International Journal of
Advance and Innovative Research

International Journal of Advance and Innovative Research

Editor- In-Chief   **Dr. Pranjal Sharma**

International Journal of Advance and Innovative Research

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Research Papers

ENVIRONMENT REFUGEE: ANOTHER FORM OF FORCED MIGRATION

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"*Environment degradation, overpopulation, refugees, narcotics, terrorism, world crime movements, and organized crime are worldwide problems that don't stop at a nation's borders*"- *Christopher Warren.*

The term 'Environment refugee' though first coined by Lester Brown of the 'World watch Institute in the year 1970s, the term was popularized byEssam El-Hinnawi,in the year 1985. El-Hinnawi defined Environmental Refugees to be those who have been forced to leave their traditional habitat, temporarily or permanently, because of a marked environmental disruption that jeopardized their existence, and/or seriously affected the quality of their life. It is estimated that there are currently about 10 million environmental refugees world over. Environmental migrants may flee to or migrate to another country or they may migrate internally within their own country. However, the term 'environmental migrant' is used somewhat interchangeably with a range of similar terms, such as 'environmental refugee', climate refugee', climate migrant' although the distinction between the term is contested. Environmental refugees are therefore, people who can no longer gain a secure and safety livelihood in their homelands because of soil erosion, desertification, deforestation, drought and profound poverty. They have taken it that they have no other alternative but to seek sanctuary somewhere else, however, hazardous the attempt. Though all of them have not fled their country and many being internally displaced, all have given up their homelands on a semi-permanent if not permanent basis, with faint hope of a foreseeable return. International Refugee legislation though does not recognize the term refugee, under the United Nations Convention Relating to the Status of the Refugees of 1951, a refugee is more narrowly defined (in Article 1A) as a person who "owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion, is outside the country of his nationality, and is unable to or owing to such fear, is unwilling to avail himself of the protection of that country". The concept of refugees though was expanded by the Convention's 1967 Protocol and by regional conventions in Africa and Latin America to include persons who had fled war or other violence in their home country, in its present state the convention does not provide long-term legal protection to refugees due to environmental change.[1]

The term climate refugees refer to the subset of environmental migrants forced to move "due to sudden or gradual alterations in the natural environment related to at least one of three impacts of climate change: sea-level rise, extreme weather events, and drought and water scarcity."[2] Climate refugees are therefore a very important segment of environmental refugees. They are the people who must leave their homes and communities because of the effects of climate change and global warming.

Therefore, as there is yet to be a universally accepted definition of 'environmental migration ' or 'climate refugee', the International Organization for Migration formulated a working definition which encompasses the complexity of the topic. This working definition of the International Organization for Migration recognizes that Environmental migrants are not only those displaced by the environmental event but also those whose migration is triggered by deteriorating environmental conditions. Environmentally induced movement can take place within as well as across international borders; it can be both long and short term; and Population movements triggered by environmental forces can be forced as well as a matter of choice.[3]

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[1] en.m.wikipedia.org/wiki/Environmental migrant

[2] Global Governance Project, 2012

[3] En.m.wikipedia.org/wiki/Environmental migrant

From a study[4], it is revealed that as of 1995 the numbers of the total environmental refugees was at least 25 million people, compared with 27 million traditional refugees i.e. people fleeing political oppression, religious persecution and ethnic troubles. The total environmental refugees doubled by 2010, since then, although there is no good estimate available of today's total. Moreover, it could increase steadily for a good while thereafter as growing numbers of impoverished people press ever harder on over-loaded environments. When global warming takes hold, there could be as many as 200 million people overtaken by disruptions of monsoon systems and other rainfall regimes, by droughts of unprecedented severity and duration, and by sea-level rise and coastal flooding.[5]The Executive Director of the United Nations Environmental Programme (UNEP) reported that 'as many as 50 million people could become environmental refugees' if the world did not act to support sustainable development.[6]

CLASSIFYING ENVIRONMENTAL REGUGEES.

<u>ENVIRONMENTAL REFUGEE</u>

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FLEEING   DISPLACED   VICTIMS

(DISSERTIFICATION)   (RISE IN SEA LEVEL)   (ENVIRONMENTAL CONFLICTS)
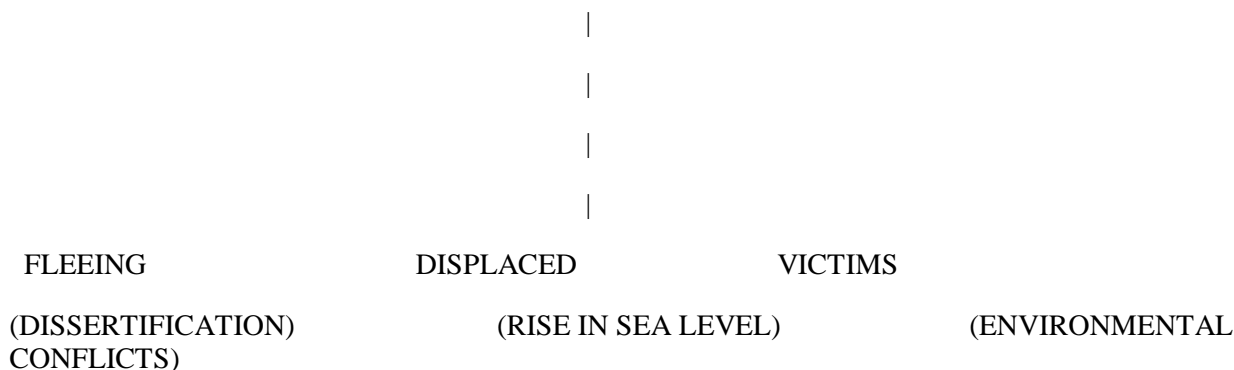
CAUSES OF ENVIRONMENTAL MIGRATIONS

There can be a number of reasons for the deterioration of a specific environment. We may think of natural causes like thunderstorms, volcanic eruptions, earthquakes, global warming, rise in sea level hurricanes, etc. Other causes of deterioration are purely human-induced, for example construction of river dams, nuclear disasters, environmental pollution and biological warfare.

Global Warming: Global warming or temperature rise is the most recent area of climate change. Human activities like burning fossil fuels and cutting down forests contribute to global warming because of releasing of greenhouse gases. This gas traps heat in the atmosphere. Rising temperatures associated with global warming cause glaciers and ice caps to melt. This can cause flooding and make sea levels rise. Temperature rising also lead to droughts and desertification. The effects are rising of sea level which can put land completely underwater, making it completely uninhabitable. Examples are many where a failure to observe principles of good environmental management and sustainable development can be seen to have contributed to the environmental decline that is at the root of displacement. In this context, the most significant argument mooted by Norman Myers for 'environmental refugees' is the predicted effect of human induced climate change and the impact this may have on sea-level

Drought: Drought creates a large number of climate refugees. While rising sea level threatens coastal regions, drought can create climate refugees inland. When because of drought people cannot grow crop in their land they have to shift to alternative places for their survival. People in Western Indian are experiencing the worst drought

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[4]Kurukshetra, Vol.62, Sept.14

[5]Kurukshetra, Vol.62, Sept.14,

[6]Tolba, M.K.(1989), Our Biological heritage under siege. Bioscience 39, 725-728

nearly more than four decades. The middle part of India is facing a water shortage worse than the severe drought in 1972.

Environmental refugees due to armed Conflicts: War creates environmental destruction. It occurs because environmental destruction is itself used as a weapon of war, and most conflicts originate from disputed claims for natural resources and land. The example is the war of Vietnam where the US resorted to the deliberate military tactic of destroying the environment. The countryside was emptied and people were forced to migrate to the urban areas. A massive campaign of deforestation resulting in the use of herbicides and bombardment of agricultural zonessoon followed immediately. Another example is the case of EL Salador in the early 1980s where the destruction of environment was resorted to in order to eradicate guerrilla bases in the forests. The gulf war depicted a case of ecocide, too, where oil fires and spillages by Iraq in Kuwait destroyed the environment.

Environmental refugee due to sea Level Rise: As per the prediction of the Intergovernmental Panel on Climate Change, the sea levels would raise by 7 inches to 2 ft. between 1990 and 2100. Rising sea level has already created a great problem in low lying areas of the world. Sea level rise is particularly high along the coastlines of the Bay of Bengal, the Arabian Sea. A study imply that if future anthropogenic warming effects in the Indo-Pacific warm pool dominate natural variability, mid-ocean islands such as the Marchipelago, coasts of Indonesia, Sumutra, and the north Indian Ocean may experience significantly more sea level rise than the global average. While a number of areas in the Indian Ocean region are experiencing sea level rise, sea level is lowering in other area.[7] A study conducted in the Basirhat range of forest in Sunder ban of West Bengal by the world Bank found that the rivers on upper Bidya and Raimangal-Pathankhali and Jhila- should have been at least 340 and 420 meters wider respectively to withstand the impact of sea level rise, th ehuman habitat on the islands like Gosaba and animal habitats in the forests of Jhila, Arbesi and Khatuajhuri are being threatened.

Environmental Refugees due to Industrial Accidents: There are a number of instances of industrial accidents causing large numbers of persons to be displaced. The infamous Bhopal Gas Tragedy witnessed a chemical accident that kill over more than 1000 people and displaced over 2000,000 people is still fresh in our mind. The people there still suffer under the after effects.   The Chernobyl incident witnessed the evacuation of thousands of people by the Russian Government. The effect of the accident is such a magnitude that till date, a thirty-mile radius around Chernobyl remains uninhabited. Radiation contamination, possessing a half-life of about more than 25,000 years assures contamination forever. Most cases of displacement of individuals out of industrial disaster depict instances of seeking refuge within the borders of the country itself.

In rural India the shortage of food, water and other resources along with the assorting climatic conditions are the reasons for forced migration. India has already witnessed the impact of climate change and would witness in the coming days severe stress on water resources and food grain production. As seen in the some parts of the country especially in the middle part that some heat sensitive species of wheat and rice had failed in yielding at a high level and apprehension that in future they may not even grow.

In India there is a great concern about the environmental migrants. A study[8] revealed that India would have around 30 million environmental migrants within the next 50 years. The study also revealed that the current illegal influx from Bangladesh would   also increase subsequently. In future decades around 15 million persons in China would be required to leave their local area because of the rising sea levels, erosion and scarce soil fertility due to climate change. The average temperature in India, the study puts would increase by 3 to 5 degree Celsius by 2100.

Absence of Legal Policy: As the country lacks a national legal policy for asylum, UNHCR conducts registration and refugee status determination, mostly for arrivals from the neighboring countries. More than 24000 refugees and asylum seekers of diverse origins are protected and assisted by their office in India. It is true that India has not ratified the United Convention of 1951 and the Protocol of 1967but it has signatory to various Human Rights

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[7]Kurukshetra, Septmber, 2014, Vol.62 p.12

[8]Study undertaken by Dr.Hefin Jones of Cardiff University.

treaties and conventions that contain provisions relating to protection of refugees. As a signatory to the different treaties and conventions, it has legal obligation to protect the human rights of refugees by taking appropriate legislative and administrative measures under article 51 (C) and article 253.India is a Member of the Executive Committee of the office of the United Nations High Commissioner for Refugees which put a moral, if not legal obligation on it to work with partnership with the UNHCR. On the other hand, the environmental refugees in order to claim refugee status must put forward some genuine claim with some documents which must prove that there is a ground of persecution or fear thereof resulting in migration from one country to another. Fear may be immediate or there is an apprehension of fear in future if they return to their homeland. Production of evidence would be at least a ground of evidence of a claim of involvement with particular groups and would also serve to prove the claimant's identity. To establish the fear of persecution, the term 'fear' is not be judged on the basis of the emotional reaction of the claimant. Instead, 'fear' must be employed to mandate a forward looking assessment of risk. Hence not only persons who had already suffered persecution in their country of origin, also those persons with prospective risk of persecution in the event of return to their country of origin would be able to claim the status of refugee. The crux of determination or refugee status is the thorough scrutiny of the claimant's own evidence provided orally or in a documentary form. It will be better if the authorities' adjudging the cases gives a patient hearing to the problems of the claimants

In the matter redressal of immediate basic problems like food, shelter and provision for legal aid etc., the United Nations High Commissioner for Refugees plays a major role by providing where ever necessary in deserving cases, 'subsistence allowance' to the destitute refugees and dependents. The UNHCR also helps the refugees provide legal aid where ever necessary through a lawyer familiar with conducting refugee maters to help mitigate the problems of the refugee. In case of deportation of the refugees, the UNHCR officials attempt to prevail over the Central government to stall deportation proceedings, pending United Nations High Commissioners attempt at resettlement of the refugee in a safe country.

INDIAN CONSTITUTIONAL PROVISIONS RELATING TO THE RIGHTS OF THE REFUGEES

With regard to the rights of the refugees and the environmental refugees in India, though India has not signed any UN Convention, it has acceded to the 1966 Convention of Civil and Political rights and Economic, social and Cultural Rights.[9] The Indian Constitution guarantees certain fundamental right which was available to citizens as well as aliens. Article 14 and Article 21 of the Constitution are the two important rights whichhelp the refugee to claim their rights in the country of stay. The liberal interpretation of Article 21 now includes right against solitary confinement, right against custodial violence, right to medical assistance, right to legal aid and shelter. The Supreme Court of India in the absence of any specific legislation has many a time taken recourse to Article 21 to regulate and justify the stay of refugees in India.Furthermore, there is also a provision in the categoryof Directive Principles of State Policy which encourages the state to endeavor to promote peace and security and foster respect to International law and treaty obligations as well.[10]The Supreme Court in the case of *NHRC vs. State of Arunachal Pradesh*[11]directed the Arunachal Pradesh government to perform the duty of safeguarding the life, health and well-being of the Chakma's residing in the State and that there application for citizenship should be forwarded to the authorities concerned and not withheld. In this case it was held that refugees should not be subjected to detention or deportation and that they are entitled to approach the U.N.High Commissioner for grant of refugee status.

Kiribati Asylum Case is a landmark case relating to the problem of environment refugee wherein a family of eight from Kiribati awaits for a decision on their fate as New Ze land's first climate change refugees. The fact of the case that 37 year old IaoneTeitiota left his Kiribati home and settled in NewZealand under a work visa. He and his wife have since six children, all New Zealand nationals. They pleaded before the New Zealand High Court who refused him asylum that in the event of their return to Kiribati, there is a risk to the health of the children. In the meanwhile,

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[9]Yasin, adil-ul "human rights" Akansa Publishing House first edition 2004 at pp.

[10] Article 51 of the Constitution of India

[11] AIR 1996 SCC (1) 792

there visa period has been expired due to legal complications and they are forced to apply for refugee status. The case is pending for decision.

In the case of *Ktaer Abbas Habib Al Qutaifi And ... vs Union Of India (Uoi) And Ors.*[12]. the principle of 'Non-refoulment' i.e. the principle of international law which requires that no state shall return a refugee in any manner to a country where his or her life or freedom may be in danger, is also embodied in Article 33(1) of the United Nations Convention on the Status of Refugees. Article 33 reads as under :- No contracting State shall expel or return a refugee in any manner whatsoever to the frontiers of territories where his life or freedom ' would be threatened on account of race, religion, nationality, membership of social group or political opinion. This principle prevents expulsion of a refugee where his life or freedom would be threatened on account of his race, religion, nationality, membership of a particular social group or political opinion. Its application protects life and liberty of a human being irrespective of his nationality. It is encompassed in Article 21 of the Constitution, so long as the presence of refugee is not prejudicial to the law and order and security of India. All member nations of United Nation including our country are expected to respect for international treaties and conventions concerning Humanitarian law. In fact, Article 51(c) of the Constitution also cast a duty on the State to endeavor to "foster respect for international law and treaty obligations in the dealing of organized people with one another". S. Goodwin Gill has stated that "The evidence relating to the meaning and scope of non-refoulment in its treaty sense also amply supports the conclusion that today the principle forms part of general international law. There is substantial, if not conclusive, authority that the principle is binding on all states, independently of specific assent".[13]

Environmental refugees are not protected under International Refugee law and therefore they are not considered actual refugees. Maldives meeting in the year 2006 proposed an amendment to the 1951 Geneva Convention relating to the status of Refugees that would extend the mandate of the UN refugee regime to include climate refugees. But such an amendment does not foresee to effectively resolve the crisis of the climate refugees. There is also uncertainty of such a proposal being politically acceptable. The UN refugee regime is already under constant pressure form the industrialized countries that seek restrictive interpretations of its provisions; it is highlyunlikely that these governments will come with a clean hand to agree to extent the same level of protection to a new section of refugees 20 times larger than those currently under UN oversight and equal to half the population of the European Union.[14] In an interview to, Oliver Smith said that "there are at least 20 million environmental refugees worldwide, the (UN) group says-more than those displaced by war and political repression combined."[15]The Living Space for Environmental Refugees Foundation is an organization which is working to put environmental refugee issues on the agendas of politicians and their website has information and statistics on environmental refugees as well as links to on-going environmental refugee programmes.

CONCLUSION

The Environmental Justice Foundation has argued that the people who will be forced to move due to change in climate do not have any recognition in international law. Therefore the case for a specific regime on Climate Refugees is the need off the hour. There is need for a separate independent legal and political regime created under a Protocol on the Recognition, Protection and Resettlement of Climate Refugees to the United Nations Framework Convention on Climate Change. By refining how environmental refugees are conceptualized and by recognizing differences and the similarities between refugee populations, it is the academicians and the policy makers who can throw some clear light to identify the underlying causes with concrete suggestions and ideas to prevent and relieve the growing numbers of people displaced by environmental change.

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[12] Indian Kanoon - http://indiankanoon.org/doc/1593094/ 6

[13] "The Refugees in International Law"

[14] http://www.indialawjournal.com/volume4/issue-

[15] Oliver Smith , an Anthropologist in an interview to the National Geographic Magazine.

FRAME WORK FOR FINDING ASSOCIATION RULES IN BIG DATA BY USING HADOOP MAP / REDUCE TOOL

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ABSTRACT
The progress in both data storage and mining technology adapts to the storage of increasingly bulk amount of data. With an advancement technology in information technology and cloud computing provides several opportunities and services to the users: storing personal information, accessing various web services for online transactions. There is a rise in the volume of data in various industries and distributed storage of this data demands for efficient parallel processing. With the arrival of big data also came the realization that this data can be utilized for intelligent decision making. These data provide opportunities that allow businesses across all industries to gain real-time business insights. In recent days it is very important to note that the Map/Reduce parallel computational model is increased for different algorithms. Its approach has been popular in order to compute huge volumes of data. Map/Reduce algorithms for Large Business Applications are one of the popular data mining algorithms. The algorithm is to be sort data set and to convert it to (key, value) pair to fit with Map/Reduce. In this paper we proposes a novel framework of cloud model for mining association rules, large datasets using Map/Reduce in Big Data Business Analytics. Big data evolution is driven by fast-growing cloud-based applications developed by using virtualized technologies. A subsequent development tools to enable data processing in a distributed environment which is emerged and leading to the Map/Reduce framework.

1. INTRODUCTION

Large amounts of data have been collected routinely in the course of day-to-day management in business, banking, the delivery of social, security and health services. Data mining, also known as Knowledge Discovery in Databases (KDD) is defined as a "type of database analysis that attempts to discover useful patterns or relationships in a group of data. The analysis uses advanced statistical methods, such as Association rules, Classification, cluster analysis, and sometimes employs artificial intelligence or neural network techniques [7]. The main tasks of Data mining are generally divided in two categories: "Predictive and Descriptive". The objective of the predictive tasks is to predict the value of a particular attribute based on the values of other attributes, while for the descriptive ones, is to extract previously unknown and useful information such as patterns, associations, changes, anomalies and significant structures, from large databases. There are several techniques satisfying these objectives of Data Mining. Discovering association rules is at the heart of data mining. Mining for association rules between items in large database of sales transactions has been recognized as an important area of database research. These rules can be effectively used to uncover unknown relationships, producing results that can provide a basis for forecasting and decision making.

Cloud computing is a new computing paradigm that offers a huge amount of compute and storage resources to the masses. Individuals (e.g., scientists) and enterprises (e.g., startup companies) can have access to these resources by paying a small amount of money just for what is really needed [1] [8].

1.1 DATA MINING IN CLOUD COMPUTING

Cloud computing denotes the new trend in Internet services that rely on clouds of servers to handle tasks. Cloud computing has recently reached popularity and developed into a major trend in IT. There are many advantages such as cost reduction impact, because less quantity of hardware is needed (virtualization), less energy consumption, no up-front investment and pay-as-you-go model, lower operating costs, rapid allocation and de-allocation, scalability when service demands are changing, accessibility through different devices and reducing business risk while outsourcing from infrastructure providers. Data mining techniques and applications are very much needed in the cloud computing paradigm. As cloud computing is penetrating more and more in all ranges of business and scientific computing, it becomes a great area to be focused by data mining.

Data mining in cloud computing is the process of extracting structured information from unstructured or semi-structured web data sources. Using data mining through Cloud computing reduces the barriers that keep small companies from benefiting of the data mining instruments.

The implementation of data mining techniques through Cloud computing will allow the users to retrieve meaningful information from virtually integrated data warehouse that reduces the costs of infrastructure and storage. When cloud applications are popular and massive data has accumulated, data mining is an important issue for cloud services, such as Salesforce.com and YouTube. Cloud computing is a good platform for data mining.

2. ASSOCIATION RULES

Association rule mining is one of the most important techniques of data mining. It aims to extract interesting correlations, frequent patterns, associations or casual structures among a large set of data items. A typical application is market basket analysis, which studies the buying habits of customers by searching for sets of items that are frequently purchased together [9]. Other application areas include customer segmentation, store layout, web usage mining, software defect detection, telecommunication alarm prediction, and bioinformatics.

Association rule is one of the important themes and essential of data mining which can find out the relationship between item sets in the database. We can use the interesting association relationships which are extracted among huge amounts of data. But, the discovery of association rule is a direct mass-oriented database system that often has hundreds of properties and millions of records, contains a complex relationship between data tables, and remains a time-consuming process.

2.1. Problem statement

The problem of mining association rules over market basket analysis was introduced in [5] [7]. It consists of finding associations between items or itemsets in transactional data. As defined in [7], the problem can be formally stated as follows. Let $I = \{i_1, i_2, \ldots, i_m\}$ be a set of literals, called items. Let D be a set of transactions, where each transaction T is a set of items such that $T \subseteq I$. Each transaction has a unique identifier TID. A transaction T is said to contain X, a set of items in I, if $X \subseteq T$. An association rule is an implication of the form $X \Rightarrow Y$, where $X \subset I$, $Y \subset I$ and $X \cap Y = \emptyset$.

Each itemset has an associated measure of statistical significance called support. For An itemset X, we say its support is s if the fraction of transactions in D containing X equals s. The rule $X \Rightarrow Y$ has a support s in the transaction set D if s of the transactions in D contains $X \cup Y$. The problem of discovering all association rules from a set of transactions D consists of generating the rules that have a support and confidence greater than given thresholds. These rules are called strong rules.

This association-mining task can be broken into two steps:

Step1. The large or frequent itemsets which have support above the user specified minimum support are generated.

Step2. Generate confident rules from the frequent itemsets.

3. HADOOP

Hadoop is the parallel programming platform built on Hadoop Distributed File Systems (HDFS) for Map/Reduce computation that processes data as (key, value) pairs. Hadoop has been receiving highlights for the enterprise computing because business world always has the big data such as log files for web transactions. Hadoop is useful to process such big data for business intelligence so that it has been used in data mining for past few years.

Hadoop can compose hundreds of nodes that process and compute peta- or tera-bytes of data working together. Hadoop was inspired by Google's MapReduce and GFS as Google has had needs to process huge data set for information retrieval and analysis [6]. It is used by a global community of contributors such as Yahoo, Facebook, and Twitters. Hadoop's subprojects include Hadoop Common, HDFS, MapReduce, Avro, Chukwa, HBase, Hive, Mahout, Pig, and ZooKeeper etc [2].

3.1 MapReduce

MapReduce is a software framework introduced by Google in 2004 to support distributed computing on large data sets on clusters of computers. MapReduce is a programming model and an associated implementation for processing and generating large data sets [3]. Map/Reduce programming platform is implemented in the Apache Hadoop project that develops open-source software for reliable, scalable, and distributed computing. It is composed of two functions to specify, "Map" and "Reduce". They are both defined to process data structured in (key, value) pairs. The MapReduce programming mode is designed to compute large volumes of data in a parallel fashion [6].
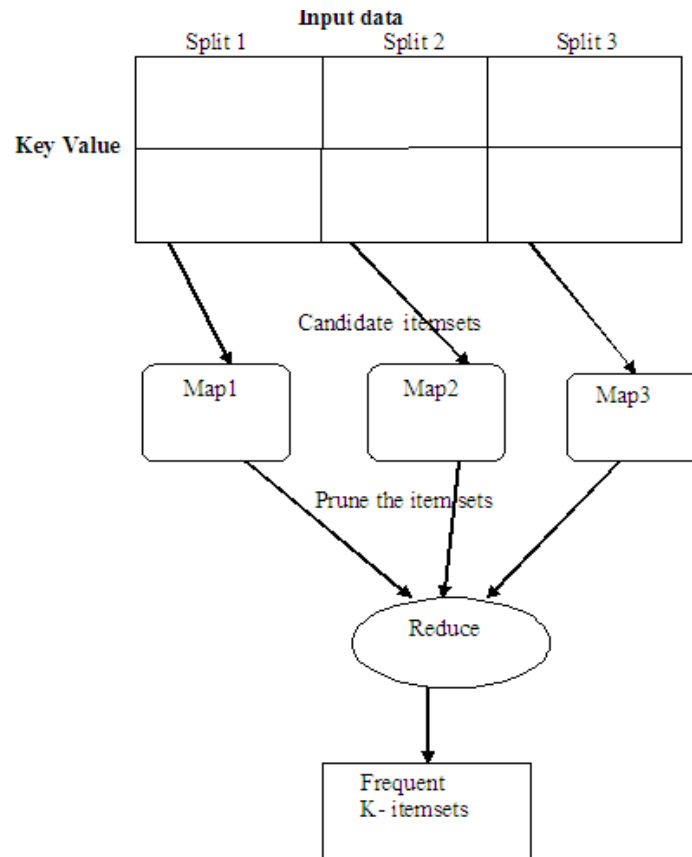
Figure 1: MapReduce framework

The logical model of MapReduce describes the data flow from the input of key/value pairs to the list output:

$$Map(k1,v1) \rightarrow list(k2,v2)$$

$$Reduce(k2, list\ (v2)) \rightarrow list(v3)$$

The Map function takes an input pair and produces a set of intermediate key/value pairs. The Reduce function accepts the intermediate key2 and a set of values for that key. It merges these values to form a possibly smaller set of values [6].

As the framework showed in Figure -1, MapReduce specifies the computation in terms of a map and a reduce function, and the underlying runtime system automatically parallelizes the computation across large-scale clusters of machines, handles machine failures, and schedules inter-machine communication to make efficient use of the network and disks.

The map and reduce functions run on distributed nodes in parallel. Each map operation can be processed independently on each node and all the operations can be performed in parallel. But in practice, it is limited by the data source and/or the number of CPUs near that data. The reduce functions are in the similar situation because they are from all the output of the map operations. However, Map/Reduce can handle significantly huge data sets since data are distributed on HDFS and operations move close to data for better performance [3] [4].

4. APRIORI ALGORITHM BASED ON MAPREDUCE

4.1 Apriori-Map/Reduce Algorithm
Figure 2 is the proposed Apriori-Map/Reduce Algorithm for Map/Reduce framework such as Apache Hadoop

The general processing flow is as follows:

- Input data is "split" into multiple mapper process which executes in parallel
- The result of the mapper is partitioned by key and locally sorted
- Result of mapper of the same key will land on the same reducer and consolidated there
- Merge sorted happens at the reducer so all keys arriving the same reducer is sorted

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Map/ReduceApriori. The steps are as follows.

Map transaction t in data source to all Map nodes;

Step1. Use MapReduce model to find the frequent 1-itemsets.

Step2. Set $k = 1$.

Step3.If the frequent $(k+1)$-itemsets cannot be generated, then goto Step6.

Step4. According to the frequent k -itemsets, use MapReduce model to generate the frequent

$(k+1)$-itemsets.

Figure 2: Apriori-Map/Reduce Algorithm

5. CONCLUSION
Cloud computing is characterized by its powerful capability for computation and storage, as well as its policy of resource sharing accomplished by virtualization. These features rendered cloud computing, valuable merit are favorable to data mining service in network environment. Searching for frequent patterns in transactional databases is being considered and it is one of the most important data mining problems. The task to find all association rules which requires lot of computation power and memory. In this paper, we propose a framework for association rules of mining which is Aprior based on Map/Reduce algorithm with resources in cloud. Therefore, the proposed algorithm can process large datasets on commodity hardware effectively.

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COMMODIFICATION OF WOMEN IN ADVERTISEMENTS: A STUDY OF PRINT MEDIA

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ABSTRACT

Advertising is communication in a paid form with a commercial message which is specifically designed to influence a consumer to make a purchase decision. Advertising deals not only with products that they are selling but also with different people of the society, therefore it should ensure that it does not hurt sentiments of sections of society , also it should take care that it refrains from projecting women as inferior section of society just to achieve the profit objective. Women are depicted as obsessed with making themselves attractive as a commodity and enjoying dominance of men at work place, in society and at home. The purpose of the article is to study how manufacturers use advertisements in print media i.e. newspapers women as a tool to sell their products.

Key Words : Stereotype, Unethical, Dignity, Consumer

INTRODUCTION

Advertising is a paid nonpersonal mode of communication from an identified sponsor using mass media to persuade or influence buying decision of a consumer of a product. Most advertising is pleasant if not sexist but advertisers often treat women as a commodity. Discriminating men against women is very common in ads. Advertisements do not influence memory for a short period of time but are very futuristic and have a long lasting impression on society.

Advertisements don't want to change when it comes to projection of women maybe because otherwise they will not be able to make profit. Media continues to project women who are financially independent as insensitive, self centered and uncaring .It is projected through advertisements women are best only when they are playing stereotypical roles that of wives, mother etc. Pictures are constantly wrapped and giving women and girls unrealistic view of beauty in society. These images lead to constant low self-esteem, eating disorders and debt amongst the other women of society. In India still there is lot of craze for white skin and females use so many beauty products to look fair. Females take lot of pressure to look good and have white skin. Men also form their opinions about females on the basis of what they see in ads and start seeing women as a product and forget what they are as individual human beings.

For the success of present day civilized society most important is the dignity of an individual. Dignity is way in which all human beings of a society are suppose to conduct themselves in a certain expected manner. For the maintenance of dignity individual rights were made by governments of every country for the citizens who lived therein. The notion of human rights was there in place in India even in the vedic period. Human Rights are naturally acquired by a human being born on the earth. It is true to say the human rights are nothing but various freedoms guaranteed to any human being.

The Universal Declaration of Human Rights, 1948 in its preamble says that the 'Peoples of the United Nations have in the Charter re-affirmed their faith in fundamental human rights, in the dignity and worth of human person and in the equal rights of men and women and have determined to promote social progress and better standards of life in larger freedom'. This declaration acknowledges the fact that if half of the population i.e. women if are not treated equally at par with men, a nation and its society can never make any development. Of the fundamental rights guaranteed to the Indian citizens and to the women specially, Indian constitution gives right to equality.

Everyone has right to life, to choose their religion, and live life with dignity. Universal Declaration of Human Rights(UDHR) clearly says that girls and women and boys and men have the same rights . Pt.Jawahar Lal Nehru said, "*if our nation is to rise how can it do so if half the nation, if your woman mankind, lag behind and remain ignorant and uneducated?*" Any nation can never progress where potential of half of its population i.e. women is wasted. Every woman has a right to live freely with dignity and without any fear.

There is a huge difference between how Indian women were treated traditionally and what status they enjoy at present. Some of the reasons which have lead to the change in the status of Indian women is because of various

laws which treat women equal to men and also because of increase in level of literacy of women. But a lot still needs to be done and for that greater role needs to be assumed by the governments and other related regulatory agencies. The primary goal of this research was to determine the extent to which women are presented as stereotypical objects and as victims in print advertisements.

ADVERTISING AND ITS IMPORTANCE

Advertisements are necessary and are a useful source of information to assist consumers in their purchase decisions and it is through advertisements as a medium, it not only helps consumers but also manufacturer as well as the advertisers. Consumers are a major reason for economic improvement of any nation.*Gandhiji said, "A customer is the most important visitor on our premises .He is not dependent on us, we are dependent on him. He is not an interruption in our work. He is the purpose of it. He is not the outsider in our business. He is a part of it. We are not doing him a favour by serving him. He is doing us a favour by giving us an opportunity to do so."* Advertisements are made to create an atmosphere where consumer can buy the product and relies on his purchase. This will make consumer to buy product again and again.

Advertisements do not influence memory for a short period of time but it has very futuristic and long lasting impression on society. Advertising also borrows its concept from literature and transfers into visual format creatively with theme of consumption. Advertising is very persuasive that is why it has deep impact both culturally and economically on the society.

Advertising though at times projects women in stereotypes and misleads customers but it cannot be ignored the kind of powerful tool it is in educating society. It is the medium which brings to light so many issues which women face and making consumer aware about wider choices of products available to them.

ADVERTISEMENTS AND PORTRAYAL OF WOMEN

Great poet Ravindranath Tagore argues that '*Culture has feminine character, for it is the woman that conserves.*' Women have been an integral part of the advertisements ever since this industry came into existence.

What is being shown in advertisements is nothing else but what market forces want or what sells and no consideration is being given to the its social impact on culture. It is leading to weakening socio cultural structure of the society. Most of the newspapers and magazines bring out special issues if a women wins a beauty contest .they ensure that t hey do not let the reader forget the achievement of the female and for this they put up all sorts of erotic photographs. On the other count if a female has won a Nobel Prize there will be very limited coverage.

Stereotypes are the commonly held beliefs about roles of girls and women and boys and men, based on traditions and customs. Media projects women as stereotype as somebody whose place is at home. The most important valuable asset a woman has her physical beauty. They are dependent, submissive, in their response to indignities, humiliations inflicted to them and finally women are women worst enemies. Advertisements can create and distort the image of women to make them appear having stereotype used as sex object wearing very less clothes on the other account men are always shown fully clothed.

Women are considered as somebody who provides nourishment to the family so they are shown more in household product items. Most of the women are shown in ads which are kids centric, household stuff or beauty products based. Generally the background used for their ads is homely. Men are mostly shown in office like environment. This reflects to some extent that women have no other jobs except home. When consumers are most of the time seeing women being portrayed as an object, then that is the image which is going to stay in their heads.

In most of the households women have become decision makers as they are financially independent but still they are mostly projected in products which are majorily household goods of small value and very seldom they are shown in ads which pertain to major innovations or big projects. They are mostly shown as somebody dependent on males always. In the ads where it is shown that males are washing utensils it is made to believe that they are doing some kind of favour by sharing household responsibilities and it is very obvious for females to do that.

"Thin is beautiful" has become very desirable with the youngsters in India specifically the advertisement has made this change. There is not only change in how females look but also there is lot of change in cosmetic products that

are used by females according to their economic affordability. Girls see images of other girl's in skinny jeans ads and other products and take pressure on them that they have to look the best. Ads which show women with fewer clothes are tall and slim, it makes other young women to believe that they have to conform to these norms and they have to look like them to be beautiful. It is projected that women only want to copy the traits female has in ad like her hair, shoes, makeup etc.

Status of Indian women has changed a lot in advertisements due to social and political influences, but more needs to be done.Amartya Sen has said *'India has still a long way to go in removing inequalities in the position of women, but the increasing political involvement in the social role of women has been an important and constructive development in democratic practice in India."*

LEGISLATIONS FOR ADVERTING IN INDIA

Modern Indian society though has gone through many socio–economic changes but still remains a conservative society and gives lot of importance to the morals. Therefore to check false and indecent advertising many statutory provisions, rules and regulations are there in place such as Article 21 and other legislations like Section 292 of IPC 1960,The Indecent Representation of Women(Prohibition) Act or IRWA1986,The Information Technology Act,2000,Young Person's(Harmful Publications) Act,1956 , Human Rights Commission ,The Press Council of India , Advertising Standard Council of India (ASCI) etc to name a few ensure equality for both men and women.

Article 21 of Indian constitution gives women right not just to live but live with dignity. The Indecent Representation of Women Act, 1986 prohibits publication of any advertisement containing indecent representation of women. The Consumer Protection Act, 1986 provides effective safeguards to consumers against misleading advertisements and other forms of exploitation. The Advertising Standards Council of India (ASCI) has adopted a code for self regulation in advertising.

(CEDAW)The Convention on the Elimination of All Forms of Discrimination against Women is an international document demands that governments change laws and customs in their country so that girls and women are not discriminated against in any way. Article 5 of CEDAW says that governments must work to change stereotypes about girls and women and boys and men, especially if these roles are based on where boys and men are being considered better than women and girls.

If the sale of media related elements has gone up whether it is print i.e. number of newspapers, magazines or visual i.e. television etc that means the exposure of people to advertisements has also gone up and it should be taken into account, since number of people getting exposed to communication mediums is rising, it is time that government should draft a media policy which strongly discusses what is ethical advertising and what is not.

CONCLUSION AND SUGGESTIONS

Media and advertisements should play a very responsible role in projecting the role that women play in the national development but they are largely still projecting women as dependent ,entertainment figures and are seldom depicted as somebody who is very intelligent having mind and thinking of her own. One of the major factors contributing to this is large number of rural women being illiterate.

As ad makers are more interested in the brand name of company and increasing its sale, they should also be sensitive when designing advertising relating to women. Erotic images of women in advertisements may get them immediate attention of customers but can never get them long term profits. What matters the most in long run is to advertise a product carefully in the market.

Government and regulatory agencies have to see selling product is one thing and if method being used to sell products, negatively affects socio cultural values of society, the same is not acceptable. Government has to make it clear that social values of society are not profit or demand driven.

Law alone cannot change overnight a society. Justice is always not given by acts and laws. Justice is a process where laws are enacted by following certain set procedure. What is more important is there should be sensitization of judiciary , so that it should change are per changing needs of society and circumstances .Also people of society should start treating women as individual who like any other living being has right to live and has human rights.

When giving justice to women they should not be made to feel they are weaker section of society but they are also equal.

Whether it is a developed nation, underdeveloped or a developing nation it is the attitude of people which decides the status of women in society and that they play a very vital role in shaping the attitude of people and advertisements alone cannot be blamed for the status of women and the thought process of society.

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EVALUATION OF IPV6 SECURE NEIGHBOR AND ROUTER DISCOVERY PROTOCOL, USING LOCALLY AUTHENTICATION PROCESS

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ABSTRACT

Internet Protocol version six (IPv6), the next generation Internet Protocol (IP), exists sparsely in today's world. Internet Engineering Task Force (IETF), in IPv6, allowed nodes to Auto configure using neighbor discovery protocol. Neighbor Discovery (ND) and Address auto-configuration mechanisms may be protected with IPSec Authentication Header (AH). However, as it gains popularity now a day, it will grow into a vital role of the Internet and communications technology in general. In Protecting all traffic will include Address Resolution Protocol. To protect this, IPSec will need agreed Key. For Key setup, UDP packet is sent, which requires IPSec for secure communication. So IPSec requires Agreed Key and for Key setup IPSec is needed, this creates a loop. To solve this problem Locally Authentication Process is presented in this paper and we provide taxonomy for the IPv6 Neighbor and Router Discovery threats, describe two new cryptographic methods, Cryptographically Generated Addresses (CGA) and Address Based Keys (ABK), and discuss how these new methods can be used to secure the Neighbor and Router discovery mechanisms.

Keywords : Stateless Address Auto-configuration, Neighbor Discovery, Cryptographically Generated Address (CGA),IPsec, MLS, IP next generation, Multilevel security, Router Discovery, Secure Neighbor Discovery (SEND), Digital Certificate, Security Attacks in IPv6.

1. INTRODUCTION

Fifteen years ago, when the basic design for IPv6 [1][2] was being decided, it was hardly possible to foresee the kinds of wireless environments that are now being considered for use with IPv6. In the Internet Protocol version six (IPv6), also known as the next generation Internet Protocol, lies the future of communications for networked computers and possibly the future of all telecommunications. IPv6 is a complete redesign focusing on eliminating the weaknesses of its predecessor, IPv4. The used IP version 4(IPv4) was developed long time back. By the end of 2012, the number of mobile-connected devices will exceed the number of people on earth, and by 2016 there will be 1.4 mobile devices per capita [1]. IPv4 address space is of 32 bits. The theoretical limit of IPv4 addresses is 4.3 billion addresses. The aggravate problem of exhaustions of addresses, was mitigated by the introduction of Classless Inter-Domain Routing (CIDR), and reduced even more by the adoption of Network Address Translators (NAT). Other problems facing IPv4 are the lack of deployed security, and the rapid growth of the size of the routing tables. Before implementing CIDR the backbone routing table was growing at very high rate as compare to memory technology. The Internet Engineering Task Force (IETF) designed a next generation protocol Internet Protocol version 6 (IPv6) to solve these problems and eventually replacing the existing Internet Protocol, IPv4. This IPv6 was designed after having the rich experience of almost 30 years, of IPv4. IPv6 functions that manage the local link were designed with physically protected, trustworthy links in mind. However, now people are planning to use IPv6 on public radio networks, such as Wireless LANs at airports, hotels, and cafes. Even though the actual link may still be somewhat protected with layer 2 authentication, access control, and encryption some of the nodes on the link may be untrustworthy.

In this research paper, we focus on IPv6 Neighbor Discovery (ND) and Router Discovery (RD) functions. Their current definition relies on the assumption that there are no untrustworthy nodes at the local link. In practice, even a single untrustworthy node can launch various kinds of attacks, including Denial-of-Service (DoS), and masquerade. The current set of RFCs [6][7][8][9] do acknowledge the situation to a degree, but do not provide much detail about how to use the suggested protection mechanism, IPsec. Unluckily, there are a number of problems when using IPsec for securing Neighbor Discovery [10]. In IPv4, the configuration of IP addresses is done manually by the network administrator or with the help of DHCP server. Apart from manual configuration and state full auto-configuration, using DHCP, IPv6 has stateless auto-configuration. Stateless auto-configuration does not require manual configuration of hosts, and additional servers and state-full auto-configuration, hosts obtain interface addresses and configuration information and parameters from a server.

2. BACKGROUND

In this research paper, we will first briefly touch upon the most widespread way of auto configuration in IPv4—Dynamic Host Configuration Protocol (DHCP) [5]. The problems stemming from the design of DHCP will let us understand the design goals behind auto configuration protocols of IPv6. After introducing both the addressing schemes of IPv6 and the ND protocol, we give an overview of the Secure Neighbor Discovery (SeND) protocol.

2.1. Neighbor Discovery Protocol

Neighbor Discovery (ND) is one of the most important functions of ICMPv6. As an ARP replacement, it is responsible for finding other hosts on the segment. Regular ND specifications do not include any security provisions. Nodes can make any claims about who they are, as long as they belong to the right multicast group. Most multicast group memberships are assigned automatically, and without any human intervention needed. In IPv6, a host automatically gains some privileges when it has an address. Therefore, the security design for IPv6 is based more on the networking topography than a logical set of privileges and limitations: everyone outside the security perimeter is considered a potential attacker, but insider threats are not considered. ND messages are implemented as a set of ICMPv6 Types and Options, like redirection or a ping service. ICMPv6's Option field [11] provides a generic interface allowing extending ICMP's functionality. For example, Source Link Layer Address (SLLA) is an option type 1 and Target Link Layer Address (TLLA) is an option type 2. To learn the link-layer address of another node that is assumed to be directly attached to the local link, the node that needs the address sends a Neighbor Solicitation (NS) message to a multicast address specified by the target address. If the target node is indeed present, it should be listening to the multicast address. Upon receiving the solicitation, it replies with a Neighbor Advertisement (NA) message. The default operation is illustrated in Figure 1. Additionally, the specification defines that the messages *may* be protected with IPsec AH. From the security point of view, there are additional problems besides authentication. First, the NA includes a number of flags. One of the flags indicates that the replying node is actually a router. Another one is an "override" flag, specifying that the information in the packet should replace any information that the receiver(s) of the packet may already have. However, unless the authentication keys are strongly bound to IP addresses.
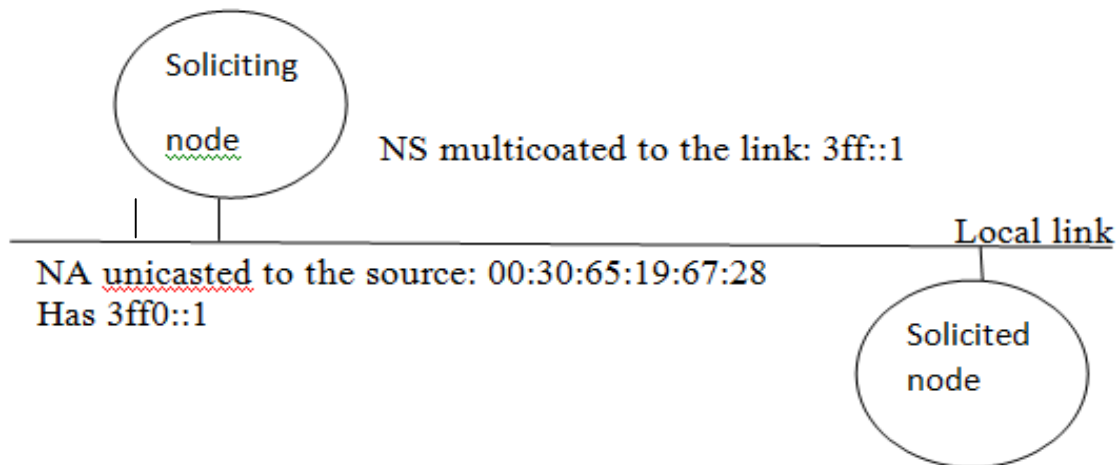
Figure 1: neighbor protocols procedure

2.2. Address Auto-Configuration

Stateless Auto-configuration is the one of the most useful feature that lies in IPv6. The configuration can be done automatically without using any specific protocol such as DHCP. This very feature enables an IPv6 host to configure link-local (an address having link-only scope that can be used to reach neighboring nodes attached to the same link), site-local (an address having scope that is limited to the local site) and global addresses (an address with unlimited scope) for each of its interface. This feature is obtained by the protocol called Neighbor Discovery Protocol (NDP). This protocol includes router (a node that forwards IP packets not explicitly addressed to itself) discovery, stateless address auto-configuration, address resolution, neighbor reach ability, duplicate address detection and redirection.

2.3. Secure Neighbor Discovery

The Secure Neighbor Discovery (SeND) protocol [2], [3] proposes to address the insider threats discussed above. The main idea behind SeND is to use asymmetric cryptography to enforce authentication and integrity without changing the zero configuration paradigm of the regular ND protocol. IPsec is supposed to be the solution to IP protocol-based security needs, but it faces many practical problems, such as the initial key distribution [12]. Internet Key Exchange (IKE) is an implemented infrastructure to support IPsec's needs for transport of keys, but it requires IPv6 connectivity to work. There is a twofold problem in bringing a similar approach to protecting lower networking layers as a part of IPv6 security. The first problem is that of momentum. Unlike enhancements of the Web, IPv6 networking has no appeal to a regular user, as it does not provide any instantly observable improvements. The second problem is a major paradigm shift. Asymmetric cryptography has been historically used to protect data, by working at the highest layers of the OSI model. SeND uses asymmetric cryptography at the lower layers, which is a very novel idea. SeND, since it is an augmentation of the ND protocol, also encodes its messages in ICMPv6by creating a few new Option Types shared among the already existing ND messages.
Following ICMP messages are used by Neighbor Discovery Protocol.

*Router Advertisement: This message is used by Routers to inform other nodes existing on all links, to which they are connected, of its presence and other link related information. The process occurs periodically or in response to a Router Solicitation message.

*Neighbor Solicitation: These messages have 3 main purposes. The first is to discover the link layer address of a neighbor as part of the address resolution process. This process replaces the use of ARP requests and replies in IPv4. The second purpose is to determine the reach ability of a neighbor. The last is to detect the presence of duplicate IPv6 addresses during the address auto configuration process which is detailed later in this report.

*Neighbor Advertisement: These messages are either in response to Neighbor Solicitations, or sent by a neighbor to announce a change in its link layer address. Upon receipt of a Neighbor Advertisement, a node will update its neighbor cache which contains mappings between IPv6 and link layer addresses of neighbors.

3. THREATS IN ADDRESS AUTO-CONFIGURATION

The stateless address auto-configuration allows a host to connect to the network without registering /authenticating itself. It simply configures the address and start communicating with other nodes on the network. Since node does not have to authenticate itself, any malicious node can get access to network. It can cause various kinds of threats which are explained as follows:

3.1. Redirect Attack:

Another big threat is in Router Solicitation / Advertisement message. In Neighbor Discovery, attacker can make fake advertisement of itself as default router, causing immediately timeout of all other default routers as well as all on- link prefixes. Node received advertisement and start forwarding its packets to this particular router causes man in middle and DoS attack.

3.1.1. Malicious Last Hop Router

A malicious router can send spoofed RA messages, pretending to be the target of RS messages. This would establish such a router as the default router. If the actual router was compromised, it would become a perfectly functional proxy, allowing hosts to carry on with regular transmissions. At the same time, the attacker could tunnel data out of the router to another computer, where sniffing for credentials could occur.

3.1.2 Neighbor Solicitation/Advertisement spoofing

A malicious node can send a NS message with a wrong Source Link Layer Address option, or a NA message with a wrong Target Link Layer Address option. Either one of these messages would populate attacker the target's Neighbor Cache with wrong IPMAC mappings. The target would send information to the wrong nodes, setting itself up for man-in-the-middle attacks and password and other sensitive information sniffing, effectively creating a redirection or DoS attack.

3.2.1. Parameter Spoofing

RA messages contain extra parameters that can be helpful to the auto configuring hosts. In case such parameters are falsified, nodes might be forced to follow rules that might get them to talk to wrong hosts, or lose connectivity. The Current Hop Limit is one of the fields propagated in RA messages. If this parameter is set to an artificially low

number, the packets will be dropped before they reach their intended destinations. Another peculiar aspect of the ND protocol is that one of its parameters can be used to indicate to hosts to use DHCPv6.

3.2.2. Duplicate Address Detection DoS
In networks where entering hosts obtain their addresses with stateless address autoconfiguration [8], an attacking node could launch a DoS attack by responding to every duplicate address detection attempt. If the attacker claims the addresses, then the host will never be able to obtain an address. This threat was identified in RFC 2462 [8] and an early attempt to solve the problem was made by Nikander [12].

3.3. Spoofing
Spoofing is a way to achieve denial of service (DoS) attack, in an IPv6 network, in the Duplicate Address Detection (DAD) procedure. Attacker on the local link waits until a node sends a Neighbor Solicitation packet. The attacker falsely responds with a Neighbor Advertisement packet, informing the new node that it is already using that address. Upon receiving the Neighbor Advertisement, the new node generates another address and repeats the DAD procedure; the attacker again falsely responds with a Neighbor Advertisement packet. Finally, the new node stops initializing its interface.

3.3.1. Neighbor Discovery Spoofing
When the attacker spoofs certain Neighbor Advertisements, he can execute a MITM attack. By answering falsified Neighbor Advertisements to the issued Neighbor Solicitations from the victims, he redirects all IPv6 traffic over his "routing instance" in the same subnet
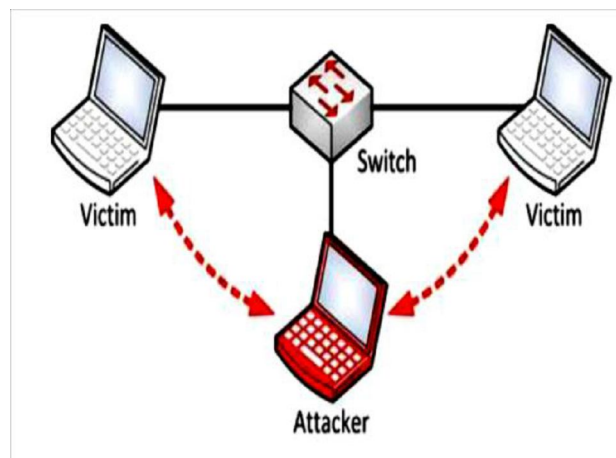
Figure 2: spoofing

3.3.2. Duplicate Address Detection
A DoS attack is executed if the attacker answers to all Duplicate Address Detection messages (DADs) from a new IPv6 node (with a not yet assigned IPv6 address). The node always believes that this address is already in use and will never get an available IPv6 address and is therefore unable to access the network. This situation remains until the attacker stops the attack.

3.3.3. Rogue DHCPv6 Server
An attacker can also place his own DHCPv6 server inside a network and distribute falsified values, e.g. a spoofed DNSv6 server address. If the clients accept this DNS server, they will get falsified DNS responses from now on if the attacker also owns the spoofed DNS server. With this attack, internal IPv6 users can be redirected to other (web-) servers than they intended to access. The picture below shows the basic attack in the local network.

4. SOLUTIONS/ EVALUATION TO PREVENT THESE THREATS:
4.1. **Sendas a solution**
SeND claims to solve the mutual authentication problem. An IPv6 address is a function of a public key, and the public key is verifiably bound to the private key. This three-way binding is supposed to prevent a malicious user from spoofing the IPv6 address. Impersonation attacks would fail because of not being able to generate the IP address at all (lack of public key), or not being able to establish the binding between private and public keys (lack

of private key). Replay attacks are supposed to be prevented by using nonces and timestamps. Old packets should simply fail, being outside of the allowed time difference, or due to response with an old nonce.

4.1.1. Cryptographically Generated Address (CGA)

A CGA can be used either as a name for a Cryptographically Generated Address, or the ICMPv6 Option. Both are at the foundations of SeND, but in this section we are concerned with the first meaning. CGA looks like a regular IPv6 address with two 64-bit portions. The first 64 bits are the network prefix portion, announcing the subnet number. The second portion is the Interface Identifier, which is derived using a SeND specific process.

4.1.2. Reply Attack

In order to prevent replay attacks, two new Neighbor Discovery options, Timestamp and Nonce, are introduced. Given that Neighbor and Router Discovery messages are in some cases sent to multicast addresses, the Timestamp option offers replay protection without any previously established state or sequence numbers. When the messages are used in solicitation-advertisement pairs, they are protected with the Nonce option.

4.1.3. RSA Digital Signature Option

Once the public key is obtained from CGA Option, the receiver can use it to decrypt messages encrypted with the corresponding private key. ICMPv6 Option 12 allows us to use RSA digital signatures to establish authenticity of such packet exchanges. Here's a list of fields contained in a RSA Signature option:

· Key Hash—leftmost 128 bits of SHA-1 of the public key, used for constructing the signature
· Digital Signature—variable length field containing PKCS#1 v1.5 [17] signatures, using the sender's private key over these entities:
* 128 bit CGA Message Tag value for SeND.
* 128 bit Source Address from the IPv6 header
* 128 bit Destination Address from the IPv6 header
* 8 bit Type, 8 bit Code and 16 bit Checksum fields from the ICMPv6 header
* ND protocol message header, starting after the ICMPv6 checksum, and up to but not including ND protocol options
* ND protocol options preceding the RSA signature option

4.2. IPsec:

The neighbor discovery messages may be protected with IPsec AH [7]. Potentially, AH could be used by the hosts to verify that Neighbor Advertisements and Router Advertisements do contain proper and accurate information. Given a suitable set of AH Security Associations (SAs), the host can verify that the ND messages it receives are really valid and authorized. The proposed mechanism is quite cumbersome due the large number of SAs needed. Internet Protocol Security is meant for protecting the communication over the IP network. It supports network-level peer authentication, data origin authentication, data integrity, and data confidentiality (encryption) and replay protection. It basically uses the cryptographic security services for protection or authentication and encrypts each IP packet of a communication session. These can be either between a pair of nodes, or between a pair of security gateways or between a security gateway and a node.

5. PROPOSED SOLUTION

This solution envisages that only those nodes will be able to join the networks which have been authenticated by issuing valid token, issued by local trusted node. The basic purpose of token is to allow node to verify link local address and its owner ship on Public key.
The basic terminologies used are:

ADDRESS BASED KEYS

Addressed Based Keys (ABK) [19] use a cryptographic technique known as identity based cryptosystems. Identity based cryptosystems allow any publicly known identifier, such as an E-mail address or the IP address of a node, to function as the public key part of a public/private key pair. That is, basically any bit string may act as a public key. The trick lies in the way the corresponding private keys and a number of parameters are generated.

Public Key [Pu(X)(Y)]

Pu stands for Public key. X denotes entity that has generated this key and Y identifies the entity for which it is generated. Like Pu(AS)(N) defines Public key generated by AS for node N.

Private Key [Pr(X)(Y)]

Pr stands for Private key. X denotes entity that has generated this key and Y identifies the entity for which it is generated. Like Pu(AS)(N) defines Private key generated by AS for node N.

Identity Based Key Algorithms

There are many algorithms available for identity based cryptosystems. Shamir [20] introduced the idea of identity based cryptography in 1984. Practical, provably secure identity based signature schemes [21][22], and Key Agreement Protocols [23] soon followed. Practical, provably secure identity based encryption schemes [24][25] have only very recently been found. In identity based signature protocols, the host signs a message using its private key supplied by its IPKG. The signature is then verified using the host's publicly known identity. In identity based key agreement protocols, two parties share a secret. Each party constructs the secret by using its own private key and the other party's public identity. In identity based encryption, the encryptor uses the recipient's public identity to encrypt a message, and the recipient uses its private key to decrypt the cipher text.

Certified addresses:

identity based algorithms are fairly similar to conventional public key cryptosystems from the practical point of view. Consequently, instead of using the addresses directly as public keys, one could just use a conventional public key cryptosystem and create certificates. Like ABK, address certification relies on a trusted agent. In this method, each node generates its own signature key pair. The node then co-operates with the trusted agent to generate 1–3 random host identifiers. For example, the host identifier can be produced by hashing together a random number R_{host} generated by the host itself and another random number R_{ttp} provided by the trusted agent.

$$\text{Host ID= HASH } (R_{host}/R_{ttp}) \qquad \text{Eq. 7}$$

Finally, the trusted agent signs a certificate that binds the host identifier to the host's public key. This can be an X.509certificate where the host identifier is used as the entity name.

Digital Certificate DC(X)

Digital Certificate issued by X .

* Calculating Digital Signature (DS)

Digital signatures for ABKs are calculated using the following algorithm:

$$\text{sig =SIGN (hash (contents), IPrK, Params)} \qquad \text{Eq. 4}$$

where:

sig   The digital signature.

SIGN   The identity based digital signature algorithm used to calculate the signature.

hash   A one-way hash algorithm, e.g. SHA1-HMAC.

IPrK   The Identity based Private Key.

Params The public cryptographic parameters.

contents   The message contents to be signed.

The recipient verifies the signature in the following way:

$$\text{IPuK = IBC-HASH (ID) Eq. 5}$$
$$\text{valid = VERIFY (hash (contents), sig, IPuK)} \quad \text{Eq. 6}$$

where:

IBC-HASH   A hash function specific to the identity based algorithm that generates the public key from the public identifier.

ID   The publicly known identifier used to generate the key.

IPuK   The Identity based Public Key.

Sig   The digital signature.

VERIFY   The identity based public key algorithm used to verify the signature.

Params The public cryptographic parameters.

valid   1 if the signature is verified, 0 if not.

 * Message Digest MD(X)

Message converted into fixed size encrypted message. X represents the parameters which were converted into digest number.

* Manufacturing Company [MC]

Here Company refers to those companies which are involved in the manufacturing of NIC (Network Interface Card) of the node wishing to participate in the communication in a network.

*Tentative Address [TA]

An IP Address Generated by node before it converted into permanent Address.

* Cryptographically Generated Address [CGA]

Cryptographically Generated Address use to authenticate sender.

*Token [TN(X)]

The Token is a Digital signature generated by AS using public key Pr(AS)(AS) of public key of AS Pu(AS)(AS) and TA and is issued to node X.

6. WORKING PROCESS:

Internet Protocol version 6 (IPv6) is a networking protocol that allows Windows users to communicate with other users over the Internet. It interacts with Windows naming services such as Domain Name System (DNS) and uses security technologies such as Internet Protocol security (IPSec), because they help facilitate the successful and secure transfer of IP packets between computers. Ideally, IPv6 is used in a pure environment, that is, an environment where IPv6 is the exclusive Internet protocol used between computers. Currently, however, pure IPv6 transmissions are attainable only with routers that support IPv6 and computers that are running Windows and that support IPv6. As IPv6 supplants IPv4, pure IPv6 across the Internet will become more prevalent and will eventually replace IPv4. Until that occurs, the transition technologies described in this reference can be used to bridge the technological gap between IPv4 and IPv6.

6.1. IPv6 Architecture

The IPv6 protocol component that is installed in Windows operating systems is a series of interconnected protocols that include Internet Control Message Protocol version 6 (ICMPv6), Multicast Listener Discovery (MLD), and Neighbor Discovery. These core protocols replace the Internet layer protocols in the Defense Advanced Research Projects Agency (DARPA) model. All protocols above the Internet layer rely on the basic services that IPv6 provides. Protocols at the Host-to-Host Transport and Application layers are largely unchanged, except when addresses are part of the payload or part of the data structures that the protocol maintains. For example, both Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) must be updated to perform new checksum calculations that include IPv6 addresses. The following figure shows the architecture of the IPv6 core protocols in relation to the Open Systems Interconnection (OSI) model, the TCP/IP protocol architecture, and the other protocols in the TCP/IP suite.
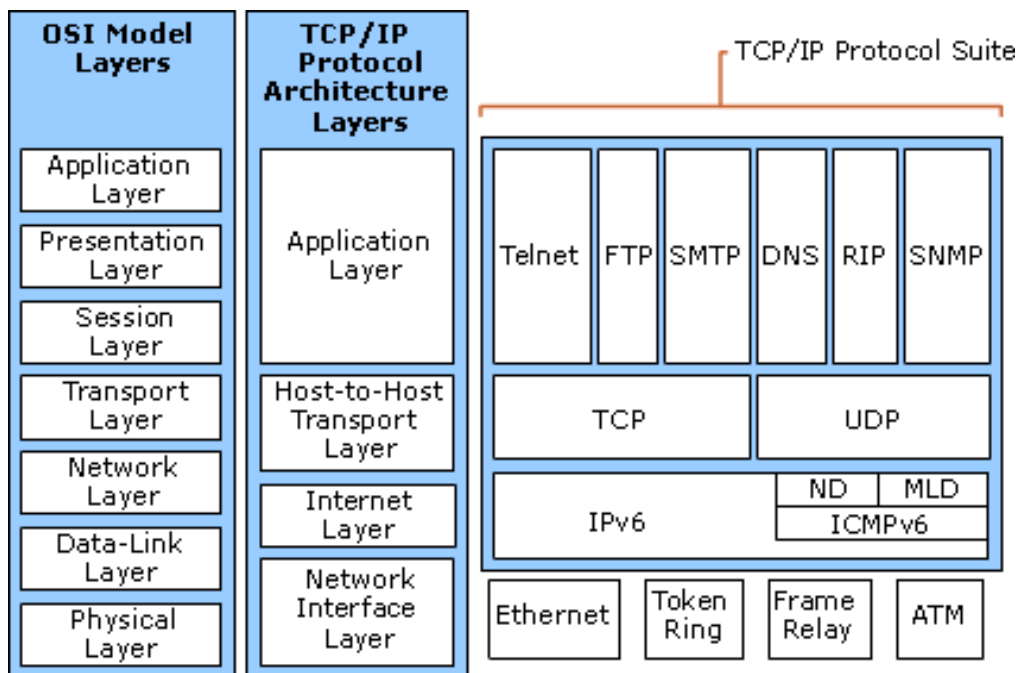
Figure 3: IPv6 architecture

6.2. IPv6 Core Protocols

Protocol	Function
IPv6	IPv6 is a routable protocol that is responsible for the addressing, routing, and fragmenting of packets by the sending host. IPv6 replaces Internet Protocol version 4 (IPv4).
ICMPv6	ICMPv6 is responsible for providing diagnostic functions and reporting errors due to the unsuccessful delivery of IPv6 packets. ICMPv6 replaces ICMPv4.
Neighbor Discovery	Neighbor Discovery is responsible for the interaction of neighboring nodes and includes message exchanges for address resolution, duplicate address detection, router discovery, and router redirects. Neighbor Discovery replaces Address Resolution Protocol (ARP), ICMPv4 Router Discovery, and the ICMPv4 Redirect message.
Multicast Listener Discovery	Multicast Listener Discovery is a series of three ICMPv6 messages that replace version 2 of the Internet Group Management Protocol (IGMP) for IPv4 to manage subnet multicast membership.

6.3. IPv6 Address Syntax

IPv4 addresses are represented in dotted-decimal format. These 32-bit addresses are divided along 8-bit boundaries. Each set of 8 bits is converted to its decimal equivalent and separated from the other sets by periods. For IPv6, the 128-bit address is divided along 16-bit boundaries. Each 16-bit block is converted to a 4-digit hexadecimal number and separated by colons. The resulting representation is known as colon-hexadecimal.

The following is an IPv6 address in binary form:

0010000111011010000000001101001100000000000000000010111100111011
0000001010101010000000001111111111111110001010001001110001011010

The 128-bit address is divided along 16-bit boundaries:

0010000111011010   0000000011010011   0000000000000000 0010111100111011   0000001010101010
0000000011111111   1111111000101000 1001110001011010

Each 16-bit block is converted to hexadecimal and delimited with colons. The result is:
21DA:00D3:0000:2F3B:02AA:00FF:FE28:9C5A

IPv6 representation can be further simplified by removing the leading zeros within each 16-bit block. However, each block must have at least a single digit. With leading zero suppression, the address representation becomes:
21DA:D3:0:2F3B:2AA:FF:FE28:9C5A

6.4. Verification of Certificate:

The message containing: DC(CA),DS(MC)(Pr(CA)(MC)) , Pu(N)(N), NIC number and DS (N)(Pr(N)(N)) are sent to AS. AS, then verifies Digital certificate DC(CA) by verifying public key Pu(CA)(MC) present in digital certificate with its database or from CA. However, it is not possible to verify from database, when AS does not have an entry into its database, of this particular company. Then AS sends request to the CA for verification of public key Pu(CA)(MC), present in Digital Certificate DC(CA).

6.5. Verification of NIC

This process is used to Verify NIC. After verification of Pu(CA)(MC), AS extract NIC Number from Digital Signature DS(MC)(Pr(CA)(MC)),using Pu(CA)(MC), and compares it with NIC Number present in message. The matching of NIC number, confirms that NIC number is not fake.

6.7. Registered Private and Public key for node

After the authentication of node and verification of token request, AS then generates Private/Public key pair Pr(AS)(N) and Pu(AS)(N) for node. The Pu(AS)(N), along with TA are stored into AS. This information is stored to reply any request made by any node for verification of owner ship of Pu(AS)(N) of TA.

6.8. DAD on Tentative address:

After receiving Token and other parameters from AS, AS then performs the DAD operation on tentative address. Nodes receiving DAD message performs the authentication of sender process using Token and other parameter. If any node replies DAD, it sends its token and other parameters to enquiring node. Node, then, performs

authentication of sender, as explained above. If node receives message from authentic node, node again generates new TA. The node sends modification request with new TA, old TA and Token issues against old TA to AS. AS will verify node and modify its database accordingly. A new token is created to send to node again.

6.9. Communicating Using a Teredo Address

A Teredo relay is an IPv6/IPv4 router that can forward packets between Teredo clients on the IPv4 Internet (using a Teredo tunneling interface) and IPv6-only hosts. In some cases, the Teredo relay interacts with a Teredo server to help it facilitate initial communication between Teredo clients and IPv6-only hosts. The Teredo relay listens on UDP port 3544 for Teredo traffic.Initial configuration for Teredo clients is accomplished by sending a series of Router Solicitation messages to Teredo servers. The clients use the responses to derive a Teredo address and determine whether they are behind cone, restricted, or symmetric NATs. If a Teredo client is behind a symmetric NAT, then it cannot function. You can see what type of NAT a Teredo client has discovered from the display of the netsh interface ipv6 show teredocommand.

IPv6 router discovery processes:

- IPv6 routers periodically send Router Advertisement messages on the local link advertising their existence as routers. They also provide configuration parameters such as default hop limit, MTU, and prefixes.
- Active IPv6 hosts on the local link receive the Router Advertisement messages and use the contents to maintain their default router lists, prefix lists, and other configuration parameters.

7. CONCLUSIONS

In this paper we have described a number of threats pertinent to current IPv6 Neighbor and Router Discovery, discussed two new cryptographic techniques, Cryptographically Generated Addresses (CGA) and Address Based Keys (ABK), and briefly described how these can be used to secure the Neighbor and Router Discovery functions. The Neighbour Discovery protocol was introduced to facilitate the node to configure itself. But if ND protocol is not protected it can open flood gate for threats. To protect from threats SEND was introduced which uses CGA address[4]. The basic idea in CGA is to generate most of the 64 low order bits in an IPv6 address as a cryptographic hash over a public key and other parameters. The underlying cryptosystem can be any public key cryptosystem, such as RSA, DSA, or Elliptic Curve based DSA. The missing part in Cryptographically Generated Address is that CGAs themselves are not certified, an attacker can create a new CGA from any subnet prefix and its own or anyone else's public key[5]. ABK uses either the low order bits of the address or all the bits of a routing prefix as a public key, relying on an identity based cryptosystem. Together these two methods can be used to secure Neighbor Discovery in a way that does not require any explicit security infrastructure. Further, the scheme presented, in this paper, ensures that owner of NIC number and its corresponding IP Address has sent the message. This provides message authentication to receiver. The Public-key mechanism is used to exchange secret key. This secret key is used to encrypt the message, to provide confidentiality. The message digest of encrypted message is used to provide integrity of message. Furthermore, it is essential to encode the security parameter as well as the address type into address bits. This may create further operational and other complications. If the security parameter were communicated in a protocol message and not encoded into the IP address, an attacker could misrepresent the values and attack a weaker mechanism than the one selected by the address owner. Further, the verification of TA and corresponding certified Pu(AS)(N), restrict the node to go to AS for verification of sender every time and in this paper are really effective only if the lower protocol layers are sufficiently protected or if the lower-layer attacks are considered unlikely or prohibitively expensive.

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A COMPARATIVE STUDY ON SEISMIC PERFORMANCE OF RC BUILDING USING LIGHTWEIGHT CONCRETE AND NORMAL-WEIGHT CONCRETE

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ABSTRACT

Analysis of seismic performance of a building plays a vital role in its efficient design and resistance to withstand earthquakes. For the analysis of buildings under seismic loads, weight of the building is a major aspect. Heavier building experiences higher seismic loads and possess lesser frequency than lighter buildings. In this study, the performance of two G+9 T shaped buildings, one with normal-weight concrete and the other with lightweight concrete of similar strength were analysed and compared by using static pushover analysis in SAP2000 .The lightweight concrete used was argex expanded clay aggregate concrete. Material properties of the lightweight concrete were collected from one of its manufacturer named GBC INDIA. Both these concretes were kept at same strength level and loading conditions and then they were compared. The study results revealed that the lightweight concrete building showed a higher frequency and a lesser displacement in a greater base shear as compared to the normal-weight concrete which showed a lesser frequency with more displacement in a smaller base shear. As a result the lightweight concrete building showed a better seismic performance as compared to normal-weight concrete .Hence the study gave an idea that stability along with economy can be attained by using lightweight concrete in place of normal-weight concrete resulting in an efficient construction.

Keywords: Argex expanded clay aggregate, lightweight concrete, base shear, frequency

1. INTRODUCTION

Behaviour of any building under the action of earthquake plays a major role in its stability and design. Specially in the north-eastern part of India, which is an earthquake prone area and had experienced some major earthquakes in the past, the seismic performance evaluation of buildings becomes very important for its efficient design and greater resistance during earthquakes. A good performance analysis and subsequently efficient seismic design ultimately contributes to the long life of the building (Barrosso . 1998). Weight of a building plays a major role in the magnitude of the earthquake load acting on any structure .It implies that a heavier building will experience a more seismic load as compared to a lighter building .Therefore if instead of normal-weight concrete ,a lightweight concrete is used to construct the building, it will have less dead load than the normal concrete as a result of which the building will be lighter and it will experience a less seismic load (www.escsi.org). At the same time for a safe and efficient design ,the structural member sections and the quantity of steel required for a lightweight concrete will be less than that for a normal concrete building. Hence economy without compromising on the stability of a structure can be achieved by using lightweight concrete instead of normal-weight concrete (Kivrak et al. 2006).

This paper aims to evaluate ,analyse and compare the performance of the two buildings made of normal concrete and lightweight concrete under static lateral loads as well as compare the frequency and time periods of both the types of building. The static pushover analysis was used to draw the comparison between both the qualities of concrete by plotting graphs between displacement and corresponding base shear and henceforth the performances were discussed accordingly.

1.1. Static pushover analysis

Pushover analysis is a static, nonlinear method using simplified nonlinear technique to estimate seismic deformations. It is an incremental static analysis used to determine the force-displacement relationship, or the capacity curve, for a structure or structural element (Jan T.S et al. ,2004). In pushover analysis, a model of the building generated is subjected to a lateral load. The intensity of the lateral load is slowly increased and the sequence of cracks, yielding, plastic hinge formation, and failure of various structural components are recorded. Pushover analysis can provide a significant insight into the weak links in seismic performance of a structure. A series of iterations are usually required during which, the structural deficiencies observed in one iteration, are rectified and followed by another. This iterative analysis and design process continues until the design satisfies a pre-established performance criteria. The performance criteria for pushover analysis is generally

established as the desired state of the building given a roof-top or spectral displacement amplitude (Chintanapakdee C. et al. 2003).

1.2 Building performance level

The various seismic performance ranges obtained after analysis and design of a building are defined as building performance level. The four building performance levels are Collapse Prevention, Life Safety, Immediate Occupancy and Operational. These levels are discrete points on continuous scale describing the building's expected performance, or alternatively, how much damage, economic loss, and disruption may occur (Allahabadi R., 1987).

1. Operational Performance level: It means the post-earthquake state which is the highest performance level in the building during which the building undergoes a very little and minimum damage.
2. Immediate Occupancy (IO) level: It means the post-earthquake damage state in which only very limited structural damage has occurred. The risk of life threatening injury as a result of structural damage is very low.
3. Life Safety (LS) level: It means the post-earthquake damage state in which significant damage to the structure has occurred, but some margin against partial or total structural collapse remains.
4. Collapse Prevention (CP) level: It means the building is on the verge of experiencing partial or total collapse. Substantial damage to the structure has occurred, including significant degradation in the stiffness and strength of the lateral force resisting system, large permanent lateral deformation of the structure.

2. METHODOLOGY

A G+9 T shaped building was modeled in SAP2000 and was designed accordingly. At first, the building was modeled by giving the material properties of normal-weight concrete and secondly the same building was modeled, using the properties of lightweight concrete (Kappos A.J. and Manafpour A., 2000).

2.1 Material properties

The material properties of both the types of concrete used in designing the building are shown in Table 1.

Table 1. Material properties used to design the buildings.

Properties	Normal-weight concrete	Lightweight concrete
Concrete type	M30	M30
Rebars	Fe500 , Fe250	Fe500 , Fe250
Unit weight, γ (kg/m^3)	25	15.11
Compressive strength, f_{ck} (N/mm^2)	30	30
Modulus of Elasticity, E (N/mm^2)	27386.128	27386.128
Poisson's Ratio ,μ	0.15	0.15
Shear stress reduction factor	1.00	0.75

2.2 Section properties

The section properties were kept same for both the types of concrete for proper comparison of the seismic performance.

Table 2. Dimensions of various members of the considered RC building

Member	Dimension
Beam	500mm×600mm
Column (Type-1)	600mm×600mm
Column (Type-2)	650mm×650mm
Column (Type-3)	500mm×500mm
Column (Type-4)	550mm×550mm
Column (Type-5)	380mm×380mm
Column (Type-6)	460mm×460mm
Slab (thickness)	125mm
Infill-wall (thickness)	127mm
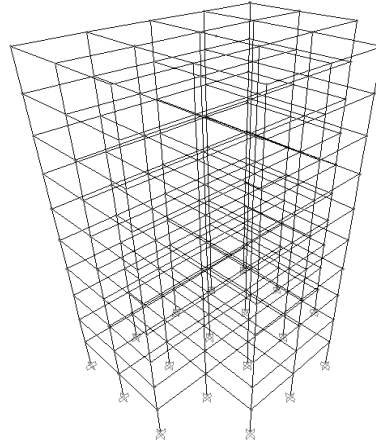
Fig. 1. SAP2000 model (skeletal view) of the sample building.

3. RESULTS AND DISCUSSIONS

3.1. Comparison of modal properties

Modal properties like natural frequencies, mode shapes have significant contribution in dynamics performance of any structure (Chopra A.K., 1995). Significant vibrations are likely to be produced in structures, if the natural frequency range of the dominant modes matches with the earthquake frequency content-range (Chen et al. 2010; Debnath et al. 2013). Therefore, it is a great interest to observe the changes in natural frequencies in case of the light-weight concrete building in comparison with the normal-weight building. The frequency, time period and circular frequencies were obtained after analyzing the buildings and compared accordingly in a tabular form for both the types of buildings as shown in Table 2.

Table 2. Modal parameters for 5 modes in both the types of building.

Mode No.	Normal-weight Concrete building			Lightweight Concrete building		
	Time period (sec)	Frequency (Hz)	Circular-freq. (rad/sec)	Time period (sec)	Frequency (Hz)	Circular-freq. (rad/sec)
1	1.457	0.686	4.311	1.396	0.730	4.587
2	1.402	0.713	4.480	1.318	0.758	4.766
3	1.261	0.792	4.978	1.196	0.835	5.252
4	0.524	1.907	11.984	0.493	2.027	12.741
5	0.506	1.976	12.417	0.476	2.100	13.200

A total of five modes were taken for the comparison with their frequencies and time periods. It was observed that both the frequencies were higher for the lightweight concrete building as compared to the normal-weight concrete building and subsequently the time period was less. Further, mode shapes for the first three dominant modes are shown in Figs. 2-4.

(a)   **(b)**
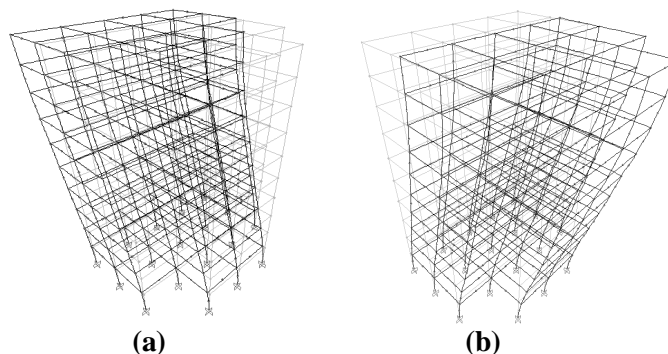
Fig. 2. 1st mode-shape for the considered (a) normal-weight and (b) light-weight building.

(a)   **(b)**
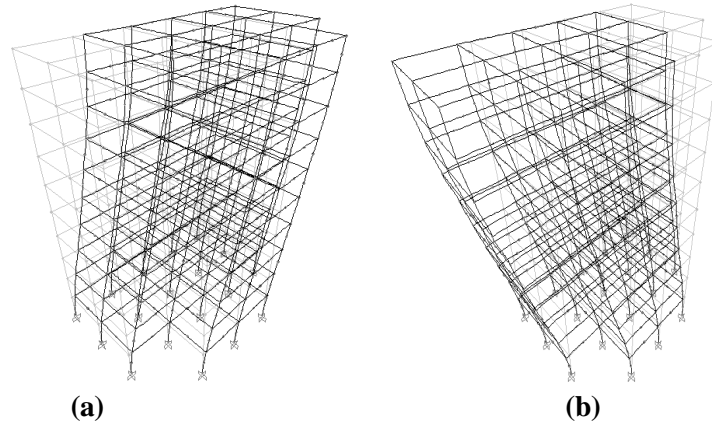
Fig. 3. 2nd mode-shape for the considered (a) normal-weight and (b) light-weight building.

(a)   **(b)**
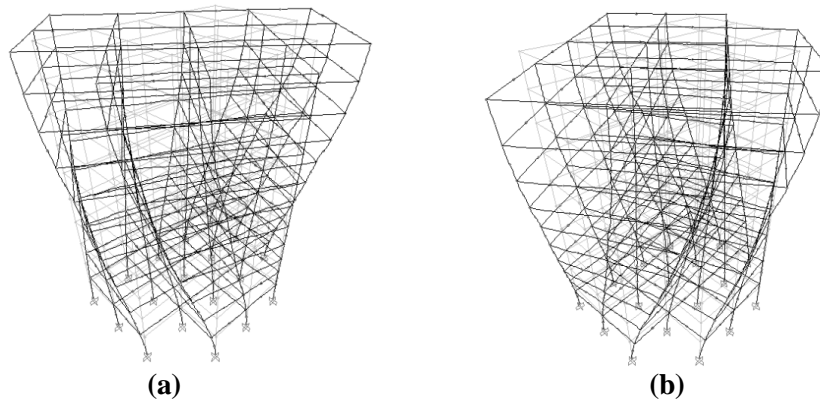
Fig. 4. 3rd mode-shape for the considered (a) normal-weight and (b) light-weight building.

3.2. Performance comparison by static pushover analysis.

An incremental lateral load was given to the building in x and y directions in both types of concrete. The load in x-direction was termed as Px and the load in y-direction was termed as Py for both types of concrete. The performance point which is a well defined point on a scale measuring how much loss is caused by earthquake damage was obtained from the curves resulting from pushover analysis and was used as a parameter to evaluate seismic performance of both the buildings (Fajfar P. et al. 1987). The performance point was plotted in the following curves between base shear and displacement with different building performance levels. The seismic performance assessment for the building was based on the position of the performance point in the following curves.
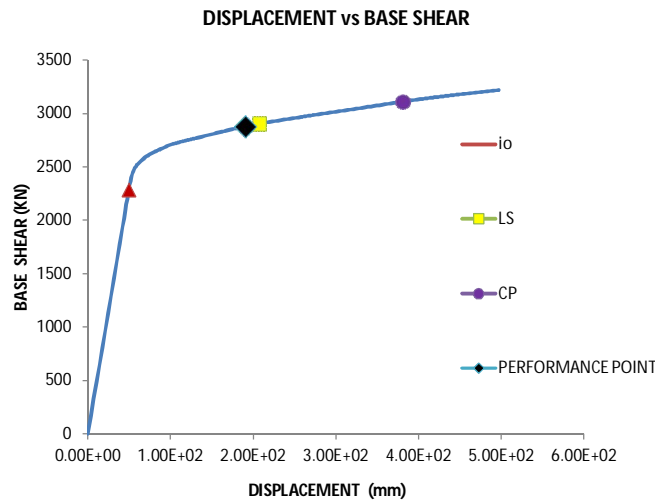
Fig. 5. Performance point for Px in lightweight concrete building
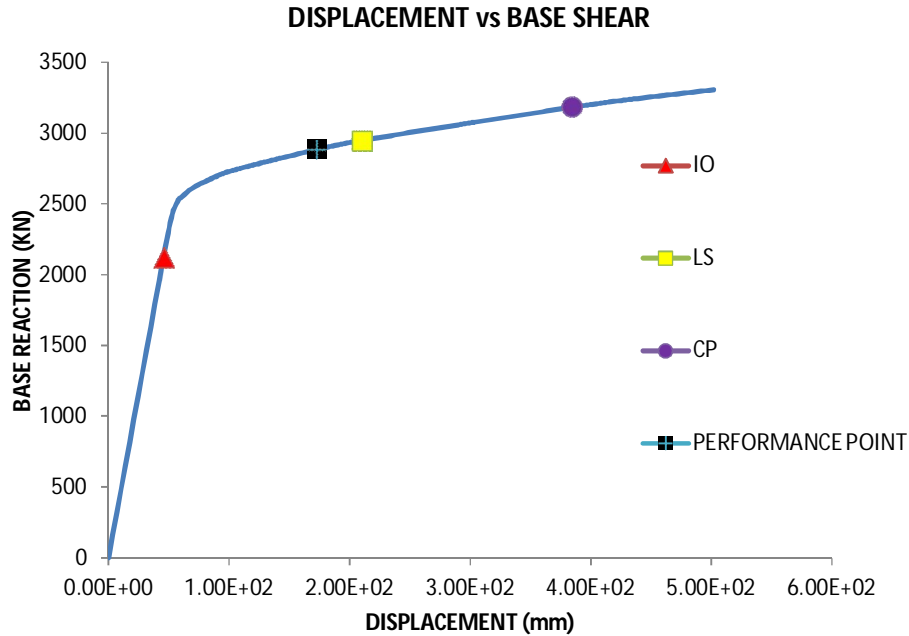
Fig. 6. Performance point for Px in lightweight concrete building

Performance point for Px in normal-weight concrete building was obtained at (191.003 , 2879.911) and plotted in Fig. 5 and that for the lightweight concrete building ,the point was obtained at (172.566 , 2884.913) shown in Fig. 6 . The displacement axis was kept at a unit of 100mm i.e 1.00E+02 was interpreted as 100mm and so on. From the above plots ,it was seen that the performance point of the lightweight concrete building was at a lower displacement level than the conventional concrete for a base shear which was higher than the normal concrete building. Hence the lightweight concrete building showed a higher performance level under seismic load. Both the types of building were at Life safety level (LS) but the lightweight concrete building was at a lower LS level than the normal concrete building which could be understood by observing the position of the performance point in Fig.5 and Fig.6.
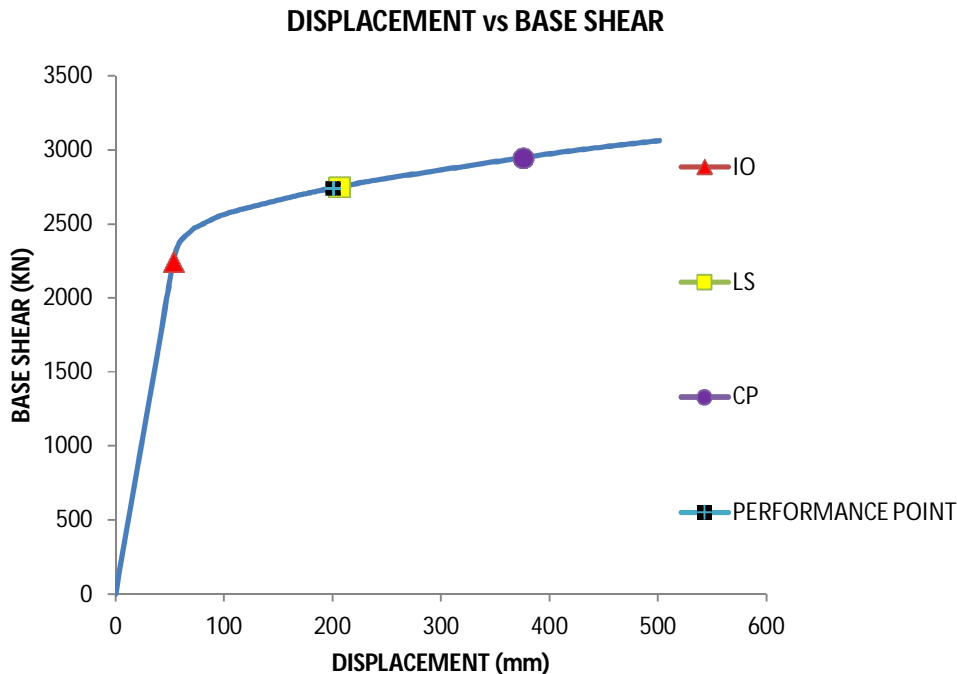
Fig. 7 Performance point for Py in normalweight concrete building.
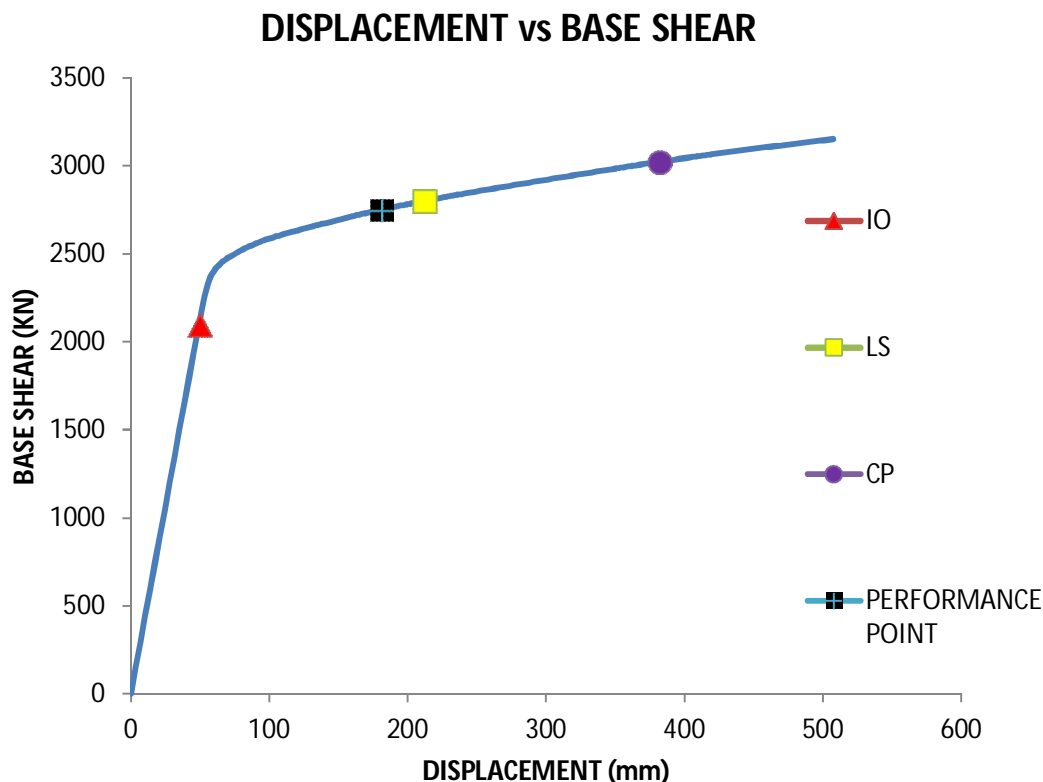
Fig.8. Performance point for Py in lightweight concrete building.

The Performance point for Py in normal-weight concrete building was obtained at (200.391 , 2741.976) and plotted in Fig. 7 and that for the lightweight concrete building ,the point was obtained at (181.2354 , 2750.448) shown in Fig. 8. Similarly as discussed for the case of Px in both the buildings, the graphs for Py also revealed the higher seismic performance of the lightweight concrete building than the conventional concrete based on the position of the performance point which can be understood from Fig.7 and Fig. 8

CONCLUSION

The following conclusions can be drawn from the results of this study :

1. Structural Lightweight concrete buildings can be used in place of normal-weight concrete buildings with the same strength level to attain a better seismic performance than conventional concrete buildings.

2. Lightweight concrete buildings possess less displacement for a higher base shear and frequency than the conventional concrete buildings which on the contrary possess more displacement in a lesser base shear and frequency (Chung-Ho Huang et al. 2008).

3. If the seismic performance of both the types of building can be optimized at a particular level, then the section of structural components and corresponding steel required for lightweight concrete buildings will be less as compared to normal concrete buildings and hence it will be much more economical than the conventional concrete buildings. This dimension can lead to a future scope of study in this field.

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CONSTRUCTION OF PORTFOLIO USING SHARPE'S INDEX MODEL WITH SPECIAL REFERENCE TO CONSTRUCTION INDUSTRY IN INDIA

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ABSTRACT

Today's avenues for investment are abundant like bank deposits, Insurance, property and shares etc. But taking investment decision is much tougher task.

Analysis of the risk associated with each investment option and evaluates the return out of investment becomes very crucial. The confidence level of primary and secondary market investors also increased several fold, this change in scenario is encouraging people to invest in stocks and bonds who earlier park their savings like fixed deposits and other type of investments like gold and other avenues.

By using Sharpe's index model the construction of portfolio for construction industry will make viable for the investors. The stock prices will be taken from the S&P, CNX Nifty. The main objective is to calculate the risk and return factors to help the investors to arrive at the decision of interest to invest money in return more and risk less company and also gain knowledge of stock market. Findings and suggestions would help the investor to choose the company to invest.

Keywords: Sharpe Index, risk and return, Construction industry, investors, riskless, portfolio management, securities, market return, unsystematic risk, diversification and share value

BACKGROUND OF THE STUDY

The topic of risk and analysis in the construction sector has been selected because it is the most sought sector where FDI are sapling their seeds in this sector as there is rapid growth in India's construction Industry. The Investors has developed an appetite in interest to know more about this sector and there are investors who invest in construction companies.

So the investors have to be aware of risk involved in making the investment. The Investors have to calculate the variance α and β value to know whether there is risk in investing in the particular company and does the company offers good returns. Shopping malls, Appartments, Villas and other infrastructure avenues have developed higher growth values. This is largely in a bid to ensure continued interest from retailers to take up space. In the past, the experience has been unfavourable, when values have increased rapidly. Thus in keeping with the overall positive sentiments from the end user and retailers at the current price, we expect the values to hold stable in the next few months.

Despite the fragile economic recovery and subdued consumer sentiment in many countries, global retail markets have bounded strongly during the last year. Retailers continue to expand in west Asia and Japan, but India remains the focus of attention for many of the world's leading retailers. Statistics on Construction Company has to be written in this space.

STATEMENT OF THE PROBLEM

India's construction sector has attracted considerable international interest in recent years. The construction industry of India plans to invest in 75 lakhs square feet in near one year, in absolute value it is estimated up to 10billion US dollars. This move illustrates the rapid growth of India is Construction industry. But many investors are not having interest to invest in the construction industries in India due to lack of awareness.

So, in order to create awareness and bring more investments in the construction Industry in India. It felt pertinent to do a research in this area and main aim of this research is to find out opportunities in this sector and to find out the financial benefits associated with the Construction Industry.

OBJECTIVES

1. To analyze the risk and return of the companies.
2. To maximize the return by creating a balance of risk.
3. To measure actual return and expected return with the help of Standard deviation and Beta.
4. To study the volatility of companies in Comparison with market.

5. To guide the investors of various investing opportunities and guiding companies about investing money in the expansion of the Business.
6. To find riskless and return more companies to invest.

THEORETICAL FRAMEWORK (REVIEW OF ARTICLES)

1. F.J.A. Broeze, (2009), in this study the author carefully selected the sample of companies publicly listed in US stock exchange. It investigated the market risk of the construction companies. The market capitalization values and their equities are widely traded in the stock market. This helps the investors who invest in the stock market. This paper explains about the risk and return of the construction companies.

2. Michael B. Grelck, Stefan Prigge, Lars Tegtmeier and Michael Topalav, (2009), this article contributed to closing this gap in the literature and investigations the returns and diversification properties of investment in construction. From overall perspective they find the investment in construction stocks to the base portfolio worsened diversification. The overall view of diversification properties of construction stock based on single stock market.

3. Edward I. Altman (2008), this paper presents a detailed review of the way credit risk models, developed during the last thirty years, treat the recovery rate and, more specifically, its relationship with the probability of default of an obligor. It also reviews the efforts by rating agencies to formally incorporate recovery ratings into their assessment of corporate loan and bond credit risk and the recent efforts by the Bases Committee on Banking Supervision.

4. Panagiotis Xidonas and John Psarras (2007), the current study provides a categorized application of the technique of multiple criteria decision making to the problems and issues of portfolio management. A large number of studies in the field of portfolio management have been compiled and classified according to the different methodological approaches that have been used. The outmost aim of this paper is to stress the inarguable multiple criterion nature of the majority of the problems that modern financial management faces.

RESEARCH METHODOLOGY

The nature of study is descriptive as the study describes the characteristics of the construction Industry. Sampling technique used here is purposive sampling.

Sharpe's Model of Portfolio Optimization

Using Sharpe's Model, the return for each security can be represented by the equation

$$R_i = \alpha_i + \beta_i + e_i$$

Where,

R_i = expected return on security i.

α_i = Intercept giving return on security when index return is zero.

β_i = Slope which measures the change in the security in return with respect to change in the market return.

e_i = error term with mean and zero and a standard deviation which is constant.

The desirability of any security is directly related to its excess returns to beta ratio given by $(R_i - R_f)/\beta_i$

Where,

R_i = Expected return on stock i.

R_f = Risk free rate of return.

β_i = beta of stock i.

Authors have detailed the overview of analysis and interpretation.

	2010	2011	2012	2013	2014	Average
Mean (x)	0.07	0.13	0.15	0.11	-0.25	0.042
Mean (y)	0.46	0.06	0.42	0.54	-0.67	0.162
SD X	1.69	1.11	1.64	1.67	2.79	1.78
SD Y	4.74	3.74	3.72	4.93	4.33	4.292
BETA	-0.003	0.43	0.30	0.07	0.32	0.2234
ALPHA	0.46	0.009	0.37	0.53	-0.59	0.1558
Covariance	-0.01	0.54	0.82	0.21	2.53	0.818
Correlation	-0.001	0.12	0.13	0.02	0.20	0.0938

Table No. 1: Sobha Developers

The Table No. 1 shows the average stock return Mean(y) is highest in 2013(0.54) and is negative and lowest is 2014(-0.67).It further notices that average market return mean(x) is highest in 20012(0.15) and is negative and lowest in 2011 (-0.25).Risk factor BETA is more in 2011(0.43) showing the progress from pros and cons, but reduced in 2012(0.30) and 2013(0.07).By the end of the study period it showed an increasing trend and stood at (0.32) in 2014 and average BETA is 0.2234.Standard deviation is less only in 2011.

Table No. 2: DLF

	2010	2011	2012	2013	2014	Average
Mean (x)	0.07	0.13	0.16	0.19	-0.25	0.06
Mean (y)	0.12	0.14	0.03	0.41	-0.25	0.09
SD X	1.69	1.11	1.70	1.60	2.79	1.778
SD Y	2.99	2.22	3.64	2.49	4.82	3.232
BETA	0.12	0.08	0.25	0.27	0.38	0.22
ALPHA	0.11	0.13	-0.004	0.36	-0.16	0.0872
Covariance	0.36	0.10	0.75	0.70	2.97	0.976
Correlation	0.07	0.41	0.12	0.17	0.22	0.198

The Table No. 2 under reference shows that Mean value of (x) and (y) is highest in the year 2013 (0.19) and (0.41) and shows negative values in 2014 (+0.25) and (-0.25).Highest deviation is seen in 2014 and least so is in 2011. Risk factor BETA is below 1 for all the years of study under reference and average is also less than 1.

Table No. 3: Gammon

	2010	2011	2012	2013	2014	Average
Mean (x)	0.07	0.13	0.15	0.19	-0.25	0.058
Mean (y)	0.16	0.31	0.03	0.18	0.11	0.158
SD X	1.69	1.11	1.64	1.60	2.18	1.644
SD Y	3.24	2.79	2.69	2.33	2.51	2.712
BETA	0.17	-0.08	0.08	0.23	0.05	0.09
ALPHA	0.15	0.32	0.02	0.14	0.10	0.146
Covariance	0.49	-0.10	0.22	0.60	0.24	0.29
Correlation	0.08	-0.03	0.04	0.16	0.04	0.058

The Table No. 3 shows the average stock return is greater than Average market return in 2010 and 2011. In other financial year it is not in the case. The Average BETA is 0.09 which is lesser than 1 which again shows that market price is less than Stock price. Highest deviation is in 2010 and low in 2011 and seems gradually growing from 2013 onwards.

Table No. 4: Jai Prakash

	2010	2011	2012	2013	2014	Average
Mean (x)	0.07	0.13	0.15	0.19	-0.25	0.058
Mean (y)	0.57	0.74	-0.11	0.12	-0.55	0.154
SD X	1.69	1.11	1.64	1.60	2.79	1.766
SD Y	4.32	4.63	4.70	3.30	4.79	4.348
BETA	0.005	0.01	0.07	0.35	0.14	0.115
ALPHA	0.57	0.74	-0.12	0.12	-0.52	0.158
Covariance	0.10	0.26	1.60	0.38	3.23	1.114
Correlation	0.013	0.05	0.20	0.07	0.24	0.1146

The Table No. 4 shows the average stock return is higher than average market return in the beginning two years of the study period (2010 and 2011), where as it is in vice-versa position in remaining study period. The Average BETA value is 0.115 and is lesser than 1, where shares are defensive. . Highest deviations are seen in 2014 and least in 2010.

Table No. 5:Brigade

	2010	2011	2012	2013	2014	Average
Mean (x)	0.07	0.13	0.15	0.19	-0.25	0.058
Mean (y)	0.12	0.44	0.02	0.32	-0.43	0.094
SD X	2.88	1.14	2.70	2.55	7.79	3.412
SD Y	12.7	3.44	4.40	11.00	19.05	10.118
BETA	0.09	0.14	0.02	0.15	0.007	0.0814
ALPHA	0.11	-0.01	0.01	0.29	-0.43	-0.006
Covariance	0.75	0.23	0.18	0.98	0.44	0.516
Correlation	0.02	0.05	0.01	0.03	0.003	0.0226

The Table No.5 shows the average stock return is higher than the average market return in the financial year 2010 and 2011 during the study period under reference, but it is in opposite position in 2012 and 2014, but average of 7 years stock return is higher than market return. The BETA value is 0.0814 and is lesser than 1.The Correlation is 0.0226 where it is positive one. Highest deviations are seen in 2014.

Table No.6: NCC

	2010	2011	2012	2013	2014	Average
Mean (x)	0.26	-0.09	0.26	-0.11	0.25	0.114
Mean (y)	0.27	-0.01	0.22	-0.19	0.11	0.08
SD X	4.83	1.12	2.21	1.06	2.18	2.28
SD Y	8.71	6.18	4.05	1.99	2.51	4.688
BETA	0.03	0.15	0.13	0.23	0.05	0.118
ALPHA	0.26	-0.01	0.18	-0.16	0.10	0.074
Covariance	0.75	0.19	2.26	0.92	0.24	0.872
Correlation	0.018	0.02	0.25	0.43	0.04	0.1516

The Table No. 6 shows the average stock return is more than Average market return is more than average market return in 2010 where as in all other remaining years. It was in the opposite direction. It further states that average stock return of study period is also less than the average market return. Highest deviations of both the returns are manifested in the year 2010 (4.83 and 8.71).the Average BETA value of the study period is 0.118 and is lesser than 1.

Table No. 7: Cut-off point vs. Unsystematic Risk

	Sobha	DLF	Gammon	Jai Prakash	Brigade	NCC
Unsystematic Risk	18.52673	7.694649	15.43213	9.76818	11.57802	9.7649
Cutoff point	3.180377	8.592306	23.09314	25.04787	33.6133	15.9834

The Table No. 7 notices that the cutoff point is high for Brigade and Jai Prakash. So the revenue generation time is more for Brigade and Jai prakash the cutoff point is very low for Sobha developers and very soon they will turn out the revenue in which they have invested other than rest of the Companies'. The diversification has to be done in Brigade and Jai Prakash in order to reduce the unsystematic risk to compete in market and give much more profit.

FINDINGS
1. We compared BETA values of all 6 companies, the value of BETA is always below 1.where risk associated with these stocks are pretty low and also the price of the shares are highly fluctuating because the reason may be inflationary trends in economy. So Construction Company exhibits low risk in terms of BETA.

2. As all the companies' selected for the study are in India, it is bound to high volatility of risk. Here if there is any downturn in the economy, it will affect the shares of these companies, but long term investment is promising one in this sector.

3. When there is down turn in cement and steel production it will affect construction sector mainly.

4. People can invest in Sobha Developers Limited because it has low risk and highest return.

SPECIFIC FINDINGS

Sobha Developers Limited
1. The Average BETA value is approximately 0.2234 which is less than 1, so it mean the stock is less volatile than the market and shares in this range is called defensive shares

2. When we compare the market return with the stock return, Market return shows a tendency.

3. Correlation value is 0.0938 where 9 per cent change in market return, changes 9 per cent in individual return.

4. The ALPHA value is 0.15 per cent and there is an assurity of 0.19 per cent return if there is no risk also.

DLF
1. The BETA value is less than 1 that means it is low volatility of the price of the stock in comparison with the standard deviation of the market return.
2. The positive Correlation of 0.198 shows that 0.19 per cent change in the market return will change 0.19 per cent in company's stock return.
3. There is only 0.08 per cent return when there is no risk according to the ALPHA value.

GAMMON
1. Here BETA is less than 1, so we can say it is of Defensive shares.
2. The Correlation value is 0.058 per cent, it will affect stock return when .058 per cent change happens in market return.
3. The ALPHA value is 0.140 per cent, so there is surety of 0.140 per cent return on investment if there is no risk.

JAI PRAKASH
1. The Correlation value seems to be 0.1146 per cent which tends to 0.1146 per cent change in market return will affect the same in stock return.
2. The Stocks are less volatile because the standard deviations of market return are always less than the stock returns.
3. The ALPHA is 0.158 which reflects that there is surety of 0.158 per cent returns on investment if there is no risk.

BRIGADE
1. The correlation value is 0.02 per cent and it will change the stock return when 0.02 per cent change happens in the marker return.
2. The BETA value is less than 1, where again it is defensive shares.
3. The ALPHA has negative value of -0.006 which negatives that the return on investment will be negative if there is no risk.

NCC
1. The correlation value of 0.1516 per cent, will change stock returns when 0.1516 per cent change happen in market return.
2. The BETA value is less than 1, where again it is of defensive share.
3. The ALPHA has positive value of 0.074 which tells that 0.074 per cent is assured as return on investment when there is no risk.

SUGGESTIONS
1. Diversification should not be done before analyzing the market.
2. The stocks of the Construction sector are subjected to less risk since the BETA is less than 1.Stock price of construction sector are eventually grown because of strong bottom line and reputation.
3. In the point of view of cut off point, The Sobha Company has less cut off point. So they will generate the revenue in particular period of time. For other companies they can go for Diversification for earlier revenue generation.
4. In Brigade the risk factor is more than the stock return and also has high cut off point, so the Company has to be careful in investing further more investment and the decision taken by the manager should be clear for investment and revenue.

CONCLUSION

From this study we conclude that the construction sector exhibits low risk in terms of BETA. Investors should not only look on the BETA "When making decisions in construction companies'. The company and shareholders must go to the diversification so as to reduce their risk. As the stock market is highly volatile it depends on the investor to invest their money in order to put in the market.

The investor has to be in such a position to analyze the various markets and thus minimize the risk and maximize the return. The investor has to analyze the market on continuous basis so that the investor can pick right Company. The Companies' should also analyze the market continuously so that they can reduce the internal risk, for reinvestment and competing with the competitors for potential growth.

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QUALITY OF SERVICE IN WIRELESS NETWORKS FOR MULTIMEDIA APPLICATIONS

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ABSTRACT

Wireless LANs (WLANs) are one of the fastest growing wireless access technologies. unfortunately, since they were developed to closely match existing wired LANs, the popular IEEE 802.11 standards have several problems in providing Quality of Service (QoS) to stations. Importantly, especially for real-time multimedia services, they do not define support for traffic prioritization or upper bound delay guarantees. The IEEE 802.11e standard is being developed to overcome these drawbacks. In this paper, we give an overview of the Medium Access Control (MAC) enhancements found in the current 802.11e draft specification. The standard defines two new mechanisms for QoS support, namely the Enhanced Distributed Coordination Function (EDCF) and the Hybrid Coordination Function (HCF)

Index Terms—Delay, Differential Services, IEEE 802.11e, Quality of Service, Throughput

INTRODUCTION

The introduction of wireless data networks over the past few years led to numerous wireless extensions of the 802 specifications. IEEE 802.11b, currently the most popular Wireless LAN (WLAN) standard, uses the prevailing 802 LLC protocol but provides an independent Physical (PHY) layer and Medium Access Control (MAC) sublayer specification, allowing support for best-effort wireless communication Since WLANs are the successors of existing LANs, they are expected to support the same applications as the wired Ethernet they are replacing. In saturated conditions the performance of certain applications may be unacceptable since WLAN stations share an error prone, restricted bandwidth channel. Extensive efforts are underway to ensure acceptable QoS over wireless mediums. The WLAN protocols need to evolve to utilize the wireless channel efficiently, avoid contention, and fairly allocate the limited bandwidth to individual IP-based traffic flows where needed. The Distributed Coordination Function (DCF) and the Point oordination Function (PCF) of the original IEEE 802.11 MAC layer protocol do not provide a service differentiation mechanism to guarantee a lower bound on throughput or an upper bound on delay. Due to substantial demand for the transmission of delay sensitive video and audio data, 802.11 task group E formed to develop a MAC protocol with service differentiation. The 802.11e draft standard [8] includes two new MAC schemes to provide QoS to the requesting stations, namely the Enhanced Distributed Coordination Function (EDCF) and Hybrid Distributed Coordination Function (HCF). In this paper, an overview of the IEEE 802.11 standard and the IEEE 802.11e draft standard is given. Section IV describes the research direction which will be taken.

ORIGINAL 802.11 MACDCF

The basic 802.11 MAC layer uses the Distributed Coordination Function (DCF) to share the medium between multiple stations. DCF relies on CSMA/CA and optional 802.11 RTS/CTS to share the medium between stations. This has several limitations:

- if many stations communicate at the same time, many collisions will occur, which will lower the available bandwidth (just like in Ethernet, which uses CSMA/CD)
- there is no notion of high or low priority traffic
- once a station "wins" access to the medium, it may keep the medium for as long as it chooses. If a station has a low bit rate (1 Mbit/s, for example), then it will take a long time to send its packet, and all other stations will suffer from that.
- generally, there are no Quality of Service (QoS) guarantees.

PCF

The original 802.11 MAC defines another coordination function called the Point Coordination Function (PCF): this is available only in "infrastructure" mode, wherestations are connected to the network through an Access Point (AP). This mode is optional, and only very few APs or Wi-Fi adapters actually implement it. APs send "beacon" frames at regular intervals (usually every 0.1 second). Between these beacon frames, PCF defines two periods: the

Contention Free Period (CFP) and the Contention Period (CP). In CP, the DCF is simply used. In CFP, the AP sends Contention Free-Poll (CF-Poll) packets to each station, one at a time, to give them the right to send a packet. The AP is the coordinator. This allows for a better management of the QoS. unfortunately, the PCF has limited support and a number of limitations**.**

802.11E MAC PROTOCOL OPERATION

The 802.11e enhances the DCF and the PCF, through a new coordination function: the **Hybrid Coordination Function** (HCF). Within the HCF, there are two methods of channel access, similar to those defined in the legacy 802.11 MAC: HCF Controlled Channel Access (HCCA) and Enhanced Distributed Channel Access (EDCA). Both EDCA and HCCA define Traffic Classes (TC).

EDCA

With EDCA (Enhanced Distributed Channel Access), high priority traffic has a higher chance of being sent than low priority traffic: a station with high priority traffic waits a little less before it sends its packet, on average, than a station with low priority traffic. In addition, each priority level is assigned a Transmit Opportunity (TXOP). A TXOP is a bounded time interval during which a station can send as many frames as possible (as long as the duration of the transmissions does not extend beyond the maximum duration of the TXOP). If a frame is too large to be transmitted in a single TXOP, it should be fragmented into smaller frames. The use of TXOPs reduces the problem of low rate stations gaining an inordinate amount of channel time in the legacy 802.11 DCF MAC. A TXOP time interval of 0 means it is limited to a single MSDU or MMPDU.

The purpose of QoS is to protect high priority data from low priority data but there can be scenarios in which the data which belongs to same priority needs to be protected from data of same priority. Admission Control in EDCA addresses this type of problems. The AP publishes the available bandwidth in beacons. The clients can check the available bandwidth before adding more traffic in the network that cannot be entertained.

Wi-Fi Multimedia (WMM) certified APs must be enabled for EDCA and TXOP. All other enhancements of the 802.11e amendment are optional.

HCCA

The HCCA (HCF (Hybrid Coordinator Function) Controlled Channel Access) works a lot like the PCF. However, in contrast to PCF, in which the interval between two beacon frames is divided into two periods of CFP and CP, the HCCA allows for CFPs being initiated at almost anytime during a CP. This kind of CFP is called a Controlled Access Phase (CAP) in 802.11e. A CAP is initiated by the AP, whenever it wants to send a frame to a station, or receive a frame from a station, in a contention free manner. In fact, the CFP is a CAP too. During a CAP, the Hybrid Coordinator (HC) which is also the AP controls the access to the medium. During the CP, all stations function in EDCA. The other difference with the PCF is that Traffic Class (TC) and Traffic Streams (TS) are defined. This means that the HC is not limited to per-station queuing and can provide a kind of per-session service. Also, the HC can coordinate these streams or sessions in any fashion it chooses (not just round-robin). Moreover, the stations give info about the lengths of their queues for each Traffic Class (TC). The HC can use this info to give priority to one station over another, or better adjust its scheduling mechanism. Another difference is that stations are given a TXOP: they may send multiple packets in a row, for a given time period selected by the HC. During the CP, the HC allows stations to send data by sending CF-Poll frames.

HCCA is generally considered the most advanced (and complex) coordination function. With the HCCA, QoS can be configured with great precision. QoS-enabled stations have the ability to request specific transmission parameters (data rate, jitter, etc.) which should allow advanced applications like VoIP and video streaming to work more effectively on a Wi-Fi network.

HCCA support is not mandatory for 802.11e APs. In fact, few (if any) APs currently available are enabled for HCCA. Nevertheless, implementing the HCCA does not require much overhead, as it basically uses the existing DCF mechanism for channel access (no change to DCF or EDCA operation is needed). In particular, the station side implementation is very simple as stations only need to be able to respond to poll messages. On the AP side, however, a scheduler and queuing mechanism is needed. Given that AP's are already equipped better than station transceivers, this should not be a problem either.

OTHER 802.11E SPECIFICATIONS

In addition to HCCA, EDCA and TXOP, 802.11e specifies additional optional protocols for enhanced 802.11 MAC layer QoS:

APSD

Automatic Power Save Delivery is a more efficient power management method than legacy 802.11 Power Save Polling. Most newer 802.11 station already support a power management mechanism similar to APSD. APSD is very useful for a VoIP phone, as data rates are roughly the same in both directions. Whenever Voice data are sent to the Access Point, the Access Point is triggered to send the buffered Voice data in the other direction. After that the Voice over IP phone enters doze state until next Voice data have to be sent to the Access Point**.**

BA

Block Acknowledgments allow an entire TXOP to be acknowledged in a single frame. This will provide less protocol overhead when longer TXOPs are specified.

NOACK

In QoS mode, service class for frames to send can have two values: QosAck and QosNoAck. Frames with QosNoAck are not acknowledged. This avoids retransmission of highly time-critical data.

DLS

Direct Link Setup allows direct station-to-station frame transfer within a Basic Service Set. This is designed for consumer use, where station-to-station transfer is more commonly used. Microsoft previously announced a Virtual Wi-Fi initiative designed to accomplish the same goal. Virtual Wi-Fi allows gamers to connect wireless while accessing the Internet through an AP by allowing station adapters to have multiple MAC addresses. The release date of this capability is unknown**.**

III RELATION TO SUBJECTIVE QUALITY MEASURES

An alternative and disputable definition of QoS, used especially in telephony and streaming video services, is a metric that reflects or predicts the subjectively experienced quality, for example the Quality of Experience (QoE) subjective business concept, the "user perceived performance", the "degree of satisfaction of the user", the "number of happy customers" or the Mean Opinion Score (MOS). In this context, QoS is the cumulative effect on subscriber satisfaction of all imperfections affecting the service. This definition includes the application and the human in the assessment, and demands an appropriate weighting of diverse objective measures.

Quality of Service Experience (QoSE) on the other hand, is the actual measure of user's experience with an operator in terms of delivered quality with or without reference to what is being promised. This differs from QoS as the former is defined only in the context of user experience but not Quality of Experience (QoE) because it is not subjective.

PROBLEMS

When the Internet was first deployed many years ago, it lacked the ability to provide Quality of Service guarantees due to limits in router computing power. It therefore ran at default QoS level, or "best effort". There were four "Type of Service" bits and three "Precedence" bits provided in each message, but they were ignored. These bits were later re-defined as DiffServ Code Points (DSCP) and are largely honored in peered links on the modern Internet.

When looking at packet-switched networks, Quality of service is affected by various factors, which can be divided into "human" and "technical" factors. Human factors include: stability of service, availability of service, delays, user information. Technical factors include: reliability, scalability, effectiveness, maintainability, Grade of Service, etc. Many things can happen to packets as they travel from origin to destination, resulting in the following problems as seen from the point of view of the sender and receiver:

Dropped packets

The routers might fail to deliver (*drop*) some packets if they arrive when their buffers are already full. Some, none, or all of the packets might be dropped, depending on the state of the network, and it is impossible to determine what will happen in advance. The receiving application may ask for this information to be retransmitted, possibly causing severe delays in the overall transmission.

Delay

It might take a long time for a packet to reach its destination, because it gets held up in long queues, or takes a less direct route to avoid congestion. In some cases, excessive delay can render an application, such as VoIP or online gaming unusable.

Jitter

Packets from the source will reach the destination with different delays. A packet's delay varies with its position in the queues of the routers along the path between source and destination and this position can vary unpredictably. This variation in delay is known as jitter and can seriously affect the quality of streaming audio and/or video.

Out-of-order delivery

When a collection of related packets is routed through the Internet, different packets may take different routes, each resulting in a different delay. The result is that the packets arrive in a different order than they were sent. This problem requires special additional protocols responsible for rearranging out-of-order packets to an isochronous state once they reach their destination. This is especially important for video and VoIP streams where quality is dramatically affected by both latency and lack of isochronicity.

Error

Sometimes packets are misdirected, or combined together, or corrupted, while *en route*. The receiver has to detect this and, just as if the packet was dropped, ask the sender to repeat itself.

APPLICATIONS REQUIRING QOS

A defined Quality of Service may be required for certain types of network traffic, for example:

- streaming multimedia may require guaranteed throughput to ensure that a minimum level of quality is maintained.
- IPTV offered as a service from a service provider such as AT&T's U-verse
- IP telephony or Voice over IP (VOIP) may require strict limits on jitter and delay
- Video Teleconferencing (VTC) requires low jitter and latency
- Alarm signalling (e.g., Burglar alarm)
- dedicated link emulation requires both guaranteed throughput and imposes limits on maximum delay and jitter
- a safety-critical application, such as remote surgery may require a guaranteed level of availability (this is also called *hard QoS*).
- a remote system administrator may want to prioritize variable, and usually small, amounts of SSH traffic to ensure a responsive session even over a heavily-laden link.
- online games, such as fast paced real time simulations with multiple players. Lack of QoS may produce 'lag'.

These types of service are called *inelastic*, meaning that they require a certain minimum level of bandwidth and a certain maximum latency to function.By contrast, *elastic* applications can take advantage of however much or little bandwidth is available. Bulk file transfer applications that rely on TCP are generally elastic.

OBTAINING QOS

- Per call
- In call
- In advance: When the expense of mechanisms to provide QoS is justified, network customers and providers typically enter into a contractual agreement termed a service level agreement (SLA) which specifies guarantees for the ability of a network/protocol to give guaranteed performance/throughput/latency bounds based on mutually agreed measures, usually by prioritizing traffic.
- Reserving resources: Resources are reserved at each step on the network for the call as it is set up. An example is RSVP, Resource Reservation Protocol.

QOS MECHANISMS

An alternative to complex QoS control mechanisms is to provide high quality communication by generously over-provisioning a network so that capacity is based on peak traffic load estimates. This approach is simple and economical for networks with predictable and light traffic loads. The performance is reasonable for many

applications. This might include demanding applications that can compensate for variations in bandwidth and delay with large receive buffers, which is often possible for example in video streaming.

Commercial VoIP services are often competitive with traditional telephone service in terms of call quality even though QoS mechanisms are usually not in use on the user's connection to his ISP and the VoIP provider's connection to a different ISP. Under high load conditions, however, VoIP quality degrades to cell-phone quality or worse. The mathematics of packet traffic indicate that a network with QoS can handle four times as many calls with tight jitter requirements as one without QoS. The amount of over-provisioning in interior links required to replace QoS depends on the number of users and their traffic demands. As the Internet now services close to a billion users, there is little possibility that over-provisioning can eliminate the need for QoS when VoIP becomes more commonplace.

Early work used the "IntServ" philosophy of reserving network resources. Applications used the Resource reservation protocol (RSVP) to request and reserve resources through a network. While IntServ mechanisms do work, it was realized that in a broadband network typical of a larger service provider, Core routers would be required to accept, maintain, and tear down thousands or possibly tens of thousands of reservations. It was believed that this approach would not scale with the growth of the Internet, and in any event was antithetical to the notion of designing networks so that Core routers do little more than simply switch packets at the highest possible rates.

The second and currently accepted approach is "DiffServ" or differentiated services. In the DiffServ model, packets are marked according to the type of service they need. In response to these markings, routers and switches use various queuing strategies to tailor performance to requirements. (At the IP layer, differentiated services code point (DSCP) markings use the 6 bits in the IP packet header. At the MAC layer, VLANIEEE 802.1Q and IEEE 802.1D can be used to carry essentially the same information)

Routers supporting DiffServ use multiple queues for packets awaiting transmission from bandwidth constrained (e.g., wide area) interfaces. Router vendors provide different capabilities for configuring this behavior, to include the number of queues supported, the relative priorities of queues, and bandwidth reserved for each queue.

Additional bandwidth management mechanisms may be used to further engineer performance, to include:
- Traffic shaping (rate limiting):
  - Token bucket
  - Leaky bucket
  - TCP rate control - artificially adjusting TCP window size as well as controlling the rate of ACKs being returned to the sender
- Scheduling algorithms:
  - Weighted fair queuing (WFQ)
  - Class based weighted fair queuing
  - Weighted round robin (WRR)
  - Deficit weighted round robin (DWRR)
  - Hierarchical Fair Service Curve (HFSC)
- Congestion avoidance:
  - RED, WRED - Lessens the possibility of port queue buffertail-drops and this lowers the likelihood of TCP global synchronization
  - Policing (marking/dropping the packet in excess of the committed traffic rate and burst size)
  - Explicit congestion notification
  - Buffer tuning

One compelling example of the need for QoS on the Internet relates to this issue of congestion collapse. The Internet relies on congestion avoidance protocols, as built into TCP, to reduce traffic load under conditions that would otherwise lead to Internet Meltdown. QoS applications such as VoIP and IPTV, because they require largely constant bitrates and low latency cannot use TCP, and cannot otherwise reduce their traffic rate to help prevent meltdown either. QoS contracts limit traffic that can be offered to the Internet and thereby enforce traffic shaping that can prevent it from becoming overloaded, hence they're an indispensable part of the Internet's ability to handle a mix of real-time and non-real-time traffic without meltdown. Asynchronous Transfer Mode (ATM) network protocol has an elaborate framework to plug in QoS mechanisms of choice. Shorter data units and built-in QoS

were some of the unique selling points of ATM in the telecommunications applications such as video on demand, voice over IP.

IV PROPOSED RESEARCH

In prioritized service of heterogeneous traffic flows is provided, using a distributed MAC approach. However, qualitative throughput and delay guarantees, which are needed for time-sensitive traffic, cannot be made. The addition of a MAC admission control mechanism should be explored, which could allow efficient QoS guarantees to be made to admitted traffic flows. The fairness balance between starvations versus non-admittance of flows should also be considered. The majority of existing works on IEEE 802.11x

performance assumes that there are no hidden stations, no overlapping WLANs, and that no transmission errors occur. However, channel quality does vary, and due to the popularity of IEEE 802.11b, overlapping WLANs and hidden stations are very much a reality. Therefore, the effect of these issues on QoS guarantees should be investigated.

Since backward compatibility is a necessity, the effect of the HCF scheme on legacy stations should also be examined. Using the results of the above research, we hope to propose improvement to the 802.11 draft standard, which could provide prioritized QoS guarantees to heterogeneous traffic flows.

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TRAFFIC MANAGEMENT STUDY IN SILCHAR, ASSAM

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ABSTRACT

The fast rate of urban growth has always posed a serious challenge to road capacity of a growing city like Silchar. Unless attention is immediately directed for designing and implementing an optimal system and efforts are made on a continuous basis to build up adequate carrying capacity, we will never be able to remove congestion. Silchar is one among the many cities in India which has witnessed sudden rise in urban population. The core areas of the city are characterized by insufficient road width which do not permit smooth flow of traffic. The absence of effective Mass Transit System for the transportation of passengers, has led to the growth of auto rickshaws as the primary mode of public transportation system and frequent use of private vehicles leading to congestion. The rapid increase in vehicular trips without corresponding increase in road space is causing heavy congestion in many parts of the city.

The study aims to throw light on the existing traffic flow conditions in Silchar city area. Various surveys are conducted to get an idea about the problems being faced by the road users. Traffic volume surveys are being done in various important locations which consists of Rangirkhari, Ambikapatty and Premtola area. Parking Surveys are also conducted to calculate the on street parked vehicles. Pedestrian volume count and spot speed surveys are also done so as to confirm the ease of traffic flow in peak and non peak hours.

Keywords: Traffic flow, parking, spot speed, pedestrian, Silchar

1. INTRODUCTION

Silchar is the headquarters of Cachar district in the state of Assam in India. It is located at a latitude of 24.82° North and 92.8° East longitude. It is the 2nd largest town of the state in terms of population and municipal area.

Nowadays, the number of vehicles on the road and the need of urban passenger transportation are growing faster. Road transportation has become the backbone of industrialized countries. Nevertheless, the road network system in cities is not sufficient to cope with the current demands due to the inadequate width of the roads. Constructing new or expanding existing roads do not always solve the traffic congestion problem due to space limitation, high cost and environmental problems. The transportation system consists of mixed mode of traffic flow – due to the slow moving vehicles flow speed becomes less resulting to reduction of level of service and capacity of the existing road. As a consequence, the urban society is facing more traffic congestion, higher fuel bills, high levels of CO_2 emissions etc. Vehicular traffic is one of the most critical concerns of urban societies where cities are ever growing. About 30 percent of is residing in urban areas and this percentage is going on increasing. As a consequence, drivers and passengers spend a large percentage of working hours on road.

As the economic development activities in Silchar are growing, transportation needs have increased, accordingly number of vehicles have grown. With the recent advancements in vehicle manufacturing technology and the increase in GDP of the population, lead to the rapid increase of vehicular population. But corresponding road infrastructure is not increasing at the rate of the vehicular increase. This mismatch between supply and demand of infrastructure has culminated in increasing traffic related problems such as congestion, accidents, air pollution etc.

In Silchar, the commercial activities are located along Central Road in the Premtola area around Goldighi Mall, Vishal Mega Mart and Metro Bazar. This is the major arterial road of the urban area having direct access to and from major roads. Most of the area has on-street parking blocking half of the carriageways. The traffic which is already congested has to face further congestion due to on street parking. In the absence of sidewalks and crossing facilities, pedestrians are also forced to share the carriageways along with the vehicles and thus are exposed to safety hazards and also interfere with the free movement of vehicles. Improper traffic regulation, ill-designed intersections and inadequate road infrastructure are causing immense traffic problems, which needs immediate attention in improving the traffic situation.

PARKING FACILITIES

Parking is the act of stopping and disengaging a vehicle and leaving it unoccupied. Parking on one or both sides of a road is often permitted, though sometimes with restrictions. Parking facilities are constructed in combination with some buildings, to facilitate the coming and going of the buildings users. The use of a major area in Silchar is not properly monitored and managed especially with regards to on-street parking thereby reducing the capacity of the road and even could cause accidents. By understanding the effects as well the relationship of on-street parking to moving vehicles the impact of on-street parking on moving traffic is required to be studied and provide a better means of estimating the level of service and capacity of the road. Analytical survey method and experimental method are to be used in this study by videotaping the traffic flow of the street and analyzing the effects of on-street parking to moving traffic. The presence of on-street parking as well as the manoeuvring of vehicles in and out of an on-street parking prolongs the travel time of moving vehicles whether it be parallel or angled to the curb.

EFFECT OF PEDESTRIANS AND PEDESTRIAN FACILITIES ON TRAFFIC FLOW

Pedestrians form a major part of the traffic flow in a transportation system. Simulating pedestrian traffic becomes most important in areas of high congestion. Because of the complex, chaotic nature of the pedestrian flow, the traffic flow of an area is effected at a very high rate. Various pedestrian facilities are required to be provided for the smooth functioning of the traffic flow. Facilities such as footpaths, zebra crossings, foot over bridges, underground pass etc. are required to be provided so that the volume of pedestrian traffic flows smoothly and does not intersect with the traffic flow. If adequate pedestrian facilities are not provided, then pedestrians will be using the carriageway provided for the vehicles and thus reduce the road width which in turn will lead to reduction of speed of vehicles and congestions.

2. OBJECTIVES AND SCOPES

OBJECTIVE

To work out a traffic management plan to ease the existing traffic problems in Silchar and to optimise the use of existing infrastructure focusing on short term remedial measures to improve traffic conditions considering junction improvement, area traffic management schemes, parking plans etc. For this purpose, various traffic studies namely traffic volume studies at Intersections and Mid-blocks, Pedestrian Studies and Speed and Delay Studies need to be conducted and based on these short term solutions will be recommended.

SCOPE

The study aims to come out with some solutions for the existing traffic problems in Silchar. The research work aims to propose to widen the identified sections of the road network, to restrict the movement of commercial vehicles in specific areas, comment on parking facilities and pedestrian facilities along with traffic control devices namely signals, signages etc.

3. LITERATURE REVIEW

A review is made of several traffic management planning studies. The studies include all-encompassing efforts during a major urban reconstruction project to simple methods to improve sign placement and increase the number of open lanes. Traffic engineers must plan and execute projects with an effort to mitigate impact costs to the user. A comprehensive corridor traffic management plan can significantly reduce user costs, reduce the public frustration during delays, improve the public relations and image of the agency undertaking the project, and lead to long term benefits of increased use of mass transit alternatives in urban areas.

Traffic Management Plan for Port Blair City, India by Madhu Errampali, Ravinder Kayitha recommends various measures to be taken to improve traffic conditions in Port Blair.

Freeway capacity can be increased significantly by using road shoulders as travel lanes. William C. McCasland in Impact of Using Freeway Shoulders as Travel Lanes on Fuel Consumption specifically mentions the ability to use the freeway shoulder to restore a portion of the capacity lost during lane closures.

Sight-Distance Requirements at Lane-Closure Work Zones on Urban Freeways conducted by Stephen H. Richards and Conrad L. Dudek consisted of a preliminary field study followed by a controlled field study. The results of this study clearly show that increased sight distance and signs which attract more attention improve driver response to closed lanes. The flashing arrow has now become the standard for lane closures.

Evaluation of 1-75 Lane Closures by Jerry G. Pigman and Kenneth R. Agent, evaluates the effects of additional traffic control devices in addition to the minimum requirements set forth in the Manual on Uniform Traffic Control Devices on driver behaviour at lane closures. The additional devices used included variable message signs, supplemental signs, and rumble strips. Overall, the study shows the strong need to preplan the placement of traffic control devices to ensure adequate sight distance with respect to the geometric configuration of the freeway at the work zone.

In his report, Traffic Impacts of Bridge Resurfacing on Northbound Interstate 5 Through Seattle John Mieras describes the traffic management plans implemented and their success rate at reducing delays caused by the resurfacing project. The bridge to be resurfaced was a primary corridor for commuter traffic. In fact, it was one of six routes available to cross the Washington Ship Canal. The project consisted of three phases. The Commuter Pool did see a sharp increase of 33 percent and 47 percent in ridership calls per month over the prior year during the two-month project. The only disappointment was with Metro Transit. The three new bus routes garnered ridership numbering only 50 people per day, primarily on two routes prompting the bus service to cancel one route. Also, ridership on existing routes did not show any appreciable increase.

In Freeway Incidents and Special Events: Scope of the Problem. Conrad L. Dudek examines the problem in general and recommends preplanning in traffic management to minimize the impacts of these occurrences. While not written toward construction work zones in particular, he emphasized the need for planning in incident detection and incident response (which includes response time and type).

4. RESEARCH METHODOLOGY

To achieve the objective mentioned, the study methodology for this study has been devised and presented in the form of step by step procedure. As can be seen from the following steps of research work, a reconnaissance survey was made to understand the existing road network and related traffic problems at the first instance. In addition to that, discussions were also made with the road users to get the various inputs before proceeding for data collection. Then, the study methodology has been devised in terms of conducting various traffic studies. The data analysis is followed from the various traffic and transportation studies to estimate vehicular traffic, pedestrian and parking demand. These results have been utilized in tern to develop short term solutions.

The research is to be proceeded as per the following steps:-

STEP I:- Reconnaissance Survey

STEP II:- Conceptualization of Study (includes discussions with the road users, related officials, consideration of the limitations of the research work).

STEP III:-Data Collection

      Field Studies

   i) Classified Traffic Volume Count
   ii) Speed and Delay Survey
   iii) Parking Demand Survey
   iv) Spot Speed Survey
   v) Pedestrian facilities Survey

STEP IV:- Data Analysis and Interpretation

      Analysis of the collected data at various survey points, Plotting of Graphs, Pie Charts etc.

STEP V:- Estimation of Vehicular Traffic Demand, Parking Demand and Pedestrian Demand

      Recommendation of Solutions to the existing problems:-

   i) Proposal regarding widening of the identified sections of the road network.
   ii) Recommendations on Parking Facilities.
   iii) Preparation of Traffic Management

Plan of the specific area of research.

iv) Transport Infrastructure Improvement Plans.
v) Preparation of traffic circulation plans for central business district areas.

5. TRAFFIC STUDIES
5.1. Classified Traffic Volume Counts

Classified traffic volume count survey is conducted at various intersections. These studies conducted for 12 hours (from 8:00 AM to 8:00 PM) for certain locations and 10 hours (from 8:00 AM to 6:00 PM) for certain locations in order to understand the pattern of traffic movement along the major district road throughout the day. The typical hourly variation of traffic volume and traffic composition for Rangirkhari Junction is presented in Fig 1-4 below. The summary of different modes of traffic flow is presented in Table 1 and 2 respectively.
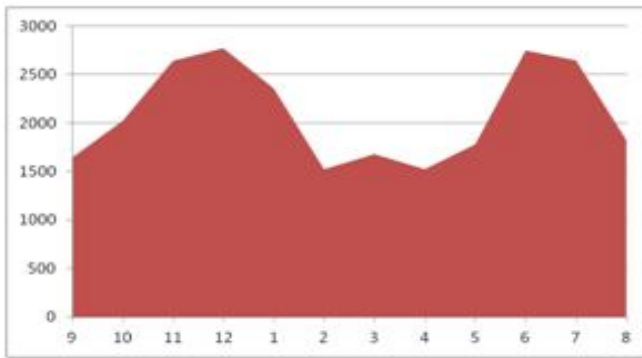
Fig 1:- Traffic flow in Rangirkhari towards Premtola
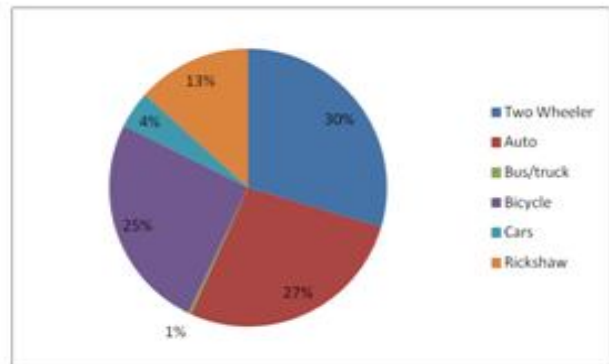
Fig 2:- Traffic composition in Rangirkhari towards Premtola
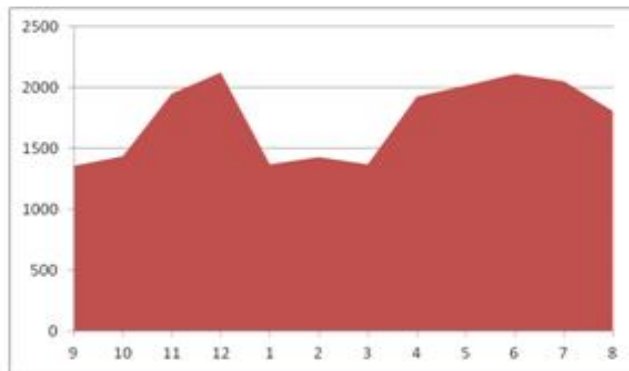
Fig 3:- Traffic flow in Rangirkhari towards NIT
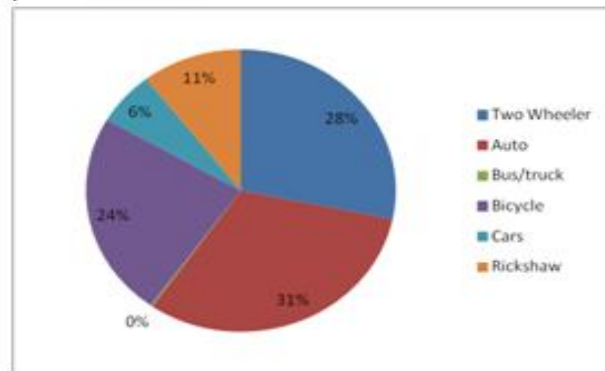
Fig 4:- Traffic composition in Rangirkhari towards NIT

Table 1:- Traffic Flow from Rangirkhari towards Premtola

	2 Wheeler	Auto	Bus/Truck	Cycle	Cars	Rickshaw	PCU
09:00	630	606	12	390	66	282	1644
10:00	834	702	24	552	168	258	2022
11:00	984	972	0	888	204	354	2646
12:00	1026	942	12	876	150	462	2772
01:00	942	816	12	582	120	414	2358
02:00	852	702	30	126	180	42	1524
03:00	858	744	12	252	246	66	1680
04:00	678	630	6	192	270	114	1524

Table 2:- Traffic Flow from Rangirkhari towards NIT

	2 Wheeler	Auto	Bus/Truck	Cycle	Cars	Rickshaw	PCU
09:00	510	492	18	330	228	108	1356
10:00	588	618	12	414	114	108	1434
11:00	708	870	24	534	168	144	1950
12:00	744	828	6	618	162	276	2124
01:00	570	534	6	438	102	138	1368
02:00	732	738	12	144	132	54	1428
03:00	642	582	18	192	162	102	1368
04:00	1146	786	12	252	180	150	1926

Auto rickshaws and two wheeler vehicles consists of the major traffic in Silchar. In the absence of other mass transportation system auto rickshaws have to meet the need of the people. The peak traffic in both the directions is found to be during 12:00 to 01:00 PM. The maximum peak hour flow is found to be 2772 PCU/hr which leads to congestion reducing the speed of traffic flow.

5.2. Pedestrian Studies
For a safe and free movement of pedestrians there is an imminent need to study the pedestrian needs and accordingly plan appropriate facilities for their safe movement along and across the carriageways. For this purpose, Pedestrian Volume Counts are conducted at different locations in tandem with the traffic volume counts. Typical hourly variation of pedestrian count at Rangirkhari point is shown in Figure 5. The analysis of pedestrian volume count have found peak hour pedestrian volumes as high as 1500 pedestrians / hr which is warranting for appropriate pedestrian facilities.
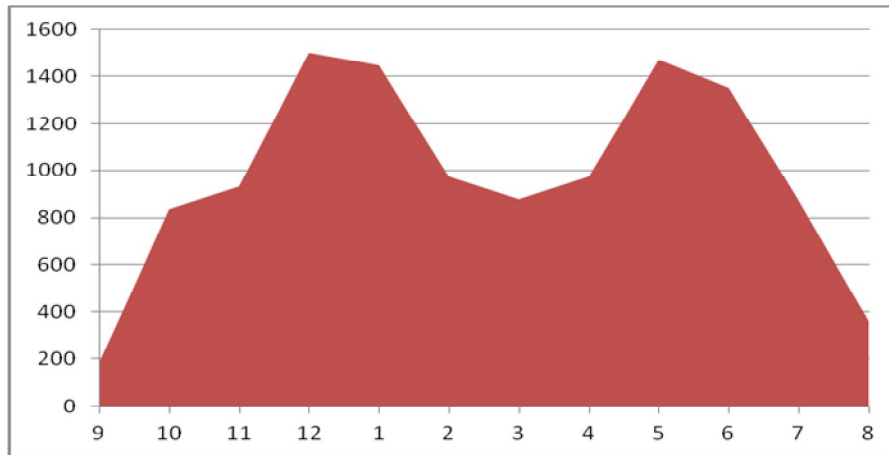
Fig 5:- Pedestrian Flow from Rangirkhari towards NIT

5.3. Parking Studies
There are commercial activities spread over the city and these areas with shops having direct access to the road with little space left for providing formal parking lot. This has resulted in the usage of available road space for on-street parking by encroaching the carriageway. Of late, the parking situation has worsened and has left people with no choice other than to park on roads. Presently, the ill organized parking in the commercial centre is on the increase and needs to be regulated and supplemented with additional off-street parking facilities. For this purpose, the appropriate parking studies are conducted selected locations in the city centers and commercial places to assess the parking demand and based on the same, remedial measures are suggested appropriately. The typical hourly variation of accumulation and duration of parking at Rangirkhari Junction is presented in Figure 6. From the parking duration analysis, it can be observed that most of the parkers are parking for short duration

which may lead to congestion of roads. It can be recommended from the analysis that the multi- storey parking facilities at Premtola area and Off-street parking facilities at Rangirkhari are wesranted.In addition to this, suitable on-street parking space shall be developed so as to avoid obstruction to main carriageway traffic.
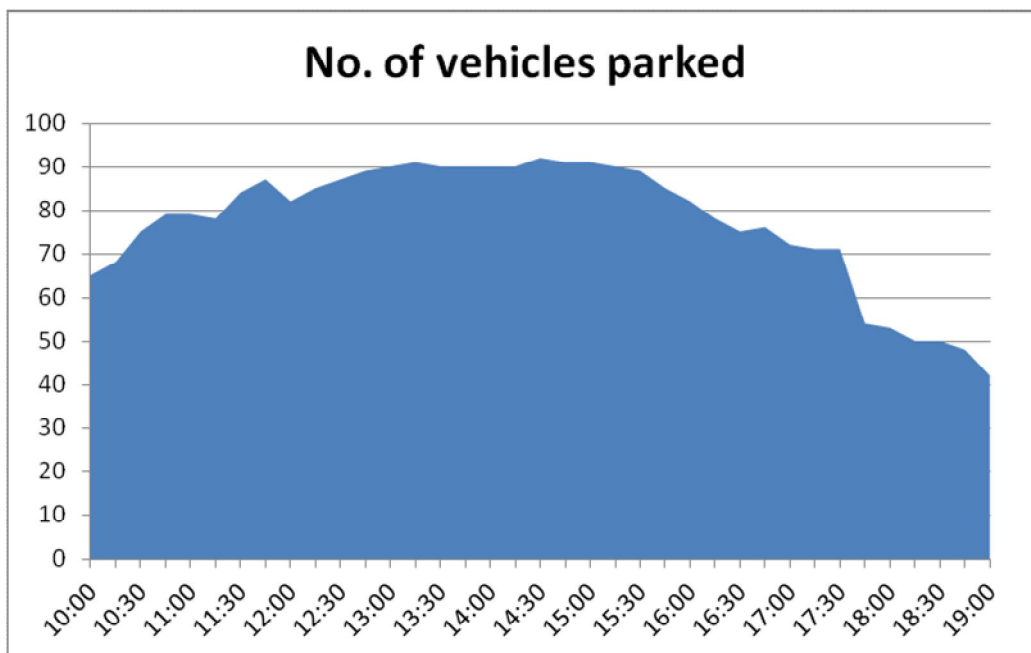
Fig 5:- Variation of On street Parking in Rangirkhari area throughout the day for 150 metre distance.

5.4. Spot Speed and Speed & Delay Studies

Spot speed surveys were also conducted in Rangirkhari, Ambikapatti and Premtola area. It was found that the instantaneous speed or the spot speed in Rangirkhari area for most of the vehicles varied between 12 to 28 kmph. The spot speed was measured using a Radar Gun. A radar gun is a device used to measure the speed of moving objects. It is used to measure the speed of moving vehicles. A radar speed gun is a Doppler radar unit that may be hand-held, vehicle-mounted or static. It measures the speed of the objects at which it is pointed by detecting a change in frequency of the returned radar signal caused by the Doppler effect, whereby the frequency of the returned signal is increased in proportion to the object's speed of approach if the object is approaching, and lowered if the object is receding.

6. CONCLUDING REMARKS AND RECOMMENDATIONS

In order to ease the existing traffic problems in the city of Silchar and to optimize the use of existing infrastructure, short term remedial measures in terms of traffic management plans to improve traffic conditions are proposed. For this purpose, traffic studies namely traffic volume studies at various locations, Pedestrians Studies, Parking Studies and Speed and Delay Studies are conducted. Based on these studies short term solutions are recommended which include:

- Widening of existing roads and junctions along with addition of new links.

- Pedestrian flows are significant at the junctions namely Rangirkhari, Ambikapatty, Premtola. The pedestrian movements are quite high because of the land use characteristics. From the above following measures are recommended:

✓ At these junctions, encroachments shall be totally removed and clear passage in terms of continuous foot paths for pedestrian around the intersection shall be developed.

✓ The foot over bridges (FOB) at different locations namely at Rangirkhari area and Premtola (Near Goldighi Market Complex) can be considered.

✓ Well marked Zebra Crossings to be provided for the smooth passage of the pedestrians.

- Parking Facilities are recommended to deal with parking problems as they are very severe and deteriorating the traffic conditions in terms of congestion and safety issues. Since the road space is not available for parking, off-street parking can be developed at the appropriate locations such as Rangirkhari, Ambikapatty, Premtola.

Multi-storey parking facilities are recommended near Rangirkhari area to cater the parking needs of the traffic which are heading to entire central business district (CBD) area.

- Traffic Signals like Fixed time signals with channelisers are proposed at various locations as peak hour traffic flow is high.

- Traffic Signages in terms of Overhead Gantry Signs (Place Names and Directions), Informatory Signs (Place Names and Directions, Facility information etc.), Warning Signs (Curves, Pedestrian Crossing, School Ahead etc.) and Regulatory Signs (Speed Limits, Parking restrictions, one way etc.) as per the IRC code (IRC:67-2012) are recommended to be installed at the appropriate places on the major corridor so that the road user gets the right information at right time.

7. REFERENCES

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4. Evaluation of 1-75 Lane Closures by Jerry G. Pigman and Kenneth R. Agent

5. Traffic Impacts of Bridge Resurfacing on Northbound Interstate 5 Through Seattle by John Mieras

6. Freeway Incidents and Special Events: Scope of the Problem by Conrad L. Dudek

DESIGN GRADATION OF SURFACE LAYER FOR POROUS ASPHALT PAVEMENTS

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ABSTRACT

Porous asphalt pavements offer an alternative technology for storm water management. A porous asphalt pavement differs from traditional asphalt pavement designs in that the structure permits fluids to pass freely through it, reducing or controlling the amount of run-off from the surrounding area. By allowing precipitation and run-off to flow through the structure, this pavement type functions as an additional storm water management technique. The overall benefits of porous asphalt pavements may include both environmental and safety benefits including improved storm water management, improved skid resistance, reduction of spray to drivers and pedestrians, as well as a potential for noise reduction. With increasing environmental awareness and an evolving paradigm shift in storm water management techniques, this research aims to provide guidance for Indian engineers, contractors, and government agencies on the design of porous asphalt pavement structures. One of the keys to the success of this pavement type is in the design of the asphalt mix. The air void percentage, which is ultimately related to the effectiveness of the pavement to adequately control the runoff, is a critical component of the mix.

Keywords: Asphalt, Gradation, Asphalt pavement, Cellulose fibre.

1. INTRODUCTION

Traditionally pavements are designed to allow fluid to flow along the surface and drain towards catch basins and/or ditches along the side of the roads or parking lots. Porous pavements are distinct pavement types that actually permit fluids to flow through the structure. The objective of the system is to reduce or control the amount of run-off from the surrounding impermeable area as well as providing additional benefits such as noise reduction, improved safety measures for drivers and pedestrians due to reduced spray during rain, and reduced potential for black ice/ice due to improper drainage. Disadvantages of this technology may include: lack of technical expertise (particularly in cold climates), clogging potential, potential risk of groundwater contamination, potential for toxic chemicals to leak into the system, and potential for anaerobic conditions to develop in underlying soils if unable to dry out between storm events. To date there has not been extensive research into the performance of porous pavements in cold climate applications. Little research has been conducted on porous asphalt to investigate the actual performance of these mixes in colder climates.

2. MATERIALS

The Porous Asphalt mix contains the materials like Aggregates, Fibres as additive and Bitumen.

2.1 Aggregates

The aggregates used in the porous asphalt mixtures (as shown in Fig.1) consisted of coarse aggregate and a screenings fine aggregate.

Fig.1 Coarse and Fine Aggregates

The properties of the coarse and fine aggregate are recommended by NAPA for the porous asphalt mix [NAPA, 2003] as shown in Table.1

Table.1 Properties of Coarse and Fine aggregate

Coarse Aggregate:	Value
L.A Abrasion	≤ 30%
Fractured Faces	≥ 90% two fractured faces, 100% one fractured face
Flat and Elongated	≤ 5% 5:1 ratio
	≥ 20% 2:1 ratio
Fine Aggregate:	value
Fine Aggregate Angularity (FAA)	≥ 45

2.2 Fibres

Porous asphalt because of the nature of the mix design, can be susceptible to drain down of the asphalt binder. Cellulose fibres (as shown in Fig.2) were added to the mix in order to prevent drain down from occurring during mixing and placement. Fibres may assist with the mix's durability as the fibres may allow for the asphalt content to be increased allowing for an increased film thickness around the aggregates [Cooley 2000]. Cellulose fibres of 0.3% by total weight of dry aggregates are added during mixing.

Fig.2 Cellulose fibre

2.3 Bitumen

Two different types of bitumen were used in the design of the mixes. It has been recommended that high stiffness binders be used in porous asphalt mixes, specifically two grades higher then what is typically placed in a region. It is also recommended that polymer modified binders (as shown in Fig.3) may be used to enhance stiffness. [NAPA 2003]. A PMB 120 and a PMB 70 polymer modified asphalt (PMA) binder were chosen to be used in the porous mixes and here 6% of bitumen by weight of total dry aggregates is used for determining final design gradation.

Fig.3 Polymer modified bitumen

3. METHODOLOGY

The design gradation for surface layer of porous asphalt pavement is determined based test results of verification of stone-on-stone contact and air void.

3.1 Recommended design gradations

For the surface layer of Porous asphalt pavement three different authorities recommended the three different JMF(Job Mix Farmula) as shown in Table.2.Therefore, for determining the final design gradation or final JMF for porous asphalt pavement surface layer, the JMF of the following are referred as fallows

The Franklin Institute JMF = Finer.

The National Asphalt Pavement Association (NAPA) = Medium.

The Cahill Associates = Coarser.

Table.2 Various Recommended Design Gradations for Porous Asphalt Surface Course

Sieve Size	Percent Passing (%)		
	The Franklin Institute [Thelen, 1978]	**National Asphalt Pavement Association [NAPA, 2003]**	**Cahill Associates [Cahill, 2003]**
37.5 mm	100	-	-
19 mm	-	100	-
12.5 mm	-	85-100	100
9.5 mm	95	55-75	95
4.75 mm	35	10-25	35
2.36 mm	15	5-10	15
1.18 mm	10	-	10
0.6 mm	-	-	2
0.075 mm	2	2-4	-
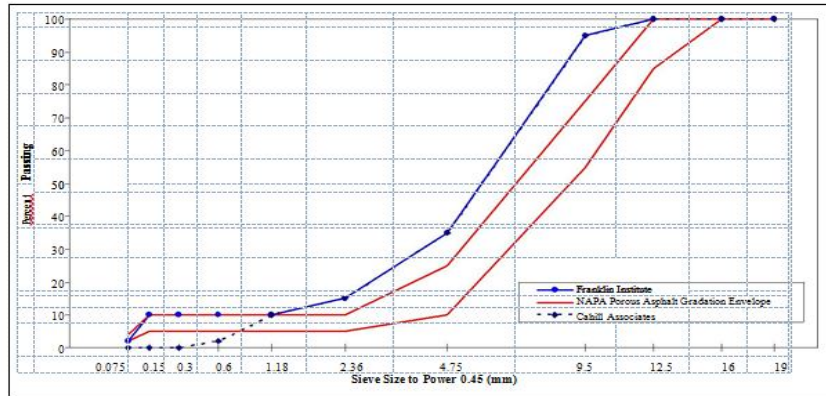
Fig.4 Various Recommended Design Gradations for Porous Asphalt Surface Course (Table.2)

3.2 Verification of Stone-On-Stone Contact

Choose the design gradation to meet the air void requirements and to ensure that the aggregate skeleton exhibits stone-on-stone contact. Sieve aggregates proportioned to meet the selected JMF gradation over a No. 4 sieve. Keep the material retained on the No. 4 sieve as the coarse aggregate fraction. Determine the unit weight G_{uwca} of the coarse aggregate fraction of the aggregate using the dry rodding technique according to AASHTO T 19 For the selected JMF, determine the voids in the coarse aggregate of the mix (VCA_{mix}) based on specimens compacted with 50 gyrations according to AASHTO T 312.The VCA_{drc} (The voids in the coarse aggregate fraction) and VCA_{mix} (The voids in the coarse aggregate fraction of the mix) are expressed as

$$VCA_{drc} = \frac{(G_{sbca} \times \gamma_w - G_{uwca})}{G_{sbca} \times \gamma_w} \times 100\% \quad (1)$$

Where:

G_{sbca}= The bulk specific gravity of the coarse aggregate fraction as determined by AASHTO T 85.γ_w=Unit weight of water (kg/m^3).

G_{uwca}= The unit weight of the coarse aggregate fraction (expressed in kilograms per cubic meter) as determined by AASHTO T 19.

$$VCA_{mix} = 100 - \frac{G_{mb}}{G_{sbca}} \times P_{ca} \quad (2)$$

Where:

G_{mb}= The bulk specific gravity of the mix.P_{ca}= Thepercent of the coarse aggregate fraction by weight of total mix.

For stone-on-stone contact VCA_{mix} must be less than VCA_{drc}.

3.3 Air void

The air void percentages (AV%) of the porous asphalt samples were very difficult to determine due to the higher porosity and it is expressed as

$$AV = \frac{G_t - G_{mb}}{G_t} \times 100\% \qquad\qquad (3)$$

Where:

G_t = Theoretical Specific gravity of the mix.G_{mb} = Bulk Specific gravity of the mix.

4. EXPERIMENTAL RESULTS

For the recommended trial gradations verification of stone-on-stone contact and air void test were conducted and their results tabulated in Table.3

Table.3 VCA_{mix} , VCA_{drc} and AV (%) Values for Trial Gradations

Binder type	Trial blend	VCA_{drc}	VCA_{mix}	AV (%)
PMB120	Finer	34.48	23.44	5.82
PMB120	Medium	30.92	24.15	9.65
PMB120	Coarser	32.87	31.77	9.43
PMB70	Finer	34.48	23.64	6.08
PMB70	Medium	30.92	23.56	8.93
PMB70	Coarser	32.87	30.58	7.84

5. DISCUSSION

It was recommended that the design gradation be determined by the trial blend where the VCA_{mix} was less than VCA_{drc} and achieved the highest air voids. [NAPA 2003]. Based on the results, the middle gradation was chosen as the design gradation for both binder types.

6. CONCLUSION

The National Asphalt Pavement Association (NAPA) recommended design gradation was selected as the final design gradation for the Porous asphalt pavement surface layer.

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THE DIGITIZATION OF WORD-OF-MOUTH IN TRAVEL AND TOURISM

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ABSTRACT
The research paper investigates the influence of hotel guest reviews on customer hotel preferences in the context of online hotels' booking applying a conjoint design. The empirical research shows that the subjects' willingness to pay is significantly higher than their reference price for hotels. In addition to that, the results of this study indicate that reviews on the hotel in general and on the hotel's rooms are perceived the most useful for consumers reading reviews.

Key Words: Eelectronic word of mouth (eWOM), Travel and Tourism, Service sector, Hotel

1. INTRODUCTION

With the growing importance of Internet communication, a multitude of new possibilities has become available for consumer-to-consumer communication. One popular form of electronic word-of-mouth (eWOM) communication refers to online reviews. Unlike traditional word-of-mouth, consumers using online reviews for their purchase decision benefit from the fact that numerous positive as well as negative opinions are available from other people at the same time (Chatterjee, 1991). Studies focusing on travel products and services are still rather scarce although today many platforms offer online travel reviews. For instance, numerous online hotel and travel booking platforms provide their customers with features to evaluate hotel room offerings in form of formalized ratings and reviews (examples are www.tripadvisor.in, www.makemytrip.com, www.holidayiq.com et al). No studies have investigated consumer reviews in the context of online booking using willingness to pay and reference price as a measure for preference rating. Therefore, the present study attempts to address this issue by examining how certain review categories influence an individual's preference for hotels. Moreover, the study investigates if providers of review platforms need to target different homogeneous groups of users based on their perceived importance of review categories.

2. WORD OF MOUTH

WOM is defined as "all informal communications directed at other consumers about the ownership, usage, or characteristics of particular goods and services or their sellers" (Hennig-Thurau and Walsh, 2003). Basically, WOM in online environments occurs in form of user generated content (UGC) which describes media content that is not initiated and published by commercial parties on the web but by users themselves (OECD, 2007). Unlike traditional commercial web content, UGC comprises "all sources of online information that are created, initiated, circulated and used by consumers' intent on educating each other about products, brands, services, personalities and issue." (Blackshaw and Nazzaro, 2006).

For many years, studies have investigated the influence of interpersonal communication on consumers' decision–making processes (Kiel and A., 1981; Beatty and Smith, 1987). The study by Buttle (1998) showed that WOM influences an individual's expectation and perception when searching information about a product. In addition to that, interpersonal communication also impacts consumers' attitudes when evaluating product alternatives due to increased product consciousness and perceived trustworthiness of WOM as a source of information. More specifically, unfavourable or neutral perceptions of a product or service are nine times more effectively transferred into positive attitudes by positive WOM than they are transferred by traditional advertisement (Buttle, 1998). Likewise, negative WOM statements dissuade potential customers from purchasing a specific product or service (Sundaram et al., 1998). However, Chatterjee (1991) found that the influence of negative product reviews varies with previous experience. This means that consumers who had satisfying prior experiences with a specific retailer or product are less attentive to negative WOM than consumers who solely choose one retailer because s/he offers lower prices. Since more and more consumers use the Internet to collect information about products and services online, consumer reviews have received increased attention in literature concerning their influence on consumer purchase decisions. Dellarocas (2003) found that with the growing importance of the Internet the scale and scope of WOM communication has dramatically increased. Senecal and Nantel (2004) investigated the influence of online

product recommendations on consumers' product choices as well as the moderating influence of variables related to recommendation sources and the purchase decision. The results indicated that online product recommendations had a stronger impact on an individual's product choice for experience products than for search products. Interestingly, online recommendation systems were found to be the most influential source in the choice process. At the same time, consumers perceived these systems as less experienced and as less trustworthy compared to human experts. However, it has also been found that consumer reviews do not necessarily contain customers' own experiences but are strongly influenced by public opinions. Especially, expert reviews have an enormous impact on the information carried on in consumer reviews (Gao et al., 2004). Another issue that has come up in literature refers to the relationship between WOM communication and product sales. Senecal and Nantel (2004) found that persons using consumer reviews and recommendations during their process of information search prior to purchasing a product bought the recommended product twice as often as consumers who did not consult any product reviews.

3. ELECTRONIC WOM IN THE TOURISM INDUSTRY

Especially in the case of experience products, WOM communications are considered important information sources. Tourist services cannot be experienced before use or returned in case of dissatisfaction. This means that every time a tourist product is purchased the consumer faces a certain risk. This risk can be reduced through reading reviews and experience reports written by fellow customers (Ricci and Wietsma, 2006). Whether WOM sources are trustworthy was an issue in the survey by Gretzel and Park (2007). The survey was conducted on the online booking platform on www.tripadvisor.com . Results showed that the highest trustworthiness was assigned to customers who had similarities with the reader concerning travel experience, choice of activities, intention of travel and where the tone of the review was considered nice and friendly. Also, the highest informational value was assigned to reviews from experienced travellers who carried out similar activities during their travel and had similarities concerning age, gender and marital status. Additionally, pictures and the evaluation of guest reviews by readers increased the perceived value of a travel review. Concerning the frequency of reading, more than half of the respondents (7000 respondents in total) stated to read customer reviews every time they plan a pleasure trip, and 36.7% indicated to read reviews very often or regularly. Most of the participants usually read other customers' comments because they want to reduce the choices of travel destinations and accommodations and to obtain ideas. More than two thirds think that customer reviews are extremely or very important in their travel decision process (Gretzel et al., 2007). Ricci and Wietsma (2006) employed a user behaviour survey to investigate the possible roles and functions of product reviews in travel decision making. They found that usage and impact of reviews depend on user characteristics. Men seem to have a stronger tendency to trust the opinion expressed in product reviews whereas women tend to rely more on their own product interpretations. Additionally, the results showed that more experienced users of online booking platforms or consumer-opinion platforms show a better understanding of product reviews than inexperienced users. More experienced users also tend to be more open towards critical reviews with negative product evaluation. In general, the importance of product reviews increases throughout the consumer's decision process. In early stages, consumers primarily focus on product features. With increasing knowledge of products and alternatives users become more attentive to product reviews. The study by Gretzel and Yoo (2008) showed that users' access reviews mainly to get information for decisions concerning accommodation. However, reviews are hardly ever used for en route travel planning. As regards the hospitality industry a study by Dickinger and Mazenec (2008) revealed that recommendations of friends and online reviews have the strongest influence on booking hotels online. The impact of online hotel reviews on consumer consideration was investigated by Vermeulen and Seegers (2009). It is shown that positive reviews have a positive influence on the guests' attitude toward a hotel. Awareness of hotels is increased by positive as well as negative reviews.

Based on the foregoing discussion, the study intends to examine the role of consumer reviews on price acceptance and preferences in the context of booking hotels online. Thus, the main research questions addressed in this study are:

Research question 1: Which categories of consumer reviews are considered the most important for a consumer when evaluating hotels?

Research question 2: Do these importance values differ among groups of users?

Research question 3: Do willingness to pay and reference price differ?

4. METHODOLOGY

The first step of our research design was to select an appropriate online hotel booking platform and attributes which are relevant when consumers want to book a hotel online. Our survey was finally carried out in cooperation with the booking platform HolidayCheck (www.holidaycheck.com). HolidayCheck offers package tours, accommodations, and cruises in eight different languages as well as the possibility to write hotel and cruise reviews. In addition to that, users can upload holiday pictures and videos. At present, over 700,000 travel reviews, more than 600,000 user-created pictures and nearly 9,000 videos as well as over 900,000 travel forum entries are available. On HolidayCheck, consumer hotel evaluations can be itemized into different categories on a scale from one to six suns (six suns for 'very good' and one sun for 'unsatisfactory'). In addition to that, reviews and corresponding sun ratings can be displayed separately by different travel parties (e.g. couples, families, solo travellers and friends). Moreover, the platform offers a general hotel evaluation trend which is computed based on consumers' reviews. The second step of our research methodology comprised the conjoint design of our study. A simple viable conjoint design was preferred in order to examine the influence of customer reviews and the number of evaluations on customer preferences for hotels. For this purpose, we adapted the review attributes available on HolidayCheck based on literature review. In our study, we used the following six attributes for the hotel review:

1. Hotel in General

2. Hotel Room

3. Service

4. Location

5. Number of Hotel Reviews

6. Pictures

Each attribute was divided using two levels which were determined on the basis of literature review. The two levels, for the first four attributes were represented by one to two suns (poor) and five to six suns (good). The number of hotel reviews (attribute 5) ranged from one to three (few) and 48 to 58 (many) evaluations. These numbers are based on realistic values to be found on the HolidayCheck platform. For the last attribute 'picture' we used two different kinds of pictures: the public hotel area (picture of the hotel lobby) or private area (picture of the room). Thus, the last attribute also consisted of two levels.
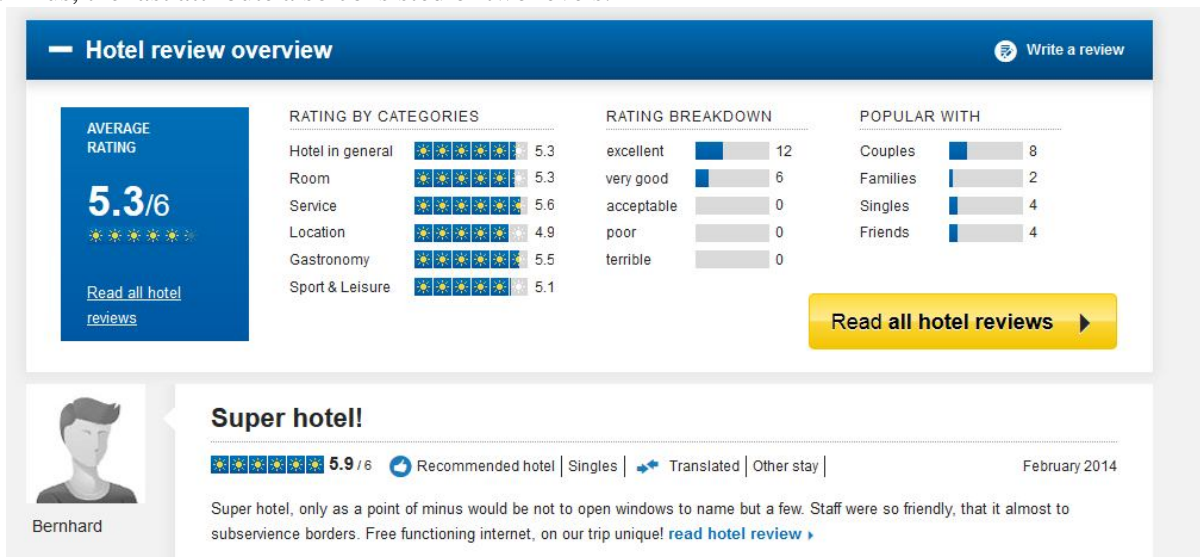
Figure 1: Example of a hotel review package to be evaluated by the test persons

Once the attributes and their levels have been selected, they must be combined forming different hypothetical hotel profiles (i.e. cards) for the study subjects to assign their preference ratings. For this study we used a full profile approach. In order to specify the number of possible hotel profiles we need to multiply the levels of the attributes. This results in 64 hotel profiles (2 x 2 x 2 x 2 x 2 x 2 = 64). However, to evaluate such a high number of cards

would be much too demanding for survey respondents. Thus, we used the IBM SPSS 20, which generated eight hotel profiles used in this study. This procedure permits statistical testing of several attributes without testing every combination of attribute levels. Figure 1 shows an example of a hotel review which the study subjects had to evaluate. As the figure depicts, the levels for this example are the following:

Imagine you do a reservation in the hotel presented above:

Which price would you pay at maximum for one night?
Less than Rs. 1000, Rs 1000-1499, Rs 1500- 1999, Rs 2000-2499, Rs 2500-2999, Rs 3000-4999, Rs 5000- 9999, Rs. 10000 and more
Which price do you consider as fair and adequate?
Less than Rs. 1000, Rs 1000-1499, Rs 1500- 1999, Rs 2000-2499, Rs 2500-2999, Rs 3000-4999, Rs 5000- 9999, Rs. 10000 and more

Table 1: Questions for preference ratings – to evaluate the cards

Hotel in general 'good', room 'good', service 'poor', location 'poor', number of hotel reviews 'many', and picture 'picture of the hotel lobby'. It is important to mention that hotel standard and offered facilities were held constant throughout all hotel reviews.

The respondents were asked to imagine booking a holiday trip to Delhi or Agra or Goa or parts of Kerala including a hotel stay. They had to assign their preference ratings for the eight hotel profiles using two different questions (Table 1). The first question measures an individual's willingness to pay whereas the second question refers to the reference price. Willingness to pay refers to the upper threshold a consumer is prepared to pay while the reference price indicates the price which is considered as fair and adequate.

In addition to the preference ratings, questions about the respondents' Internet usage, their previous hotel booking experience and travel behaviour as well as demographic data were included in a subsequent questionnaire.

4.1 Preference analysis with conjoint data
In order to analyse part worth utilities for the attributes we estimate utility functions at the individual level first and aggregate these afterwards. For both willingness to pay and reference price the following part worth utilities are calculated at an aggregated basis (Figure 2). From the relative span of one attribute utility the importance of each attribute can be calculated. Concerning willingness to pay, the results show that the attributes 'hotel' and 'room' are each responsible for 26% of the overall preference building. The 'service' and 'location' factors weigh 18% and 19% respectively. The attributes 'number of hotel reviews' and 'picture' are only of minor importance (8% for the former and 3% for the latter). Turning to reference price, the results are similar: 'hotel' and 'room' are again the most important attributes (26% for each attribute). 'Service' is responsible for 19% and 'location' for 18% of the overall preference building. For the attributes 'number of hotel reviews' and 'picture', exactly the same small weights as for willingness to pay are calculated.

In order to determine if, in general, the subjects' willingness to pay significantly differs from their reference price, we apply a Wilcoxon signed–rank test. The results show that the difference is significant at a level of $p<0.001$. Interestingly, we find no significant difference between willingness to pay and the reference price when respondents evaluated the hotel which performed the worst in all review categories.

4.2 Segmentation based on attribute importance
Using importance values on an aggregate level only, does not take into account that the sample might actually be heterogeneous while containing homogeneous groups at the same time. Therefore, we use individual importance values for cluster analysis in order to reveal possible homogeneous groups. In the first phase of the cluster analysis, we have to specify the numbers of clusters. Second, in order to find homogeneous groups the network needs to be trained. In the last phase, the output values are used to profile the segments.
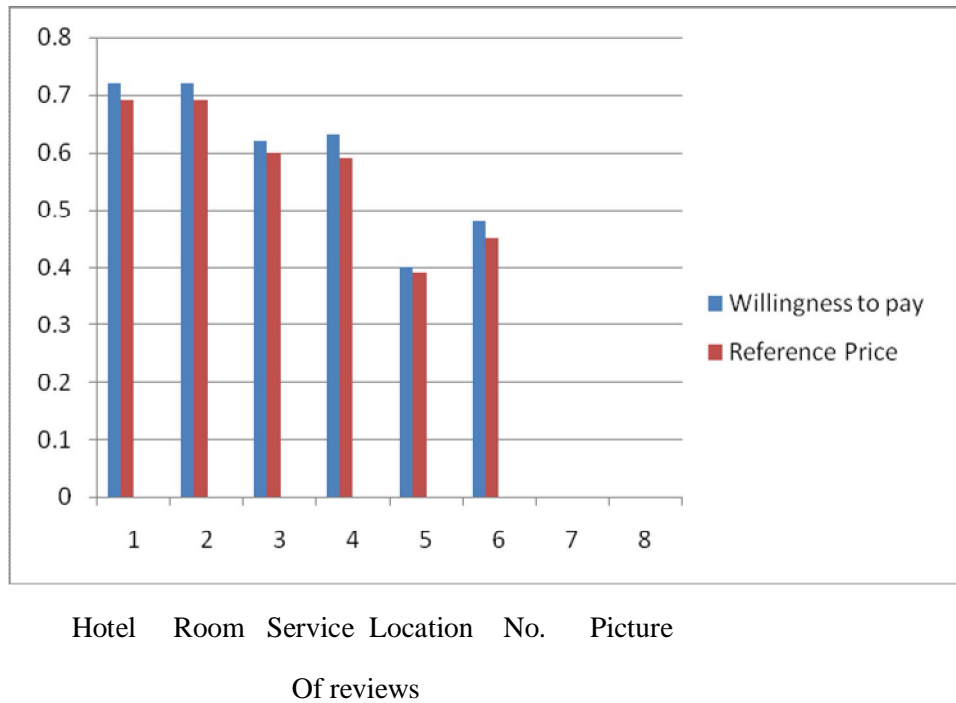
Hotel   Room   Service Location   No.   Picture

Of reviews

Figure 2: Part worth utilities for six attributes: Willingness-to-pay versus reference price

As the table shows, the first segment 'environment' includes one fifth of all cases. This segment comprises subjects who primarily focus on evaluations about the hotel in general and the hotel room.

	Hotel	**Room**	**Service**	**Location**	**Number of reviews**	**Picture**	**Share of cluster**
Environment	28.7	23.3	14.9	7.9	9.9	15.3	21.2
Indifferent	16.7	15.3	12.2	16.3	18.8	20.6	19.2
Interior	9.6	40.6	12.2	14.2	10.3	12.7	19.2
Service	14.5	14.2	29.3	17.8	13.7	10.6	18.4
Place	15	23.3	9.9	37.3	9.3	5.2	12.1
Atmosphere	36.8	6.7	35.7	7.1	7.6	6.0	7.1
Exterior	59.3	7.1	6.2	10.6	12.4	4.4	2.8

Table 2: Attribute importance and seven segments

Subjects in the second segment ('indifferent') do not discriminate between different categories of evaluation. This segment includes marginally less subjects (19.2%) than the first segment. An equal amount of respondents are highly hotel room oriented (segment 'interior'). 18.4% of the subjects attach importance to reviews on services (segment 'service'). The fifth segment 'place' includes subjects who concentrate on the hotel's location. The smallest segments are 'atmosphere' and 'exterior'. For the segment 'atmosphere' the hotel in general and service are highly important compared to the other attributes whereas for the segment 'exterior' only the hotel in general is essential accounting for nearly 60% of overall importance.

DISCUSSION AND CONCLUSION

The study aimed at measuring the influence of hotel guest reviews on customer hotel preferences in the context of booking hotels online. The results of our study show that the part worth utilities of consumer reviews are the highest for the hotel in general and for hotel rooms. Referring to our research question one, we can say that travellers using hotel reviews find it most useful if they have information on how their fellows evaluate the hotel's environment. Contrary to this, the part worth utilities for the number of reviews are the lowest followed by picture. This means that consumers in general do not care much if many or only a few people have commented on a hotel

before or, which picture of the hotel is shown. Comparing our preference scales, we could hardly find any differences concerning the part worth values for willingness to pay and for the reference price. However, when we compared the respondents' willingness to pay with their reference price in general, we found significant differences between the two prices expect for the situation where a hotel performed poor in all review categories (research question 3). This is a noteworthy finding. Subjects do not discriminate between their willingness to pay and their reference price when the hotel has bad evaluations in general. This means that as long as at least one review category is good, people are willing to pay a higher price for a room than a price they perceive to be fair and adequate. This result corresponds to previous findings which show that positive reviews have a positive influence on the guests' attitude toward a hotel (Vermeulen and Seegers, 2009).

With regards to importance values, we found differences between the six categories of consumer reviews examined. At a first glance, it seems that the most important review categories are hotel in general and room, each responsible for more than a fourth of the overall preference building. The number of reviews and which kinds of pictures are shown plays only a minor role. The cluster analysis resulted in seven different segments of people who evaluate the usefulness of review categories differently. This means we can answer our second research question that importance values for review categories differ among groups of users. Less than one fifth of the subjects do not discriminate between the categories assessed. All other six segments attach great importance to at least one or two review categories. People focusing on reviews of a hotel's environment have the biggest share among all segments followed by the group of subjects who attach importance to the hotel's room or to the service offered. Only a very small group of subjects judges reviews of the hotel in general as most important for their preference building.

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ESSENCE OF WOMEN'S EMPLOYMENT ON HER ROLES, HEALTH AND CAREER CURVATURE

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ABSTRACT

In the last few years, the roles and responsibilities of women have undergone a huge metamorphosis. In spite of all these alteration at place of work and her life, women have to still face a lot of hitches in trying to strike a balance between the different errands she plays. In today's world where a woman wants to uphold her family financially and is trying to balance her personal and professional life she is facing a lot of setbacks related to her work, family and lot of personal problems, among which her health is an important issue

Keywords : Roles and responsibilities, health, family.

INTRODUCTION

Women in today's society play various roles. They were able to penetrate the dense barrage of conventional strangles and evolve into a different world of education, independence and economic liberty. Despite, women still are deduced to be asymmetrical to her male counterparts. In spite of having demands as professionals they have to quit their assignments in order to meet their traditional line of responsibilities, giving rise to the attrition rate of women professionals.

Increase in women's participation in labor force has lead to the increased interest in the effects of employment on women's' well being, which can be either beneficial (role enhancement) to women's psychological well being. This effect may be mediated by the over absorption of one's time and resources with a particular identity role. *(Elder & Chester, 2007)*

In working women with multiple roles, enhancing problem and emotion focused coping by strengthening the use of the support network is important for wellbeing. (Rao, Apte, & Subbakrishna, 2003)

Indian women of all strata have also have entered into remunerated occupations, as per the fifth Economic Census the percentage of total adult female workers to the total persons employed is 19.3 % *(A Hand Book of Statistical Indicators on Indian women , 2007)*. The participation of women in every sphere of economic activities rather than their traditional engagement has increased over the period. (Economic Census 2005, 2007).

MULTIPLE ROLES AND ITS IMPACT

Super (1980) identified some life roles that in reality, most individuals have to play at various stages of their lives but rather than following a transitional sequence from one role to another, women are required to perform an accumulation of disparate roles, each with its unique pressures. *(Kopp & Ruzicka, 1993)*. Kopp & Ruziicka (1993) articulated that women discharging two or three responsibilities as a partner, mother and paid employee were happier than those occupying one or none. Baruch & Barnet (1986) found that women need to play multiple roles of mother, wife, employee etc. and were less depressed and had high self esteem than women who were not married , unemployed or childless. Further they established positive association between multiple roles and good mental health (when a women like her job and home life).Radhika & Jaiprakash(1987) in Henry & Parthasarathy(2010) found that dual-earning couples in India have a poorer quality of marital life compared to single-earning couples.

WORK FAMILY VARIANCE

An employee is essentially connected and engrossed with her job. This required to compensate as and when the employee can over the weekend or on days or late nights when she does not need to be busy with her paid occupation. It is expected that she should give time to herself and her family. Work-life balance is the preservation of a balance between errands at work and at home. Work and family have increasingly become hostile spheres, equally voracious of energy and time and responsible for work-family conflict (Coser, 1974). These conflicts are intensified by the *"cultural contradictions of motherhood",* as women are gradually more encouraged to seek self-fulfillment in demanding careers; they also face pressures to forfeit their aspirations for their children. In view of "intensive parenting", childrearing and their development (Hays, 1996), *"Maternal wall bias"* (Williams and Cuddy, 2012) have aptly described the relation to discrimination is a name given to the type of discrimination on

the subset of employees who belong to the cadre of caregivers or working mothers. The study revealed that the chances of working mothers of being hired have reduced by 79% and a woman is 50% as likely to be promoted as a childless woman. *(Williams & Cuddy, 2012)*.Recent research *(Benard, Paik, & Corell, 2006) (Erin Cech, 2012)* shows that even when women sustain their professional ambitions, motherhood often triggers strong and unconcealed workplace bias, as they are less likely to be interviewed, hired(Correll, Stephen, Paik ,2012) in Harvard Business review,2012 ,promoted and also appraised less positively giving her less pay. *(Williams & Cuddy, 2012)*

Similarly Amy Cudddy, Fiske and Peter Glick in Harvard Business review,2012, found that a women candidate had a child was judged to be less efficient to become a consultant and the hiring chances reduced significantly. Interestingly those mothers who left their job assign the reason that they would like to devote more time to their family concealing the fact of hostile workplace environment. This is considered as a bad news for the companies as the real reason for the employee leaving the job would never be highlighted as even in the feedback in exit interviews, they sustain the same reason of family priority, in order to remain employable. Moreover, Companies have started paying for their biases against working mothers who sue them for being discriminated at workplace."Maternal wall" discrimination is one element of the largest class action suit ever filed in United States, Dukes v.Wal-Mart, and Velz v.Novartis Pharmaceuticals, a case that merged maternal wall bias and other gender discrimination issues, where the jury awarded the plaintiffs approximately $250 million. Further, "Maternal Wall bias" engrosses discrimination by women against women. National Computer System, a jury awarded $625,000 to a top performing saleswoman, who faced hostility after she had a baby. The women supervisor may have felt she had something to prove in a way no male supervisor would have done. (Williams & Cuddy, 2012) .Studies reveal that most private sector employers are stingy with maternity leave: most companies offer as little as three months' worth of paid leave as maternity benefits (Mothers at work, 2012).Wipro has increased the maternity leave from six months to one year. All the top IT companies are today offering work-from-home policies for women, and some even are open to relocate them to a city of their choice if their husbands get transferred. (Singh & Singh, 2009).Further, some large companies have unwritten reservations about hiring women, in anticipation of maternity benefits that they would have to shell out. Moreover, the unorganized sector, of course, offers no benefits apart from daily wages. (Mothers at work. , 2012). These perhaps, compelled 50 percent women among India's 500 largest companies give up their careers before they turn 30.Boles & Babin (1996) that indicated that Work Family Conflict is related to a number of negative job attitudes and consequences including lower overall job satisfaction and greater inclination to leave a (Grovalynn et al. 1988).

CAREER GROWTH
Generally, Career reflects the relationship between people and the providers of official position namely institutions and organizations and how these relationships fluctuate over time. Van Maanen(1977) said studying of career needs the study of both individual, organizational and societal change.

 Women are being discriminated in the business world especially when it comes to evaluation of leadership skills *(Ibarra & Obodaru, 2009)*.A study of thousands of 360-degree assessments collected by Instead's executive programs over last five years depicted that women have outshone men in most of the leadership aspects except in envisioning- the talent to identify new opportunities and trends in the environment and give the organinization a new direction.

This issue was further explored with successful female executives, which raised to another question which asked if the reputation of being a visionary really acclaimed by the women professionals? When a CEO of a leading service company was questioned with regard to this issue, she declared the pillar of her leadership style was a to "stay close to details", or else it would lead her to be captivated to people who would play politics.

The answer 'how to lengthen the career for women',10 career enablers were identified ,where women were interviewed for the study highlighted top 3 enablers- flexible working arrangement, mentoring and sponsorships and skill building initiatives. These could make a difference between women staying or leaving the organization. Studies in abroad reveal that Organizations are trying to find ways to retain their female talents by providing mentoring and women specific programs. Although women are mentored they are not promoted. A Catalyst study of more than 4,000 high potentials shows ,in spite of women getting more mentorship than men , still promotions in

case of women are lesser than men(men get 15% more promotions than women *(Ibarra, carter, & silva, sept 2010)*as women are perceived as "Risky Appointments" for roles which are generally male dominated. Further, studies (HBR Jan-Feb 2010) in *(Ibarra, carter, & silva, sept 2010)* revealed the fact that women are less likely to win the CEO tournaments in their own firms in spite of the fact that nearly twice women are hired than the males from outside the organization. Studies in India depict almost the same scenario with a little adverse color where percentage of women directors(5.4% in India) has increased from 1.66%(1995) to 3.63%(2007),which is much lower to any advanced countries like Canada(15%), USA(14.5%), UK(12.2%),Hong Kong(8.9%),Australia(8.3%) .Again when compared to men directors, which was almost constant with 1.19% (from 1995-2007); percentage of women directorship has increased from 1.045 (1995) to 1.34%(2007).(working paper) (Chandrashekhar & Muralidharan, 2010).There are some IT companies Like GE , Accenture who are coming up with some strategies of attracting and retaining women employees. Accenture's had introduced a new global theme "defining success your-way". Accenture has created a unique program to support their women employees by introducing women's mentoring programs –which pairs female executives with senior executive mentors and also include virtual workshop and provide networking tips to help ensure the advancements of women at Accenture. Likewise GE has several global affinity networks that help made the workplace conducive for growth and development of diverse talent. At GE India, the most important affinity network is the women's network which includes-a) Career Development b) Women's Initiative on learning c) Business innovation d) Attracting talent through re-start. e) New mother's program f) gender sensitizing training. *(Jagannatha, 2012)*

Recently it is seen that Indian companies following the trend of multinationals, talk about equal opportunity and gender diversity and hence have opted to *'forced hiring '* of women professionals, at times compromising on the merit and competencies of the candidates just for the purpose of maintain the tag of 'broad diversity' in the organization. According to Kalpana Morparia, CEO, J.P Morgan, merit should be the sole criteria of hiring employees to the organization instead of *tokenism.* Vinita Bali, MD, Britannia Industries said the goal to enforce gender diversity, should not be *statistic* oriented, which may hamper the organizations' prospect as Kaplana Morparia, CEO ,J.P Morgan rightly says *meritocracy has to be gender neutral* ;instead qualified women should be provided with sufficient opportunities for senior corporate positions to ensure balance in the statistics. Studies reveal that organizational heads were so much pressurized to upheld the ornamental female headcounts in board of directors that at times made them utter in jovial way the need to get their gender transformed if at all the requirement of female headcounts in BOD was not achieved. Even head hunting companies were offered extra commission by organizations (mostly multinationals in financial and IT services) if they were able to hunt for female candidate for high management positions, which not only detained resumes of male candidates but also hurt the self esteem of women cadre who would be deemed as undeserved beneficiary of the positions. (Viyaraghavana & Bhattacharyya, 2012).

HEALTH

Health is the barometer of the balance. Exhaustion, fatigue holds a spirit that health now has more priority than work, family or anything else that may fall in the schedule. (Kumar, 2012). Sources of stress in the lives of working women emerged from a lack of time to attend to multiple roles, presence of children (6-12 years) in the family, conflict with partners (Davidson & Cooper, 1986)and added responsibility at work in the form of promotions. (Surti & Sarupriya, 1983;Shukla & Varma, 1996; Khanna, 1992;Davidson & Cooper, 1986) than male managers. Khanna (1992) conducted a study to determine life stress among working and nonworking women in relation to anxiety and depression. The study reveals that Anxiety is significantly and negatively correlated to positive life change in nonworking women; Depression is significantly and positively related to positive life change in working women, and negative life change in nonworking women. The study concluded that, among working women positive life changes are related to depression, whereas among nonworking women positive life changes are related to anxiety, and negative life changes to depression. The most common outcome of stress for the working woman was found to be poor mental and physical health resulting in depression, anxiety, asthma and colitis. (Khanna, 1992). Rajadhyaksha (1996) studied dual career as opposed to dual earning couples in two metropolitan cities in India and found that sources of conflict and stress however differed along traditional lines. For instance women faced more conflict between their jobs and home roles while men experienced more conflict between their job and spousal roles. (Khanna, 1992;Surti & Sarupriya, 1983). Studies in abroad revealed that in certain instances women with multiple roles reported better psycological health than women with less role involvement I,e they cherished

motivational stimulation, self esteem, a sense of control , physical stamina and bursts of energy(Doress-Wortes,1994). On the other hand Hughes and Glinsky (1994) found that multiple roles have found to caused a variety of adverse effects on women's mental and physical health including loss of appetite, insomnia, overindulgence and back pain.

CONCLUSION

From the aforesaid studies it is quite transparent that there is a need of supply of women professionals in the corporate sector, but still it is seen that there occurs a large vacuum in the women section in mid and senior level positions. Attrition rate of women which is going high in all the sector is an alarm to this phenomenon. As IT-ITes sector is considered to be the sunshine sector which is also one of the largest provider of employment faces high attrition rate at the entry level of women professionals; the result of which tends to create very low percentage of women occupying high management positions. This entire conditions at entry level has lead companies to enforce 'forced hiring' of women in such high management positions. This not only would hamper the organizations enhancement but also can hurt the self esteem of professional women. The reason of such high rate of attrition especially in the entry level can be due to the tug of war arising out of their traditional strangles and the new responsibilities of a paid employee, which also at times detoriates the mental and physical wellness of a professional women, forcing them to resign from their current assignments. It is also seen that a very small percentage of women ultimately after getting filtered from the different structural barriers of home and job can reach the high management positions. The reason of such phenomena can be due to the lack of appropriate organizational culture rendering proper mentoring, training etc. for the actual upliftment of this section of women instead of trying to inject in the process of *"forced hiring"*. This has necessitated in undertaking in-depth study to assess and identify the underlined causes in an organization. In this respect IT-ITes sector is considered to be appropriate field of study for the above reasons stated above. Literature related to determinants of wellness of professional women particularly in IT-ITes sector is at the nascent stage. Moreover, research gap lies in perusing a comprehensive study in this area of multidimensional factors related to- covering employees perception from the organization, organization culture, family expectation and high aspiration from career growth.

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SKILL DEVELOPMENT OF YOUTH IN RURAL AND URBAN SOCIETY FOR BETTER EMPLOYABILITY

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ABSTRACT

Communication strategies are about the alignment of communication with the goals of the business. Companies do not have a face, but they do have an image, which they need to maintain by consistently delivering to their customers. A company's employees are the means by which its services and products are actually delivered; therefore, it is vital for employees to know what the company wants to achieve. It is necessary for them to be to develop the skills of its employees to accomplish success. RUBAN (Rural and Urban) societies can be uplifted by developing soft skills in the youth for better employability .

Key words : Employability, RUBAN societies, Soft Skills.

INTRODUCTION

India's development and contribution in world's information technology sector is of highest reputation. Big banners like HSBC, Dell, Microsoft, GE, Hewlett Packard, and several Indian multinational firms like Infosys Technologies, Wipro, and Microland have set up their offices in the city of Bangalore . It is because the city offers good infrastructure, with large floor space and great telecom facilities and availability of resources. This can be judged on the basis of the high growth statistics of India and the changing outlook of the companies towards India. This speedy growth of IT Sector is undoubtedly due to the efforts of Indian government and the other developments that took in the other parts of the globe.

With time and the continuous growth across the world, the country continued struggling and came up as the world leader in Information Technology Sector. The industry has grown up to US $ 5.7 billion (including over $4 billion worth of software exports) in 1999-2000, with the annual growth rate not sliding below 50 percent since 1991. It exports software and services to nearly 95 countries around the world. The share of North America (U.S. & Canada) in India's software exports is about 61 percent.

Thus India is a perfect solution for all those companies which seek for less expensive, yet technically skilled labour who have innovative minds and state of art to work over a project.

CONCEPT OF SKILL DEVELOPMENT*

This paper takes in to account soft skills development as part of skill development in the Rural and Urban Societies . This paper throws light on the need of developing soft skill and transforming the "RUBAN" to utilize booming service sector. Communication involves ensuring that messages reach the persons to whom they are sent, that the receivers understand and respond as we want them to, and that we ourselves are able to understand, interpret and respond to messages that are sent.

The primary element in the skills of management is competence in communication. It is the tool with which the organizations exercise influence on others, bring about changes in the attitudes and views of their associates, motivate them ,establish and maintain relations with them. Therefore, there is a need to develop and improve these skills of communication in order to accomplish the organization goals.

SIGNIFICANCE OF COMMUNICATION IN ORGANIZATIONS

Effective communication is important for managers in organizations to perform their basic functions of planning, organizing, leading and controlling. The process of communication makes it possible for managers to carry out their task responsibilities. Written and oral communications are an essential part of controlling.

The communication process is thus the foundation upon which the management functions depend and a skill that is required to be in an individual at all levels in the organization.

INTERNAL COMMUNICATION STRATEGY

An internal communications strategy defines the formal communications mechanisms used for management and employee communications. Effective communications is an essential business component.

Soft skills are those **intrapersona**l and **interpersonal** skills that conveys an individual's ability to excel or at least fit in a particular social structure .These skills include competencies in areas such as **Emotional Intelligence**, communication, leadership ability, etiquette, conflict resolution, decision making, self-motivation, self-discipline, persuasion, stress management . etc.

Such skills are important because experts ranging from psychologists to business and spiritual leaders, such as Donald Trump and the Dalai Lama, agree that one or couple of more of the soft skills have the greatest impact on a person's level of success.

CONCEPT OF EMPLOYABILITY
University of *Worcester defines* employability as
Being 'a set of achievements – skills, understandings and personal attributes – that makes graduates more likely to gain employment and be successful in their chosen occupation, which benefits themselves, the workforce, the community and the economy' (Yorke 2006).

The USEM model of employability
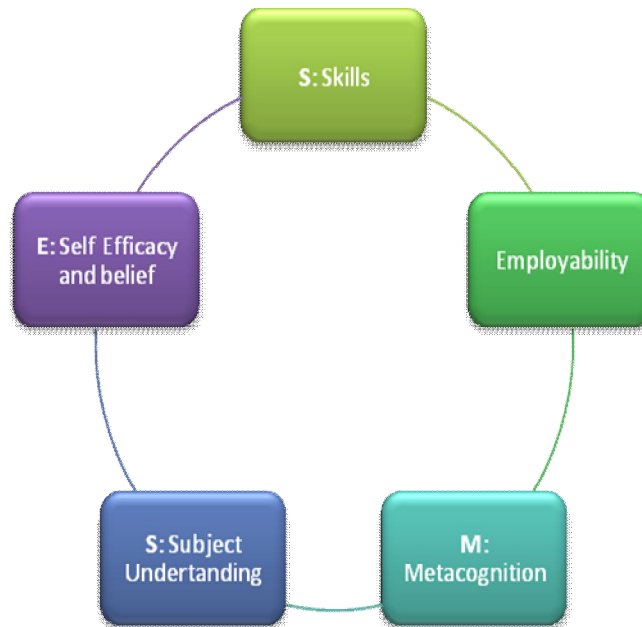
The term 'understanding' is used in preference to 'knowledge' as it implies a depth of understanding. 'Skills' should be seen as a wider concept than the traditional 'core' or 'key' skills and could more accurately be referred to as 'skilful practices'.

This model particularly emphasises the importance of a youth's efficacy beliefs, the extent to which they feel they might be able to 'make a difference', and their skills of meta-cognition where they are able to plan their own learning and development.

DEFINING THE TERM NON-METRO
In India, the Census Commission defines a metropolitan city one having a population of over 4 million. Mumbai, Delhi, Kolkata, Chennai, Bengaluru, Hyderabad, Pune, Gurgaon, Chandigarh, Ahmedabad, Surat, Nashik, Jaipur, Patna, Lucknow, Allahabad , Bhubaneswar, Nagpur are the Indian cities that qualify. Youth of such regions have better exposure towards the need and demands of the global environment. Whereas, the ones from a non-metro or rural background do not seem to understand the relevance of being groomed in such skills .As a consequence the problem of un-employability arises. A situation where there are jobs existing but due to insufficient talent pools the positions do not get filled.

According to Section 3 of the Housing & Urban Development Act of 1968 "Metropolitan area means a metropolitan statistical area (MSA), as established by the Office of Management and Budget. Non-metropolitan County means any county outside of a metropolitan area."

In this study the problem is studied in Mysore, Gulbarga and Belgaum these are small towns in Karnataka which has potential to give employment to its youth but faces the problem of unemployability due to skills deficiencies. **Mysore** has a Population of 9.83 lakhs spread over Area of 128.42 Sq Kms

Gulbarga: Gulbarga had a population of 532,031. Males constitute 55% of the population and females 45%. Gulbarga has an average literacy rate of 67%, higher than the national average of 59.5%: male literacy is 73%, and female literacy is 60%. In Gulbarga, 13% of the population is under 6 years of age.

According to Business Standard 17th May 2011, with over 26 million graduates to be trained, more and more companies are launching skill training ventures. Companies like **IL&FS** will set up 100 ITIs in the next 5 years. Bharti Group's centum work-skills to train 12 million people in 11 years .Kolkata-based Globsyn group to train **352,000 youth** in the next decade.

There are 18 joint ventures with the private sector that the National Skill Development Corporation (NSDC) has formed .Vocational training, the erstwhile CSR activity for companies, is now seen as a profitable venture. And the interest from private sector is evident— a market size between Rs 3 lakh cr and Rs 5 lakh cr to cash in on by delivering skill training.

Consider this, as per data from the planning commission, around 2 per cent of existing workforce in India has skill training against 96 per cent in Korea, 75 per cent in Germany, 80 per cent in Japan and 68 per cent in the UK. *So India by 2022, needs to create a pool of 500 million skilled workers against the present 40 million. "With around 50 existing players (including NGOs and local skill training institutes), there is room for 250 more such organizations,"* says Dilip Chenoy,[16]

NSDC[17]— which was set up under the Centre's 11th Five-Year Plan with seed capital of Rs 1,000 cr from the government-- has a mandate to train people in 21 sectors identified by the government. Against 12.8 million per annum new entrants to the workforce the existing training capacity in India is only 3.1 million per annum.

This shortage explains why the sector has seen emergence of companies like – India Can (an Educomp and Pearson venture); Indiaskills (A manipal and UK-based City and Guilds venture); Teamlease and Indian Institute of Job Training and Aspire Human Capital Management aiming at the business of training and transforming skills in RUBAN societies.

CONCEPT OF EMPLOYABILITY

Employability[18] refers to a person's capability for gaining and maintaining employment (Hillage and Pollard, 1998). For individuals, employability depends on the knowledge, skills and abilities (KSAs) they possess, the way they present those assets to employers, and the context (e.g. personal circumstances and labour market environment) within which they seek work (Hind and Moss, 2011). As such employability is affected by both supply-side and demand-side factors which are often outside of an individual's control.

India has a bigger unemployability problem than an unemployment problem. There is a need in our country to bridge the gap between industries and skilled manpower.

UNEMPLOYMENT AND UNEMPLOYABILITY[19] :PROBLEM OF UNEMPLOYABILITY

Changing standards of employability rises from the dependence of variables to perform a task, eg. a blind, handicapped, over aged etc may not be employable. People with insufficient skills are also considered as *unemployable.*

Soft skills are most essential to handle and service related job. Youth of RUBAN societies who are aiming to get such jobs are considered unemployable if they do not posses such skills.

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[16] Chief Executive Officer and Managing Director, NSDC

[17] National skill development corporation of India

[18] *http://en.wikipedia.org/wiki/Employability*

[19] Glenn W. Miller , *The American Journal of Economics and Sociology,*Vol. 7, No. 4 (Jul., 1948), pp. 429-438 , Published by: American Journal of Economics and Sociology, Inc.

It's just that the problem of Un-employability and lack of real Talent with Right Skills which is the biggest problem of INDIA. India has the Demographic Advantage but until there is a "Right Business model with huge Investments" where these Raw Talent can be converted to appropriate Human Skilled workers - this Opportunity to have demographics would be a disaster.

EMOTIONAL INTELLIGENCE VS SOFT SKILLS

Most of the time emotional Intelligence is confused with Soft Skills. In the past researchers have written Emotional intelligence (EI) refers to the ability to perceive, control and evaluate emotions. It is also being said as emotional *intelligence can be learned and strengthened*, while others claim it is an inborn characteristic.[20]

Since 1990, Peter Salovey and John D. Mayer[21] have been the leading researchers on emotional intelligence. In their influential article "Emotional Intelligence," they defined emotional intelligence as, "the subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (1990).

The area of IQ has already been researched thoroughly in the past, a standardized testing instrument can actually determine an individual's IQ rating or score, similar to the IQ method of determining a person's level of intelligence. The instrument, known as the baron eq-i, was developed by Dr. Reuven bar-on[22]. He was the one who coined the term "IQ" more than 18 years ago.

The theory suggests that traditional psychometric views of intelligence are limited. This was first outlined in 1983 in his book Frames *of Mind: The Theory of Multiple Intelligences*, where he suggested that different Individuals have different kinds of "intelligences."[1] Gardner proposed that there are eight intelligences, and has suggested the possible addition of a ninth known as "existentialist intelligence".

In 1985 - Wayne Payne introduces the term emotional intelligence in his doctoral dissertation entitled "A study of emotion: developing emotional intelligence; self-integration; relating to fear, pain and desire and problem-solving

Work Identities and Soft Skills: *Another interesting approach which has explained that an individual has different identity at work and in his personal life .*These identities have their own positive or negative impacts on the work understanding and performance in varying degrees. These have been already enunciated by thinkers like Chopra (1993) and Covey (1994), and spiritual leaders like Yeti (1996) and Ravi Shankar (2000) in different works. Recent research in this field have examined the role of literacy and numeracy specifically, identifying an inverse link with unemployment and earnings (Dearden *et al.*, 2000; McIntosh and Vignoles, 2001). Concern over the levels of literacy and numeracy in the population and their effect on individuals and on the economy prompted the establishment of a government inquiry into basic skills in 1998 (DfES, 1999). A major aim of the programme was to enhance the employment prospects of people with low basic skills.

Beder (1999) and McIntosh (2004), in reviewing previous evaluations of literacy training programmes, found a dearth of robust evidence.

In his book David A. Whetten, Brigham young University and Kim S Cameron of University of Michigan 2005 has defined Management skills as controllable, developable interrelated and overlapping.

Anderson Consulting Company (2000). Skills needed for the e-business environment .Chicago. By Bernanke, R.F (1976) The effects of behavioral modelling training upon managers behaviour and employees perceptions. Has studied personnel Psychology and its relevance in performance.

RESEARCH METHODOLOGY

This study is a part of analysis done on certain reasons for unemployment of youth in RUBAN areas. This study has been conducted by responses received from youth population of Mysore, Gulbarga and Belgaum in South India.

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[20]*/psychology.about.com/od/personalitydevelopment/a/emotionalintell.htm*

[21] University of New Hampshire

[22] Founder of the term "IQ"

THE STUDY IS DONE ON CERTAIN ASSUMPTIONS SUCH AS

1. Developing of soft skills is not given emphasis in the current education scenario.
2. Most of the job vacancies in telecom , Service sector and retail demand young energetic people with pleasant personality. This important for job aspirants of the RUBAN society, with good soft skills.
3. Universities in RUBAN societies are not giving much emphasis on building these skills, and have not got well developed content to teach this as a mandatory subject to students of final semester of UG/PG courses.

RESEARCH BACKGROUND

1 . This research is a structured *enquiry that utilizes acceptable scientific methodology to solve problems and create new knowledge that is generally applicable.*
2 . Classification and interpretation of data based on response from And Mysore , Gulbarga and Belgaum .
3 . Job aspirants and Final year students, Students at soft skills training institutes, Employees of Service sectors have been interviewed in this study. General age of respondents was 20-25 yrs.

On the other hand HR managers / Hiring managers /Soft skill trainers have been interviewed to validate the study.
4. Total Sample size of 150 respondents were considered for this study.
5. Techniques of simple random sampling was adopted .

The relevance of this study comes from the high reject ratio of candidates appearing for job interviews in corporates. It is seen that most of the rejected candidates in the service sector are from the non-metro's / rural background aiming at jobs in cities. The need to understand why and how to outshines city boy , and reasons of failure of non-metro candidates. It study will evaluate the relevance of soft skills and its impact on employability.

Reliability Test:
Cronbach's alpha
Cronbach's Score

Cronbach's Alpha	N of Items
.741	240

Cronbach's alpha is a coefficient of reliability. It is commonly used as a measure of the internal consistency or reliability of a psychometric test score. Going by the thumb rule, $.8 > \alpha \geq .7$ interprets into 'Acceptable' internal consistency. Hence, the alpha value of 0.741 obtained for various soft skill variables translates into Acceptable internal consistency for these parameters.20% of respondent were selected to test the internal consistency of test scores.The study has resulted in 0.741 Cronbach's alpha which is in reliable range .

Factor Analysis (Factors with Score, Communalities, Eigen Value and TVE)

	Component				Communalities
	fac1	fac2	fac3	fac4	
V4. Candidates seeking job with good communication and presentation skills have better chances of getting hired compared to one who does not possess these skills.	.785				0.64
V6. Hiring managers of BPO and KPO decide to hire freshers purely on their communication ability.	.686				0.50
V19.Rate on a (scale of 5)the importance of communication skills, product knowledge, advanced Excel, listening, assertiveness, team building,	.675				0.47
V13.Does our education system focuses on making employable resources for future.		.755			0.61
V10.Problem solving, interpersonal effectiveness and networking skills are expectations of employers of today.		.668			0.63
V5. Most recruiters look for presentable students while on campus Interview drive.		.568			0.56
V3. Assertiveness is required to deal with demanding customers.			.775		0.75
V2. Pleasant personality and good communication skills are important for employees directly dealing with customers.			.735		0.76
V15.Making presentations, negotiating, telephoning and participating in meetings are the most essential business communication skills				.801	0.67
V9. A mix of simulation, discussion and role plays will give students an edge in meeting the requirements of corporate looking for talent.				.683	0.65

	Components			
	fac1	**fac2**	**fac3**	**fac4**
Eigen value	2.17	1.74	1.30	1.02
Total variance explained (62.29)	17.41	17.18	13.94	13.76

The general purpose of factor analysis is to find a method of summarizing the information contained in a number of original variables to a smaller set of new composite dimensions (factors) with minimum loss of information. Factor Analysis tries to identify and define the underlying dimensions in the original variables.

'Total variance explained', we find the variance on the new factors that were successively extracted. In that, these values are expressed as a percentage of the total variance. As we can see, factor 1 (communication) accounted for about 17.41% of the total variance, factor 2 (problem solving) about 17.18%, factor 3 (assertiveness) about 13.94% and factor 4 (presentation) about 13.76% of the total variance.

For this task, the cumulative variance extracted is 62.29%. The sums of square of all the variables in given factors are called the Eigen values. If Eigen value is greater than 1, it becomes factor. In similar pattern, sum of square of a variable across factors are called communalities. As a threshold level, communalities should be greater than .5. The last column above presents the communalities values. All the variables have communalities greater than .5.

CONCLUSION

- Youth of RUBAN society lack in soft skills .

- Youth of non- metro is not able to make use of the employment opportunities because they lack in certain corporate skills.

- Though technical skills are very important and can not be replaced with any other skills but still emphasis is given on soft skills at the time of hiring employees.

- Employer prefer individuals with soft skills.

- Post soft skills training evaluation indicates better placement ratio of youth .

- The study throws light on the developing sectors in the job market .Varoius jobs and positions which are unfilled because there is unemployability . The problem of unemployable is getting severe than the problem of unemployment **.**

- Pleasant personality , communication skills , assertiveness , Problem solving , interpersonal effectiveness , negotiating, telephonic skills and networking skills are expectations of employers of today.

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A COMPARATIVE STUDY OF "WORK LIFE BALANCE IN VARIOUS INDUSTRIAL SECTORS" IN BANGALORE

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ABSTRACT

In this fast going generation we need to habituate the work but how much we are giving preference to the life to understand this I started to study the work-life balance. Work–life balance is a concept including proper prioritizing between "work" (career and ambition) on the one hand and "life" (Health, family and spiritual development) on the other. It is the term used to describe practices in achieving a balance between the demands of employees 'family (life) and work lives. The increasing level of work life problems and increasing concern about work life issues in the corporate arena present both a challenge and opportunity for Human Resource (HR) Professionals. Today in the corporate sectors have more concentrate on balancing the life and work among the employees? There is a need for organizations to adopt human resource strategies and policies that accommodate the work-life needs of a diverse workforce in the current business environment. This paper presents the results of the study on organizational polices and provisions regarding work-life balance of the employees, which was carried out among a cross-section of leading corporate entities in Bangalore representing equally the Three industrial sectors, namely, Information technology, Educational and Banking sector. The results reveal that how the employees are balancing between in work-life balance

Keywords: Work life balance, Human resource strategies, Business Environment, Organizational Policies and Procedures, Problems

INTRODUCTION

The work-leisure dichotomy was invented in the mid-1800s. Paul Krassner remarked that anthropologists, use a definition of happiness that is to have as little separation as possible "between your work and your play" The expression "work–life balance" was first used in the United Kingdom in the late 1970s to describe the balance between an individual's work and personal life. In the United States, this phrase was first used in 1986.

Most recently, there has been a shift in the workplace as a result of advances in technology. As Bowswell and Olson-Buchanan stated, "increasingly sophisticated and affordable technologies have made it more feasible for employees to keep contact with work". Employees have many methods, such as emails, computers, and cell phones, which enable them to accomplish their work beyond the physical boundaries of their office. Employees may respond to an email or a voice mail after-hours or during the weekend, typically while not officially "on the job". Researchers have found that employees who consider their work roles to be an important component of their identities will be more likely to apply these communication technologies to work while in their non-work domain.

Some theorists suggest that this blurred boundary of work and life is a result of technological control. Technological control "emerges from the physical technology of an organization".[In other words, companies use email and distribute smart phones to enable and encourage their employees to stay connected to the business even when they are not in the office. This type of control, as Barker argues, replaces the more direct, authoritarian control, or simple control, such as managers and bosses. As a result, communication technologies in the temporal and structural aspects of work have changed, defining a "new workplace" in which employees are more connected to the jobs beyond the boundaries of the traditional workday and workplace. The more this boundary is blurred, the higher work-to-life conflict is self-reported by employees.

Many authors believe that parents being affected by work-life conflict will either reduce the number of hours one works where other authors suggest that a parent may run away from family life or work more hours at a workplace. This implies that each individual views work-life conflict differently.

Employee assistance professionals say there are many causes for this situation ranging from personal ambition and the pressure of family obligations to the accelerating pace of technology. According to a recent study for the Center

for Work-Life Policy, 1.7 million people consider their jobs and their work hours excessive because of globalization

Work-life balance is the term used to describe those practices at workplace that acknowledge and aim to support the needs of employees in achieving a balance between the demands of their family (life) and work lives. The work foundation, earlier known as the Industrial Society, believes that 'Work-life balance is about people having a measure of control over when, where and how they work. It is achieved when an individual's right to a fulfilled life inside and outside paid work is accepted and respected as the norm, to the mutual benefit of the individual, business and society'. The concept of work-family (life) balance has emerged from the acknowledgement that an individual's work-life and personal/family life may exert conflicting demands on each other.

Work-life balance is an important area of Human Resource Management (HRM) that is receiving increasing attention from government, researchers, and management and employee representatives
Factors contributing to the interest in work-life balance issues are global competition, renewed interest in personal lives/family values and an aging workforce (Lockwood, 2003). Sverko et *al* (2002) attribute the growing relevance of work-life balance in industrialized societies to changing technology, changing values and changing demographic trends. Other factors include increasing complexity of work and family roles, the increased prevalence of dual income households and the expanded number of women entering the workforce.

In the present scenario, a vast majority of people seem to be working longer and harder than ever before and as consequences are finding it ever more difficult to achieve a much desired WL. In particular, technological, structural and demographic changes brought about in employment, together with greater than ever demand for more multiskilled and flexible _knowledge workers'are being allied with negative experiences of work such as involuntary contingent work and role overload. These experiences have been correlated directly and indirectly to the quality of family life, psychological well-being, and health.

A balance between work and life is supposed to exist when there is a proper functioning at work and at home with a minimum of role conflict. Therefore, the incompatibility between the demands from the work and non work domain give rise to conflict and consequently, people experience a lack of WLB. There is confirmation of the fact that people entering the workforce today are laying emphasis on the importance of WLB more than their predecessors. In spite of this, the extent to which this balance is being achieved is far less than what is desired. In fact, the researchers bring to mind that graduates are being drawn into situations where they have to work for progressively longer hours and so experience an increasingly unsatisfactory balance between home life and work life.

From the prospective of employees, WLB is the maintenance of a balance between responsibilities at work and at home. Work life initiatives are those strategies, policies, programs and practices initiated and maintained in workplaces to address flexibility, quality of work life and work family conflict. In other words, WLB is about people having a measure of control over when, where and how they work. Strategies of WLB in organizations include policies covering flexible work arrangements, child and dependent care and family and parental leave. Several studies have shown the benefits associated with the provision of work life in organizations.

Though work-life balance was initially construed as the concern for working mothers, it has been recognized as a vital issue for all classes of employees (Bird, 2006). Despite increased interest in work-life issues, the

organizational philosophy towards work-life concerns is varied. Many organizations still see them as individual not organizational concerns. Some organizations resonate the sentiment 'work is work and family is family—and basically, the two do not mix' (Bailyn et *al,* 1997).Other organizations view work and personal life as competing priorities in a zero-sum game, in which a gain in one area means a loss in the other (Friedman et *al,* 2000). Hence, it would be interesting to study organizational perspectives on work-life balance.

OBJECTIVES
The aim of the study is

1) To understand the perceptions of organizations and Employees with respect to Work Life Balance.

2) To know the differences in the organizational initiatives for work life balance in various sectors.

3) To analyze gender-wise issues in different sectors

4) To put forth suggestions to enhance work life balance of organizations and employees.

CONCEPTUAL FRAMEWORK
The framework focuses on the proximal issues (work characteristics, non-work characteristics and personal characteristics) relating to work life balance, as the title of the study suggests. The model allows for a considerations of work life issues in a workplace and professional effectiveness program, in relation to personal effectiveness and well-being.

1. off the job-characteristics and strategies
2. Role and workplace characteristics and strategies
3. Personal characteristics
4. Work/life balance
5. Performance
6. Professional development
7. Redesign

LITERATURE REVIEW
It is of great interest to note that although the term ‗work-family balance' has been widely adopted, yet a formal definition of this term has remained elusive. It is also acknowledged that there is a recent shift in terminology used to refer to this phenomenon, with many organizations using the term ‗WLB' so as to include employees who are not parents, but who desire balance for non-work activities such as sports, study, and travel (Kalliath and Brough, 2008). ‗Workfamilybalance' reflects an individual's orientation across different life roles, an inter role phenomenon' (Greenhaus et al., 2003).

Greenhaus et al. (2003) have delved into the multiple roles definition of WLB with a focus on equality of time or satisfaction across an individual's multiple life roles. WLB was therefore defined as ―the extent to which an individual is engaged in—and equally satisfied with—his or her work role and family role consisting three components of work family-balance, time balance, involvement and satisfaction balance (Greenhaus et al., 2003).

Kirchmeyer (2000) defined WLB as ―achieving satisfying experiences in all life domains and to do so requires personal resources such as energy, time and commitment to be well distributed across domains.To sum it all,

Kalliath and Brough (2008) have put forward their own definition of WLB and defined it: ―WLB is the individual perception that work and non-work activities are compatible and promote growth in accordance with an individual's current life priorities.‖The demands and pressure of work and family may give rise to work-life balance issues to an individual. Freedman and Greenhaus'"* reveal that women in workforce have increased considerably, however women face a lot of issues and challenges. They are still seen as the primary caretakers of the home and family, even if they work just as much as men. Work role is often seen as secondary to family roles. Not just men but women also hold themselves and other women to the homemaker standard. Women spend more time on housework, child care and family responsibilities. Women used to spend almost 24 percent of their time on housework in 1966 to 30 percent of housework in 2005. However women miss more work for child care. 20 percent of women take care of both children and elders. Greenhaus and Beutell'^ defined workfamilyconflict as 'a form of inter-role conflict in which the role pressures from the two domains, that is, work and family, are mutually non-compatible so that meeting demands in one domain makes it difficult to meet demands in the other'. That is,

participation in the work role is made more difficult by virtue of participation in the family and vice versa. The major concern in this most widely used definition of work-family conflict is that role conflicts cause due to problems of role participation and emotional intelligence. Hence, difference in values, social relationships and requirements between work and family do not constitute conflict per se. Thornpson (2002) has classified the work-life initiatives as time-based strategies, information-based strategies, money-based strategies, direct services and culture change services. Time-based strategies include programs or policies like flexi time, compressed weeks, compulsory power-offs, job sharing, part time work, leave for new parents, phased return to work following childbirth, telecommuting, compulsory vacations and breaks and so on. Information-based strategies refer to programs or policies on Intranetresources on work-life balance, resource and referral service, relocation assistance, dependent career sources, work-life brochure and so on. Examples of money-based strategies are vouchers or subsidy for childcare, flexible spending accounts, adoption assistance, discounts for childcare tuition, leave with pay and so on. Direct services are those programs or policies like on-site or near-site dependent care, emergency back-up care, lactation rooms and support, help line, concierge services, after-school and school holiday activities and so on. Culture-change services include programs or policies like training for managers and supervisors to help employees deal with work-life conflicts. Pro-work-life balance culture initiatives include family-friendly policies, inclusive atmosphere, supervisor support, work-life education inputs like workshops or seminars on work-life issues, counseling, Wellness programs, fitness initiatives and so on. Thus, a work-life balance friendly culture is a productive work culture where the potential for tensions between work and other parts of employees' lives is minimized. This means having appropriate employment provisions in place, and organizational systems and supportive management under pinning them.

The rationale for providing work-life balance provisions is varied. Wood *et al* (2003) found that adoption of family-friendly practices was best explained by organizational adaptation, a combination of institutional pressures as well as competitive forces, local and technological factors, situational conditions, and managerial values, knowledge, and perceptions regarding work and family programs. The benefits of work-life balance initiatives, for employers, are better talent attraction, enhanced productivity, better talent engagement, reduced work stress, reduced absenteeism, reduced costs, better motivation, employer branding, talent retention and efficient work practices (Department of Labor, New Zealand, 2003, Byrne, 2005; Pocock, 2005; and McPherson, 2007). Implementation of work-life balance provisions involve cost that the management of the concerned organization should be willing to bear. The costs of implementing work-life balance policies are: (i) direct costs of policies (example, paying for subsidies), (ii) costs of staff and space (for instance, cost of childcare takers, space for childcare facilities), (iii) cost of equipment (for example, information and communication technology to facilitate work from home), (iv) cost of work-life balance policy formulation and implementation, (v) disruption costs (for instance, an employee availing leave), and (vi) temporary reduction in productivity from disruption (Department of Labor, New Zealand, (2003). Further, there are challenges to the implementation of the work-life balance provisions. These barriers to implementing work-life policies include cost, management of initiatives, lack of knowledge, and raising expectations.

RESEARCH METHODOLOGY
This study seeks to compare the organizational initiates on work-life balance of companies from industrial sectors, namely, Information technology, Educational and Banking sector. The data for this study was collected from primary sources that are the employees of the respective organizations. All leading organizations in Bangalore.
Stratified random sampling was adopted to collect data from two companies in each sector. Thus the sample size will be 30. A structured questionnaire was used as the tool of data collection

A Questionnaire was prepared to collect data from the respondents on the basis of self-report. The tool was developed based on survey of the research literature and inputs received from the field personnel. The questionnaire had both open ended and close ended items.

FINDINGS
The results of this study on organizational responses to work-life balance requirements of the employees are presented under four sections, namely, profile of the Candidates, , policies on work-life balance and provisions for work-life balance,

Profile of the Candidates

- Almost three-fourth (70%) of the respondents was aged between 25 and 30 years.

- All the respondents had professional qualifications in human resource management.

- A little more than half of the respondents (53.3%) were designated as 'Senior executive —HR' while only a little more than one-fourth of the respondents (26.6%) were of managerial cadre and above.

- Most of the respondents (76.7%) had between two and four years of experience in the present company. The years of experience in the company ranged from 2 to 15 years.

POLICIES ON WORK-LIFE BALANCE

Only some companies (30%) had work-life balance policies as part of the policies concerning employees out of hardly companies had similar policies across all operations around the globe. These are companies with international exposure Linkages (as in the case of most software and services companies).

Employee well-being initiatives (including those to promote work-life balance of the employees) were predominantly mooted through HR and welfare department (72.7%). A few companies had employee engagement teams to work on these work-life balance initiatives. As regards the three tier model of adequate availability, equal accessibility and wide use of work-life initiatives in organizations as suggested by Budd and Mumford (2006), three-fifth of the respondents (60%)contended that work-life balance initiatives were adequately available in their organizations. A little more than half of the respondents (56.7%) felt that it was made accessible to all employees. Only half of the respondents felt that these work-life balance initiatives were actually made use of by the employees.

ORGANIZATIONAL PROVISIONS FOR WORK-LIFE BALANCE

The organizational provisions for work-life balance were traced in terms of time-based Strategies, money-based strategies and direct services. The findings are presented below,

TIME-BASED STRATEGIES

Flexi time in terms of flexible working hours was practiced in most of the IT companies (80%) compared to other companies (20%) in the services sector The two service companies that provided flexi time option belonged to the insurance industry.

'Work from home' options were not very popular. They were absent in the services However, two-fifth (40%) of the companies in the IT sector offered them as a policy and the other IT companies do the same on case-to-case basis. While none of the organizations had provisions for compressed work weeks or job sharing or part-time work, only three IT companies had provision for career breaks. All companies had provision for maternity leave. In India, maternity leave is prescribed by the Maternity Benefit Act, 1961.

Provision of paternity leave was not very widely prevalent. Most manufacturing and services companies (50% each) did not have such provisions. Provision of adoption leave was even rarer compared to paternity leave. Great majority of services companies (90% each) did not have such provisions.

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MONEY-BASED STRATEGIES

Provision of financial planning services was more prevalent in the IT sector (80%) compared to services sector (40% each). Most companies provided assistance for tax planning. Non-taxable financial benefits were more prevalent in the services sector (80%) compared to IT sector (70%). Assistance for retirement planning was more prevalent in the manufacturing sector (80%) compared to IT sector (50%) and services sector (40%). All companies provided employees discounts/subsidies like meal subsidies or vouchers and so on. Less than one-third (30%) of the companies on the whole provided general insurance facilities.

All companies provided medical insurance coverage to the employees. It must be remembered that the quantum, coverage could vary. A few companies provided life insurance as well. Only a little more than one-third (36.7%) of the companies offered tuition fee reimbursements. Only a little more than one-third (36.7%) of the companies offered scholarships for the employees' children. Only one-third (33.3%) of the companies extended educational loan facilities to its employees' wards. Financial support for dependent care was provided.

DIRECT SERVICES

The various direct services extended by organizations are Consideration of employee's spouse/family member for Employment, On-site medical Assistance, Recreation facilities for employees at the work place. Half the companies in the IT sector did consider the employee's spouse/ family member for employment in the organization to fulfill any human resource requirement, only one-fifth (20%) of the companies in the manufacturing sector and one-tenth (10%) of the companies in the services sector did so.

A great majority of the companies in the IT sector (80%) offered fee/discounted on-site health and fitness facilities compared to three-fifth (60%) of the manufacturing companies surveyed and half the services companies studied. Very few companies (33.33%) had the provision of free/discounted off-site health and fitness facilities.

Most companies had on-site medical assistance. Almost three-fourth (70%) of the companies surveyed had recreation facilities for employees at the work place. This was more predominant in IT followed by manufacturing companies. Almost three-fifth (56.7%) of the companies surveyed had sports or activity clubs for the employees. Only three service companies had such a facility compared to seven manufacturing and IT companies. Less than one-fourth (23.3%) of the companies surveyed had outdoor exercise facilities.

DISCUSSION

The organizational outlook on human resources to a large extent influences the work-life balance quotient of organizations. For the latter organizations, a range of 'high involvement work practice' (such as cross-training, employee participation programs and group based incentives, but not flexible working practices) was associated with high staff retention and the organization's positive financial performance. Work-life balance initiatives could make more of an impact in those organizations oriented towards a 'people as asset' strategy.

The provision of work-life balance initiatives depends on various factors—the organizational philosophy, the profile of the organization, profile of the employees, the nature of business and so on. It is evident that sector specific nuances exist. For example, flexible working practices are absent in manufacturing companies while it is common in IT companies.

Further, most of the services are provided as employee welfare or well-being provisions rather than work-life balance provisions. Employee welfare is a totality concept and caters to social, economic and other domains of an individual. Consequently, though there may be many overlapping provisions coming under the purview of work-life balance and employee welfare, the awareness with respect to work-life balance per se is a grey area. The findings indicated that significant differences existed across industries in work-life responsiveness. Thus on the whole, there is inequality in the distribution of opportunities for work-life balance both within and across workplace.

IMPLICATIONS OE THE STUDY

The study has brought to light the policies of the organization for work-life balance of its employees and also the provisions for the same. Bangalore Industry's realities with respect to work-life balance are segmentation of work and life domains of employees, inequality in work-life balance responsiveness of the employers and lack of recognition for work-life orientation of organizations are a pointer. These concern need to be addressed.

SUGGESTIONS

Based on the results of the study, the following suggestions are presented:

- The provision of work-life initiatives in a time of global economic slowdown needs a vibrant HR team that will innovate on existing practices and make them more user friendly and cost-effective too.

- Organizations can provide practical interventions rather than merely money-based strategies. Example, organizations could facilitate swapping of shift routines that will help facilitate work-life concerns of the employees. Employees need to be more aware of their work-life priorities and strive for its attainment.

- Accenture company(one of the IT company) provided Leave facility in case of emergency employees can barrow the leaves from other employees which they are not using money will paid to those employees who are giving the leaves to other employees. This policy well going in companies which other company can put forth in their Industry

CONCLUSION

The implementation of work-life programs has both individual and organizational benefits. Effective work-life programs facilitate a symbiotic relationship between the employee and employer for mutual benefits. Employees who are better able to balance the demands on their time are more satisfied and content. In turn they are able to perform better. Such provisions also aid in employer branding and are emerging as retention factors.

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FINANCIAL SUSTAINABILITY- A THEORETICAL ATTRIBUTE

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ABSTRACT

A stable financial system is one in which financial intermediaries, markets and market infrastructure facilitate the smooth flow of funds between savers and investors and, by doing so, help promote growth in economic activity. Conversely, financial instability is a material disruption to this intermediation process with potentially damaging implications for the real economy. From this perspective, the safeguarding of financial stability can be seen to be a forward-looking task – one that seeks to identify vulnerabilities within the financial system and, where possible, take mitigating action. The relevance of analyses on financial stability was first recognised during the international financial crises at the end of the 90s, also strengthened by the financial and economic crisis emerging in 2007. Between 1996 and 2005, publishing of FSRs became a rapidly growing "industry", with the number of central banks issuing such reports increasing worldwide from 1 to about 50. India's FSR aims to leapfrog by adopting relatively advanced methodologies. Its approach to systemic risk regulation is also interesting due to its combination of regulators, treasury, the central bank, and political representatives. The linkage of a financial system and its stability with inflation conditions and monetary policy has been a very contentious issue in the literature. The sequence of events on the relationship of financial stability with monetary policy and price stability is divided as to whether there are synergies or a trade-off between them. In case of practicing financial sustainability in the firms, it can be compared to a table: it needs four legs in order to stand sturdily. They are therefore termed these components as fundamental pillars for the financial sustainability of an organization.

Key words: - Financial stability, inflation, monetary policy, economic growth, financial system, principles of financial sustainability.

INTRODUCTION

Today the countries across the globe are facing unprecedented sustainability challenges fraught with environmental crisis, financial crisis, social crisis and governance crisis. Hence there has been an accelerated emphasis on the need for making sustainability development goals a universal priority. Business corporations have started realizing that it is high time to move beyond short-term myopic goal of profit maximization to longer term sustainability goals involving environmental, social, and governance goals. Accordingly, companies have started integrating sustainability goals into their corporate strategy and disclosing their sustainability activities in order to assure their legitimacy. Achieving institutional financial sustainability is a goal that all non-profit organizations strive for. Theoretically, this financial sustainability will enable us to cover our administrative costs and to prioritize our activities so as to accomplish our missions, without undergoing interminable negotiations with donors who may or may not agree with our vision or with our cost percentages. Many institutions seek donors that will allow them to set up a trust fund or income-generating opportunities that yield a profit margin above market conditions. Financial stability can be defined as a condition in which the financial system – which comprises financial intermediaries, markets and market infrastructures – is capable of withstanding shocks and the unravelling of financial imbalances. This mitigates the likelihood of disruptions in the financial intermediation process that are severe enough to significantly impair the allocation of savings to profitable investment opportunities. Understood this way, the safeguarding of financial stability requires identifying the main sources of risk and vulnerability. The ingenuity and creativity of non-profit organizations has led to the development of many innovative mechanisms. This ability to dream and to persuade others to realize these dreams is one of this sector's principal strengths. Nonetheless, the percentage of organizations that achieve financial sustainability remains very low. This is due not to a lack of creativity or commitment, but rather to the fact that many organizations continue to have a donor-dependent vision. If a trust fund is obtained, it is usually through an outside source. Moreover, attaining a profit margin that exceeds market conditions generally requires appealing to the organization's non-profit status in order to obtain special concessions. While it is important to consider this capacity for access to capital or preferential terms as a competitive advantage enjoyed by a non-profit organization, attaining financial sustainability through a single source or mechanism is a stroke of luck.

MEANING OF FINANCIAL SUSTAINABILITY

Financial stability is a state in which the financial system, i.e. the key financial markets and the financial institutional system is resistant to economic shocks and is fit to smoothly fulfil its basic functions: the intermediation of financial funds, management of risks and the arrangement of payments. Financial instability and its effects on the economy can be very costly due to its contagion or spill over effects to other parts of the economy. Indeed, it may lead to a financial crisis with adverse consequences for the economy. Hence, it is fundamental to have a sound, stable and healthy financial system to support the efficient allocation of resources and distribution of risks across the economy.

The relevance of analyses on financial stability was first recognised during the international financial crises at the end of the 90s, also strengthened by the financial and economic crisis emerging in 2007. These developments prompted the need for continuously providing the professional public opinion with an up-to-date and reliable picture of the condition of a given country's financial sector. Owing to the mutual relations of dependence – affording interpretation on both a vertical and horizontal level – the analyses need to cover the whole financial intermediary system; in other words, in addition to the banking system, it is also necessary to analyse non-bank institutions that in some form take part in financial intermediation. These include numerous types of institutions, including brokerage firms, investment funds, insurers and other (various) funds. When analysing the stability of an institutional system, we examine the degree in which the whole of the system is capable of resisting external and internal shocks. Of course, shocks do not always result in crises, but an unstable financial environment can in itself impede the healthy development of the economy.

Many central banks have added a concern with financial stability to their primary focus on monetary policy. They stand ready to advance funds to banks facing liquidity issues, and many are also active in overseeing critical clearing and settlement systems and publishing frank assessments of their countries' financial stability. These financial stability reports are aimed at informing a broader public, particularly the private sector, which in the past has been insufficiently involved in issues that did not directly impact the bottom line. The global financial crisis has renewed policymakers' interest in developing and improving tools to promote financial stability. The need for a macroprudential policy framework to address the stability of the financial system is now well recognized and is widely seen as an appropriate policy response to changes in the global financial environment. Even if there is consensus on the definition of macroprudential policy, incorporating macroprudential considerations in the current framework for financial stability poses operational challenges.

FINANCIAL STABILITY REPORTING (FSR) IN INDIA

Between 1996 and 2005, publishing of FSRs became a rapidly growing "industry", with the number of central banks issuing such reports increasing worldwide from 1 to about 50. Since 2005, this number has grown somewhat less rapidly, although it has kept increasing and now reached about 107. The recent entrants into the FSR market include some of the world's largest economies. For instance, India's central bank, the Reserve Bank of India, started publishing FSRs in 2010, and the United States, which stayed out of the FSR-publishing trend for many years, started publishing an FSR in 2011.

India's FSR aims to leapfrog by adopting relatively advanced methodologies. Its approach to systemic risk regulation is also interesting due to its combination of regulators, treasury, the central bank, and political representatives. The origins of the FSR in India can be traced back to the Committee for Financial Sector Assessment, set up in 2006 to conduct a comprehensive self-assessment of India's financial sector. In 2009, it recommended that a multi-disciplinary unit the Financial Stability Unit be set up within the RBI with a remit to, inter alia, publish periodic FSRs.

The highest-level institutional body for financial stability in India is the Financial Stability and Development Council (FSDC). The Council is chaired by the Finance Minister, with members including the Governor of the RBI, the Finance Secretary and other Ministry of Finance officials, and heads of other sectoral regulators. The Council is assisted by a Sub-Committee, chaired by the RBI Governor. All the other members of the Council, except for the Finance Minister, are also members of the Sub Committee. RBI's Deputy Governors are also represented in the Sub Committee. The Sub Committee, in turn, is assisted by two technical groups—a Technical Group for Financial Inclusion and Literacy and an Inter regulatory Technical Group.

The RBI has set up Financial Stability Unit with a mandate that includes conducting macro-prudential surveillance of the financial system on an ongoing basis to enable early detection of any incipient signs of instability. In addition to the semi-annual FSRs (which the RBI sees as a critical tool in its attempt to communicate the potential systemic risks facing the financial system to all stakeholders), the Unit also produces quarterly Systemic Risk Monitors (which are placed before the RBI's senior management, but are not published) and monthly monitors (which track developments in the financial markets with a view to identifying systemic risks as they emerge; these are also not published).

WHY FINANCIAL SUSTAINABILITY MATTERS?

Financial sustainability is a major area of focus in the present era of development. Few of the major reasons why the financial sustainability matters can be enumerated as

- Significant financial instability can result in lost output.

- It can lead to a misallocation of resources across different uses and across time.

- The financial system can be a source of instability or it can transmit (and possibly amplify) problems from one part of the financial system to other parts of the system, or to the economy more generally.

- Often the combination of an economic shock and a weak financial system can give rise to much worse outcomes than would be expected from an assessment of each of these areas separately.

- Macro-financial instability can seriously impair the lending of funds from ultimate savers to ultimate borrowers, resulting in a sharp reduction in the ability of the financial system to allocate credit.

- When market liquidity becomes significantly impaired, these strategies can generate self fulfilling outcomes as asset positions are continuously adjusted to limit losses in response to price movements that were induced by earlier changes in asset positions.

- Among the problem factors affecting the whole of the financial system, literature commonly defines the following ones: rapid liberalisation of the financial sector, inadequate economic policy, non-credible exchange rate mechanism, inefficient resource allocation, weak supervision, insufficient accounting and audit regulation, poor market discipline.

FINANCIAL STABILITY AND ECONOMIC GROWTH

Initially most studies were emphasized on the role of the financial sector in economic progress with the degree of financial development, usually, measured in terms of the size, depth, openness and competitiveness of financial institutions. The stability and efficiency of institutions did not receive much attention, possible due to the intuition that the competitiveness and growth of financial institutions is due to their efficiency in operations and resource allocation and optimal risk management. Kindleberger argued that the loss of confidence and trust in institutions could stimulate disintermediation and institutional closures, and when confidence falls, investment probably falls too. Institutional instability can also affect the organization of the financial sector and, consequently, increase the cost of transactions and causes the problems within the payments system. These transaction costs, which are real resources leads to misallocation of the resources and hence the rate of economic growth may suffer. Thus, a sound financial system instils confidence among savers and investors so that resources can be effectively mobilized to increase productivity in the economy. Taking inspiration from Kindleberger (1978) and Minsky (1991), Eichengreen and Arteta (2000) studied 75 emerging market economies for the period 1975–1997. They showed that rapid domestic credit growth was one of the key determinants of emerging market banking crises. Similarly, Borio and Lowe (2002) using annual data for 34 countries from 1960 to 1999 showed that sustained and rapid credit growth, combined with large increases in asset prices, increased the probability of financial instability. Calderon et. al., (2004) on the other hand found that mature institutions and policy credibility allowed some emerging market economies to implement stabilizing countercyclical policies. These policies reduced business cycles and economic fluctuations which led to more predictability power. This predictive confidence provided a better investment environment that resulted in more rapid growth.

FINANCIAL STABILITY AND INFLATION

The linkage of a financial system and its stability with inflation conditions and monetary policy has been a very contentious issue in the literature. Deliberation in this context entails two crucial issues: the causal relationship

between inflation and financial stability and whether financial stability should be pursued as a goal of policy, especially by inflation targeting central banks. Studies provide alternative perspectives about the channels through which financial stability and inflation can share a causal relationship.

First, there is a common perspective that inflation conditions can interfere with the ability of the financial sector to allocate resources effectively. This is because inflation increases uncertainties about future return possibilities. High inflation can be associated with high inflation volatility and thus, the problem of predicting real returns and, consequently, a rapid decline in banks' lending activity to support investment and economic activities. Business cycles could get aggravated due to interaction between the price instability and frictions in credit markets. An upward growth trajectory accompanied by high inflation could cause over-investment and asset price bubbles. Sometimes, the foundation for financial instability emanates from excessive credit growth resulted due to realistic return expectations and not for real investment. There are some arguments that banks cannot pass the policy interest rate, an inflationary control measure of the central banks, as quickly to their assets as to their liabilities which lead to increasing the interest rate mismatch and, thus, market risk and financial instability.

FINANCIAL STABILITY AND MONETARY POLICY

The literature on the relationship of financial stability with monetary policy and price stability is divided as to whether there are synergies or a trade-off between them. Schwartz (1995) states that price stability lead to low risk of interest rate mismatches and low inflation risk premium. These minimisation of risks resulted from the accurate prediction of the interest rate due to credibly maintained prices. The proper risk pricing contribute to financial soundness. From this perspective, price stability can serve as both necessary and sufficient conditions for financial stability. Some authors, however, take a cautious stance in this regard and argue that price stability can be necessary but not a sufficient condition for achieving financial stability. Some have also argued that a high interest rate measure to control inflation, could negatively affect the balance sheets of both banks and firms. Views stand that lax in a monetary policy can lead to inflation volatility. Positive inflation surprises can redistribute real wealth from lenders to borrowers and negative inflation surprises can have the opposite effect. A very tight monetary policy may lead to disintermediation and hence the financial instability. It is argued that a very low inflation levels resulted from very tight monetary policy may lead to very low interest rates that would make cash holdings more attractive than interest bearing bank deposits and hence the disintermediation. Further, a sharp increase in real interest rates have adverse effects on the balance sheets of banks and may lead to credit crunch, with adverse consequences for the financial and real sectors. The central banks interest rate smoothing process might induce a moral hazard problem and promotes financial institutions to maintain riskier portfolios. This phenomenon of interest rate smoothing sometimes lead to indeterminacy of the economy's rational expectations equilibrium and inhibits active monetary policy. Thus smoothing may be both unnecessary and undesirable.

PILLARS OF FINANCIAL SUSTAINABILITY

Financial sustainability of a organization is its capacity to obtain revenues in response to a demand, in order to sustain productive processes at a steady or growing rate to produce results and to obtain a surplus. It must be kept in mind that financial sustainability may be achieved at the project, program or organizational level. In case of practicing this concept in the firms, it can be compared to a table: it needs four legs in order to stand sturdily. They are therefore termed these components as fundamental pillars for the financial sustainability of an organization. The pillars are

1. Financial and Strategic Planning

As the organization grows and takes on an increasing number of activities, it runs the risk of focusing on day to day management issues and losing sight of long range objectives. Strategic planning is the mechanism to help clarify an organization's mission and objectives as well as prioritize the actions needed to accomplish them. Effective planning has become a prerequisite for accessing available international funds. However, since it operates at the purely conceptual level, strategic planning has a weakness: it does not adequately take into account the resources an organization has available to implement the chosen strategies, or its capacity to obtain new resources. It is therefore important to engage in a parallel financial planning process that makes it possible to convert the actions described in the strategic plan into figures. A financial plan of action basically consists of projected expenditures and the organization's potential to generate the income to cover those expenditures. Although it may appear that a financial plan is very similar to a budget, there are significant differences between the two. A financial plan is a dynamic

document that changes frequently. The ultimate purpose of the financial plan is to determine if the organization is going to have sufficient resources available in the medium term to meet the objectives described in the strategic plan. The financial plan operates on the basis of scenarios, ranging from the minimum feasible to the ideal. The minimum feasible scenario quantifies priorities that are indispensable to fulfilling the mission within a specific time frame, and whether the organization can cover its fixed or operational costs during that period. These indispensable priorities and fixed operational costs represent the minimum fundraising goal.

2. Income Diversification

The second pillar of financial sustainability is income diversification, referring not only to internal income generation, but also to the number of income sources that provide our main funding. Even if an organization has twenty donors, it will remain extremely vulnerable if a large portion of the budget depends on only one of these. Any change in this donor's decision can induce a major crisis. At least 60% of the organization's overall budget must come from five different sources.

3. Sound Administration and Finance

Knowing how to manage our resources is as essential to achieving financial sustainability as knowing how to generate income. Efficient procedures for administration and finances are governed by a series of institutional policies that help us make the most of our resources and ensure transparency in fiscal management. Moreover, these procedures must enable us to anticipate the organization's financial standing and, ultimately, make appropriate decisions in a timely manner. Efficient procedures also allow us to generate income through the financial management of available assets. Accounting-administrative procedures must fit the organization's needs. Regardless of their scope and structure, these procedures must record the organization's transactions to enable us to visualize the organization as a whole. In many organizations, accounting procedures are set up by project or by donor since this facilitates issuing donor reports that often require specific accounting categories and codes.

4. Own Income Generation

Own income generation is one way for an organization to diversify its sources of revenue. In this category, however, we discuss all the ways in which an organization can generate unrestricted income: in other words, income that the organization, not the donor, decides how to spend. Principal ways an organization can generate its own revenues follow.

- Contributions to a trust or endowment fund
  The objective of a trust fund is for an institution to derive benefits from the interest generated by the capital. The capital remains untouched. Its value must be maintained and/or increased over time. An organization can include under indirect costs (overhead) a percentage earmarked for an endowment or trust fund. If this is the case, the percentage constitutes a surplus. To do this, however, the organization must legally establish the endowment fund, and must include this investment under its indirect costs as a matter of institutional policy.

- Fundraising for institution building or operations
  This refers to requesting donations from those individuals, corporations, or agencies willing to make contributions in support of the institutional development of the organization.

- Income generation through public contributions
  Some organizations turn to the public to solicit support for their mission. There are many different ways to approach the public, including:

  a. Offer membership in the organization.

  b. Organize events which people pay to attend such as parades, raffles or dinner parties.

  c. Solicit donations in public campaigns such as "telethons" or taking up national collections during a specific time frame (usually of short duration,

  such as one day).

- Income generation through financial management
  This is an income-generation technique that can be implemented by all institutions, regardless of whether it generates a little, or a lot, of income. This category refers to the appropriate, strategic management of an

organization's assets (assets may be bank accounts, property, etc.) in order to maximize their financial potential.

CONCLUSION

Achieving financial sustainability is a long-term goal that requires the concerted efforts of the entire organization. While access to grants or preferential conditions is a competitive advantage enjoyed by non-profit organizations, we cannot rely exclusively on such privileges to reach our goal. If we were to do so, we would be allowing luck to determine our fate. Achieving financial sustainability is an ongoing process that has to become part of our organization's day-to-day management: in strategic planning, in administration and finances, in fundraising policies, and in the planning and implementation of strategies that enable us to generate our own income. It also must be recall that creativity alone is not enough to achieve financial sustainability; it is essential that we adopt the most advanced strategies and methods within our grasp to maximize our potential for success. Achieving financial sustainability should no longer be an impossible dream. Achieving this goal is both a necessity and an obligation for organizations since it ensures our ability to accomplish our respective missions. In many ways, the modern analysis of financial instability is in its early stages. Much work remains to be done in the analytic area, in data collection and in empirical research. Nonetheless, the sharply increased focus on this area by public sector entities, private participants in the financial sector and academic researchers holds out the promise of substantial progress over the next few years. The role of the private sector in promoting macro-financial stability has been less developed than that of the public sector since it lacks the incentives to sufficiently modify its behaviour in anticipation of market failure or externalities. Most of the responsibility for enhancing financial stability will continue to rest with the public sector.

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A STUDY OF FAMILY ENVIRONMENT ANXIETY AND PERSONALITY OF STUDENTS IN PROFESSION COURSES

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Our country has been faced with the problem of in adequate numbers of professional personals for the past several years even though the policy of open door admission was prevalent. Now there is a rush of aspirants for these courses. After in dependence, educational facilities for various professional courses have expended rapidly.

This desire for a high level of performance and profession puts a lot of pressure on students. Education is purposefully designed and healthy development of individuals as productive Successful and well adjusted persons in society.

The present study in focused to study the students of professional courses in detail with respect to their family environment, anxiety and personality patterns. The study is conducted on 100 Engineering +100 law +100 management students of Jodhpur district only. The result shows that there is no significant correlation between the family environment and anxiety of students of engineering law and management courses. There is no significant correlation between the family environment and neuroticism (N) and Extraversion (E) dimension of personality of students of engineering and management students. But there is significant correlation between the family environment and extraversion (E) dimensions of personality of law students. It is also clear from the data that there is no significant correlation between the anxiety and personality of engineering law and management courses.

Higher education is of paramount for economic and social development towards the end, institutions of higher educational have to play a key role. Business technology and information communication technology have emerged as major force and extent an all-pervasive influence in every sphere of human life. Possession of relevant knowledge, creation of new know1ede and capacity for its application has become the determination for strengthening the nation

Anxiety is variable which can be often defined as an emotional response, consisting of cognitive concerns and physiological arousal to perceived threat (Naylor, Burton, and Crocker, 2002). Although some authors have used the terms stress and anxiety interchangeably (Passer, 1988, Scanlon, **1986),** Stress can produce numerous discrete emotions such as anger, anxiety, **fear,** pride, and happiness (Crocker, Kowalski, Graham, et al., 2002, **Lazarus,** 2000). Symptoms associated with anxiety include worry, apprehension, muscular tension, sweating, increased heart rate, and gastrointestinal dysfunction.

The present era is an age of anxiety. It is not only a favorite theme for menu poets and novelists, but has also become a model concept in education. It has been utilized for explaining many of the psychopathological problems and has become a useful construct in the field of social inter relationship and educational achievement

"Personality is the dynamic organization within the individual of that psycho-physical system that determines his characteristics, behavior and thought". All port of (1961) According to this definition an individual's inherent needs urges, or drives serve as motivation behavior toward satisfied goals

Family is the primary institution which influences in general and parents and siblings in particulars the personality, socialization, ethical values, levels of aspiration, self concept etc. during childhood learning by imitation takes place during the childhood.

Family does not provide only physical and emotional nourishment but is also provides the environment of learning and socialization. Family environment includes relationship, Personal growth and system dimension these three dimensions includes cohesion, expressiveness, conflicts independence, achievement, orientation intellectual, cultural orientation, active recreational orientation, moral religious emphasis organization and control

OBJECTIVES OF THE STUDY
1. To study the family environment, anxiety and personality of the students of engineering, law and management courses.

2. To compare the family environment of the students of engineering, law and management courses.

3. To compare personality of the students of engineering, law and management courses.

4. To compare the anxiety of the students of engineering, law and management courses.

5. To study the relationship between family environment and anxiety of the students of engineering, law and management courses.

6. To study the relationship between family environment and personality of the student of engineering, law and management courses.

7. To study the relationship between anxiety and personality of the students of engineering, law and management courses.

HYPOTHESES OF THE STUDY

Under the plan and procedure of the present investigation the following null hypotheses have been formulated:

1. There is no significant difference in the family environment of the students of engineering, law and management courses.

2. There is no significant difference in the personality of the students of engineering, law and management courses.

3. There is no significant difference in the anxiety of the students of engineering, law and management courses.

4. There is no significant relationship between family environment and anxiety of the students of engineering, law and management courses.

5. There is no significant relationship between family environment and personality of the students of engineering, law and management courses.

6. There is no significant relationship between anxiety and personality of the students of engineering, law and management courses

DELIMITATIONS

The present study is delimited in the following ways.

1. The study was confined to Jodhpur district only.

2. The students of professional courses were taken under study.

3. The study was limited only to some selected professional courses like engineering, law and management.

4. The total samples under investigation were delimited to 300 students. (100 engineering + 100 Law + 100 Management students)

METHOD OF STUDY

The investigator adapted the normative survey method for the present study.

SAMPLE OF THE STUDY

The sample of present study was consisted of male and female students of professional courses of engineering, law and management. The sample consisted of 300 students who have been drawn randomly form different professional institutions.

TOOLS USED IN THE STUDY

Three standardized tools were used in the investigation to collect data from the sample. They are as under:

1. Family environment scale constructed and standardized by Prof. Mc. Joshi and O.P.R.Vyas .

2. Comprehensive anxiety test - constructed and standardized by /Bhardwaj R.L., Sharma, H and Bhargava, M.

3. Eysenck's Maudsely Personality Inventory (MPI) - Constructed by S. Jalota and S.D. Kapoor.

STATISTICAL TECHNIQUES

The data obtained through the tools used has been computed by the following statistical techniques.

1. Mean

2. Standard Deviation

3. Analysis of variance (ANOVA)

4. "t" value

5. Coefficient of correlation

FINDINGS

The main and significant findings of the study are reported below:

- The management students have better family environment than law and engineering students. It is also clear from the data that there is significant difference between engineering and management students in relation to family environment.

- All the three groups (i.e., engineering, law and management students) of professional students show the average neuroticism stability in their personality.

- The engineering students have better extraversion (E) personality than management and law students.

- It is also clear from the data that engineering students have more anxiety than law and management students. There is also significant difference between engineering and management students in relation to anxiety. Similarly, the anxiety of law and management students also differs from each other significantly.

- The findings of this study have revealed that there is no significant correlation between the family environment and anxiety of students of engineering, law and management courses.

- There is also no significant correlation between the family environment and Neuroticism (N) and Extraversion (E) dimension of personality of students of engineering and management students. But there is significant correlation between the family environment and Extraversion (E) dimension of personality of law students.

- It is also clear from data that there is no significant correlation between the anxiety and personality of engineering, law and management courses.

SUGGESTIONS FOR FURTHER STUDY

Suggestions for the further research:

- A study of same variables with same size of sample in other states leaving Rajasthan can be done.

- In present study of Engineering, Management and Law students were taken but we can also study the same variables on Medical students Teachers' Training students and C.A. students.

- The present study is limited to Jodhpur division only further studies can be done in different cities of Rajasthan.

- A correlation study of Family environment., Anxiety and personality of different groups of professional courses can be taken in further research.

- A comparative study of different groups of professional courses can be taken.

IMPLICATIONS OF THE STUDY

It has got following educational implications

➢ This study will be useful to a counselor in understanding the studied aspects of students of professional courses and guiding them accordingly.

➢ The research students will also find it useful as a source of information.

➢ The teachers and administrators of the professional institutions can understand the students better in relation to variable and can make use of the findings in treating students of professional courses.

➢ The investigator throws light on family environment, anxiety and personality of students in professional courses. The trend in these variables will be known to the teachers, parents, administrators and researchers to make use of.

➢ The present trend in the educational practices emphasized the necessity of understanding each and every student. In order to understand the student's family environment knowledge of the anxiety and their personality traits are very important.

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INCREASING AIR POLLUTION BY VEHICLES IN INDIA

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ABSTRACT

Environment is the surrounding of us so it should be protected. But now days it has been very difficult to protect it. Motor vehicles are main sources of air pollution in India. The process of burning gasoline to power vehicle causes the emission of various harmful gases in environment. Vehicles not only emit pollutants during combustion but also at the time of refueling, manufacturing, oil refining, distribution of fuel various harmful gases enter in atmosphere. The gases released from the vehicular emission are cause of primary pollutants but these gases can react with other pollutants and form secondary pollutants which are very harmful. Smoke of motor vehicles contains carbon di oxide, carbon mono oxide, sulphur di oxide, particulate matter, hydrocarbons etc. Motor vehicles are responsible for 70% of air pollution. Now a day's smell of organic exhaust becomes a part of everyone's life. The combustion of gases and diesel fuel produce greenhouse gases that contribute in air pollution. This type of pollution is not only harmful for health but it is also responsible to some environmental changes like global warming. It is the problem of whole world. Vehicles all time produce air pollution during vehicle operating, manufacturing, disposal etc. But through clean vehicles and new technologies we can reduce the air pollution.

*Key words: pollution, global warming, vehicles, environment*

INTRODUCTION

Transport greatly affect the environment because it creates air pollution includes nitrogen oxide and particulates, It also causes of global warming by emission of CO2. Among all the means of transportation road transport is largest contribution of global warming. Other environmental impacts of vehicle are traffic congestion and urban sprawl, which is bad for natural habitat and agricultural land. It also contributes to bad air quality, acid rain, smog and climate change. Transport activities contribute among other anthropogenic and natural causes directly and indirectly to environment problem. They may be dominant factor or their role may be marginal. But it is true that rapid growth in number of vehicles ensures that this issue will remain important for future studies.

INCREASING NUMBER OF VEHICLES IN INDIA

The data taken by ministry of statistics India shows that the number of vehicles in India increasing day by day, It is showing in this table.

Table-1

Year	Two Wheelers	Light Motor Vehicles	Jeep	Cars
2011	101,864,582	4,016,888	1,974,753	15,467,473
2010	91,597,791	3,615,086	1,760,428	13,749,406
2009	82,402,105	3,146,619	1,638,975	12,365,806
2008	75,336,026	2,903,821	1,547,825	11,200,142
2007	69,128,762	2,697,449	1,460,364	10,146,468
2006	64,743,126	2,492,726	1,376,744	9,109,855
2005	58,799,702	2,337,264	1,307,926	8,072,650
2004	51,921,973	2,167,324	1,282,113	7,267,174
2003	47,519,489	2,113,781	1,180,057	6,594,166
2002	41,581,058	1,878,261	1,177,265	5,748,036
2001	38,556,026	1,777,130	1,126,148	5,297,219
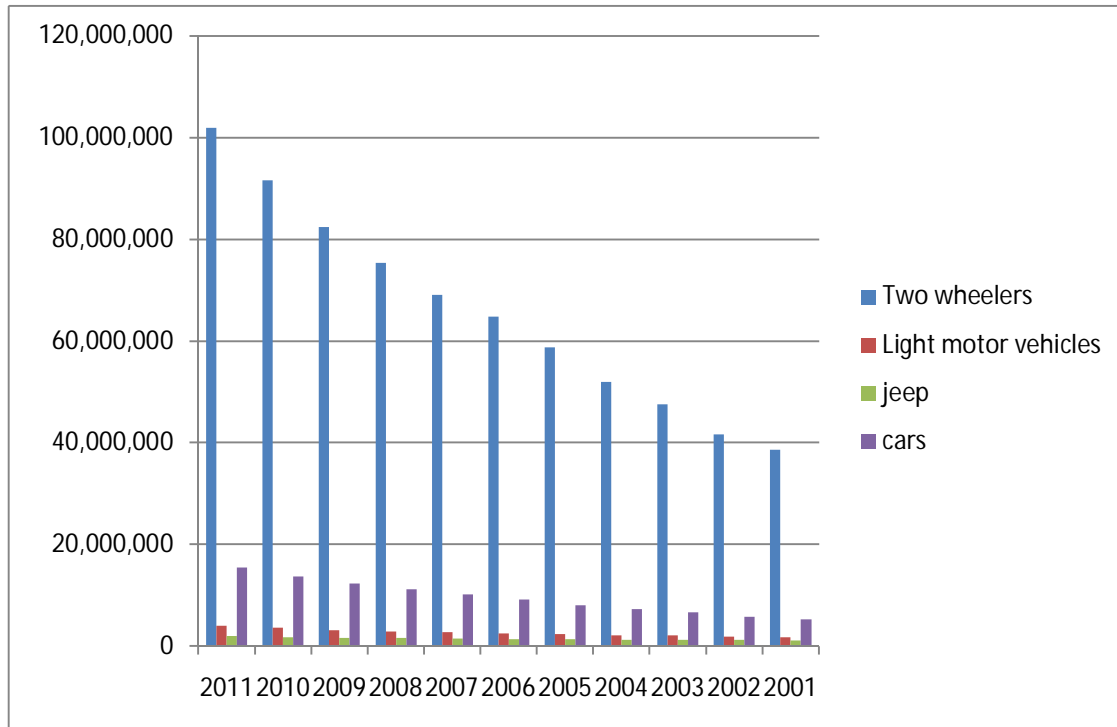
It is very clear from data that no.of two wheelers has been increased about 2.6 times,no. of light motor vehicles has been increased 2.26 times, no. of jeeps has been increased 1.75 times and no. of cars has been increased about 2.9 times in last decade.

Table-2: Top Ten States on the basis of no. of vehicles

Rank	State	No. of Vehicles per 1000 Population
/T	Chandigarh	702
U/T	Puducherry	521
1	Goa	476
U/T	Delhi	387
2	Punjab	324
U/T	Daman and Diu	302
3	Tamil Nadu	257
4	Gujarat	241
5	Haryana	231
U/T	Dadra and Nagar Haveli	228
18	Jharkhand	99
19	Odisha	91

AIR POLLUTION IN INDIA

Air pollution is rising very fastly in India. It can be shown by data of increasing air pollution in last decade in big cities of India.

Table-3: Percentage of increasing air pollution in India in last decade

| S.No.	City name	% of increasing Air Pollution
1	Delhi	4.2
2	Kolkota	11.5
3	Ahmdabad	12
4	Surat	12.5
5	Chennai	13
6	Mumbai	18
7	Nagpur	22
8	Hydrabad	26.8
9	Pune	27
10	Banglore	34

Rate of increasing air pollution in other neighbors of India are

S. No.	Country	Percentage of increasing Air Pollution
1	Dhaka (Bangladesh)	6.2
2	Lahore (Pakistan)	2.3
3	Karachi(Pakistan)	2.1

Data shows that air pollution in India is increasing greatly than other neighboring countries.

Transport sector contributes about 15-50% of particulate matter 2.5(smaller than 2.5 micrometer) emission in the cities. It is also a big contributor of NOx emission. Heavy duty trucks are big emitter of black carbon. It also be emitted by buses and three wheelers and PM 2.5 is largely emitted by heavy duty truck and also by two wheelers and then three wheelers.

There are many sources of air pollution. By comparing these sources in fig it can said that after industries transportation is the second biggest source of air pollution which contribute about 27% of total air pollution.

Sources of Emissions of Air Pollutants
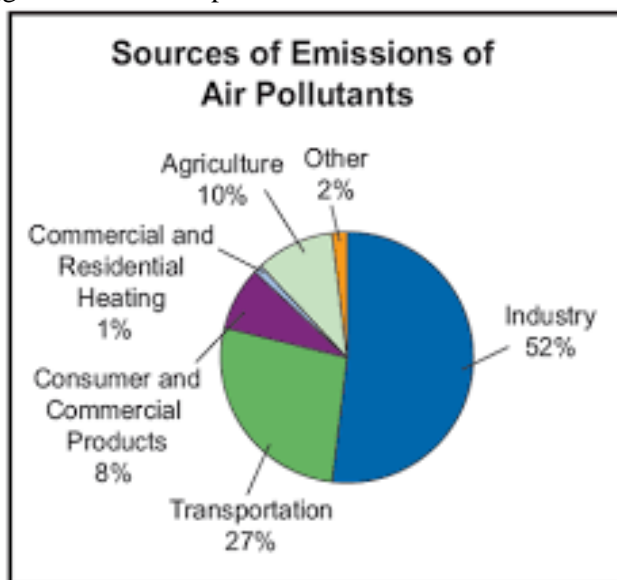
HARMFUL PRODUCTS GENERATED DURING VEHICLE EMISSION

1. Nitrogen oxide: During combustion small portion of nitrogen present in fuel is burnt in presence of oxygen and form various oxides of nitrogen. Diesel engine emit greater amount of nitrogen oxides than gasoline engine because of higher combustion temperature.

2. Fine particulate matter(PM 2.5): These are formed during combustion. It may contain acid, metal carbon and polycyclic aromatic compounds. Diesel engine emit greater amount of PM than gasoline engine.

3. Volatile organic compounds: VOC'S are generated by partially burnt or unburnt fuel or by evaporation of fuel during refilling. Gasoline engine emit greater amount of VOC'S because greater volatility of gasoline fuel.

4. CO: CO is generated by incomplete combustion of fuel. Gasoline produces more CO than diesel engine because of lower combustion temperature .

5. SO_2: SO_2 is generated by combustion of S present in fuel. Diesel engine emits more SO2 than gasoline engine because Diesel contain more S than gasoline.

6. Air toxics: Exhaust air of vehicles also contain some organic compounds like polycyclic aromatic hydrocarbons,1-3 butadiene, acrolein, formaldehyde, benzene etc. These are toxic in nature.

7. Coolant: The vehicles contain air conditioner use Freon as a coolant as in refrigerator. It is ozone depleting compounds. Now a days the new vehicles do not use Freon as a coolant but they are also responsible for pollution because they produce green house gases.

8. CO_2: It is formed by complete combustion of fuel. It does not directly have any harmful health impact but it is a green house gas.

NEW TECHNOLOGIES TO MITIGATE AIR POLLUTION

Reduction of Nitrogen Oxides: Nitrogen oxides are formed in flame front so by suppressing the peak flame the nitrogen oxides formation can be reduced. In gasoline engine by reducing the compression ratio we can reduce combustion temperature and can lowers the emission of nitrogen oxides.

Water injection technology can also be used in which water is injected into the engine so heat is transferred from hot cylinder of engine to water then water get evaporated and cool the intake charge.

Selective catalytic reduction technique can also be used in this method oxides of nitrogen are converted into nitrogen by adding catalyst. In this method exhaust is adsorbed on to a catalyst. We can use anhydrous ammonia, aqueous ammonia and urea as a catalyst. But SCR method is sensitive to contamination so it has short life due to contamination of untreated exhaust gas.

EGR (exhaust gas recirculation technique) can also be used to reduce air pollution. In this method exhaust gas is rotated back to the combustion engine. So its heat can be used by the cylinder.

A catalytic convertor can also be used in which by adding catalyst toxic pollutants can be converted into less toxic pollutants.

Reduction of Particulate Matter: To reduce the particulate matter in three techniques can be used-1.wall flow filter 2.Partial flow filter 3. Diesel oxidation catalyst

In wall flow filter system exhaust gases are forced into a series of channels made of a ceramic material that is porous to gases. When exhaust gas flow toward these channels particles are unable to flow and caught by filter. After sometimes the filters are cleaned using a process regenerator.

In a partial flow system some of the exhaust gases are passed through a filter containing woven metal mesh or fleece. Particles are caught by mesh and exhaust gases passed though exit.

Diesel oxidation catalyst is formed by a honeycomb structure coated in precious metal catalysts. The hot exhaust gases are channeled through the device and when gases come in contact with catalyst the pollutants are oxidized to harmless gases. But it acts only on particles contain hydrocarbon not on carbon black.

By using Electric Vehicles: Electric vehicles can be used in space of conventional vehicles. They emit less pollutants than gasoline and diesel vehicles. They can also travel same distance by approximately 12% less energy.

Reduction of CO Emission: In this method air is injected into the engine's exhaust to provide excess of O2 so that partially burnt fuel can also be burnt. Another way to reduce CO emission is to add oxygen containing compounds to gasoline. It increases complete combustion of fuel.

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