people. It drives innovation, creates better experiences for customers and enables employees to make faster and smarter business decisions. It’s about becoming an operation that is agile, resilient, and able to respond to change at speed. All organizations must implement the Intelligent Operations Strategic Model to make their operations elegant to deliver the desired output at reduced operational cost.

Below is the Intelligent Operations Strategy Model which depicts the Transformation related activities to be completed in the Journey of reaching form one stage to another stage. Activities at all 4 stages required Lean and Six Sigma methods and techniques to be used in order to identify and measure the Process Cost. This approach from top to bottom level in the organization must be followed by all BPO/KPO’s operating in INDIA for delivering Finance, Banking, Customer Care, and Insurance Business to all their clients to deliver the contractual commitments made before process Transition. Before deploying any tool and technology in order to improve process Lead time and critical BOI’s it is utmost important to have precise measurement of key process gap areas in order to standardize the process from upstream and downstream.

Below are the standard set of activities to be performed at each stage in Intelligent Operations Journey with SMART (Specific, Measurable, Attainable and Time bound) as applicable to different industry practices which no organisation is currently focusing in KPO/BPO to achieve the milestone as depicted in figure 1.1 above. If the below Intelligent operations Journey is followed and monitored rigorously in KPO/BPO’s, it would be easy to get the existing contracts renewed with their clients and to onboard new clients which is very limited now a days after COVID 19 break out

Intelligent Operations Journey

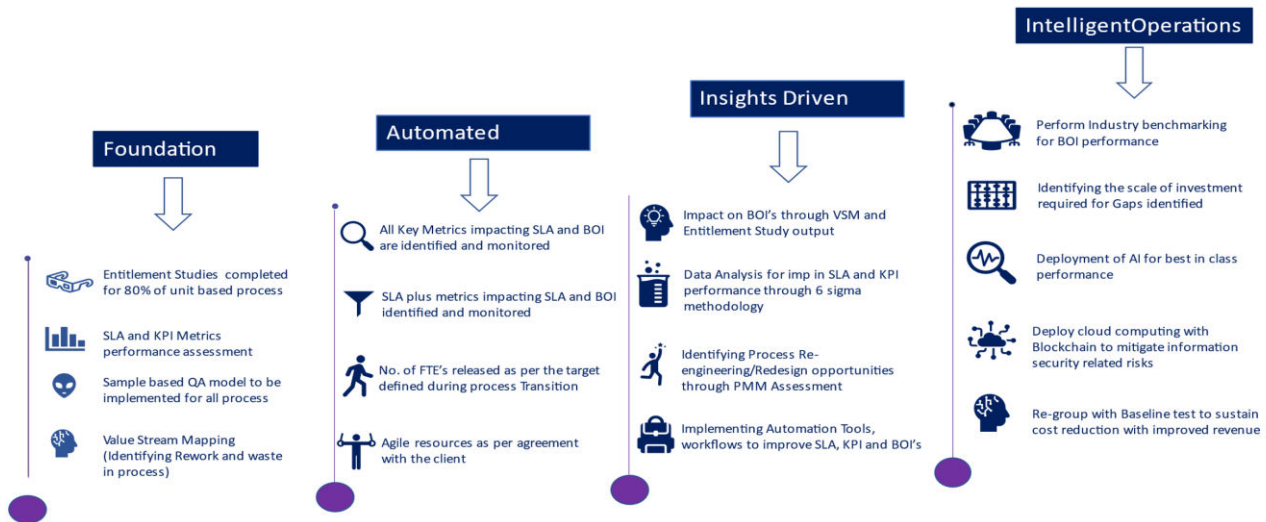


Figure 1.2

Terminologies Used

- *Entitlement Studies- A process study consisting of all the steps from beginning to end identifying steps which “Rule Based” or “Manual Judgment Based” with time spent by resources in those steps
- *SLA and KPI Metrics – Periodic process performance indicators scores to be achieved by outsourcing partner as per Service Level Agreements signed between outsourcing vendors and clients
- *Key Metrics- Internal drivers that could be measured and directly or indirectly impact the SLA and KPI Metrics
- *SLA plus Metrics- Metrics that are managed and controlled by clients with an indirect impact of outsourcing vendors performance
- *BOI metrics- Business outcome indicators reflecting the overall performance of the client operations
- *FTE’s – Full time employees working for outsourcing vendors
- *Agile Resources- Resources who can quickly move to other operations within same client or different having required knowledge to perform operations
- *VSM- Value Stream Mapping
- *PMM Assessment- Process Maturity Model Assessment on 3 Areas (i.e. Policy, Practise and Platform)
- *Industry Benchmarking- Comparison of all metrics performance of target client with other clients in similar industry
- *AI – Artificial Intelligence

CONCLUSION

Digital Transformation is used as strategy to cut down on process cost by reducing process lead time but before deploying any tool into the process it is necessary to study the process in detail through LSS techniques enabling management to identify the areas where the scope of upstream or downstream process standardization exists. Sometimes the critical data could not be measured due to manual dependencies and non-standard process’s, therefore in order to improve the Measurement System, Lean Six Sigma Methodology is the fundamental approach for any organization to improve their measurement system so that final stage of Intelligent Operations where vibrant process parameters are measured and upstream processes are improved to gain competitive advantage in the market with apparent radical changes across industries after COVID-19 break out

REFERENCES

- 1- <https://www.investopedia.com/terms/l/lean-six-sigma>
- 2- https://www.researchgate.net/publication/344428522_Digital_Currency_and_its_Implications_for_India

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-
- 3- Ana-Marija Stjepić, Lucija Ivančić, Dalia Suša Vugec, Journal of Entrepreneurship, Management and Innovation, vol-16-issue-1-2020
 - 4- Mastering digital transformation through business process management: Investigating alignments, goals, orchestration, and roles (jemi.edu.pl)
 - 5- <https://www.statista.com/statistics/328144/end-user-it-spending-india-forecast-by-segment/>
 - 6- How Lean Six Sigma Prevents Digital Transformation and ERP Implementation Failure - Third Stage Consulting (thirdstage-consulting.com)
 - 7- <https://www.processexcellencenetwork.com/lean-six-sigma-business-performance/articles/calculating-the-real-value-of-process-improvement>
 - 8- https://www.researchgate.net/publication/281965523_Digital_Transformation_Strategies
 - 9- <https://www.accenture.com/in-en/insights/operations/future-ready-operations>

MODERN EDUCATIONAL TECHNOLOGY – IMPACT AND RELEVANCE ON STUDENT LEARNING

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*Technology is perhaps the utmost gift of God after natural life. Today, the tremendous use and development of technology in edification sector, via applications such as distance learning teaching, 24*7 Internet access, recreations, and educational games, can be understood and has substantially altered the way we live. The emphasis and importance of informative technology research has squeezed different facets of life and redefined existence. In this broadside, we examine the historical and current study in inclinations, with importance on the character and influence of study suggestion for notifying instructional does and strategies to progressed education in institutes. Impact of technology in education; -*

❖ *Providing useful knowledge (teaching and learning)*

❖ *Technology as a tool to support teaching*

❖ *Technology has made students' lives easy*

❖ *Easy to store information*

❖ *Digital classrooms*

❖ *Sharing and learning*

❖ *Technology has removed space and time limitations*

❖ *Online degrees with the use of technology*

Attention is devoted to recitation varied experimental projects as options for achieving suitable rigor and relevance of study evidence, and using mixed-methods research for examining and considerate knowledge e submissions in multifaceted actual life surroundings.

Keywords: Teaching, contemporary technology, education, Impact of technology on learning, Online Learning.

INTRODUCTION

Modern education technology is web-based learning and classes for Students life. Education is the mother of cultures, of arts and of sciences. More knowledge have changed the method of students live. It has impacted diverse facets of life and redefined existence. Undoubtedly, technology plays a significant role in every range of life. Numerous manual tasks can be mechanized, thanks to technology. Also, countless complex and critical procedures can be carried out through ease and greater competence with the help of contemporary technology. Thanks to the application of technology, living has transformed, and it has reformed for better. Technology has renovated the field of education. The standing of technology in schools cannot be ignored. In fact, with the beginning of computers in education, this has become calmer for teachers to impart information and for students to obtain it. The use of technology has enabled the process of teaching and culture all the more enjoyable.

21st century has proved to be the era of Educational Technology. Earlier, Instructors viewed technology as a interruption and a time waster. In fact, they did not practice allowing the students to use and learn the social media during classroom talks. Physical teaching has been measured as the most effective way of conveying learning to the participants. But afterwards, a year of distant learning during the COVID-19 pandemic, viewpoints are varying. Rather than simply 'tolerate' it, teachers are realizing that technology and the regulator of digital devices, apps and tackles can increase engagement, inspire collaboration, spark innovation and improve student learning.

Educational technology doesn't consequence in effective teaching and education. It still requires a leader (the educator) and a drive (related to the curriculum). And there is effort and strategy required to contribute it effectively into your path substantial. But, if used with determination, technology can be transformed from a commotion to a real teaching tool with optimistic effects on student accomplishment.

There has been various hard work done by educators and rule makers to harness the control of educational skill for both assessment of knowledge and assessment for learning in schoolrooms. However, technology has altered the mindset of almost every beginner. methods

Various Instruction Approaches

Teaching method are ways to instruct students in a classroom and helping management strategies used for school room. The classroom based on subject and school demographic statement.

Teaching report can be prepared into four categories grounded on two major limitations: (1) Teacher-centered approach (2) Student-centered approach, (3) High-tech substantial use (4) Low-tech substantial use.

Teacher-Centered Method for Learning

Focus on instructor. Focus is on language forms and structures. Instructor monitors and corrects every Students attracted. Instructor chooses the interested topics for discuss. Instructor evaluates Students learning. Instructor answers Students questions about language. Instructor talks: Students listen.

Learner-Centered Approach to Learning

Instructor model's students interact with instructor and one another.

The teacher's mainpart is to instructand to ration student learning overequarely formal and informal methods of assessment, like group tasks, student portfolios, and sessioncontribution.

In the Students classroom, training and valuation are associatedwith learning is infinitely sustain to educator training.

High Tech Method for knowledge

Technology is an instrument in a collection of processes that govern the creation, dissemination, and utilisation of knowledge to fulfil the objective of students. It helps to enabling tool in facilitating the increasing of knowledge. A Technology help in knowledge life cycle for building, storing, pooling, and extending of the knowledges.

Low Tech Method for knowledge

If students or their families have access to a cell phone or email, consider sending a daily or weekly message to check in and provide updates and assignments. If families are using cellular data to receive messages and emails, do not send videos or other resources that take up a lot of bandwidth.

Contemporary Technology in Teaching

According to the newestideas as to how exactly modern students of today desire to use technology and how does their education get an impact if they use knowledge, it was revealed that the use of contemporary equipment technology and apparatuses, the teaching and interactivity of students flows. They also find it much more collaborating, as well as full of inspirational areas, when aided by technology. The broadcast of knowledge progresses very easy and appropriate, as well as actual. What this means is, that our minds now tend to work faster when aided with the use of current technology, be it any part of life, here we talk about teaching. The reliance and need of such an innovation, that simply makes lifetime an easy, smooth expedition is completely inevitable these days even in universities, campuses, and colleges. Scholars today can make tradition of skill in the following ways:

Net Connectivity

The network connectivity not all members of the student and teachers have same demographic. Today, the internet is somewhat that is present in nearly everything we use. From TVbox to gaming consoles, and our phones, the internet is factually everywhere. The use of the internet lets students to find amazing classes, webinars, seminars and other software for career and creative.

Usage of Audio Visuals and Projectors

Audio Visuals have always been a vigorousdemandin comparison to confrontations. Using visual aids like projectors and graphics to help in education. It is used to make learning more concrete and effective, more realistic and dynamic order to keep the learning communicating and interesting. Technical use such as projectors within the universities and institutes can take the un understanding and interestright up and alsoimproveknowledge. Students like to see striking visuals and something that decoys them to think rather than just interpretation words. The education part also becomes quitewell-organized when it comes to expertise.

Digital Footprint in the Education Sector

Everyone who uses the internet has a digital footprint. A digital footprint is the trail of data you create when you go online. Included in it are emails you send, websites you visit, and other information you may submit online. A

digital footprint represents a student's digital identity. The information could show up when someone (schools, prospective employers) searches their name online. Students need to understand that their online identities can influence their real-world life. Schools, employers, and law enforcement could potentially use a student's digital footprint when judging their character.

Technological use of Online degrees

Nowadays, everybody is trying to enrol for online wish to take up online expansions for their knowledge and certifications. Various top institutions offer wonderful online strategies with the use of abundant applications and the net. This online notion will see its rise in future as it gets more provision and consciousness. This online degree conditionally over the world is more prominent among students who are doing rigorous effort and are ahead for flexible studying plans.

Contemporary Technology in Education and its importance

Technology help in knowledge practice and improvement is directly related to student needs and requirements and life conducts. Given that they use different social media and the websites and play video games on a daily basis, children assume information to be accessible in a similar way at school. Lesson plan should be pictorial and entertaining, which is one of the main shortcomings of the traditional method to education. Of course, school tasks are not the same as playing video competitions, but it is useful to see what things can draw and grasp students' attention and help them master the teaching content.

It is clear that educators need to understand the needs of their scholars, how they communicate with each other, and things that can be used to draw their dedication and make them absorbed in the teaching material. This way, learners will want to apply their information for educational purposes, instead of incurring intergenerational conflict. Fascinatingly enough, teachers also profit from the new technologies and instruction methods, because many segments of their occupation have been simplified.

Easier Teacher-Student Communication and Cooperation

The most efficient teaching technique is traditional lecturing, where students follow the teacher's lecture. A ration has changed in the previous couple of years, and teachers were given the chance to make use of the rewards of modern possessions. Therefore, as far as teachers are concerned, the standing of technology in education is understandable:

- Easier communication with students
- Records of students and their progress are digitized
- Testing can be done using different apps for students
- Teachers are better informed which positively affects the quality of teaching
- Possibility of creating engaging, multimedia-assisted lectures
- More effective, and time-efficient effort in the classroom
- More time and chances for professional development

All these things improve teacher-student collaboration and aim to deliver students with the best possible education.

Technology has Permanently Changed our Approach to Education

The importance of knowledge in education is noticeable at each level of education, however, junior grades of basic school and high school are where modernization is most intensely felt, because in this period, children make for important challenges that expect them at the next phase of education, which is why it is vital that they approach knowledge in the right way. Numerous things are now available, which allows children to emphasize on their personal development.

Creates a more Engaging Learning Environment

Technology can encourage students to participate in the classroom actively. While some students might find the experience of talking in front of their classmates intimidating, the online classes might have the opposite effect on them. They might feel more comfortable expressing themselves in writing by joining discussions on discussion boards that online courses offer. Not to mention the lessons that become more interactive and interesting for students to follow. It may also help with communication between students. While some find it awkward to ask colleagues for help on subjects, communicating online might be easier for them.

Online Education

Modern communication models have greatly facilitated learning from home, i.e. online learning. This teaching method became extremely important during the 2020 global pandemic when schools were forced to shut down and fully switch to distance learning. Even before that, online courses were very popular, because they provided education to people who wanted professional development but didn't have enough time or money to get it. Distance education enables individuals to attend lectures even if the lecturer is on another continent.

Not only does online education enable people to attend schools that may be physically located in another part of the planet, but it also allows them to work and study. Namely, many educational institutions have recognized the role of technology in education and enabled students to attend classes, take tests and work on projects when it suits them. This way, quality education has become available to a larger number of people.

Improved Development of Student Critical Thinking

The importance of technology in education is particularly evident when it comes to the development of critical thinking. Different educational approaches allow students to express themselves in original ways, thus arriving at different solutions. In that process, they approach information critically, thinking about each available piece of information to reach the desired result.

The place that used to belong to textbooks and notebooks is now occupied by tablets, videos, animations, Internet, audio recordings, collages, etc. This way, students can communicate in a way that is most familiar and relatable to them, so even shy students or those who struggle with teamwork now can shine and achieve better results.

Modern Classroom

Perhaps the most obvious change occurred in the classroom of modern schools. The only 'gadgets' that were available in the traditional classroom were the blackboard, chalk and the classroom globe, whereas nowadays, they have access to state-of-the-art technological advances, even artificial intelligence. Thanks to virtual reality, students can visit any part of the planet in geography classes or watch a 3D movie about the ancient world in history classes.

Education has come a long way from using a projector in class. All the things mentioned above are used in higher education, where bigger university budgets allow a wider and more comprehensive application of the latest technologies for educational and research purposes.

The Potential of Technology in Education

As you can see, the importance of technology in education is tremendous, and its impact is growing. However, it is crucial to implement technology in education in the right way, because many traditional teaching methods should continue to exist. In addition, the computer is not applicable in every situation, nor is learning with it necessarily more efficient. Therefore, it is up to teachers to strike a balance between future-ready education and the good old offline teaching.

From teachers in early years settings supporting children's cognitive, social and emotional development to universities preparing adults for active participation in further education, research and work, our teachers and lecturers are second to none. At the same time, we have a flourishing EdTech business sector, punching above our weight internationally and with a steadily growing export market.

Technology is often associated with increased automation and reduced human interaction, although within the education sector it will never replace the role of our great teachers.

However, I believe technology can be an effective tool to help reduce workload, increase efficiencies, engage students and communities, and provide tools to support excellent teaching and raise student attainment.

Advantages and Disadvantages of Technology in Education

Technology has invaded the classroom. A generation ago, students were lucky enough to have a computer lab in their school. Today's students use computers for many tasks, including reports, presentations, and testing.

The internet has allowed for a learning of technological tools to come into the classroom as well. Instead of watching an educational television program, students can now play interactive games and compete with one another to further the learning process.

Using technology has some definite advantages. There are also potential risks that must be considered when introducing technology into the classroom environment. The advantages of technology in education apply to the K-12, undergraduate, graduate, and doctorate programs that are available today.

Reduces Educational Costs in Education

The technology in education, resources have become more accessible, which resulted in declining tuition fees, the need for books and their price, as well as the reduced need for school supplies.

Advantages of Technology in Education

Looking back over the last hundred years, introducing technology into the classroom has been a blessing only for younger students and teachers. In other words, with a sudden introduction of a wide range of devices and the Internet, students got the opportunity to make the learning process much easier and more interesting. Key benefits of technology in education include:

Recognize their interests and talents, and maybe even their future profession.

Personalised Learning

Technology has a good impact on the environment of the classroom. It serves as a function of helper to the teacher, enhancing a teacher's capability to teach without losing his energy on the daily protocols. As every class has a different learning temper. On other hand, you can personalize the whole learning process according to the choices and needs of the class.

Access to Behavioural Data Charts of Students

Technology in education gave teachers access to their student's behavioural charts. By the regular marks up of exams and attendance, it was made relatively easier to evaluate the weak aspects of students learning. This way, a teacher can pay more attention to turn their weak points into a stronger intellect.

Improve the Learning Objective

Technology in education has allowed students to gain control over their learning, but it also provided flexibility to teachers in transferring knowledge to students. It is a combination of synchronous real-time learning, and asynchronous learning where students can listen to a lecture when they choose. Easy and fun notes making

Easy and Fun Note Making

There are many fun notes making apps that'll make this deadly boring task more fun than ever. We all know memes and GIFs are fun when they relate to scientific facts and formulas. I have an app for you (OneNote). One note is one of those fun apps through which you can digitally make notes, add video clips to notes, colours, stickers, and much more. And mind you, that's just the edge of it that I described.

Access to Current Information

Technology in education gives you access to the most recent research and experiments that you need to learn to keep yourself updated. It has also lowered the burden on the paper companies, which used to provide papers by deforestation. So, to sum it up it has kind of an indirect effect on our environment also.

Disadvantages of Technology In Education**Presence of Technology can be distracting to students.**

When kids play video games, they can find themselves reacting with addiction-like behaviours. Their focus is on the entertainment they receive more than anything else. If the educational environment uses reward-based games to encourage learning, then the child might be more concerned with what they receive through the software or app instead of what they are learning.

Technology can make it easier to cheat.

Now a student can send themselves a text with that information. They can send that data to anyone else with a phone. Email can relay this info too. There must also be strict rules in place about the use of technology during quizzes or tests when an exact measurement of student knowledge is needed to evaluate their overall progress.

Cause Some Students to Disconnect from the Classroom.

Interacting online with others is a different experience than when you collaborate over the Internet with someone. Being behind a screen provides you with a layer of anonymity that you don't receive with a face-to-face conversation. Learning how to work with one another using technology is an essential skill, but it cannot be the other option that teachers introduce to their classroom. We must encourage social interactions that accurately communicate thoughts, feelings, or emotions so that when a child is offline, they can still make a better life for themselves.

Students may not know the difference between reliable and unreliable resources.

There is a lot of information on the Internet today that is fake or exaggerated in some way, but it masquerades as being real. Not only is the content sometimes fake, but then also the users might not be real too. Teachers must show students how to access real information, show them how to verify its validity, and then encourage them to use it appropriately.

Technology is a resource that not all families can afford.

Whether technology is in the classroom or at home, there is the issue of affordability to worry about in today's world. Some households cannot afford to purchase computers for their students to manage their schoolwork. There are school districts that do not have enough money to pay their salaries each year, much less add new tech components for learning.

When we emphasize having technology in the classroom, then we place those at the lowest end of the wage scale at a significant disadvantage. Students with greater access can learn more and have access to lessons more often, which means they have additional information exposure that can increase their opportunities to succeed.

Privacy concerns to consider with technology in the classroom.

Over 15 million people each year experience identity theft in some way. It is a criminal empire that costs the economy over \$16 billion per year. Since 2011, over \$100 billion in losses have happened because of this issue. One of the reasons why it is becoming more prevalent is because more people have greater access to technology today.

When we introduce technology to the classroom, we are placing the identity of our children at risk every day. Even when apps, computers, mobile devices, and operating systems have advanced privacy filters that reduce the threat of identity loss, there is no way to guarantee that all risks are gone unless the equipment never goes online. If we take this step, then we end up losing many of the advantages of having technology in the classroom in the first place.

Create medical problems for some students

Eye strain occurs when you look at a computer screen for too long. Symptoms of this issue include back pain, eye pain, neck pain, feelings of tiredness, blurred vision, and problems with focus. Continuous heavy computer usage may lead to issues with early myopia, with a prevalence rate of more than 60% for those older than the age of 12. For some people, the impact of this health issue is cumulative, which means the time they spend in front of a phone, tablet, and television can contribute to eye health issues as well.

Technology can create dependencies for information

Most people would say that they would look online for the data they want or ask a virtual assistant, like Alexa, to give them the answer. Having access to a treasure-trove of resources is wonderful, but it can also create a dependency because of its presence. If we do not teach students how to recall info by themselves without the use of a smart device or computer, then the next generation of students may be unable to function unless there is technology for them to access.

Final thoughts on the pros and cons of technology in education

Different people have different opinions on the introduction of these changes in the education system, especially if it's done so suddenly and in such a short time. However, one should be realistic, because the advantages still far outweigh the disadvantages.

So, a continuous insistence on disadvantages should not be seen as a desire to return to traditional education, but as a reason for caution and the possibility to better see the holes in the technologies and methods used in education. It is up to educational institutions and teachers to analyse the disadvantages in the next revision and improve the quality of teaching both in their digital and physical classrooms.

Example of Online Education**(1) NCPCR issues summons to BYJUs for selling of its course to students**

The National commission for protection of Child Rights (NCPCR) has summoned to BYJUs for hard selling and mis-selling of its course for students.

(2) India top court rules online education access cannot be denied to underprivileged children

Article 21A of the Constitution, which codifies the right to education as a fundamental right for children between 6 to 14 years, citing a lack of funds. Furthermore, governments at all levels of the federal structure must cooperate to guarantee that suitable facilities are formed available to children from all socio-economic backgrounds, ensuring that those who lack resources are not denied access to education. The failure to provide access to online education would defeat the entire purpose of the Right of Children to Free and Compulsory Education Act, 2009, which has been enacted to uphold Article 21A.

(3) Regulation 22 of the UGC (Open and Distance learning Programmes and Online Programmes) Regulations.

"The degrees at the undergraduate and the postgraduate level in conformity with the UGC notification on the Specification of Degrees, 2014 and, the post graduate diplomas awarded through Open and Distance learning or Online mode by Higher Educational Institutions, shall be treated as equivalent to the corresponding degrees and post graduate diploma offered through conventional mode,"

Beringer, V. (2009, October 20) For kids, pen's mightier

REFERENCES

- Beringer, V. (2009, October 20) for kids, pen's mightier than keyboard. futurity.org. Retrieved February 25th 2013 from <http://www.futurity.org/society-culture/for-kids-pens-mightier-than-keyboard/#more-4909>.
- Bounds, G. (2010, October 5) How handwriting trains the brain – forming letters is key to learning, memory, idea. wsj.com. <http://online.wsj.com/article/SB10001424052748704631504575531932754922518.html>
- Bransford, J., Brown, A., & Cocking, R. (2000). How people learn: Brain, mind, experience, and school. Washington, DC: National Academic Press.
- Brill, J. M., & Galloway, C. (2007). Perils and promises: University instructors' integration of technology in classroom-based practices. *British Journal of Educational Technology*. 38(1), 95-105.
- Advantages and disadvantages of technology in education | Allison Academy Impact of modern technology in education (researchgate.net) http://www.huffingtonpost.com/2011/07/16/why-does-writing-make-us-_n_900638.html
- <http://online.wsj.com/article/SB10001424127887323644904578272151551627948.html?KEYWORDS=handwriting>

INNOVATIONS & INDIAN RAILWAYS: CASE STUDY OF T-18 (VANDE BHARAT EXPRESS)**¹Dr. Shailendra Kumar Dube and ²Professor Kumar Biswas,**¹Professor, Operations Management, ITS School of Management, Ghaziabad²Professor of Management, I.T.S School of Management, Ghaziabad, Uttar Pradesh, India & Former Joint Director (Operations), Petroleum Planning and Analysis Cell, Ministry of Petroleum and Natural Gas, Government of India**ABSTRACT**

The Research paper deals with the innovation practices undertaken by Indian Railways. The behemoth Indian Railways stood for low speed, average comfort provider to its customers and perennially loss-making PSU for quite long time. But, emergence of new T-18 (or Train 18), which was rechristened as Vande Bharat Express, brought out by Integral Coach Factory (ICF) Chennai, became a saga of success and a game changer in the Indian Railways for passenger railway ecosystem. This research paper is case study based, exclusively deals with the innovative, agility and sustainability aspect of ICF Chennai and highlights innovative practices used by engineers & staff in designing and manufacturing of T-18.

Keywords: Innovation, Indian Railways (IR), T-18, Vande Bharat Express, Integral Coach Factory ICF Chennai, innovative practices.

1.0 INTRODUCTION

“If You Are Not Profitable, You Cannot Afford the Future and If You are not Innovative, You Have No Future”
Late Prof. C.K. Prahlad

MANAGEMENT GURU

Flagging off newly designed Vande Bharat Express by PM Narendra Modi, made a headline next day. That ushered the Indian Railways into new pedestal of world class, indigenously designed trains. Since the launch of first Vande Bharat in 2019, total 15 sets of Vande Bharat has been launched by April 12, 2023.

But, the journey of innovative product hinged around the prevailing innovation culture and policies pursued by the Indian Railways. This led to churning out new trains like Rajdhani, Gatiman, Tejas and now Vande Bharat express. Each evolutionary new Rail product displayed more speed and comfort level to its users. Despite all this, Indian Railways (IR) still lagged behind the International Level Standards in key areas of Design & manufacturing, Transfer of Technology (ToT), Production of components under foreign patents and license, thus less focus on indigenous manufacturing.

1.1 EVOLUTION OF INDIAN RAILWAYS

The journey of first Indian Railways started 16th April 1853, when the train covered a stretch of 21 miles between Bombay (now Mumbai) to Thane. By 1880, the Indian Railway had a route mileage of 9000 miles. Infact, Indian Railways, the premier transport organization of the country is the largest rail network in Asia and the world's second largest in the one management. Indian Railways is a multi-gauge, multi-traction system covering total 108,706 kms of rail tracks out of which Broad Gauge (1676 mm) covers 86,526 kms and Meter Gauge (1000mm) covers 18,529 kms. Rest railway tracks comprises Narrow gauge (762/ 610 mm). Total Broad Gauge electrified route covers 16,001 kms. Some of the other interesting facts which make Indian Railways proud are: it runs 11,000 trains every day out of which 7000 are passenger trains. No. Of Locomotives-7556; Yards-300; Goods Shed-2300; Repair Shops-700; No. Of wagons-222, 147; No of stations-6853; coaching vehicles-37840; and 1.54 million work force.

Under the National Railway Vikas Yojna, strengthening of the golden Quadrilateral was undertaken to run more long distance mail/Express and freight trains at a higher speed of 100 kmph. New steps were taken to provide safety and security to 13 million passengers everyday. It also launched “**National Train Enquiry System**” to upgrade passenger information and enquiry. Also, introduction of “**Freight Operations Information System**” for better Rake management system was done. **RTES** of Indian railways, entered into export/leasing of locomotives in different countries in Asia and Africa. Similarly, **IRCON**, another company of Indian Railways, is executing projects in Malaysia, Bangladesh and Indonesia. Indian Railways also encourage public-private partnership in infrastructure building. Today, Indian Railways is more geared towards “**ATMANIRBHAR BHARAT**” initiative of the Central Government.

1.0 LITERATURE SURVEY

A hosts of literature related to “Innovation” was explored in order to understand the inter linkages of a new product development and processes too. Do they impinge on commercial viability and subsequently economy was also explored.

According to R. Gopalkrishnan (2017), innovation has three stages: first, invention, which is the origin of the new artefact; second, innovation, it concerns with the conversion of that invention into a viable commercial proposition and the final stage is development, which involves the continuous evolution and improvement of the initial commercial product. He also stresses on ‘knowledge creation’ which is the base for innovation.

There is another view put forth by Rowan Gibson(2018), business strategy consultant and author of “Re thinking the future”. He believes that innovators came to their innovation by looking at the world from a fresh perspective. He has identified four lenses to depict four different stages. First lens is challenging orthodoxy and conventional wisdom. The second lens is to harness trends and discontinuities. The third lens is of innovation-leverage the resources embedded in the existing business model and the fourth lens is to understand the unarticulated customer needs.

Clayton Christensen(2013) argues that there are two kinds of innovations: sustaining innovations that improve the performance of established products, and disruptive innovations that result in worse performance in the short run, but which brings to the market a somewhat different value proposition. Many times, innovation is also led by leader. Where the leader carries the flag and all others follow and assist to make the dream come true.

The National Knowledge Commission (NKC) in its Report (2007), “Innovation In India”, defined innovation as a process by which varying degree of measurable value enhancement is planned and achieved, in any commercial activity. This process may be breakthrough or incremental, and it may occur systematically in a company or sporadically; it may be achieved by:

- Introducing new or improved goods or services and /or
- Implementing new or improved operational processes and or
- Implementing new or improved organizational / managerial processes in order to improve market share, competitiveness and quality, while reducing costs.

There is another dimension to innovation is ‘**global competitiveness**’. **World Bank study Report (2007)** on Innovation, highlighted that “Innovation can be a critical driver of **increased productivity and competitiveness**. Innovation is not an end in itself but a means to **productivity growth**”. Globalization provides opportunities as well as challenges for nations to use Innovation as a **strategic lever to generate knowledge flows**. It provides unprecedented potential for Innovation to be used as **tool for revenue generation**. At the same time, globalization creates challenges for firms to either innovate or perish. In the race to top slot, the only way ahead for companies for the companies is to innovate. Innovation is the ‘**necessary core competence**’ to remain competitive in the new landscape. Considering the global network of knowledge sharing and interdependence, requiring the combination of various disciplines. This can be said that in the present globalized landscape, comparative knowledge advantage and availability of cutting-edge innovation at lower costs are becoming critical factors in the race to achieve **economic competitiveness**.

According to Bowander, India is emerging as a **global hub of innovation at low cost as well as high value products and services**. The same is also reflected in case of Indian Railways.

3.0 OBJECTIVES OF THE STUDY

The Objectives of the study are:

- i. To explore the innovative practices used during the design & development of T-18
- ii. To ascertain operational efficiency & commercial viability of T-18
- iii. To highlight the global business prospects during ongoing Geopolitical developments.

3.1 RESEARCH METHODOLOGY

The present study is ‘Case- based’ and extensively depends on descriptive study. It heavily depends on secondary sources- magazines, Government reports, journals and newspapers.

4.0 INNOVATIONS AT INDIAN RAILWAYS

The latest Report on Indian Railways by **India Brand Equity Foundation**, an initiative of the Ministry of Commerce, states that-

- i. Indian railways is looking towards **new revenue generation prospects**, one of which involves change the composition of coaches, so that it can push “**more profitable AC coach**”. Railways introduced economy class of AC coach to attract more passengers towards AC class.
- ii. IR also planning to upgrade Delhi- Mumbai & Delhi-Kolkata high traffic routes to 160 kmph;
- iii. The Indian Railways planning to have a Rajdhani style of Vande Bharat. The third version will be Rajdhani style premium AC sleeper coaches.

4.1 INNOVATION POLICY & INDIAN RAILWAYS

A broad framework of policy guidelines laid toward engaging innovators, entrepreneurs and Indian Railways, for the development of technology, products and need based solutions for Indian Railways.

With the objective of harnessing technological, economical and operational benefits, offered by next-gen innovative and emerging technologies, and also to promote ‘Start Up’ culture in the country, Indian Railways intends to engage with the entrepreneurs, technology developers, and innovators through Start Ups, to get low cost user friendly reliable products and solutions for use on Indian Railways network.

4.2 INNOVATION PROMOTION GROUP (IPG)

Keeping the above objective, The Innovation Promotion Group (IPG) was constituted to interact with national and International Railway Organizations, industries, universities, institutes of repute, Railway men, Railway customers, and citizens to promote innovations.

The Board (CRB) had launched a “**Suggestion Scheme**” for Best Innovation in Indian Railways in the year 2002, primarily with the objective to identify and award the large number of creative employees who are working tirelessly, to improve the Indian Railways. Here, provisions of cash awards to best three innovations are made. That shows how Indian Railways had nurtured the culture of innovations at all level. The innovative design of T-18 at ICF was the outcome of one such initiative in the country.

5.0 CASE STUDY OF TRAIN-18 (VANDE BHARAT EXPRESS)

The twin **objectives** of launching T-18 (VANDE BHARAT EXPRESS TRAINS) was to:

- i. **Achieve Improved Railway Finances and**
- ii. **Operational Efficiency**

GOI in its Budget 2022 laid out a grand plan for the lay out of introducing **400 semi –high speed, next generation, Vande Bharat Trains, in next three years**. As per Railway Minister, these are new generation trains which to offer, better energy efficiency and better passenger riding experience. It is also expected that the 400 Vande Bharat Trains, will offer better passenger revenue collection to Indian Railways besides a big boost to “Make in India” initiative.

In 2018, a 16 –coach train set, designed for operation speed of 160 kmph and test speed of 180 kmph, was conceived, designed and developed in by the Integral Coach factory(ICF) Chennai. The project was completed in a record time of 18 months as against the industry standards for about 3-4 years. The train cost , from the drawing board to its final physical form running on track, INR 97 Crores, which was nearly one third the estimated price of importing such a train.

This train, designated as Train 18 and subsequently launched as Vande Bharat Express. What was more important that Intellectual Property Rights (IPRs) of the train completely rested with ICF Chennai and that Train had more than 80% Indian Origin Components. It was India’s fully home-grown modern rolling stock. It implies that Indian Railways had developed the capabilities to such an extent that the entire process of concept-design-engineering-manufacturing-validation-testing , for a “Train-Set”, was done in India. Further, no Technology of transfer(TOT) was executed from a global manufacturer. And, even if, value of such imported items, based on self developed drawings and specifications, was less than 20% of the cost of the T-18. The T-18, became a reality in October 2018, in exactly 18 months of hard toil of team members and staff of ICF Chennai.

5.1 INTEGRAL COACH FACTORY (ICF) CHENNAI

Mr. Sudhanshu Mani, who was posted at ICF as General Manager, in 2016, was instrumental in ushering new dream for Indian Railways. Through his own initiatives Mr. Mani, brought sea changes at ICF Chennai. Some of the salient points are as follows:

- Upgraded shop floor facilities and providing pleasant work environment
- ICF Chennai was the only industrial unit of Indian Railways, to implement Enterprise Resource Planning (ERP), leading to improved efficiencies.

- Implementation of powerful Apps and online applications for vendors, customers and staff.
- investment at ICF Design Centre brought ergonomically-designed work places with top-of-the –line work stations and procurement of design & drafting software licenses helped in developing new sub-assemblies/systems and variants of coaches.
- An exemplary fast track protocol was put in at ICF to express clearance to vendors involved in design process and supply of components/systems for Train-18.
- The policy of treating vendors as partners was followed.
- Under the Public Procurement Policy (PPP), high numbers of vendors were engaged, for development, manufacture, and supply of equipment and components.
- Interaction with vendors became more professional and business -like.
- Judicious selection of vendors played a key role in the success of the project.
- The vendors were already a part of the main design process and they had set up dedicated design teams specifically for the project.
- A fast track protocol was put in place for T-18 and it applied to all outsourced components/ systems for T-18.
- Implementation of “One Man One Idea”.
- Participation of staff in management is inherent in building teamwork and belongingness
- Creation of the “**Innovation Illam** or “**House of Innovations**”.
- The role played by Civil Engineering, Electrical Services, machinery Maintenance and Stores Depots, resulted in increase in number of berthing for coaches doubled, by building new sheds and installing fixtures and machines. The infrastructural capacity at ICF rose from 1800 to 4500 coaches per year.
- High investment to bring ergonomically-designed work places with top-of-the-line work stations and design and drafting software licenses.
- Organizational sustainability- certificate of excellence for transformational initiatives at ICF by Minister of Railways in Apr 2018

The PR department came out with a write up on June 2017 which read:

“ICF plans to turn out the prototype Train 18 on 30th June 2018 which would be a semi-high speed (180/160 kmph) train set with fast acceleration and world class passenger amenities. All coaches will be inter-connected by fully –sealed gangways affording smooth passage from one coach to another. It will have automatic plug doors which will open and close only when the train is stand still, wide windows for panoramic view and ergonomically –designed seating. Equipped with sleek energy-efficient under-slung 3 phase IGBT based propulsion system, the passenger area will be spacious with all coaches provided on-board wi-fi, infotainment & GPS-based passenger information system (PIS). The train will have plush interiors and diffused LED lighting. The toilet of these coaches will be fitted with zero-discharge vacuum-evacuation bio-toilets and touch –free fittings. To keep the jerks and vibrations at bay, the train will be equipped with improved mechanical couplers and modern bogies with fully –anti-roll bar. The train will have a modern electro-pneumatic microprocessor based brake system capable of providing safe braking with reduced braking distances. This train will have improved safety with newer concepts like semi-permanent couplers with anti- climbing feature. Train-18 promises to be a modern train set the likes of which have hitherto not been seen on Indian railways and it will be a fast and wholly new travel experience.”

It became the **guiding principle** for designing and developing a prototype T-18, for entire engineers, staff , vendors and consultants. (p103-104)

5.2 INNOVATIONS IN DESIGN & DEVELOPMENT

5.21. DREAM- A dream of the team leader, Mr. Sudhanshu Mani (GM) was to India have a world class train. It must be a fast, smart and modern train set, in design and manufacturing too.

5.22. IDEA- An idea by a 15 member team to build an indigenous semi high-speed modern train set was proposed, in November 2016, for a Rail Shivar.

5.23. PROJECT SANCTIONED- The Chairman, Railway Board (CRB), sanctioned the project, for two train sets , against sanctioned amount of INR 100 Crores.

5.24.. DESIGN- Instructions were issued for seamless participation of all cross-functional groups, including Production, with the consultants whenever required. Between July 2017 till third quarter of 2018, a series of Design Meetings were held with the consultants and the partner vendors. The Train 18 exemplifies the creativity of the ICF engineers. Because of the environment of the innovation at ICF, many ideas flowed from bottom to top and some were adopted or adapted.(P117)

5.3. TECHNICAL FEATURES OF T-18 FIXED

- Stainless Steel car body
- 16 coach chair car type configuration
- 160 kmph speed with 180 kmph test and validation speed in RDSO trials
- Maximum design axle load 17 tonnes (aiming for 16.5 tonnes)
- Starting acceleration -0.8 m/ s²
- Peak deceleration- 1 m/s²
- Train 18 to require 11000 hp with 16 coaches to offer operational advantages ie much higher energy efficiency and superior maintainability.

5.4. CONFIGURATION FOR A CLASSIC 4-COACH BASIC UNIT:

1. Driving Trailer Coach (DTC with battery, charger & compressor)
2. Motor Coach (MC with traction Convertor & Brake Chopper Resistors)
3. Trailer Coach (TC with Transformer, Auxiliary Converter, Pantograph, VCB)
4. Motor Coach (MC with Traction Convertor, Brake Chopper Resistors)

In above configuration, out of the 16 coaches, 8 coaches must be traction motors.

- The nose was designed through multiple Computational Flow Dynamics (CFD) reviews for air resistance at high speed.
- Plug doors offer great safety and security

5.5. PROTOTYPE DEVELOPMENT- During the design stage following articulation was done:

- i. Design a train set at 160kmph and validation testing at 180kmph.
- ii. Detailed table listing of main features and categorising them into three areas:
 - A. Areas where ICF quite comfortable to design & develop
 - B. Areas where ICF, with the judicious selection of manufacturing vendors, including import but strictly as per specifications and drawings developed by ICF and
 - C. Areas where ICF Design Team with handholding of superior professionals was required.

5.6. LIST OF COMPONENTS/ PARTS OF T-18, CONSIDERED FOR SELF TECHNICAL ASSESSMENT

ITEM	STATUS
Car Body shell design and manufacture, including painting	Category-A & C
Bogie with fully suspended traction motors(TMs)	Category-A
Coach bogie design to run at 180 kmph test speed or a bogie to accept fully suspended motors.	Category-A Design a bogie from scratch
Efficient 3-phase IGBT propulsion with regenerative braking	Category-C It is most expensive part of train
Train Control & Management System	Category-C
Modern Passenger Information System	Category-C
Smart Train Concepts	Category- A
Pleasing & ergonomically designed interiors	Category-B
Toilets to match the best in the world	Category-B

Special facilities for differently-abled passengers	Category-B
Brake system	Category- C
Interface with ground infrastructure / cab signalling etc.	Category- A
Minor structural assemblies	Category-A
Mechanical & Electrical Assemblies	Category-A
Validation & performance testing in ICF before RDSO took over for oscillation, brake and other tests.	Category-A
Aircraft type seats, including rotatable ones for Executive Class	Initially import & simultaneously start a process to indigenize through a competent firm
Electrically operated automatic plug doors with retractable steps	Approach As above
Contactless sliding doors at each end of the passenger area	Approach as above

The entire exercise was undertaken to keep two things in mind:

First, to identify capable and willing Indian companies for most of the items to manufacture as per drawings and specifications and

Second, to keep cost under control. So that, the prototype to built at much less than 50% of the ruling international price for an equivalent train set.

Third, also to identify the gap, between inherent capability and the requirement. After, thorough review, three such critical areas were identified-

- **Bogies**
- **Exteriors &**
- **Interiors**

It was evident that a **consultant** has to be engaged for such crucial areas.

5.7. TRAINING

The ICF design staff were given upfront education to imbibe the nuances of all design concepts and processes, the **know-why**. Later on, when design would be taken to manufacturing, a deeper understanding of **know-how**, through continuous two-way synergy with the consultants would also develop. The planning and design team, came up with Gantt Charts, to fix the date for prototype, to be rolled out by June 2018. It helped every one in the team, including members from Stores & Finance, to get sensitized about the T-18 project.

5.8. CONSULTANCY CONTRACT

The status of three major consultancy contracts, by mid 2017 were :

- New Bogie Design with fully suspended contracts
- Improvements in design, tooling and processes for shell, including supervision during manufacturing
- Interior styling concepts

5.9. VENDORS AS PARTNERS

Indian Railways tried to tap its existing Indian vendor base to keep its cost low

ITEM	REMARKS	TECHNOLOGY DEVELOPED	INDIAN COMPANY
GLASS	Initially imported high quality glasses.	Shatter –proof to boot	St. Gobain
SEATS	Based on European trends		
WHEELS	Due to Ukraine Crisis, IR had to airlift Wheels from Ukraine	Tender floated for private players for setting up of sate of art plant for manufacturing 80,000 wheels for semi-high-speed trains. India’s current	SAIL’s Durgapur plant at West Bengal and now, Integral Coach Factory, Chennai

		requirement is 2,00,000 units per annum.	
Coaches	Vande Bharat Coaches to offer innovative sanitised Environment	Indigenously developed solution, which is embedded in the air-conditioning unit that kills 99.9 percent germs. Such innovation called a “photo-catalytic ultra-violet air purification system”	Indian Company
Noise Free Air Conditioning(Ac) Equipment	Required development of three prototypes of AC ducting	Redesigned the complete equipment and delivered the same without affecting the timelines	Indian company with vast experience on IR and Metros

- 1. Ideation** **Nov-Dec 2016**
- 2. Multi-Disciplinary Team** **Mar 2017**
- 3. Project formal go-ahead** **April 2017**
- 4. Design Started** **April 2017**
- 5. Consultancies awarded, Procurement starts** **May 2017**
- 6. Carbody manufacture started** **February 2018**
- 7. First Car body start furnishing** **June 2018**
- 8. Commissioning Starts** **July 2018**
- 9. Flag off** **August 2018**

Time Line for T-18 progress from Go Ahead (April 2017) to proposed Flag Off (August 2018)

5.10. FEATURES: T-18 (VANDE BHARAT EXPRESS)

- Faster acceleration and deceleration, cuts travel time drastically,
- Also reducing the turn around time, since it uses self propelled locomotives
- Vande Bharat is definitely step up from Shatabdi
- Fully sealed gangways for dust free environment, modular bio-vacuum bio toilets,
- Rotating seats in executive class, automatic entry/exit doors, diffused LED lighting,
- Sensor based interconnecting doors in each coach
- Centralised Coach Monitoring System,
- Push back Reclining arrangement for seats,
- Emergency windows,
- Disaster lights
- Flood protection for underslug equipment
- More emergency push buttons

5.11. PROPOSED BENEFITS

- a. Competition with Aviation sector- It is expected to compete with flights in particularly mid distance segment routes such as Bengluru-Chennai, Pune-Mumbai, Delhi-Chandigarh, and Delhi-Jaipur.
- b. Turning Ukraine crisis into opportunity- First, Indian Railways to become as “Atmanirbhar” (Self Reliant) and second, exporting wheels to global market, especially European market.
- c. Competition with Aviation sector- It is expected to compete with flights in particularly mid distance segment routes such as Bengluru-Chennai, Pune-Mumbai, Delhi-Chandigarh, and Delhi-Jaipur.

5.12 FINDINGS

1. As per the first objective, **Innovative practices** have been identified at all stages, from idea conceiving, feasibility, to design and development, prototype development & testings and finally, commercial production. The entire project was completed in 18 months, which was far-far ahead of the international standards of designing and developing a prototype in 3 to 3.5 years. During the product design and development, vendors were treated as partners, in designing a new component or product and Intellectual Property Rights were with ICF Chennai. Similarly, no proposal of transfer of technology was considered at any stage. Rather, Indian vendors were identified to develop technology for the same. It saved huge money to T-18 prototype. Few components, which were initially imported, which was approx 20 percent of the total cost, later developed by Indian vendors.

2. Considering the **Operational Efficiency**, the Integral Coach Factory (ICF), without diluting its regular productions, it focused on T-18. The important point to be noted that, between 2015-2016, the production of coaches were 2005, which rose to 4166 for 2019-20 period. During the same period, No. Of staff per coach, came down from 5.9 (2015-16) to 2.5 (2019-20). It was due to no. of workers came down to 10,000 in 2018, from 12000 in 2016.

3. T-18 project also shown commercial viability. T-18 product was quite cost effective, since the allocated budget was INR 100 crores but it was completed in INR 97 Crores. Again, cost of T-18 prototype was, one third of the internationally accepted cost of the same racks.

4. Considering Geopolitical developments, ie ongoing Ukraine crisis, which disrupted supply chain of wheels, led to indigenously development of wheels with the intent of exporting to European market. It will earn FOREX for our country. Also, supply of new coaches to other countries will also pave the opportunities for exports.

6.0. CONCLUSION

It can be concluded that ICF Chennai is a classic example of a Indian Railways, which adopted best practices in all stages of T-18, and thus, churned out a world class semi high speed train with better amenities for its customers, on par with international standards. But, this was not without its share of challenges. Challenges-technical challenges were handled by the entire team. Managerial challenges included managing the contradictions at the railway Board, supply chain, close interaction with the industry, adhering to pressing timelines etc.

The production cost of T-18 was almost one third of the internationally manufactured same train while manufacturing duration two times of T-18 (36 months or more)

ICF Chennai also shown agility, in terms of designing and manufacturing an entirely new product(T-18) on its shop floor, while increasing its productivity, from 1433 coaches in 2009-10 to 4166 coaches per annum in 2019-20, , which also included coaches meant for exporting to Sri Lanka too. The number of workers were close to 12000 in early 2016, where as it came down to near 10,000 in December 2018. Number of staff per coach came down, from 9.0 (2009-10) to 2.5(2019-20) (P-49).

On the sustainability front, ICF Chennai, got an order to manufacture 200 sets of Vande Bharat Train. In no circumstances, Technology of Transfer (TOT) was accepted from foreign companies. Similarly, any design developments through collaborations, with the help of consultants or vendors, became the property of ICF Chennai and it laid claims of all patents.

Indian Companies are becoming global competitors. BHEL bagged INR 58,000 crores contract for manufacturing 200 Vande Bharat coaches, against global competitors like French Company Alstom, Swiss Company Staddler Rails, Seimens, and Russian company Transmanholding (TMH). Also, Indian Railways not only becoming Atma Nirbhar (Self Reliant) but also exporting wheels to global market, especially European Market.

Today Indian railways are truly giving competition to aviation sector, especially in mid distance routes like Bengluru-Chennai, Pune-Mumbai, Delhi-Chandigarh, and Delhi-Jaipur. Some innovative variants of Vande Bharat like sleeper coaches and Vande Mini is also being planned for future operations.

6.1 LIMITATIONS OF THE STUDY

Lack of appropriate data availability and Government controlled online sources puts another challenge. More information is required to collate the information. There is not much clarity on engagements of vendors and technology developed or component designed. Time and resources constraint had its own share in limiting the research.

6.2 FUTURE SCOPE OF THE STUDY

There is always a better way of doing research work considering Indian Railways has undertaken ambitious project of launching 200 train sets in coming future. There are also plans of designing and developing Semi High Speed AC sleeper coaches for long distance travel. This will generate more revenue and save time of railway passengers in future. This new revenue generation model will certainly attract researchers for future study. At the same time, those routes which are not generating much revenue, IR had decided to use 8 racks instead of 16 racks thus save more traction cost and make “Vande Mini” more viable.

REFERENCES

- BHEL shares hit 52-week high on bid to manufacture Vande Bharat trains, Business Today, December 2, 2022, retrieved from <https://www.businesstoday.in/markets/stocks/story/bhel-shares-rise-52-week-high-manufacture-vande-bharat-trains-355030-2022-12-02>
- Christensen, Clayton M, (2013), The Innovators Dilemma. Harvard Publisher, P288
- Explained: The big plan for 400 Vande Bharat Trains and what it Means for Indian Railways, TOI, February 2, 2023, retrieved from <https://timesofindia.indiatimes.com/business/india-business/vande-bharat-trains-budget-2022-indian-railways-semi-high-speed-new-trains-explained/articleshow/89298422.cms>
- Gibson, Rowan (1998). Re-Thinking the Future. Nicholas Brealey Publishing, P288.
- Gibson, Rowan, (2018) The Four Lenses of Innovation <https://blog.12min.com/the-four-lenses-of-innovation-pdf/>
- Gopalkrishnan, R., (2017) A Biography of Innovations: From Birth to Maturity. P256
- Govindrajan, Vijay, & Trimble, Krish (2012) Reverse Innovation: Create far from Home, Win Everywhere, Harvard Publishing, P256
- Govindrajan, Vijay, Outlook Business, May 5, 2007
- Hamel, G, & Prahalad, C.K. The Core Competence of the Corporation. Harvard Business Review, Vol. 68, No,3,pp 79-91, 1990
- How the Ukraine war is making Indian Railways literally reinvent the wheel to become self-reliant, Business Today, September 9, 2022, retrieved from <https://www.businesstoday.in/latest/economy/story/how-the-ukraine-war-is-making-indian-railways-literally-reinvent-the-wheel-to-become-self-reliant-346859-2022-09-09>
- Inamdar, Nikhil. (2020). 7 Sutras of Innovation. Jaico Books, Marico Innovation Foundation
- India Brand Equity Foundation, retrieved from [https://commerce.gov.in/about-us/other-organisation/india-brand-equity-foundation/#:~:text=India%20Brand%20Equity%20Foundation%20\(IBEF,facilitate%20dissemination%20of%20knowledge%20of](https://commerce.gov.in/about-us/other-organisation/india-brand-equity-foundation/#:~:text=India%20Brand%20Equity%20Foundation%20(IBEF,facilitate%20dissemination%20of%20knowledge%20of)
- Innovation in India: Recent Trends, TTMC Research Paper (2006)
- Innovation Promotion Group & Suggestion Scheme retrieved from [https:// Indian railways.gov.in/ railway board/uploads/directorate/eff_res/suggestion_scheme/E_R_SUGGESTION%20SCHEME%20UPLOADED%20BRIEF.pdf](https://Indianrailways.gov.in/railwayboard/uploads/directorate/eff_res/suggestion_scheme/E_R_SUGGESTION%20SCHEME%20UPLOADED%20BRIEF.pdf)
- Innovation Policy, Ministry of Indian Railways, retrieved from [https:// Indian railways. gov.in/ railwayboard/uploads/directorate/eff_res/Policy_Letters/Innovation-Policy-2022.pdf](https://Indianrailways.gov.in/railwayboard/uploads/directorate/eff_res/Policy_Letters/Innovation-Policy-2022.pdf)
- Mani, Sudhanshu. (2021). My Train 18 Story. Kiva Prakashan, Lucknow P 283
- Mani, Mr. S. Gurusurthy, Director, Central Boards of Reserve bank of India, in his forward of the Book.
- Ministry of Railways, retrieved from [https://indianrailways.gov.in/ railway board/ view _ section.jsp? lang=0&id=0,1,261](https://indianrailways.gov.in/railwayboard/view_section.jsp?lang=0&id=0,1,261)
- My train 18 story: Interview with Sudhanshu Mani, Innovator of Vande Bharat retrieved from [https:// urban transportnews.com/news/my-train-18-story-interview-with-sudhanshu-mani-innovator-of-vande-bharat-train](https://urbantransportnews.com/news/my-train-18-story-interview-with-sudhanshu-mani-innovator-of-vande-bharat-train)

- New Vande Bharat Express To Be Inaugrated With Better Facilities, Business Today, January 16, 2023, retrieved from <https://www.businessworld.in/article/New-Vande-Bharat-Express-To-Be-Inaugrated-With-Better-Facilities/05-12-2022-456689/>
- PIB, Train Modernisation, <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/dec/doc20221228148501.pdf>
- RDSO- ANNUAL REPORTS- 2018-19, retrieved from https://rdso.indianrailways.gov.in/uploads/RDSO%20Annual%20Report%202018_19.pdf
- Report National Knowledge Commission (2007), (<http://knowledgecommission.gov.in/recommendations/higher.asp>)
- Second Train 18 to be rolled out this month; to sport more 'Make in India' components than first one, Business Today, march 7, 2019, retrieved from <https://www.businesstoday.in/latest/economy-politics/story/train-18-make-in-india-indian-railways-vande-bharat-express-second-train-18-to-be-rolled-out-this-month-to-sport-more-make-in-india-components-than-first-one-report-174491-2019-03-07>
- Train 18: 10 things to know about Indian Railways' first engine-less train, India Today Web, January 22, 2023, retrieved from <https://www.indiatoday.in/india/story/train-18-10-things-to-know-about-indian-railways-first-engine-less-train-1374457-2018-10-24>
- World Bank Study Report on Innovation (2007)

FOOT NOTES

1. Ministry of Railways, retrieved from https://indianrailways.gov.in/railwayboard/view_section.jsp?lang=0&id=0,1,261
2. Gopalkrishnan, R., (2017) A Biography of Innovations: From Birth to Maturity. P256
3. Gibson, Rowan (1998). Re-Thinking the Future. Nicholas Brealey Publishing, P288. Also see
4. Gibson, Rowan, (2018) The Four Lenses of Innovation <https://blog.12min.com/the-four-lenses-of-innovation-pdf/>
5. Christensen, Clayton M, (2013), The Innovators Dilemma. Harvard Publisher, P288.
6. Report National Knowledge Commission (2007) (<http://knowledgecommission.gov.in/recommendations/higher.asp>)
7. World Bank Study Report on Innovation (2007)
8. Innovation in India: Recent Trends, TTMC Research Paper (2006)
9. India Brand Equity Foundation, retrieved from [https://commerce.gov.in/about-us/other-organisation/india-brand-equity-foundation/#:~:text=India%20Brand%20Equity%20Foun,dation%20\(IBEF, facilitate%20dissemination%20of%20knowledge%20of](https://commerce.gov.in/about-us/other-organisation/india-brand-equity-foundation/#:~:text=India%20Brand%20Equity%20Foun,dation%20(IBEF, facilitate%20dissemination%20of%20knowledge%20of)
10. Innovation Policy, Ministry of Indian Railways, retrieved from https://indianrailways.gov.in/railwayboard/uploads/directorate/eff_res/Policy_Letters/Innovation-Policy-2022.pdf
11. Innovation Promotion Group & Suggestion Scheme retrieved from https://indianrailways.gov.in/railwayboard/uploads/directorate/eff_res/suggestion_scheme/E_R_SUGGESTION%20SCHEME%20UPLOADED%20BRIEF.pdf

ARTIFICIAL INTELLIGENCE IN HUMAN RESOURCE: DEPLOYMENT & CHALLENGES**¹Dr. Manoj Kr. Jha and ²Shailesh Dhyani**¹Department of Business Administration, ITS Mohan Nagar, Ghaziabad, (U.P), India²Research Scholar, Mewar University, Chittorgarh, Rajasthan, India.**ABSTRACT**

Human resources have become an essential part of every company as it affects the work of the employees in the organization. Human resources play an important role in the company in selection, recruitment, training, evaluation and more. While the integration of artificial intelligence into human management increases the performance of human resources, on the other hand, this integration faces many problems while performing the good work of humanity. Employees should have good communication skills and a healthy workplace that makes them productive and efficient.

Keywords: HR, Artificial Intelligence, CuteHR, SAAS

INTRODUCTION

Human Resources ensures that employees have the safety and support they need to do their jobs well and the space to be creative, intelligent and talented.

If HR tasks are automated, it can help speed up and work on lowcost HR tasks so that more focus can be placed on operational plans. This can be done with the help of wisdom. Today, artificial intelligence is the most advanced and constantly evolving technology with the potential to transform the workforce in many ways, from recruiting to talent management, by processing large files quickly and accurately.

LITERATURE REVIEW

Martincevic and Kozina (May 2019) shows that one of the most important aspects of fair competition involved in AI-based recruitment is the unconscious decision-making organizations through recruitment.

He also decided that companies should be able to train humans and machines to overcome these trends. Dinesh G. Harkut and Kashmira Kasat (March 2019) "Artificial Intelligence - Challenges and Applications" In This Open Access Study - Peer Review See. Building Trust, Artificial Intelligence Human Intervention, Investment, High expectations, data security less competitive. Meet with organizations. Vivek Yawalkar (February 2019) "Research on Intelligence and Its Role in Human Resource Management" - Chapter 6, Issue 1 (E-ISSN 2348-1269, P-ISSN 2349-5138) - Describes the main research paper. Using secondary data, the researchers concluded that AI had a larger role to play; Among the many tasks performed by human resources, the company's robots can work on recruiting, recruiting, analyzing data, collecting data, reducing work in the workplace and increasing productivity.

IT decision makers are increasingly aware of artificial intelligence (AI) bias, according to a survey of 350 US and UK CIOs, CFOs, VPs and IT executives by Cliff Saran (2019). Almost half of AI experts in the US and UK say they are "very" to "rarely" concerned about AI bias. Research from Robot Data revealed that organizations are using AI to work across departments, including human resources (35%). The survey also revealed that 85 percent of IT executives surveyed believed that AI policy would help better identify the causes of AI bias and prevent How to Prevent it. Buzko et al., (2016) - "Artificial Intelligence Technologies in Human Resources Development". Researchers address the challenges of AI technology in HR, and the authors state that AI determines the effectiveness of training. In the research paper, the authors point out that the AI process makes it easier for data to be analyzed by humans

AI INTEGRATION IN HUMAN RESOURCES

Amalgamation of Artificial intelligence in Human Resource requires the use of pre-programmed algorithms so that real-time decisions could be made. It also enables to adopt coherent computing approaches so as to maximise the output qualitatively as well as quantitatively.

There will be an upgraded and evolved condition for the companies as well to experience for their applicants and workers as a result of the panoptic human component of Human Resources combined with the intelligence of technology. This amalgamation of AI in HR will also commit the promotion of the value of producing better and faster outcomes.

APPLICATIONS OF AI IN HR

HR in HR plays an important role in recruiting and training employees. AI offers many applications to reduce the burden of human resources.

- **Talent Acquisition and Recruitment**

Talent Acquisition is a crucial task for HR departments because it brings great skills to the team. will guide the development of the company. Perhaps the most important aspect of using AI in HR is talent acquisition.

From scanning applicants to document management, scheduling interviews, and processing and solving candidate queries, AI reduces the time and effort required to complete these tasks and other activities.

AI-powered recruitment will help select candidates who meet most of the company's criteria. Therefore, the scanning method is simple, fast and convenient.

- **New Employee Orientation**

This includes the delivery of necessary information like corporate knowledge and rules, their job profile, business regulations, etc., via a AI based software and applications .

Onboarding is a critical step for improving the HR team's capacity to remember and efficiently. Candidates that go through a well-organized and informative onboarding process are more likely to stay with the firm in the long run. There are a lot of questions that might be asked by the recruits, and the AI for HR answers all of them so that the employees do not have to do that manually.

Artificial intelligence in HR allows procedures to be customized to need workers and their associated roles to be separated. AI also keeps track of all the important contact details of the company and other important tasks like verification of legal documents, etc.

- **Training the Recruits**

Employees will be able to study and teach themselves about appropriate roles and needs using AI development services. It will also assist them in staying current by providing information on current technologies and software advancements in the industry. By evaluating the papers and exams, the AI will automatically comprehend and assign appropriate training to the employee.

Relevant skill set information will be provided based on their job description for improved growth. AI in HR technology may evaluate data and alert the HR team to the employees' training needs. This clever technique will enhance employees' productivity and brains, as well as teach them more quickly and effectively. They can educate particular programs and teaching skills so that employees can self-learn and execute according to the demands of the company.

- **Enhancement of employee experience:**

Employees anticipate a helpful and constructive experience when they join customized engagement because of the high degree of automation and a big focus on customer experience surrounding the environment.

Employee experiences are being shaped by consumer technology these days, and they are searching for alternatives for how they want to be engaged and supported.

AI may be efficiently integrated across the employee lifecycle, from recruiting and onboarding through HR service delivery and career pathing, resulting in a personalized employee experience.

Human resources departments could now evaluate employee engagement and job satisfaction more precisely than ever before with tailored feedback questionnaires and employee recognition programs.

This is especially useful given how vital it is to understand employees' general requirements, but there are also numerous significant organizational benefits to having this knowledge.

- **Leadership**

Because AI will assist and develop trainees, it will also improve the working techniques of trainers and project leaders in a firm. The AI will evaluate the structure of the leader's characteristics by asking questions of the members of their separate teams and will give them the talents they lack or the traits they need to adapt.

Second, by looking at the dashboard, leaders may analyze themselves and enhance their skill sets following the demands of the workplace.

DEPLOYING AI IN HR

Like any other technology, AI should be used with caution. CuteHR lists some factors to consider when using AI in HR:

- Real-time and reliable data is essential for achieving AI results. That's why it's important to get the right information first and then clarify the design goals.
- The AI ecosystem is unlike any other IT environment. Success requires certain skills and knowledge.
- The HR team must ensure that they are proficient at maintaining and managing as well as collecting the necessary data.
- Understanding and understanding driving perception is important. Therefore, there should be clear instructions and instructions on how to identify the right model to learn and follow.
- Artificial intelligence can produce accurate and consistent results based on the algorithm and logic provided to the system.
- Companies must ensure the accuracy of data and remember that AI only does what the user wants it to do, it cannot make decisions on its own.

CHALLENGES OF AI IN HUMAN RESOURCE MANAGEMENT

While artificial intelligence will continue to be beneficial to human resource management for years to come, HR practitioners should be aware of the problems that may arise.

HR managers' biggest concern is to make AI easier and safer to use. In fact, security and privacy concerns are why most people are reluctant to use AI in the workplace. According to the

Workplace survey, 31% of respondents said they would rather work with people than with machines. HR professionals must also keep up with trends and technological advances and changes to meet these challenges.

Employees expect their employers to protect their personal information and obtain permission before using technology to obtain information about them. On the other hand, organizations want to avoid data breaches, so for HR professionals this becomes the trust they need. Another challenge facing the

is the maintenance of artificial intelligence. AI needs constant monitoring and updating, which makes it time consuming. Due to migration, data is limited and the ability to work with the HR function with its full bandwidth is limited.

While it is evident that artificial intelligence will continue to have a beneficial impact on the field of human resources management in the future years, HR practitioners should be aware of the potential problems.

CONCLUSION

based HR solutions increase employee productivity. It can identify resources, predict, diagnose and become more efficient while focusing on employee needs and outcomes. Organizations need to get AI solutions that meet their business needs and create accurate charts that meet your company's culture.

The businesses of the future will be driven by intelligence in many ways and will be able to deliver fast and accurate experiences to customers. Therefore, it is important to focus on the employee's needs and understand the factors involved.

Issues include privacy, lack of staff, oversight, pooling capacity and lack of evidence. However, being careful while developing AI services can avoid unnecessary problems.

REFERENCES

1. Verma Richa, Bandi Srinivas, "challenges of artificial intelligence in human resource management in Indian it sector", XXI Annual International Conference Proceedings; January 2020.
2. O'Connor W. Scott, "Artificial Intelligence in Human Resource Management", Northeastern University Graduate Programs, January 2, 2020.
3. <http://hj.diva-portal.org/smash/get/diva2:1322478/FULLTEXT01.pdf>
4. [https://www.ey.com/Publication/vwLUAssets/EY-the-new-age-artificial-intelligence-for-human-resource-opportunities-and-functions/\\$FILE/EY-the-new-age-artificial-intelligence-for-human-resource-opportunities-and-functions.pdf](https://www.ey.com/Publication/vwLUAssets/EY-the-new-age-artificial-intelligence-for-human-resource-opportunities-and-functions/$FILE/EY-the-new-age-artificial-intelligence-for-human-resource-opportunities-and-functions.pdf)
5. https://www.employmentstudies.co.uk/system/files/resources/files/mp142_The_impact_of_Artificial_Intelligence_on_the_HR_function-Peter_Reilly.pdf

FINANCIAL INCLUSION & FINTECHS

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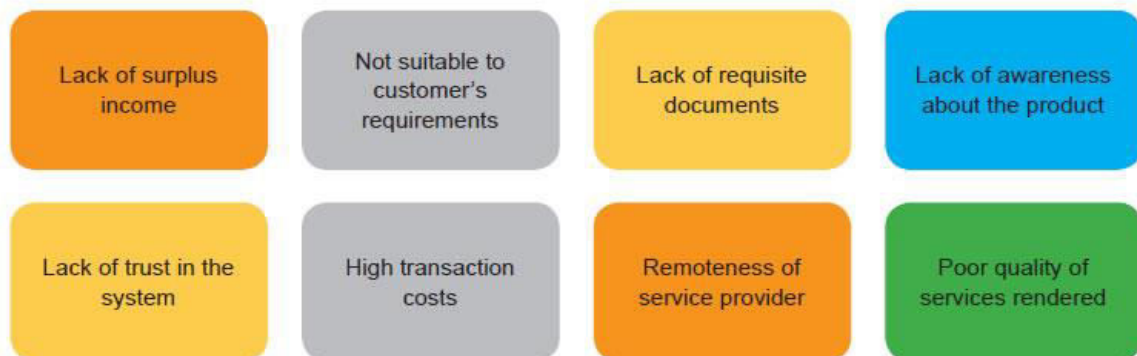
2.1. FINANCIAL INCLUSION

Financial inclusion has become a key driver of economic growth and poverty alleviation the world over. Access to formal financial avenues can boost job creation, reduce vulnerability to economic shocks and increase investments in human capital. In absence of formal financial services, individuals and firms rely on their own limited resources or rely on costly informal sources of finance to meet their financial needs and pursue growth opportunities. Financial Inclusion at a macro level can support sustainable and inclusive socio-economic growth for all.

Evidence shows how financial inclusion has a multiplier effect in boosting overall economic output, reducing poverty and income inequality at the national level. Financial inclusion of women in particular is important for gender equality and women’s economic empowerment. Women with greater control over their financial lives, can help themselves and their families to come out of poverty; reduce their risk of falling into poverty; eliminate their exploitation from the informal sector; and increase their ability to fully engage in measurable and productive economic activities. Financial Inclusion supports stability, integrity and equitable growth. Therefore, financial exclusion because of Several barriers like physical, socio-cultural and psychological leads to financial exclusion.

Some of the key reasons resulting in exclusion are:

Figure I.1 - Causes of Financial Exclusion



UN Sustainable Development Goals & Financial Inclusion

It is relevant to state that, seven¹ of the seventeen United Nations Sustainable Development Goals (SDG) of 2030 view financial inclusion as a key enabler for achieving sustainable development worldwide by improving the quality of lives of poor and marginalized sections of the society. (Home- Sustainable Development Goals, 2018)

Defining Financial Inclusion in the Indian Context

Financial inclusion has been defined as “the process of ensuring access to financial services, timely and adequate credit for vulnerable groups such as weaker sections and low-income groups at an affordable cost”. (Committee on Financial Inclusion - Chairman: Dr C Rangarajan, RBI, 2008). The Committee on Medium-Term Path to Financial Inclusion (Chairman: Shri Deepak Mohanty, RBI, 2015) has set the vision for financial inclusion as, “convenient access to a basket of basic formal financial products and services that should include savings, remittance, credit, government-supported insurance and pension products to small and marginal farmers and low-income households at reasonable cost with adequate protection progressively supplemented by social cash transfers, besides increasing the access of small and marginal enterprises to formal finance with a greater reliance on technology to cut costs and improve service delivery,”

Rationale

A lot of effort has been put to increase financial inclusion in the country. Further, steps need to be taken to ensure adequate access to financial services and usage of these services by various segments of under-served and un-served population in India.

An inclusive financial system should be supported by the following–

- sound financial inclusion policies
- focus on financial education and
- customer protection

A financial system today has to be pro-growth and pro-poor.

The financial system should have the following features-

- potential to reduce income inequality
- potential to reduce poverty
- promote social cohesion &
- shared economic development

Financial exclusion, on the other hand, leaves the low- income segments of society with no choice other than informal options, making them vulnerable to distress and poverty.

Figure I.2- Inclusion, Literacy and Grievance Redressal



2. FINANCIAL INCLUSION IN INDIA

As evidenced, there are huge implications of poverty on financial stability. Therefore, the focus of Financial Inclusion is to ensure that poverty is tackled in all its manifestations and that the benefits of economic growth reach the poor and excluded sections of the society.

India began its financial inclusion journey in the year 1956 with the nationalisation of Life Insurance companies. Banks got nationalisation in 1969 and 1980. The general insurance companies got nationalised in 1972. A host of initiatives have been undertaken over the years in the financial inclusion domain.

India is actively engaged with other countries and multilateral fora viz. Global Partnership for Financial Inclusion (GPII) and Organization for Economic Co-operation and Development (OECD). India is also a co-chairs along with Indonesia and United Kingdom in the GPII Subgroup on Regulation and Standard Setting Bodies. India is actively involved in preparing relevant research and policy guidelines in Regulation, Digitalisation, and Financial Inclusion that are published by GPII from time to time.

Leadership

A strong leadership is a required to drive financial inclusion in a mission mode. Indian policy making has shown resolve for inclusive growth which culminated in the National Mission for Financial Inclusion, namely the Pradhan Mantri Jan Dhan Yojana (PMJDY). Launched in August 2014, it was a watershed in the financial

inclusion movement in the country. The programme leverages on the existing large banking network and technological innovations to provide every household with access to basic financial services, thereby bridging the gap in the coverage of banking facilities. Status of Financial Inclusion in India

Under PMJDY, 34.01 crore accounts have been opened with deposits amounting to ₹89257 crore upto January 30, 2019 within a short span of five years. The achievement of opening the largest number of accounts (1,80,96,130 nos.) under PMJDY, in one week has found a place in the Guinness Book of World Records. A bouquet of products viz., overdraft of ₹10,000, accidental death cum disability insurance cover, term-life cover and old age pension have been made available under PMJDY to the account holders. The focus has also shifted from opening account for “every household to every adult”. III.6 Under Pradhan Mantri Suraksha Bima Yojana (PMSBY) a renewable one- year accidental death cum disability cover of ₹2 lakhs is offered to all subscribing bank account holders in the age group of 18 to 70 years for a premium as low as ₹12/- per annum per subscriber. Another insurance product with one-year term life cover of ₹2 lakhs under Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) is made available to all subscribing bank account holders in the age group of 18 to 50 years, for a premium of ₹330/- per annum per subscriber. III.7 To take care of the financial needs in old age, a pension product named Atal Pension Yojana (APY) guaranteed by the Government of India has also been made available to the newly included bank account holders. Under APY, a subscriber (in the age group of 18 to 40 years) will receive fixed monthly pension in the range of ₹1,000 to ₹5,000 after completing 60 years of age, depending on the contributions made by the subscriber

FinTech- Innovation, Inclusion and Regulation

New technology often reshape economies. In the last few decades, information technologies perhaps had the most transformative effect on the economy and particularly in financial services. The interlinkage of Finance and Information technology, known as FinTech now, has played significant role in the evolution of finance.

Today technology has led to globalisation of financial services, initiated a tectonic shift in the efficiency and speed of these services and increased convenience as well as better experience to consumers.

Fin Tech is Different

FinTech revolution that started soon after the North Atlantic Financial Crisis of 2007-08, is unique in many ways. This revolution is identified with increased computing power, use of new technologies such as Machine Learning, Artificial Intelligence, & APIs that leverage Big Data in providing financial services. There also is an emergence of new entrants and new business models.

Prior to current FinTech revolution, digitalisation of financial services was used by banks and financial institutions to have structured data on their consumers which was used to have better understanding of the customer’s risk profile. With the emergence of Big Data analytics, even better insights on customer preferences and behaviour, can be obtained using alternate semi-structured and unstructured data. Also, the analytics, rather than being performed by the Financial Institution themselves is being outsourced to new age FinTechs. In fact, the financial sector is benefiting from this synergistic collaboration between the regulated entities and FinTechs that have a huge future potential.

Benefits from FinTech

Technology has reduced entry barriers. It has allowed FinTechs to enter the financial services. It has allowed the unbundling of financial services in a manner that is economically viable even at a lower scale of operations. Consumers have also benefited by better customer experience and convenience. Payment sector innovations in India can be typical example.

One of the key value propositions that FinTechs offered was that it provided the same financial services as regulated entities but at a lower cost. FinTech disruption in the Indian brokerage companies is a shining example of this.

Large technology companies, such as Alphabet, Meta, Amazon, etc. have also expanded into financial services. These companies leverage the data from their large existing user base along with network effects to provide contextualised or embedded financial products along with non-financial products. In many jurisdictions, in addition to payment systems, Big Techs have successfully expanded into credit scoring and lending.

Risks from FinTech

Irrespective of the type of player undertaking financial business or the type of technology underlying it, it is prone to a few risks.

- a. For regulated entities or new entrants, depending on the business model, they face legal, governance, reputational, and market operational risks in addition to the usual credit, liquidity, and risks.
- b. From customers' perspective, key risks include mis-selling, data privacy, discrimination and security.
- c. From a regulator's perspective, there are risks associated with financial stability, customer protection and market integrity.

The regulatory and supervisory response across these risk areas is under calibration. Nevertheless, new entrants and new technologies can further aggravate these risks. For instance, FinTechs operating on lending side have spurred the availability of unsecured loans, globally. Most of the times, such loans are often driven by machine learning models. However, effectiveness of these models for delinquency has not been fully established, especially. Any significant failure of these models will not only be limited to new entrants but will also impact regulated entities with exposure to them.

Use of models also brings the question of fair treatment in the extension of credit. It is necessary that highly automated fintech business models for decision making take care of requirement of fairness through additional procedures, controls, and safeguards both in the development and deployment of models and also in the final decision making.

Risk of unreliability or vulnerability of technology is not limited to FinTechs. However, since their business is heavily dependent upon automation, their vulnerability is also greater.

FinTechs need to be conscious of customer protection. Miss-selling, fraud, or misconduct by FinTechs may harm the very consumers they intended to serve. Careful management of this risk is significant for the sustainable development of the FinTech Sector. A loss of consumer trust may put an unrepairable dent on the sectors growth story. So, while regulators are always worried about customer protection, FinTechs should even be more aware, vigilant, and proactive in ensuring that the bedrock of their business remains protected.

A financial sector that does not prioritise financial inclusion cannot distribute the benefits of economic growth to all levels of society. Financial inclusion entails providing access to avenues of savings and investments, and credit at an affordable cost. It benefits the economy and society as it is accompanied by increased economic growth and reduction in inequality. In countries that have large numbers of people who are "unbanked," financial innovation could help enhance financial inclusion, especially if they are paired with digital identifications systems.

With the use of alternative data, end-to-end digitalisation coupled with other technology interventions, FinTech can bridge the credit gap that exists due to various reasons such as absence of credit scores, cumbersome documentation, manual processes, etc.

16. The Reserve Bank Innovation Hub (RBIH) in association with RBI is piloting an end-to-end digitalisation of Kisan Credit Card (KCC) lending. The project envisages automation of various processes within banks and integration of their systems with the service providers which will make granting of KCC loans more efficient and economical.

Regulatory Approaches

Any approach to regulate the FinTech sector will invariably be informed by five fundamental objectives- (i) financial stability, (ii) consumer protection, (iii) integrity of financial system, (iv) competition and (v) orderly development of sector concerned.

Under these overarching objectives, there are various approaches to regulation. At one end of the spectrum, there is a 'hands-off' approach that advocates allowing the sector to operate freely and develop without any regulatory intervention. While this allows for harnessing benefits of innovation, it risks the possibility of failing to protect the financial system and customers from adverse outcomes.

At the other end of the spectrum there is the 'status-quo' approach that aims to maintain the existing framework without any relaxation to cater for new developments. Under this approach, fintech product and services are regulated in the same way as the traditional financial product or service. From the perspective of controlling risks, it may appear to be the best approach as it applies tried and tested regulations. However, benefits of innovation may be lost.

In India, the RBI has endeavoured to find a middle ground trying to balance between the innovation brought by FinTech while addressing the unique risks they introduce.

The NBFC – Account Aggregator framework of 2016, NBFC -Peer to Peer lending guidelines of 2017 and recent Digital Lending Guidelines are examples of adaptive regulation intended to address emerging risks.

P2P regulations were introduced in the early stages allowing India to avoid failures witnessed in other jurisdiction, while at the same time enabling an innovative mode of credit intermediation. Similarly, guidelines on Account Aggregator (AA) facilitate innovations related to open banking while building a robust data privacy regime. Last year's digital lending guidelines was a reiteration of two well established principles, namely, (i) lending business is regulated activity and (ii) onus of ensuring compliance in an outsourcing arrangement lies on the regulated entity.

The RBI introduced the regulatory sandbox framework in 2019 for live testing of innovative products or services in a controlled environment. The success stories emanating from the Regulatory Sandbox initiatives include the recently launched UPI123Pay which can enable more than 400 million feature phone mobile subscribers to make UPI payments even without an internet connection. Further, to extract the full benefit of regulatory sandbox, a framework for Inter-operable Regulatory Sandbox (IoRS) was also unveiled last year. This framework is to facilitate testing of innovative products/services falling within the regulatory ambit of more than one financial sector regulators.

In 2022, as part of its efforts to promote innovation in the financial sector, the RBI set up of the Reserve Bank Innovation Hub (RBIH). Within the RBI a new FinTech Department was established in 2022 to give focused attention to this evolving sector. Its objective is to not only promote innovation in the sector, but also identify the challenges and opportunities associated and address them in a timely manner.

Within the regulatory envelope, activity-based regulation as opposed to entity-based regulation is gaining traction. Entity-based regulatory requirements are prudential, conduct and governance related to the regulated entity rather than targeting at any activity. On the other hand, activity-based regulation focuses on the activity being undertaken attempting to apply uniform rules to the activity across all regulated entities. For instance, the recent review of the regulatory framework for microfinance loans attempts to provide a uniform regulation for such lending across banks and NBFCs, by having a common definition of microfinance, same business conduct and fair practice requirements, etc.

Fin Tech Sector – the Way Forward

India has the third largest FinTech eco-system in the world. While regulation can play a supporting role, FinTechs themselves have to ensure the balance between innovation and risks arising therefrom. Naturally, the resilience of such an ecosystem will also inter alia depend on self-monitoring of the conduct of the constituents. Therefore, from the FinTech sector perspective, self-regulation can be a useful tool for setting and enforcing rules and standards.

The sector should attempt to organise itself under a self-regulatory organisation which in turn can monitor the conduct of member FinTech entities. This approach can also help in the objective of protecting the interest of customer and promoting high level of governance standard in FinTech entities. Role of such an SRO can include setting the standards for conduct as well as acting as a bridge between the sector and regulators.

Regulation is merely a guardrail to keep the sector on the right path. However, beyond its ability to innovate, the development of this sector will largely depend on two critical elements. These two elements are (i) Customer Centricity and (ii) Governance. It is essential for the FinTechs to keep customers at the centre of their innovation and follow high standards of good governance as part of culture.

While developing their products and process, FinTech should ensure adherence to three basic principles from a customer protection perspective –

- i. Firstly, design robust customer-centric products that avoid fintech induced losses to customers such as those from cybersecurity breaches, technical glitches, frauds, etc.
- ii. Secondly, ensure customer suitability and appropriateness. Refrain from mis-selling or imprudent lending.
- iii. Thirdly, ensure that any inherent biases in models are addressed in a fair manner.

As far as governance is concerned, the importance of adopting and adhering to good governance cannot be overemphasised. Mis-governance is at the root cause of several failures. For the sustainable development of the sector, it is essential that FinTechs inculcate the values of accountability, fairness, transparency, and independence. The Board of Directors should be sufficiently empowered to assert its role as the balancer of conflicting interests of various stakeholders. It should have adequate experience and independence.

3. WORLD BANK OPENION

In the year 2017, the World Bank Global Findex Report indicated that the percentage of adult bank account holders in India increased to 80% from 53% in 2014 and 35% in 2011. This is comparable to 80% of adults in China in 2017, who had an account.

The data further showed 55% of the new bank accounts opened globally were from India. Of the 51.4 crore bank accounts opened from 2014-17 globally, a whopping 55% were from India. The World Bank recognises the success of the Jan Dhan Yojana, the government’s initiative aimed at bringing masses within the formal banking system.

According to government data, the total number of Jan Dhan account holders rose from 28.17 crore in March, 2017 to 31.44 crore in March,2018.

Due to government efforts, more women have opened bank accounts, highlighting a sharp fall in gender gap from 20% in 2014 to 6% in 2017.

The World Bank report acknowledges impact of government policy in reducing gaps in bank account ownership between rich and poor to 5% in 2017, down from 15% in 2014. The percentage of adult bank account holders in India increased to 80% in 2017 as compared to 53% in 2014 and 35% in 2011.

The World Bank Report also attributes this progress as being driven by the Jan Dhan Yojana policy which used biometric ID to expand access to financial services.

4. GROWTH IN PMJDYA

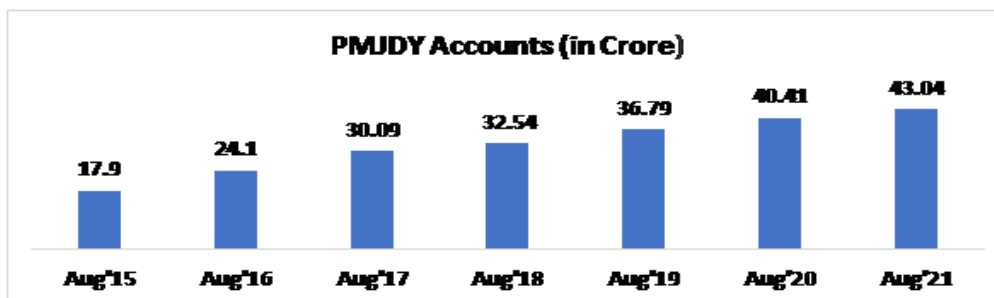
On 15th August, 2021, as India celebrated its 75th Independence Day, nearly 43 crore poor beneficiaries in the country now have a basic bank account, thanks to Centre’s flagship financial inclusion scheme, Pradhan Mantri Jan Dhan Yojana (PMJDY).The PMJDY scheme, as was announced by the Prime Minister in August 2014, has dispelled initial apprehensions on its efficacy and has proved to be a steady vehicle for financial inclusion.As per the latest information. PMJDY now has 42.89 crore beneficiaries (basic bank account holders) with ₹1,43,834 crore total balance. More than half of the beneficiaries are women (i.e. 23.76 crore). Also, 28.57 crore are from rural and semi urban areas.

As was stated by Shri. D Janakiram, Director, Institute for Development and Research in Banking Technology (IDRBT) , an arm of RBI, that the PMJDY has done extremely well so far. He also stated that the massive financial inclusion achieved by the scheme was unparalleled.The average balance in the accounts was around ₹3,000-3,500 across banks is ‘an indication’ that the scheme has now become a channel for savings for the low income families.The total deposit balance stood at ₹1.43-lakh crore, which a huge amount. A good number of these accounts are being regularly used.

The Global Findex data base of the World Bank has shown ‘substantial’ increase in financial inclusion in the country after 2014. As per the index, 80 per cent of people above 15 years of age in the lower-middle income group have a bank account now compared to 53 per cent in 2014.

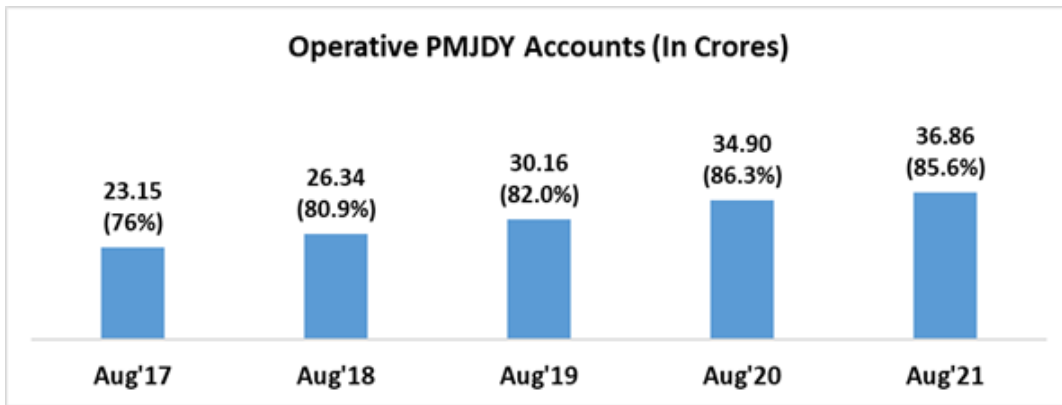
5. PERFORMANCE OF PMJDY

a. PMJDY Accounts



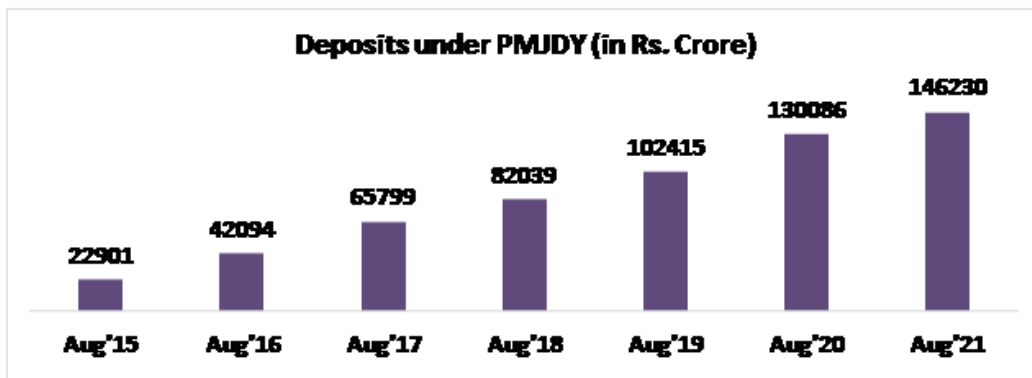
- As on 18th August '21 number of total PMJDY Accounts: 43.04 Crore; 55.47% (23.87 crore) Jan-Dhan account holders are women and 66.69% (28.70 crore) Jan Dhan accounts are in rural and semi-urban areas
- During first year of scheme 17.90 crore PMJDY accounts were opened
- Continuous increase in no of accounts under PMJDY
- PMJDY Accounts have grown three-fold from 14.72 Crore in Mar'15 to 43.04 Crore as on 18-08-2021.

b. Operative PMJDY Accounts –



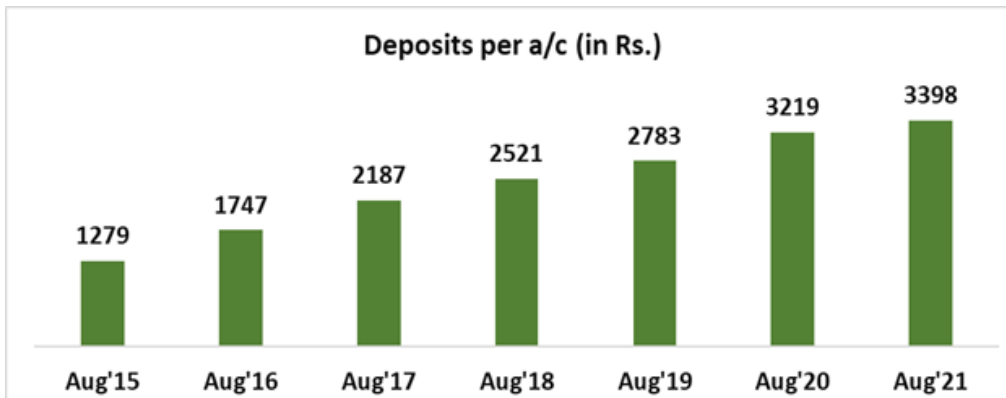
- As per extant RBI guidelines, a PMJDY account is treated as inoperative if there are no customer induced transactions in the account for over a period of two years
- In August'21, out of total 43.04 crore PMJDY accounts, 36.86 crore (85.6%) are operative
- Continuous increase in % of operative accounts is an indication that more and more of these accounts are being used by customers on a regular basis
- Only 8.2% PMJDY accounts are zero balance accounts

c. Deposits Under PMJDY Accounts -



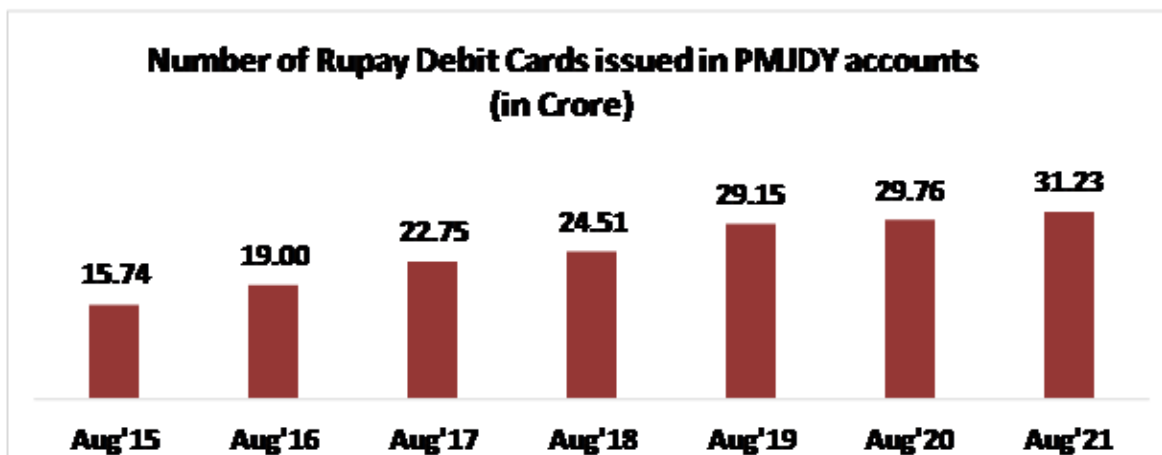
- Total deposit balances under PMJDY Accounts stand at Rs. 1,46,230 crore
- Deposits have increased about 6.38 times with increase in accounts 2.4 times (Aug'21 / Aug'15)

d. Average Deposit per PMJDY account -



- Average deposit per account is Rs. 3,398
- Avg. Deposit per account has increased over 2.7 times over Aug'15
- Increase in average deposit is another indication of increased usage of accounts and inculcation of saving habit among account holders

e. RuPay Card issued to PMJDY Account holders

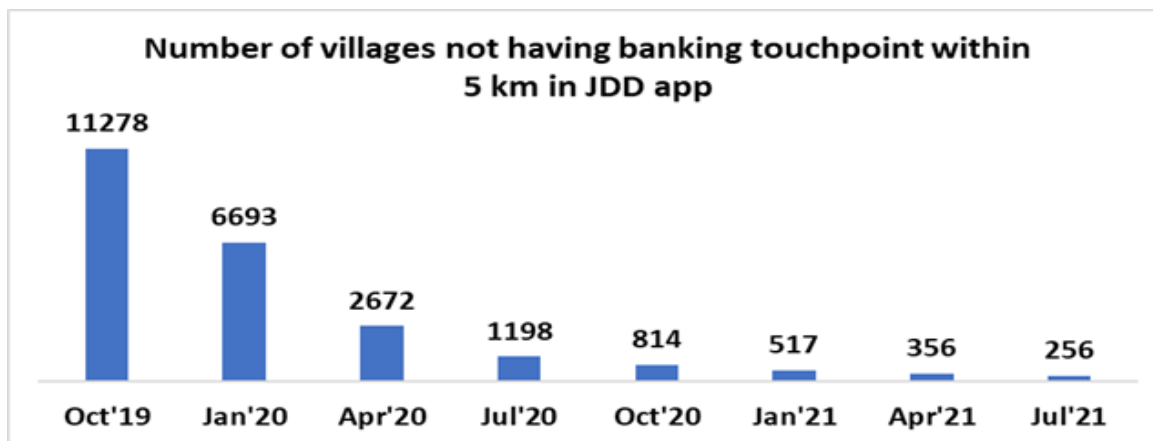


- Total RuPay cards issued to PMJDY accountholders: 31.23 Crore
- Number of RuPay cards & their usage has increased over time

8. Jan Dhan Darshak App

A mobile application, was launched to provide a citizen centric platform for locating banking touch points such as bank branches, ATMs, Bank Mitras, Post Offices, etc. in the country. Over 8 lakh banking touchpoints have been mapped on the GIS App. The facilities under Jan Dhan Darshak App could be availed as per the need and convenience of common people. The web version of this application could be accessed at the link <http://findmybank.gov.in>.

This app is also being used for identifying villages which are not served by banking touchpoints within 5 km. these identified villages are then allocated to various banks by concerned SLBCs for opening of banking outlets. The efforts have resulted in significant decrease in number of such villages.



9. Pradhan Mantri Garib Kalyan Package (PMGKP) for PMJDY Women Beneficiaries

As per announcement made by the Hon'ble Finance Minister on 26.3.2020, under PM Garib Kalyan Yojana, an amount of Rs. 500/- per month for three months (April'20 to June'20), was credited to the accounts of women account holders under Pradhan Mantri Jan Dhan Yojana (PMJDY). A total of Rs. 30,945 crore have been credited in accounts of women PMJDY account holders during Covid lockdown

10. Towards Ensuring Smooth DBT Transactions:

As informed by banks, about 5 crore PMJDY accountholders receive direct benefit transfer (DBT) from the Government under various schemes. To ensure that the eligible beneficiaries receive their DBT in time, the Department takes active role in identification of avoidable reasons for DBT failures in consultation with DBT Mission, NPCI, banks and various other Ministries. With close monitoring in this regard through regular VCs with banks and NPCI, the share of DBT failures due to avoidable reasons as a percentage of total DBT failures has decreased from 13.5% (FY 19-20) to 5.7% (FY 20-21).

6. THE ROAD AHEAD

The next step forward should be moving ahead from financial inclusion to financial empowerment by providing credit to everyone who needs it. The PMJDY may become PM Jan Dhan Vridhi scheme with universal access to bank credit to the most underprivileged sections of our society.

For this we would require a model of credit history. This would require reduction in cash transactions and moving to digital transactions and building credit models using artificial intelligence/machine learning techniques.

While building India's next generation digital financial infrastructure, the focus will increasingly be on cashless transactions. This would help reduce transaction cost as well as the maintenance cost.

There is a need to build up a data base to capture the income, transaction history of the Jan Dhan account holders on the basis of which credit delivery models can be developed.

Banks and Fintech firms can do further data analysis to create a new data base.

The FinTech revolution is also well underway in India, and it presents us with a unique opportunity to drive financial inclusion, improve the efficiency of the financial sector, and create new economic opportunities for millions of people. The country has created a stack of open APIs and digital public goods which can be leveraged by the industry to innovate and promote financial and social inclusion.

While India has made significant strides in developing its domestic payments systems which are acknowledged globally, it can also contribute to innovations in cross-border payment systems. In this context, CBDC holds significant promise. With India already piloting its CBDC, it is well poised to steer the discussion on the need for cross-border interoperability of CBDCs and developing standards for effective interfacing, so as to realise the potential of cheaper, efficient and faster cross-border payments.

REFERENCES

- [1] Global Financial Development Report 2014 of the World Bank, econ.worldbank.org
- [2] Financial Inclusion and Development: Recent Impact Evidence, April 2014. <https://www.cgap.org>
- [3] Financial Inclusion in India – An Assessment, Speech by Shri P Vijaya Bhaskar, ED, RBI on Dec 10, 2013, at MFIN and Access-Assist Summit at New Delhi. www.rbi.org.in
- [4] K. Hema Divya, "A Study On Impact Of Financial Inclusion With Reference To Daily Wage Earners, India". *Journal of Business Management & Social Sciences Research (JBM&SSR)* Volume 2, No.6, June 2013.
- [5] Douglas Pearce and Claudia Ruiz Ortega (2012), *Financial Inclusion Strategies Reference Framework*, June 2012. www.worldbank.org/inancialinclusion.
- [6] Global Financial Inclusion (Global Findex) April 19, 2012 data.worldbank.org
- [7] Joseph Massey (2010), "Role of Financial Institutions in Financial Inclusion" *FICCI's Banking & Finance Journal*, Issue: 4, October-2010.
- [8] Chakrabarthy K.C (2009), "Financial Inclusion, RBI Initiatives" at National seminar on launching a National initiative for inancial inclusion, DFS GoI.
- [9] *Financial Inclusion by Sameer Kochhar, R. Chandras.*
- [10] News Papers – Business Line, and The Times of India. Websites
 - i. www.borjournals.com
 - ii. Econ.worldbank.org
 - iii. <http://www.rbi.org.in>
- [11] Press Information Bureau, Government of India 28th August,2021 [https:// pib.gov.in/ Press Release Detail.aspx?PRID=1749749](https://pib.gov.in/PressReleaseDetail.aspx?PRID=1749749)

A STUDY TO UNDERSTAND AUDIENCE PROSPECTIVE ABOUT OTT PLATFORMS AND INDIAN CINEMA'S FUTURE**¹Ashutosh Sharma and ²Sakshi Tomar**¹Asst. Professor, I.T.S School of Management, Ghaziabad and²Student of PGDM, IMT, Ghaziabad**ABSTRACT**

This study aims to know the viewers perception and experience about the different available OTT (Over the Top) platforms. Another objective of this study is to point-out the features/parameters that influence the OTT video streaming and the effect of cost element on user subscription for OTT video streaming. To have a real picture an online survey is conducted in which 126 viewers participated and gave satisfactory responses to the questions asked. Survey also revealed the future of Indian cinema industry. As Indian entertainment industry plays an important role in economy and still has a huge scope to play a major role in Indian GDP. India secures 4th rank in "ICT Services exports". India's Media & Entertainment industry is expected to grow to \$(55-70) Bn by 2030 at (10-12)% CAGR, led by OTT, Gaming, Animation and VFX. The growth is being driven primarily by consumers' ever-increasing hunger for streaming video over the internet, now amplified by the migration of more broadcast and cable TV onto direct-to-consumer over-the-top (OTT) internet delivery networks. Therefore this study is being conducted to know about the parameters, based on which OTT service providers may provide better content & services according to the viewer's requirement. To study the data Excel & SPSS software have been used for analysis purposes. Study concludes that 47% audience prefer a OTT platform because of its content.

Keywords: OTT video streaming, Direct to consumer, Future of Indian Cinema, SPSS (Statistical Package for Social Sciences), CAGR (Compound Annual Growth Rate), VFX (Visual Effects), ICT (Information & Communication Technology)

1. INTRODUCTION

Gone are the days when people used to wait for their favourite movie/TV show to come on Cinema Hall/Television and watch it; the advent of OTT platforms has changed the way people got their entertainment on screen. Now people don't wait for hours to watch their favourite movie or keep patience when an ad is coming but watch whatever they want to watch on OTT. The growth of OTT platforms in India has been incredible over the past few years. Original premium content is one of the biggest growth drivers and differentiators as OTT platforms compete for consumers' attention. Industry players are investing heavily to developing content and services, as well as to improve customer experiences. The video OTT market was valued at INR 249.09 Bn in FY 2022 and is expected to reach INR 581.21 Bn by FY 2027, expanding at a CAGR of ~16.58% during the FY 2023 - FY 2027 period.

The growth of the OTT industry, which makes up 7%-9% of the entertainment industry, is being driven by the low cost of data plans and the rise of short-form content. In FY 2021, OTT platforms invested an estimated INR 55.21 Bn, with Netflix, Amazon Prime Video, and Disney+ Hotstar leading the pack with a combined expenditure of INR 31.55 Bn.

Covid 19 has generated leisure time to families in India. People started to spend more time on online streaming services and get engaged with content on television. Chats on different platforms, video calls, web-series and movies turn out to be most favourite choices of people to spend time. OTT platform boomed to get quality content. It has grown as a convenient and easy option for people. It casts quality content with variety of options and without any advertisement. The easy availability of smart-phones has also enabled large part of the population to gain access to online platforms. This point made lot of people from urban area to subscribe the OTT platform. 500 million smart-phone users exist currently in India.

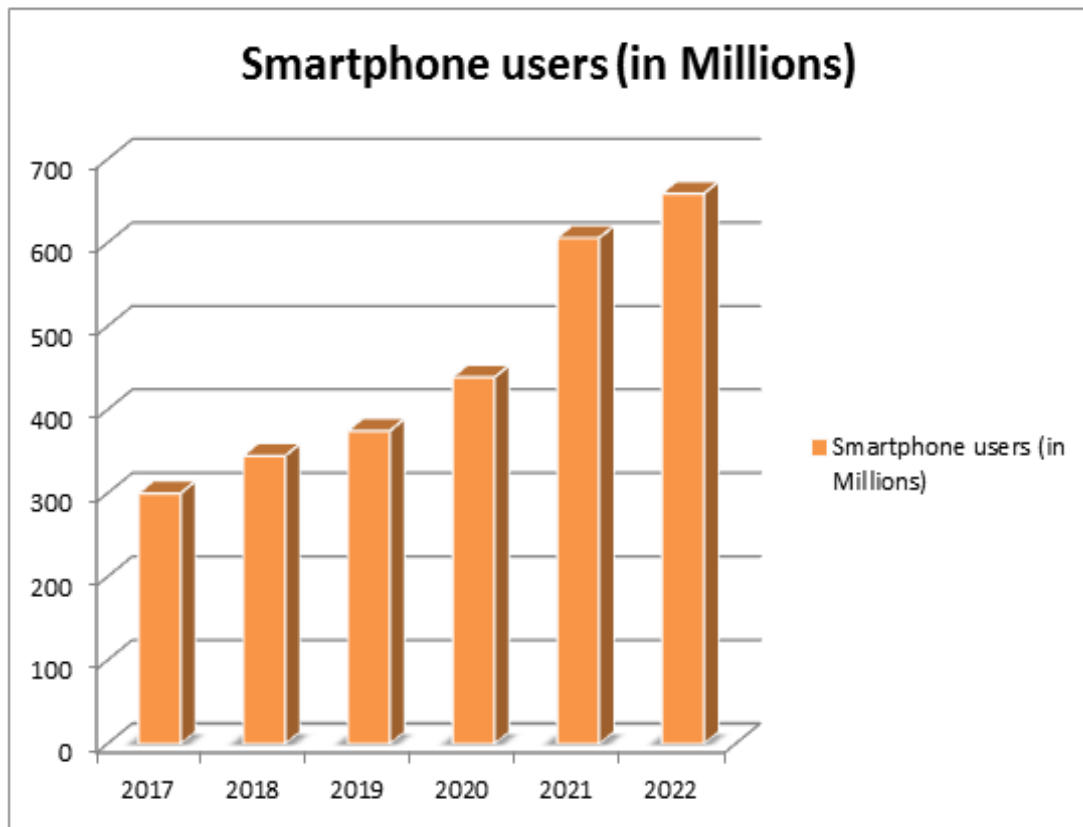


Figure-1

The growth is being driven primarily by consumers’ ever-increasing hunger for streaming video over the internet, now amplified by the migration of more broadcast and cable TV onto direct-to-consumer over-the-top (OTT) internet delivery networks. Through data, it is predicted for the huge demand in Asia market expected to account for 51% of video streaming by 2024. Though the market capture is very high, however it is a challenge for content delivery due to limited mobile networks.

Yearwise Smartphone users in India		
Year	Smartphone users (in Millions)	Expected Users
2017	300	265.3485714
2018	345	340.8171429
2019	375	416.2857143
2020	439	491.7542857
2021	606	567.2228571
2022	659	642.6914286
2023		718.16
2024		793.6285714
2025		869.0971429
2026		944.5657143
2027		1020.034286

Table-1

Regression Line of Expected Number of Smartphone users in India by FY-2027

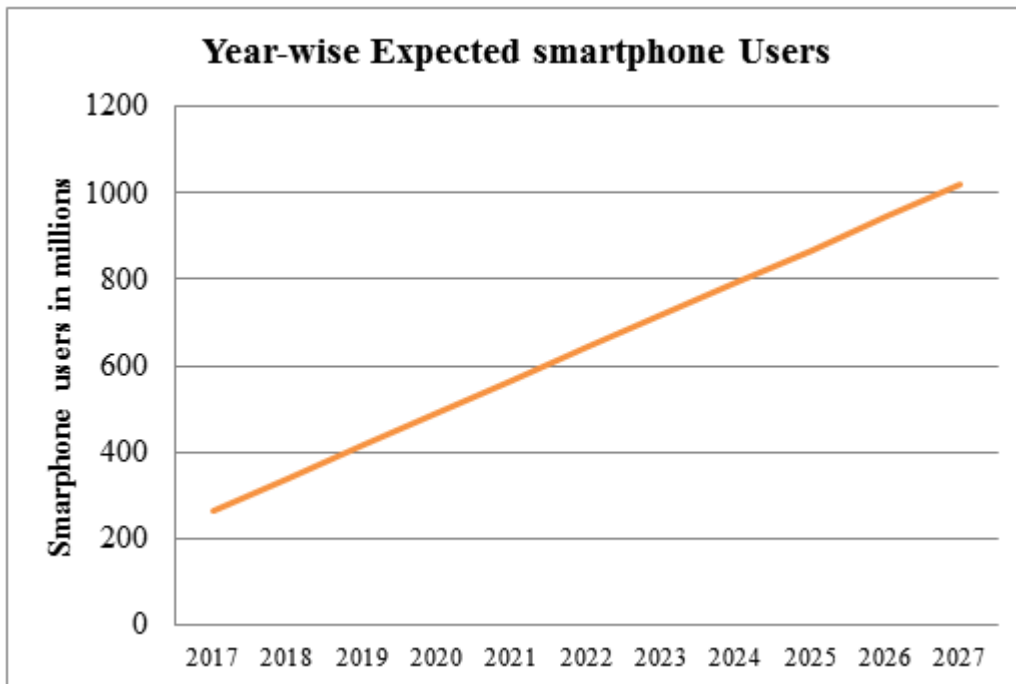


Figure-2

2. LITERATURE REVIEW

COVID-19 has forced the people to make maximum usage of Internet as the concept of work from home get prominent. Moreover, the availability of Internet in economical rate made the generation from a small kid to the old fellow to subscribe the internet packages along with OTT platform packages. Technological innovation has made the development of OTT platform great in India. Under OTT platform, You-tube has grabbed the consumer attention from 2005 & Netflix from 2016 whereas, current situation formed many more such as Amazon, Hot star, ALT Balaji, Voot, Sonyliv, Zee5, and many more. The international content exposure made the Netflix more attractive in the OTT options. Netflix is also reflected as an initiator in India in OTT platform. The international options on contents made the public to deal with greater choice with an ease which enhance the popularity of Netflix in the public. Though India, is far behind in comparison with other countries, but the future of viewing entertainment is changing rapidly (Moochhala, 2018). With increase in technological innovation by Reliance GIO & other telecom competitors', growth in availability of 4G, 5G network with unlimited data generated the online services more affordable and accessible.

Television industry has great transformation as Government controlled Door darshan channel over 800 channels in 2018. Star TV initiated first to launch its services in India in 1991. It come out with five television channels as Star Plus, Prime Sports, BBC World, Star Movies, Channel V. With this initiative other channels like Zee TV, a General Entertainment channel, founded by local entrepreneur Subhash Chandra Goel entered the market in 1992 (Thomas and Kumar, 2003). By mid-1990, 70 satellite and cable channels started in India. Global broadcasters like BBC, Discovery, M TV, Sony, STAR entered the market besides local players (Thussu, 1999). By 2018, Indian television boasts of 866 channels with 60% of its revenue being funded from advertisers (Katharina et al., 2019). The first Indian web-series Permanent Roommates (2014) produced by TVF on the YouTube. The series tackles issues of live-in relationships and premarital pregnancy, both of which are common for the urban middle-class audiences and would not find airing time on television for reasons discussed earlier. The content on the Internet has also received favourable response from Indian millennial who find resonance with its 'relatable' content as opposed to television (Kay, 2018). People fall in love with web-series as they watch on real characteristics and incidences around them on screen. Apart from this without any delay, spectators are allowed to finish it in one go with enthusiasm.

COVID has impacted on the closure of multiplexes which is a major part of urban population who lives a hustle & bustle life. Though OTT is not a potent and significant option for Movie audience as a larger screen, Dolby digital sound etc. (Karim 2020), but OTT platform during lockdown played a key role as stress burster in the lives of working population. Not only working population but it emerged as an anxiety reliever for all age groups who are forced to remain in their homes for months. The various services offered by OTT platform like

convenience, preference, flexibility, and cost-benefit affect TV providers (Rono and Mugeni, 2019). Die-hard OTT subscribers avoids TV broadcasting. Nonusers of OTT platform also perceives online video platform as a substitute for TV (Cha and Chan-Olmsted 2012). This booming OTT platform rather has no contribution to government’s tax revenue and even no advantage to the income of access providers (Sujata et al., 2015). With technological evolution and internet progression, soon TV may be obsolete for the upcoming generations. The lockdown because of COVID-19 has been a blessing for OTT players and subscriptions for OTT platforms such as Zee5 and AltBalaji have grown tremendously (Kaushal, 2020).

The revolution in telecom industry, easy availability of mobile handsets in economy rates, 4G, 5G revolution, etc. factors have tremendously enhanced the OTT mobile users. The pricing model for mobile content is also an influential factor to increase the number drastically in OTT mobile users. In upcoming days, it will become a part of day-to-day leisure time of life and slowly as a need. OTT will be the future of entertainment. India is the second largest and fastest growing market for smart phones.

3. RESEARCH OBJECTIVES

1. To study the preferences of customers among the available various OTT network service providers.
2. To understand customer’s perception from OTT network service providers.
3. To know customer’s views about the future of Indian Cinema.

4. HYPOTHESIS

1. There is no significant association between age of the customer and number of hours spent on OTT platforms
2. There is no significant association between Educational qualification of the customer and device used to watch OTT content.
3. There is no significant association between OTT App and reason to choose that app for OTT.

5. METHODOLOGY

Data Source/Location	Data type – Primary/Secondary	Analytical Tools
Fresh data is collected from 126 respondents living in NCR through an online questionnaire.	Primary and Secondary (both)	Excel to draw Table & charts, whereas SPSS is used to test the association between nominal variables by Crosstab & Chi-square test.

6. DATA ANALYSIS

Age * Hours_per_day_spent_on_an_average_on_OTT_platform Crosstabulation							
		Hours_per_day_spent_on_an_average_on_OTT_platform					
		0 to 1 hour	1 - 2 hours	2 - 3 hours	More than 3 hours	Total	
Age	15 - 20	Count	2	3	2	0	7
		% within Age	28.6%	42.9%	28.6%	.0%	100.0%
		% within Hours_per_day_spent_on_an_average_on_OTT_platform	4.2%	5.8%	12.5%	.0%	5.5%
		% of Total	1.6%	2.4%	1.6%	.0%	5.5%
	20 - 25	Count	32	34	6	5	77
		% within Age	41.6%	44.2%	7.8%	6.5%	100.0%
		% within Hours_per_day_spent_on_an_average_on_OTT_platform	66.7%	65.4%	37.5%	45.5%	60.6%
		% of Total	25.2%	26.8%	4.7%	3.9%	60.6%

25 - 30	Count	11	8	7	1	27
	% within Age	40.7%	29.6%	25.9%	3.7%	100.0%
	% within Hours_per_day_spent_on_an_average_on_OTT_platform	22.9%	15.4%	43.8%	9.1%	21.3%
	% of Total	8.7%	6.3%	5.5%	.8%	21.3%
30 - 35	Count	0	2	0	2	4
	% within Age	.0%	50.0%	.0%	50.0%	100.0%
	% within Hours_per_day_spent_on_an_average_on_OTT_platform	.0%	3.8%	.0%	18.2%	3.1%
	% of Total	.0%	1.6%	.0%	1.6%	3.1%
35 - 40	Count	1	1	0	0	2
	% within Age	50.0%	50.0%	.0%	.0%	100.0%
	% within Hours_per_day_spent_on_an_average_on_OTT_platform	2.1%	1.9%	.0%	.0%	1.6%
	% of Total	.8%	.8%	.0%	.0%	1.6%
40 - 45	Count	0	2	0	1	3
	% within Age	.0%	66.7%	.0%	33.3%	100.0%
	% within Hours_per_day_spent_on_an_average_on_OTT_platform	.0%	3.8%	.0%	9.1%	2.4%
	% of Total	.0%	1.6%	.0%	.8%	2.4%
45 - 50	Count	0	2	1	1	4
	% within Age	.0%	50.0%	25.0%	25.0%	100.0%
	% within Hours_per_day_spent_on_an_average_on_OTT_platform	.0%	3.8%	6.2%	9.1%	3.1%
	% of Total	.0%	1.6%	.8%	.8%	3.1%
50 - 55	Count	2	0	0	0	2
	% within Age	100.0%	.0%	.0%	.0%	100.0%
	% within Hours_per_day_spent_on_an_average_on_OTT_platform	4.2%	.0%	.0%	.0%	1.6%
	% of Total	1.6%	.0%	.0%	.0%	1.6%
55 - 60	Count	0	0	0	1	1
	% within Age	.0%	.0%	.0%	100.0%	100.0%

		% within Hours_per_day_spent_on_an_ave rage_on_OTT_pl atform	.0%	.0%	.0%	9.1%	.8%
		% of Total	.0%	.0%	.0%	.8%	.8%
Total		Count	48	52	16	11	127
		% within Age	37.8%	40.9%	12.6%	8.7%	100.0%
		% within Hours_per_day_spent_on_an_ave rage_on_OTT_pl atform	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	37.8%	40.9%	12.6%	8.7%	100.0%

Table-2

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	41.766 ^a	24	.014
Likelihood Ratio	36.363	24	.051
N of Valid Cases	127		

a. 30 cells (83.3%) have expected count less than 5. The minimum expected count is .09.

Table-3

Educational_qualification * Device_used_to_watch_OTT_platform Crosstabulation							
			Device_used_to_watch_OTT_platform				Total
			Laptop/Co mputer	Mobile	Others	Smart TV	
Education	Others	Count	0	1	1	1	3
		% within Educational_qualific ation	.0%	33.3%	33.3%	33.3%	100.0%
		% within Device_used_to_watc h_OTT_platform	.0%	1.4%	33.3%	4.2%	2.4%
		% of Total	.0%	.8%	.8%	.8%	2.4%
	Post Graduate	Count	19	52	2	15	88
		% within Educational_qualific ation	21.6%	59.1%	2.3%	17.0%	100.0%
		% within Device_used_to_watc h_OTT_platform	67.9%	72.2%	66.7%	62.5%	69.3%
		% of Total	15.0%	40.9%	1.6%	11.8%	69.3%
	Under graduate	Count	9	19	0	8	36
		% within Educational_qualific ation	25.0%	52.8%	.0%	22.2%	100.0%

		% within Device used to watch OTT platform	32.1%	26.4%	.0%	33.3%	28.3%
		% of Total	7.1%	15.0%	.0%	6.3%	28.3%
Total		Count	28	72	3	24	127
		% within Educational qualification	22.0%	56.7%	2.4%	18.9%	100.0%
		% within Device used to watch OTT platform	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	22.0%	56.7%	2.4%	18.9%	100.0%

Table-4

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.024 ^a	6	.020
Likelihood Ratio	7.767	6	.256
N of Valid Cases	127		

a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is .07.

Table-5

App preferred to watch OTT platform * Reason for preferring the App Cross tabulation											
App preferred to watch OTT platform		Reason for preferring the App									
		Content	Easy to Operate	Live Streaming	Movies	Others	Reasonable price	Sports	Subscription	TV Serials	Total
Amazon Prime	Count	13	2	0	10	0	0	1	4	0	30
	% within App preferred to watch OTT platform	43.3%	6.7%	.0%	33.3%	.0%	.0%	3.3%	13.3%	.0%	100.0%
	% within Reason for preferring the App	24.5%	25.0%	.0%	29.4%	.0%	.0%	14.3%	50.0%	.0%	23.6%
	% of Total	10.2%	1.6%	.0%	7.9%	.0%	.0%	.8%	3.1%	.0%	23.6%
Discovery+	Count	0	1	0	0	0	0	0	0	0	1
	% within App preferred to watch OTT platform	.0%	100.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%
	% within Reason for preferring the App	.0%	12.5%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.8%
	% of Total	.0%	.8%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.8%
Hotstar	Count	3	2	0	7	0	2	6	2	3	25
	% within App preferred to watch OTT platform	12.0%	8.0%	.0%	28.0%	.0%	8.0%	24.0%	8.0%	12.0%	100.0%
	% within Reason for preferring the App	5.7%	25.0%	.0%	20.6%	.0%	33.3%	85.7%	25.0%	50.0%	19.7%
	% of Total	2.4%	1.6%	.0%	5.5%	.0%	1.6%	4.7%	1.6%	2.4%	19.7%
Jio-Cinema	Count	0	0	1	0	0	0	0	0	0	1
	% within App preferred to watch OTT platform	.0%	.0%	100.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%
	% within Reason for preferring the App	.0%	.0%	50.0%	.0%	.0%	.0%	.0%	.0%	.0%	.8%
	% of Total	.0%	.0%	.8%	.0%	.0%	.0%	.0%	.0%	.0%	.8%
MX Player	Count	1	0	0	3	0	0	0	0	0	4
	% within App preferred to watch OTT platform	25.0%	.0%	.0%	75.0%	.0%	.0%	.0%	.0%	.0%	100.0%
	% within Reason for preferring the App	1.9%	.0%	.0%	8.8%	.0%	.0%	.0%	.0%	.0%	3.1%
	% of Total	.8%	.0%	.0%	2.4%	.0%	.0%	.0%	.0%	.0%	3.1%
Netflix	Count	36	2	0	14	1	3	0	2	1	59

	% within App preferred to watch OTT platform	61.0%	3.4%	.0%	23.7%	1.7%	5.1%	.0%	3.4%	1.7%	100.0%
	% within Reason for preferring the App	67.9%	25.0%	.0%	41.2%	33.3%	50.0%	.0%	25.0%	16.7%	46.5%
	% of Total	28.3%	1.6%	.0%	11.0%	.8%	2.4%	.0%	1.6%	.8%	46.5%
Others	Count	0	1	0	0	2	1	0	0	0	4
	% within App preferred to watch OTT platform	.0%	25.0%	.0%	.0%	50.0%	25.0%	.0%	.0%	.0%	100.0%
	% within Reason for preferring the App	.0%	12.5%	.0%	.0%	66.7%	16.7%	.0%	.0%	.0%	3.1%
	% of Total	.0%	.8%	.0%	.0%	1.6%	.8%	.0%	.0%	.0%	3.1%
ULLU	Count	0	0	1	0	0	0	0	0	0	1
	% within App preferred to watch OTT platform	.0%	.0%	100.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%
	% within Reason for preferring the App	.0%	.0%	50.0%	.0%	.0%	.0%	.0%	.0%	.0%	.8%
	% of Total	.0%	.0%	.8%	.0%	.0%	.0%	.0%	.0%	.0%	.8%
Zee5	Count	0	0	0	0	0	0	0	0	2	2
	% within App preferred to watch OTT platform	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%	100.0%
	% within Reason for preferring the App	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	33.3%	1.6%
	% of Total	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	1.6%	1.6%
Total	Count	53	8	2	34	3	6	7	8	6	127
	% within App preferred to watch OTT platform	41.7%	6.3%	1.6%	26.8%	2.4%	4.7%	5.5%	6.3%	4.7%	100.0%
	% within Reason for preferring the App	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	41.7%	6.3%	1.6%	26.8%	2.4%	4.7%	5.5%	6.3%	4.7%	100.0%

Table-6

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	277.842 ^a	64	.000
Likelihood Ratio	105.539	64	.001
N of Valid Cases	127		

a. 75 cells (92.6%) have expected count less than 5. The minimum expected count is .02.

Table-7

10. Due to OTT platform cinema halls are going to be finished in future. What is your opinion about this statement?

126 responses

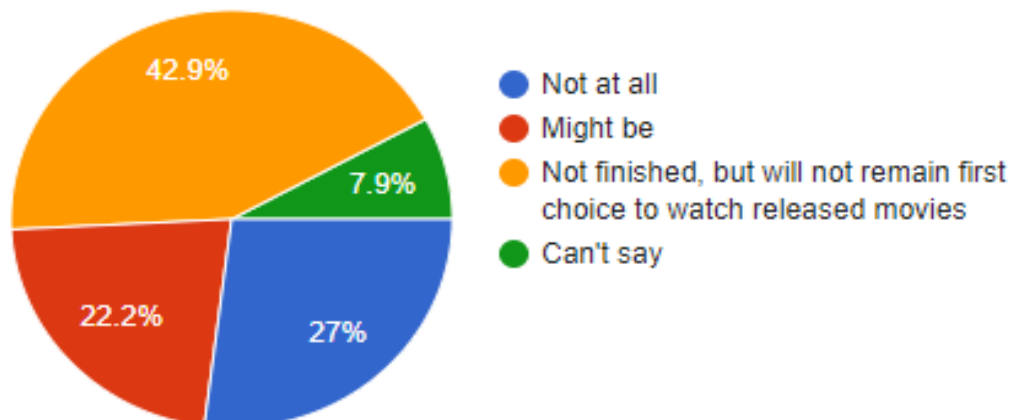


Figure - 3

7. INTERPRETATION

- i) Table-2 shows the cross-tabulation between age and number of hours spend/day to watch OTT content. As in Table-3 Chi-square statistics is significant at 5% level of significance. From the analysis it is being revealed that age group (20-25 years old) audience watches the OTT content the most and therefore OTT platform providers should focus on audience in this age group more to provide them appropriate content. And hence our test is significant.
- ii) Table-4 shows the cross-tabulation between educational qualification and device to watch OTT content. As in Table-5 Chi-square statistics is significant at 5% level of significance. From the analysis it is being revealed that most of the postgraduate audience watches the OTT content on their mobile phones and therefore to watch OTT content there is an association between education and device used to watch OTT content. And hence our test is significant.
- iii) Table-6 shows the cross-tabulation between Preferred App and reason to choose app for OTT network. As in Table-7 Chi-square statistics is significant at 5% level of significance. From the analysis we can conclude that there is high level of association between Preferred App and reason to choose app for OTT network. And hence our test is significant.
- iv) Figure – 3 shows that 42.9% of the audience think that OTT platform will be first choice to watch new releases but Cinema Hall will also survive. And interestingly said that Cinema Hall industry will not get effected due to OTT platforms.

8. DISCUSSIONS AND RECOMMENDATIONS

In this study we found that OTT is going to first choice to watch TV serials, Short movies, Movies Series, New released movies etc. and the reason behind it is the ease of access. It can bring in the psychological angle in discussion as OTT platform is more inclined to technology that brings luxury to life. The biggest user of mobile phone at the current point of time is this younger generation (20 – 25 years old). So different psychological factors can reflect on the usage of OTT. Future studies can make comparative comparison as well in the generation and their inclination towards the OTT platform. This study is more focused on urban sample, so separate finding may be researched and discussed on rural population and its inclination towards OTT.

9. CONCLUSIONS

The research paper concludes the Movie/Movie series and content richness as significant factors in the usage and promotion of OTT platform. Price sensitivity does not matter that much for individuals. Variety of content makes platform stronger than usual. Life with ease, own comfort, and satisfaction brings the individuals closure to the OTT platform. Programme with own choice, time, location, duration makes possible everything with mobile phones. Mobile phone makes it easy to use this platform. It brings the control of an individual in all respects. The research study also concludes with the demand for Netflix is comparatively greater. Future of Cinema halls is not secure and slightly going downwards day by day. Cinema industry needs to think about the ways by which audience can be attracted to watch new released movies in cinema halls.

10. REFERENCE

1. A Proposed Selection Process in Over-The-Top Project Portfolio Management, Jemy Vestius Confido, Dermawan Wibisono, Yos Sunitiyoso, Journal of Industrial Engineering and Management JIEM, 2018 – 11(3): 371-389 – Online ISSN: 2013-0953 – Print ISSN: 2013-8423 <https://doi.org/10.3926/jiem.2448>
2. Factors influencing the shift from traditional TV to OTT platforms in India, Rohit Jacob Jose, International Journal of Advanced Science and Technology Vol. 29, No. 7s, (2020), pp. 4044-4051
3. Analysing the impact of COVID-19 on over-the-top media platforms in India, Divya Madnani, Semila Fernandes, Nidhi Madnani, <https://www.emerald.com/insight/1742-7371.htm>
4. Why the networks can't beat Netflix: speculations on the US OTT Services Market, Eun-A Park, VOL. 19 NO. 1 2017, pp. 21-39, © Emerald Publishing Limited, ISSN 2398-5038 Digital Policy, Regulation and Governanc, DOI 10.1108/DPRG-08-2016-0041
5. Proliferation of OTT apps in India: an empirical study of OTT apps and its impact on college students, Reshma, Chaitra, IJAR2001475 International Journal of Research and Analytical Reviews (IJRAR) www.ijrar.org, (E-ISSN 2348-1269, P- ISSN 2349-5138)
6. How Digitization Has Created a Golden Age of Music, Movies, Books, and Television, Joel Waldfogel, The Journal of Economic Perspectives, Summer 2017, Vol. 31, No. 3 (Summer 2017), pp. 195-214, American Economic Association, <https://www.jstor.org/stable/44321286>

-
7. Television's role in Indian new screen ecology, Smith Mehta, Smith Mehta, Queensland University of Technology, Digital Media Research Centre, z1-515, Musk Ave, Kelvin Grove, QLD 4059, Australia.
 8. Exploring Performance Determinants of China's Cable Operators and OTT Service Providers in the Era of Digital Convergence—From the Perspective of an Industry Platform, Xing Wan, Javier Cenamor, andJing Chen, *Sustainability* 2017,9,2247; doi:10.3390/ su9122247, www.mdpi.com/journal/sustainability
 9. Television and Globalization: The TV Content Global Value Chain, Jean K. Chalaby, *Journal of Communication* 66 (2016) 35–59 © 2016 International Communication Association
 10. Kohli, D. 2019. "Looking into the future - OTT trends". Retrieved from [https:// yourstory. com/ 2019/ 02/ looking- into-future-top-ott-trends-2019](https://yourstory.com/2019/02/looking-into-future-top-ott-trends-2019).
 11. Sharma, K. 2020, "Will movies releasing directly on OTT platforms become a norm post-Covid? Experts think otherwise". Retrieved from Business insider.
 12. Singh, D. 2020, "How is coronavirus impacting the streaming platforms with an increasing appetite of viewers". Retrieved from Financial express: <https://www.financialexpress.com/brandwagon/how-is-coronavirus-impacting-the-streaming-platforms-with-an-increasing-appetite-of-viewers/1919916>.

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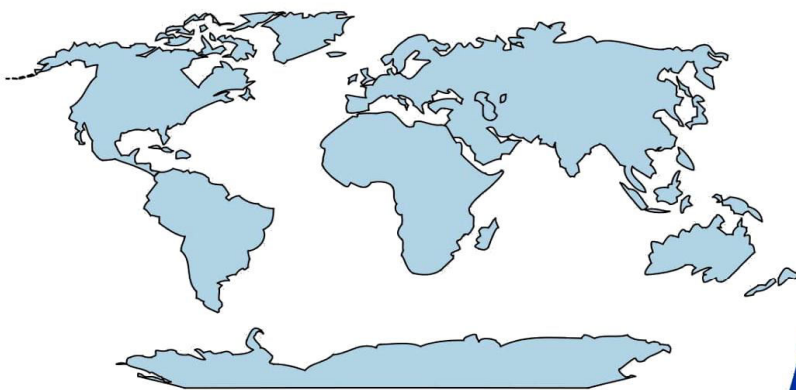
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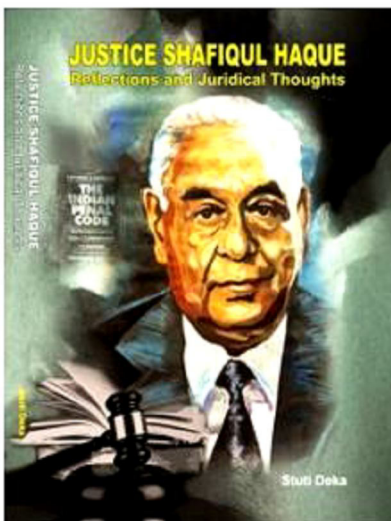


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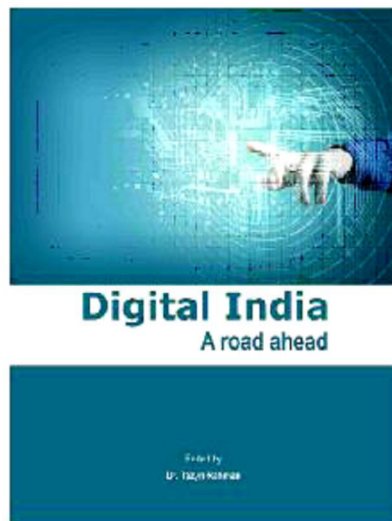
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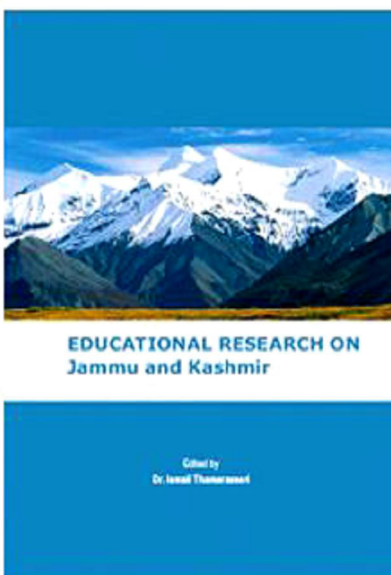
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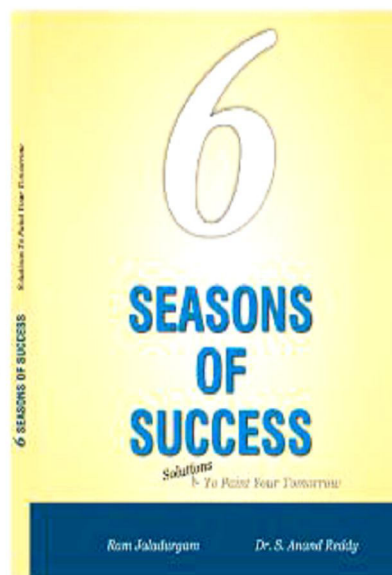
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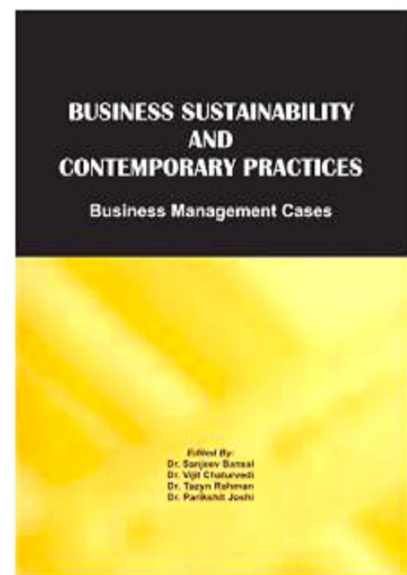
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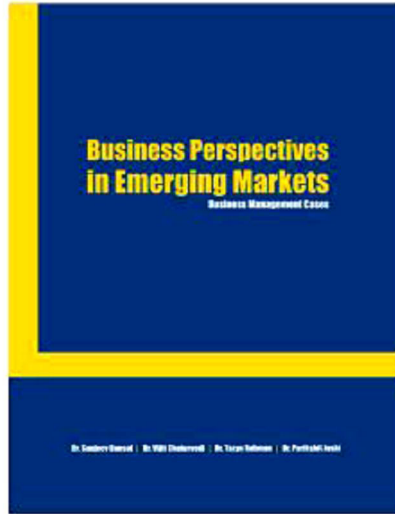
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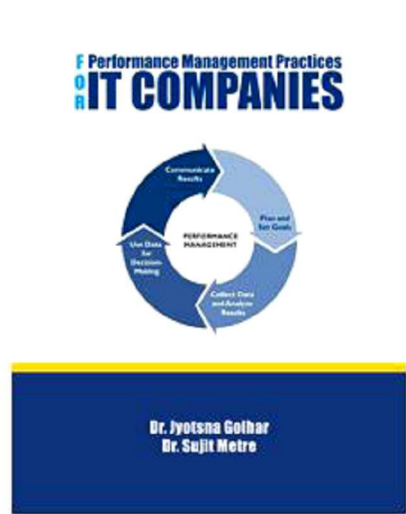
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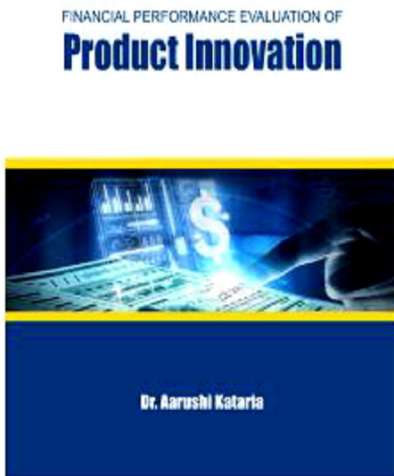
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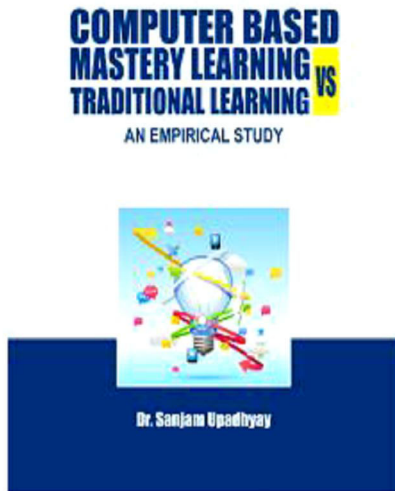
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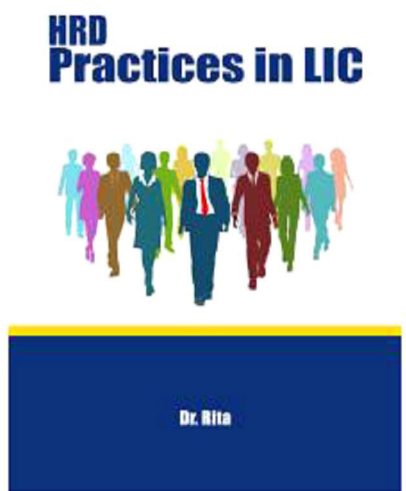
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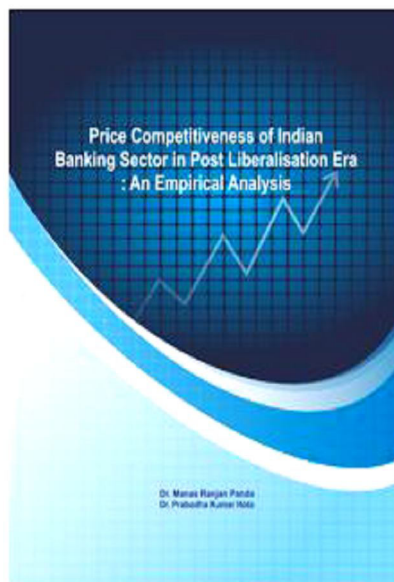
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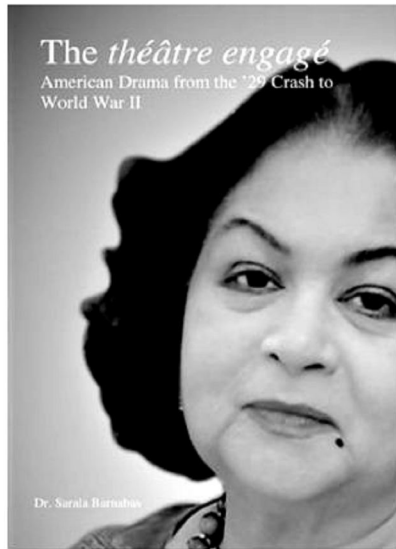


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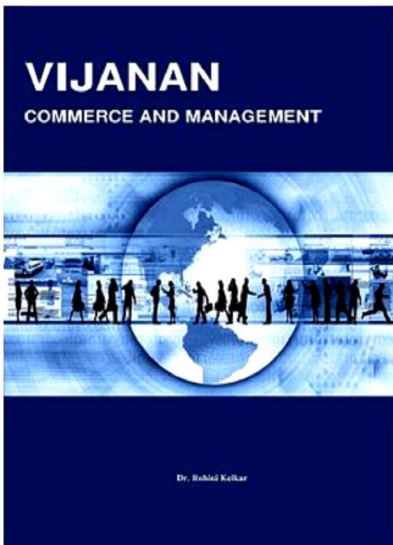
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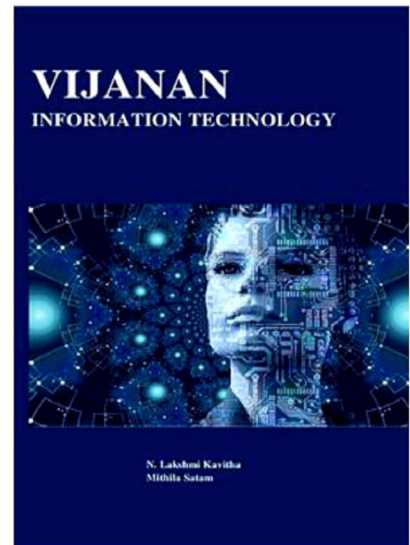
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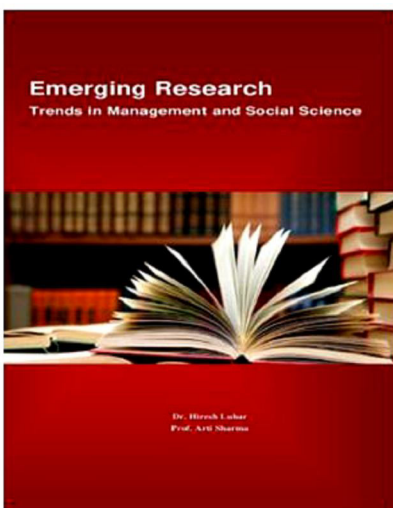
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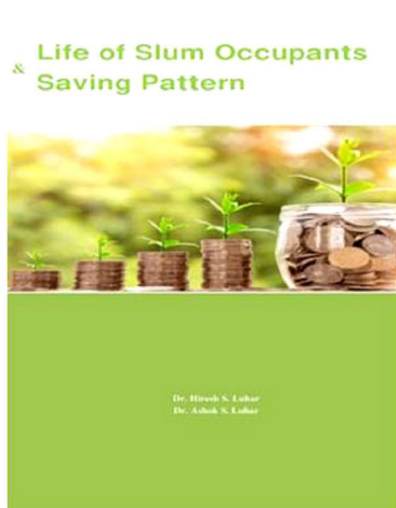
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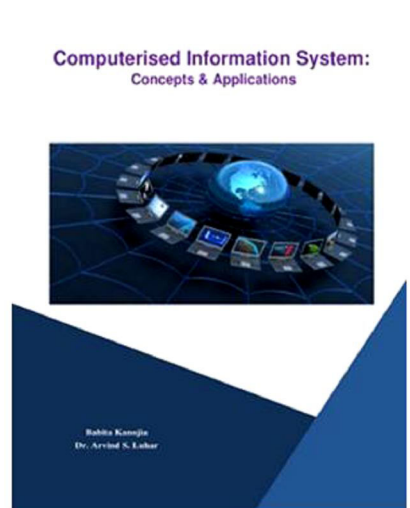
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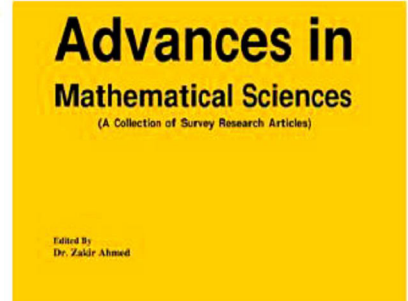
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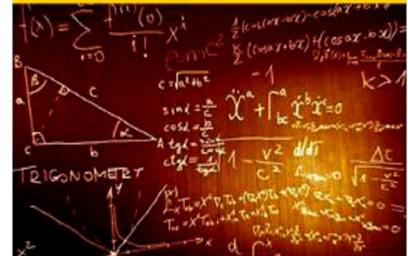
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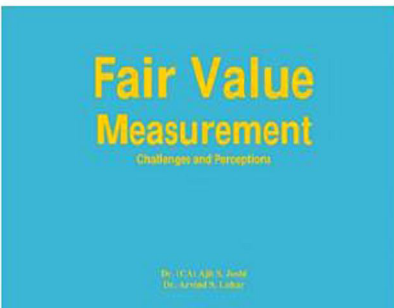
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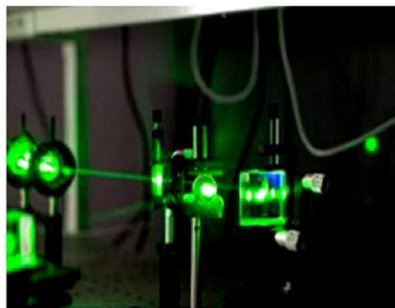
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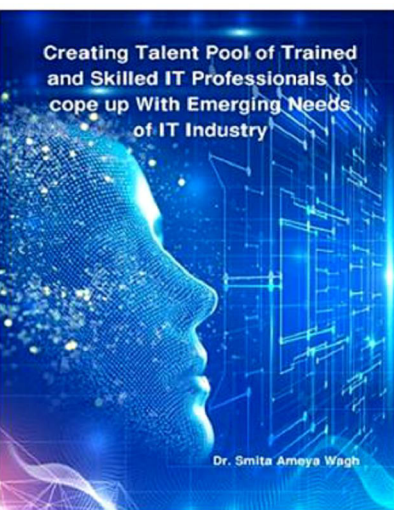


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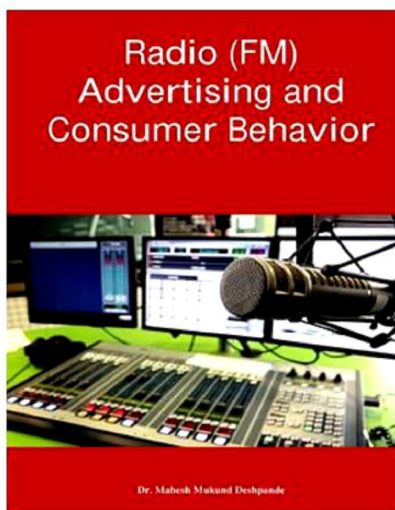
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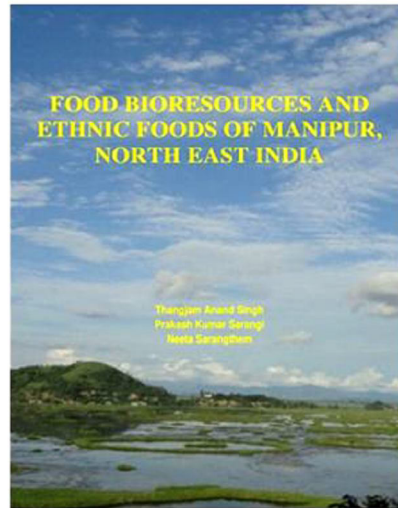
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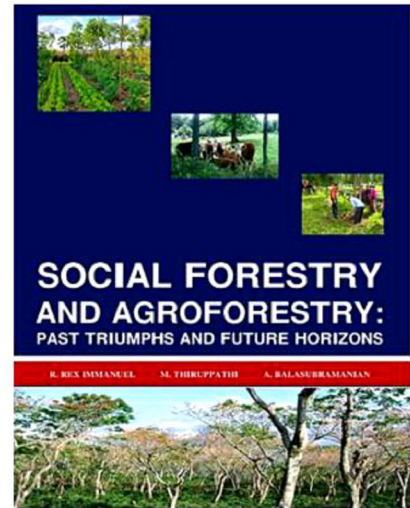
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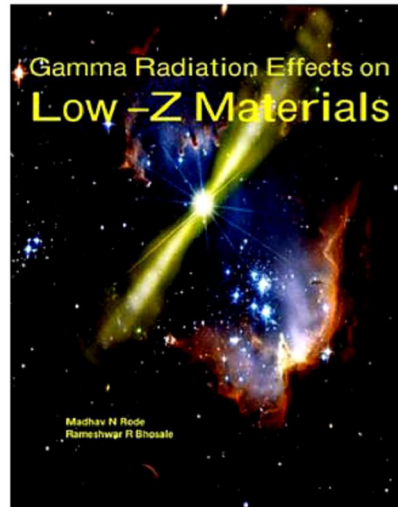
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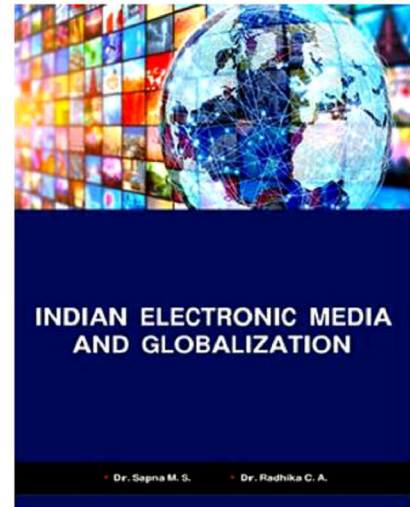
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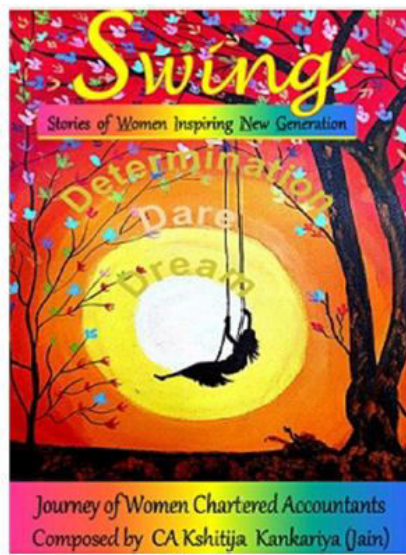
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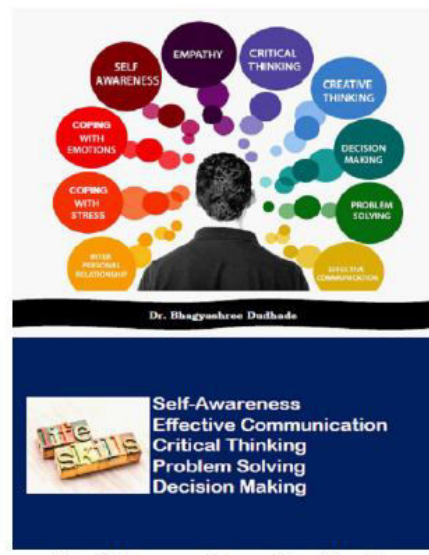


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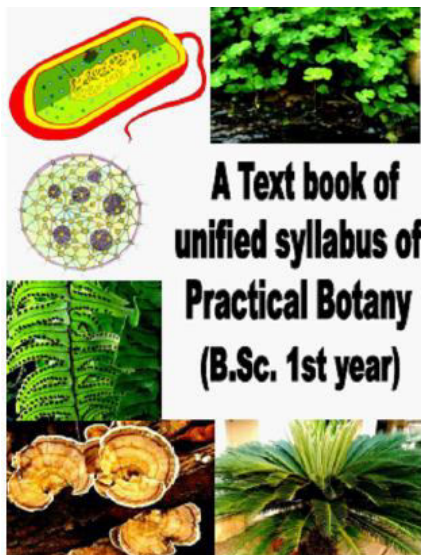
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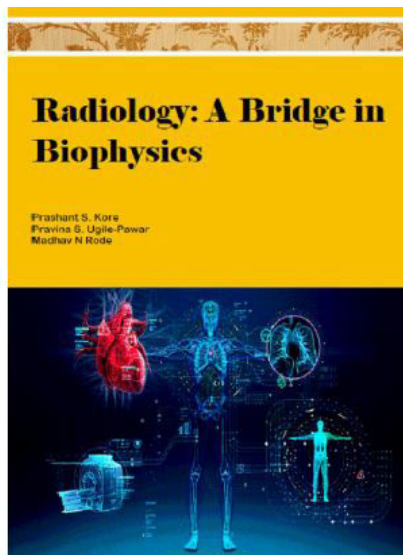
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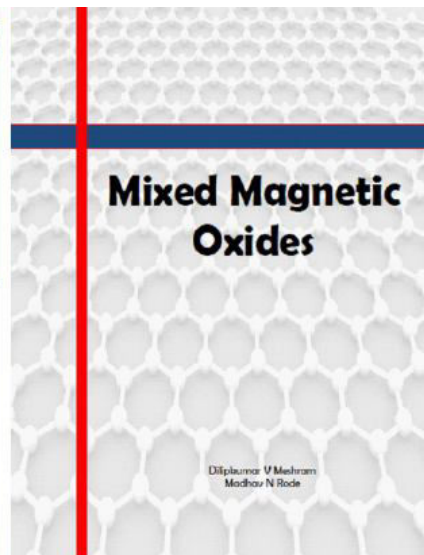
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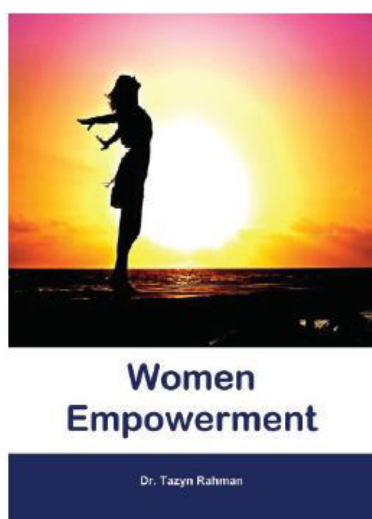
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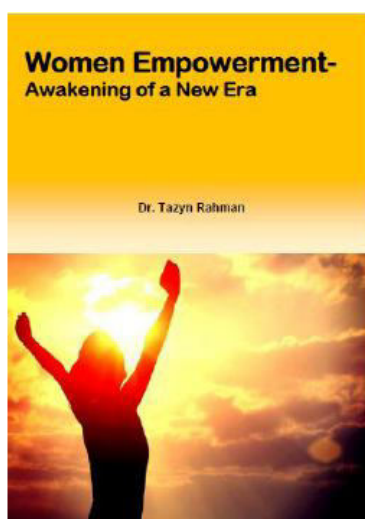


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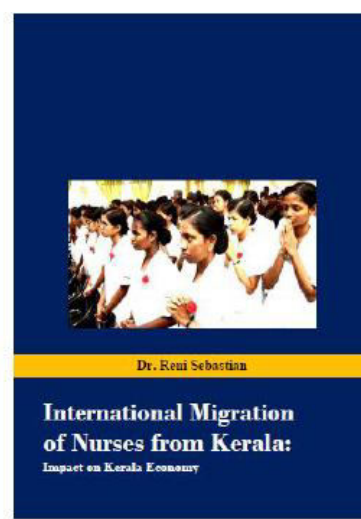
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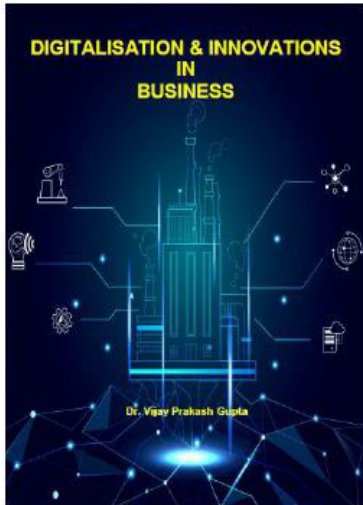
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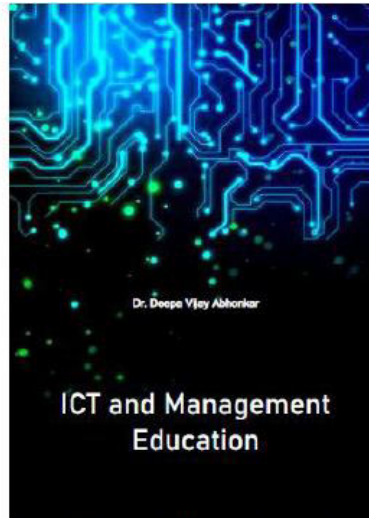
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