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CORRELATE OF LEADERSHIP STYLES OF SPORTS ADMINISTRATORS OF SECONDARY SCHOOL SPORTS IN RIVERS EAST SENATORIAL DISTRICT OF RIVERS STATE

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ABSTRACT
The study investigated the correlate of leadership styles of sports administrators of secondary school sports in Rivers East Senatorial District of Rivers State. Two research questions and two hypotheses were formulated for to study. The descriptive survey design method was used in this study. The population of this study comprised of 61, 841 secondary school students in Rivers East Senatorial District of Rivers State. A multistage sampling technique was used to arrive at the sample size of 400 students used for the study. A self-structured questionnaire was used for data collection. Face and content validities were ensured by experts from the department of Human Kinetics and Health Education. Mean and standard deviation were used to answer the research questions while the inferential statistics of z-test was used to test the null hypotheses at 0.05 alpha levels. The study found that authoritarian leadership style of sports administrators will not be a significant correlate of active participation in secondary school sports in Rivers East Senatorial District, of River of State. The study also reveal that authoritarian leadership style does not correlate with passive participation among secondary school students in Rivers East Senatorial District of Rivers State. It was recommended that sports administrators should consult stakeholders in the management and administration of school sports. This will help to enhance and improve the quality of the programme.

Keywords: Leadership styles, sports administrators, school sports, Rivers East Senatorial District.

INTRODUCTION
Sports has become part and parcel of human organizations the world over. This indeed is a paradox because of the amount of energy and resources expended by organizations to bring people of different ages, cultural background, races, colours and religions together through sports competitions. Oyeniyi in Deemua (2015) in support of this assertion, revealed that sports are social agents that bring people of different ages together. Players (producers) and spectators (consumers) gather together to entertain each other in order to make good use of sports an leisure time. Sport is an Indispensable programme of physical education in school because of its numerous benefits to the school and individual development Orunaboka (2004) opined that sports is an important arena for youths in which fun, fitness, socialization and motoric competence, particularly, price attributes are publicly demonstrated.

The inception of school sports in Nigeria, according to Baker. And Cote (2006), dates back to the colonial days during the 1930's. At this period, a lot of regional competitions were held and organized for different secondary schools in the country, which later gave birth to secondary school sports. Morakinyo (2002), also noted that since after independence, secondary school sports in the form of interscholastic competition in the state has assumed the shape of inter school competition, schools invitational relay teams (during inter-house sports) among others. This is as a result of growing awareness of the importance of interscholastic sports programmes in the development of sports among secondary schools in Nigeria. Moreover, part of the objectives of sports in Nigeria is promotion of healthy and keen competition among participants under a climate of sportsmanship and friendly interaction, thereby enhancing and strengthening unity.

This assertion was corroborated by Mallam Ibrahim Mohammed, the president of Nigeria School Sports Federation. Ibrahim saw sports as a factor of bringing Nigeria children to interact with their peers, thereby fostering unity among them, thus, people of diverse socio-economic and political backgrounds would be brought together in sports as participants, officials and spectators (Muhammed, 2011).

Deemua. (2015:71-72) discussed that providing all young adolescents with opportunities to participate, build their skills levels, and experience the positive outcomes that can result from well-planned sports programmes is a high priority in developmentally responsive sports programmes. National middle school Association (2003) upheld the view that intramural and extracurricular activities that required physical activity must be develop mentally appropriate, be opened to entire student body and comply with recognized national standard (P.32).

Interschool sports in which schools complete with one another in league or conference setting have been established at the vast majority of Nigerian secondary schools. The percentage of Nigerian secondary schools participating in school sports has virtually increased in recent times. Therefore, there is wide spread belief that participation in school sports offers many advantages for young adolescents. However, research showing

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instances of leadership styles of sports administrators and coaches, funding parental influence and state of facilities and equipment have raised issues that needed to be addressed.

Consequently of the above, the growing awareness of interscholastic sports programme (school sports) could only be realized through effective leadership. Leadership is important for meaningful sports development in all secondary school sports in Nigeria and particularly in Rivers East Senatorial District of Rivers State. In general terms, Warren (2000) defined leadership as a complete process by which a person influences other to accomplish a mission, task or objectives and directs the organization in a way that makes it cohesive and coherent.

In the same manner, Babajide (2000), reported that leadership influences the activities of an individual or a group of efforts towards goal achievement in a given situation. Nwankwo (1996) identified an authoritarian leader to be of one man leader who imposes his decisions upon members. The leader gives command and expects total compliance. This style of leadership is very rigid and does not succeed in a democratic society.

In school sports, the coach is always the leader of the team who must posses leadership qualities that enable the athletes maintain interest in sports. Orunaboka (2004) in support of the above assertion, reported that coaches should develop positive leadership skills which will be capable of motivating the athletes and the public towards their sustenance in sports and in the same vein enable the athletes to respond positively to his coaching techniques.

STATEMENT OF THE PROBLEM

Sports participation dates back to the ancient Greek time. Nigerians practiced several indigenous sports which served recreational, leisure, cultural and religious functions. Consequently, before a child enters school, he has already acquired a lot of sports skills through participation in traditional sports. Secondary school sports is an indispensable programme of physical education in school because of its numerous benefits to the school and individual development. But due to the partial implementation of the National Education Policy of 1986, which made physical education an optional subject at the senior secondary school level, has reduced students' and sports administrators including coaches interest in secondary school sports programmes. Since leadership is required in the organization and administration, of school sports, sports administrators have not been able to develop leadership qualities that will enable the students and the public to sustain their interest in sports most especially in Rivers Senatorial District of Rivers State. It was in this regard that the researcher wants to find out whether the leadership style of an authoritarian coach influence sports participation among secondary schools students in Rivers East Senatorial District of Rivers State.

AIM AND OBJECTIVES OF THE STUDY

The aim of this study is to find out correlate of leadership styles of sports administrators of secondary school sports in Rivers East Senatorial District of Rivers State. Specifically, this study intends to determine whether;

1. Authoritarian leadership style correlates actively with students participation in school sports in Rivers East Senatorial District of Rivers state.
2. Authoritarian leadership style correlates with passive participation of students in school sports in Rivers East Senatorial District of Rivers State.

RESEARCH QUESTIONS

1. Does authoritarian leadership style of sports administrators correlate actively with students' participation in school sports in Rivers East Senatorial District of Rivers State?
2. How does authoritarian leadership styles of sports administrators correlate passively with students' participation in school sports in Rivers East Senatorial District of Rivers State?

HYPOTHESES

1. Authoritarian leadership style will not be a significant correlate of active students participation in school sports in Rivers East Senatorial District of Rivers State.
2. Authorization leadership style will not be a significant correlate of passive students' participation in school sports in Rivers East Senatorial District of Rivers State.

METHODOLOGY

The study adopted a descriptive survey design. The population of the study comprised of 61,841 secondary school students in Rivers East Senatorial District of Rivers State. Source; Rivers State universal Basic Education Board, 2015.

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A multistage sampling technique was used to arrive at the sample size of 400 student-athletes used for the study. Two research questions and two hypotheses were used to guide the study. The mean, and rank order were used to answer the research questions, whereas, z-test statistics was used to test the null hypotheses at 0.05 alpha level. Self structural questionnaire titled "Correlate of Leadership Styles of Sports Administrators". Questionnaire" (CLSSAQ) was instrument for data collection. The instrument was in two sections. Part a consisted the demographic variables of the respondents while part B contained the variables under study. This section was structured after the modified likerts four points rating scales of Strongly Agree (4 points), Agree (3 points), Disagree (2 points), Strongly Disagree (1 point). This section contains 14 items on authoritarian leadership styles of active and passive students participation in school sports in Rivers East senatorial District of Rivers State. Face and content validities were ensured, while Pearson product moment correlation coefficient was used to establish the reliability index of 0.75.

RESULTS

The results of the study were presented as shown below: **Research Question 1:** Does authoritarian leadership styles of sports administrators correlate with active students' participation is school sports in Rivers East Senatorial District of Rivers State?

Table-1.1: Mean Scores of authoritarian leadership style of coaches and interscholastic sports participation among secondary schools in Rivers East Senatorial District, Rivers State. N= 400

S/N	Items	SA	A	D	SD	Total	Mean	Rank Order	Remarks
1	The failure of coach to consult others coaches in the maintenance of sports equipment and supplies encourages interscholastic sports participation among the school athletes	115	102	89	94	400	2.59	1st	Correlate
2	The coaches' planning of daily training programme for his or her athletes without the help of other sports officials encourages interscholastic sports participation among students athletes.	108	97	92	103	400	2.52	3Id	Correlate
3	Only the coach setting high standards of discipline for his team as well as maintaining the standard encourages interscholastic sports participation among students athletes.	112	101	92	95	400	2.57	2'	Correlate
4	The failure of coach to consult others officials in the planning and presenting budget proposal encourages interscholastic sports participation among students athletes.	105	91	88	116	400	2.46	4th	Rejected

Table 1.1: reveals that the failure of coach to consult others coaches in the maintenance of sports equipment and supplies encourages interscholastic sports participation among the school athletes with the mean scores of 2.59. The coaches' planning of daily training programme for his or her athletes without the help of other sports officials encourages interscholastic sports participation among students athletes with the mean score of 2.52. Only the coach setting high standards of discipline for his team as well as maintaining the standard encourages interscholastic sports participation among students athletes with the mean score of 2.57. The failure of coach to consult others officials in the planning and presenting budget proposal discourages interscholastic sports participation among students athletes with the mean score of 2.46 respectively.

Research Question 2: Does authoritarian leadership styles of sports administrators correlate passively with students participation in school sports in Rivers East Senatorial District of Rivers State?

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Table-2.2: Mean Scores of authoritarian leadership style of coaches and passive interscholastic sports participation among secondary schools in Rivers East Senatorial District, Rivers State. N = 400

S/N	Items	SA	A	D	SD	Mean	Rank Order	Remarks
1	Failure of coach to cooperate with parents, students body and school officials encourages interscholastic sports participation among students and teacher	106	78	102	114	2.44	1st	Rejected
2	Failure of coach to maintain good relationship with the press when losing encourages interscholastic sports participation among students, teachers, principals and parents.	106	81	104	109	2.18	3rd	Rejected
3	Failure of coach to allow the school officials and students to offer encoragement and constructive criticism when team is losing encourages interscholastic sports participation among students and teachers.	56	64	180	100	2.19	2nd	Rejected
4	Inability of coach to motivate school staff, parents and students toward desired goals of his team encouragenterscho1astic sports participation among students and teachers.	44	76	110	140	1.91	4th	Rejected

Table 2.2 reveals that failure of coach to cooperate with parents, students body and school officials discourages interscholastic sports participation among students and teachers with the mean score of 2.44. Failure of coach to maintain good relationship with the press when losing discourages interscholastic sports participation among students, teachers, principals and parents had a mean score of 2.18. Failure of coach to allow the school officials and students to offer advice and constructive criticism when team is losing discourages interscholastic sports participation among students and teachers had a mean score of 2.19. Inability of coach to motivates school staff, parents and students towards desired goals of his team discourages interscholastic sports participation among students and teachers with mean score of 1.91 respectively.

Hypothesis 1: Authoritarian leadership style will not be a significant correlate of active students' participation in school sports in Rivers East Senatorial District of Rivers State.

Table-3.3: z-test Analysis of Difference between the Mean opinion of authoritarian leadership style and active interscholastic sports participation

Status	$\bar{x}$	S.D	df	Z-cal	Critical value	Decision
Authoritarian leadership style	220	2.59				Accept
Active interscholastic sports participation	180	2.57	400	0.62	1.96	HO_1

Table 3.3 shows the z-test analysis of difference between the mean opinion of authoritarian leadership style and active interscholastic sports participation among secondary schools in Rivers East Senatorial District, Rivers State. The result shows that the z-calculated value of 0.62 is less than the z-critical value of 1.96 at 400 degree of freedom and 0.05 alpha significant levels. Hence, the null hypothesis is accepted. Therefore, authoritarian leadership style will not be a significant correlate of active interscholastic sports participation among secondary schools in Rivers East Senatorial District, Rivers State.

Hypothesis 2: Authoritarian leadership style will not be a significant correlate of passive interscholastic sports participation among secondary schools in Rivers East Senatorial District, Rivers State.

Table-4.4: z-test analysis of difference between the mean opinion of authoritarian leadership style and passive interscholastic sports participation.

Status	N	$\bar{x}$	S.D	df	Z-cal	Critical value	Decision
Authoritarian leadership style	220	2.44	1.33				Rejected
Passive interscholastic sports participation	180	1.218	1.16	400	3.8	1.96	HO_1

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Table 4.4: shows the z-test analysis of difference between the mean opinion of authoritarian leadership style and passive interscholastic sports participation among secondary schools in Rivers East Senatorial District, Rivers State. The result shows that the z-calculated value of 3.8 is higher than the z-critical value of 1.96 at 400 degree of freedom and 0.05 alpha significant levels. Hence, the null hypothesis is rejected. Therefore, authoritarian leadership style is a significant correlate of passive interscholastic sports participation among secondary schools in Rivers East Senatorial District, Rivers State.

DISCUSSION OF FINDINGS

Authoritarian leadership style and active interscholastic sports participation

The finding from this study reveals that authoritarian leadership style correlates with active interscholastic sports participation among secondary schools in Rivers East Senatorial district, Rivers State. This findings is in line with Crust (2006) who revealed that a manager/coach is charged with the responsibility of making decisions for the team or athlete and plays a fundamental role in the operation of the team. He also supports that mangers also handle personnel matters, institute policy and are responsible for skill development, fitness preparation and public relations. Ojeme (2016) observed that coach is a manager of human and material resources and must have a robust personality, discipline and power of communication. He further stated that the coach, it must be said, is the key to the success of a team. If he fails, the team fails. In fact, a team's performance cannot raise above the quality or level of competence of the coach in charge of the team. In support of this assertion Barechle (2008) observed that in the case of strength and conditioning, coach design and implement periodized exercise programs to elicit continuous results.

Authoritarian and passive participation in school sports

The findings from this study reveal that authoritarian leadership style does not correlate with passive interscholastic sports participation among secondary schools in Rivers East Senatorial District, Rivers State. This finding is in line with the view of Trzaskoma-Biscerdy (2007); who observed that one key cog to the success of an athlete and coach is the relationship they share. In the same vein Jowett and Cockerill (2002) also observed that this relationship further, makes the coach and the athlete interaction unique with the goal to bring about successful performance outcomes and satisfaction. In support of this finding, Mageau (2003) revealed that coaches also serve as motivators to maximize an athlete's full potential and utilize supportive behaviours such as providing choices within specific rules within the sport, providing a rationale for tasks and units, and acknowledging their athletes' feelings.

CONCLUSION

From the findings of this study, it is upheld that authoritarian leadership style of sports administrators (coaches) correlate actively with students' participation in school sports in Rivers East Senatorial District of Rivers State.

Secondly, the findings of the study revealed that authoritarian leadership style does not correlate with passive sports participation among secondary school students in Rivers East Senatorial District of Rivers State. Failure of the coach to cooperate with parents, teachers, principals and the community impede the smooth running of school sports among others.

RECOMMENDATIONS

On the basis of the findings and conclusion of the study, the following recommendations were put forward

1. The coach should consult sports master, other coaches and games prefect in the maintenance of sports equipment and supplies.
2. The coach should motivate the physical education teachers, teachers, parents, students and student athletes to enhance and improve interscholastic sports programme.
3. The coach should involved teachers, parents, students and student athletes into the school sports committee, to ensure effective decision making on sports programme.
4. The coach should create close relationship between the athlete, students, parents and the entire teachers.
5. The coach should maintain good standards of discipline for his team as well as maintaining the standard.

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ORDER DETERMINATION OF AUTO REGRESSIVE TIME SERIES MODEL BAYESIAN APPROACH

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ABSTRACT
In Time Series analysis, the order of various Time series models plays an important role in studying model selection criterion. Hannan and Quinn(1979) have been studied the order determination of an auto regression through classical approach. In this paper, an attempt is made to study the order determination of autoregressive time series model by employing Bayesian methodology.

Keywords: Autoregressive, Order determination, Bayes theorem, Model selection

1. INTRODUCTION

Statistical analysis of autoregressive (AR) models is an important nonstandard problem. No classical approach is widely accepted. Bayesian approach are designing a structure through which prior information can be incorporated and designing a practical computational method. In addition to the standard results, the Bayesian approach gives a different method of determining the order of the AR model, that is *p.*

Bayesian inference holds a distinct advantage over so-called classical statistics in non-standard problems where concepts such as sufficiency or completeness do not apply. That advantage is that the program is unchanged: the prior together with the likelihood produce the posterior. A disadvantage is that conjugate families are not available and so the Bayes Theorem must be used numerically, for which approximation and numerical integration techniques are required.

Autoregressive (AR) time series models are quite nonstandard, even if the usual assumption of normality is retained. The number of parameters, reflected in the order of the model (p) is undetermined. Given *(p),* the parameter space must then be constrained for identifiability reasons. Classical analysis of AR models must rely on asymptotic behavior: consistency, asymptotic normality, and efficiency.

Bayesian statistics are little affected by sample size. Moreover, the asymptotic in a Bayesian analysis are substantially the same as the classical. But in small sample problems, the choices of prior distribution and loss function do influence the consequential decision. In cases such as these, the effort in expressing these two are well rewarded.

Bayesian analysis of time series is not new in itself. As another nonstandard statistical problem, Zellner (1971) devotes a chapter to it and , Box and Jenkins (1976) devote a section, employing probabilistic assumptions, such as starting values ($X_{0,} X_{-1,}$.....), and relying on Jeffreys non-informative and improper priors. However, Zellner and Geisel (1970)' employ informative priors and investigate the use of Bayes factors for comparing models.

Bayesian analyses of non-standard problems are commonly believed to suffer from the profound defect of computational intractability. This paper finds that belief directly, proving that a Bayesian analysis of AR models can be done. The proof is a computational method that has been successfully implemented and that can be extended in its sophistication. Thus most of the effort lies in solving the challenging computational problems that arise.

In section 4, the parameter structure is laid out and the form of the prior distribution is designed. Secondly, the dual tasks of computing and expressing numerically the posterior distribution are discussed in section 5. The inference novel to this Bayesian analysis is a method of selecting the order of the model *(p).* This methodology is demonstrated using as examples two well known series in section 6. Classical methods of estimation and model selection are discussed in section 3. Explanation of the probability structure of the AR model follows in section 2.

2. AUTOREGRESSIVE MODEL

The autoregressive process of order p, AR(p) , is defined by

$$X_t = \mu + \alpha_1 X_{t-1} + \alpha_2 X_{t-2} + \cdots \alpha_p X_{t-p} + e_t$$

where α_1, α_2 ... α_p are autoregressive parameters and e_t's are white noise process.

The autoregressive (AR) process $\{x_t\}$ of order *(p)* is defined by the stochastic difference equation

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$$(x_t - \mu) - (x_{t-1} - \mu)\alpha_1 - (x_{t-2} - \mu)\alpha_2 - \ldots (x_{t-p} - \mu)\alpha_p = e_t \quad \ldots (1)$$

where e_t, t = ..., -2, -1, 0, 1, 2 are i.i.d. Normal (0, σ_e^2) random variables. A finite segment x = (x_1, x_2 . . .x_N)^T is observed, which has a multivariate normal distribution with mean vector $\mu 1_N$, and covariance matrix σ_e^2 A_N (here 1_K, is *k* by 1 with all entries equal to one), denoted by

$$X \sim N(\mu 1_N, \sigma_e^2 A_N) \quad \ldots.$$

(2)

The matrix A_N, is defined by

$$(A_N)_{ij} = cov(x_i, x_j) = \rho(i-j) = \rho(|i-j|) \quad \ldots. (3)$$

where the covariance function ρ depends upon α_1, $\alpha_2 \ldots \alpha_p$ and characterizes the time series process {x_t}. The n periods of the process to be forecast, X_F = $\left(X_{N+1,} X_{N+2,} \ldots\ldots X_{N+n}\right)^T$, when conditioned upon the observed x, then has an n-dimensional multivariate normal distribution with mean vector

$$\mu 1_n + A_{21} A_N^{-1} (X - \mu 1_N) \equiv \mu a + b \quad \ldots..(4)$$

and covariance matrix $\sigma_e^2 A_{nN}^*$ where

$$A_{N+n}^* = \begin{bmatrix} A_N & A_{12} \\ A_{21} & A_n \end{bmatrix}_n^N,$$

and

$$A_{nN}^* = A_n - A_{21} A_N^{-1} A_{12}$$

Two conditions must be enforced on the autoregressive parameters,

$$\Theta \equiv \left(\alpha_1, \ldots, \alpha_p,\right)^T,$$

of this model. The *stationarity condition* states that the roots of the polynomial equation $\sum \alpha_i w^i = 0$ must lie outside the unit circle in the complex plane $(\alpha_0 \equiv -1)$. Otherwise, the process is explosive and an indefinite past for it cannot exist. Secondly, the *identifiability condition* states that the roots of the equation $\sum w^i = 0$ lie on or outside the unit circle. These identifiability conditions here enforce a unique parameterization of the model in terms of μ, σ_e^2, and the AR parameters Θ .

A slightly different probability model is sometimes posed where starting values X_0, . . . , X_1- p, are introduced as parameters or where starting conditions $a_{p+1-q} = \cdots = a_p = 0$ are enforced. Conceptually, this would allow for models with explosive autoregressive behavior, but it also can lead to the identifiability problems discussed by Pagano (1973). The big advantage is a simpler probability structure which permits evaluation of the likelihood in O(N) operations. This is the motivation for the 'conditional least squares' estimation discussed by Ansley and Newbold (1980). A drawback is dealing with the starting values as nuisance parameters. The computational advantage was eliminated by Ansley (1979) who showed that the exact likelihood of the model in eq. (1) can be evaluated in O(N) also.

Lastly, AR models exhibit what might be called near-nonidentifiability. The parameterization just described is truly unique if the requisite conditions are enforced. But for finite samples, quite different parameter values can produce very similar distributions. In terms of moments, the variance and first three autocovariances of an AR(l) process with α = 0.3 and σ^2 = l are 1.10, 0.33, 0.10, and 0.03; From the likelihood viewpoint, the difference in expected log likelihood for these two parameter values is -0.196 when the AR model is true and N =50, while the variance of the log-likelihood is 25 when evaluated at the true. Near-non-identifiability becomes more of a problem with the more flexible mixed and higher order models.

3. MODEL SELECTION AND ESTIMATION

The problem of determining (p) has led to three different approaches. A fourth, a Bayesian procedure due to Akaike, will be discussed later. The first approach is to extend the standard regression r-test or F-test to the autoregressive model. For pure AR models, rewrite (1) as

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$$x_t = x_{t-1}\alpha_1 + x_{t-2}\alpha_2 + ... + x_{t-p}\alpha_p + e_t \quad .... (5)$$

and regress x, on the lagged values (x_{t-1}, . . . , x_{t-p}) to obtain estimates of α . The standard t-test of $\alpha_1 = 0$ or F-test of $\alpha_k = \alpha_{k+1} = ... = \alpha_t = 0$ can then be used to determine the true value of p. This procedure is discussed in detail by Anderson (1970). A second procedure is Akaike's (1974) MAICE criterion: find *(p)* to minimize

AIC = - 2 log (maximum likelihood) + 2(p*)*.

This procedure can be viewed as an adjustment for the number of parameters in a likelihood ratio test, or as an analogue to the F-test described above, with *AIC* ('adjusted information criterion') corresponding to an adjusted sum of squares. This procedure has been modified for consistency [see Hannan and Quinn (1979)].

A third approach relies on a family of goodness-of-fit procedures. Assuming the correct *(p)* and values of Θ , the asymptotic distribution of the residual correlations have a zero mean. Box and Pierce (1970) proposed a chi-square test which was modified and improved by Ljung and Box (1978); see also Newbold (1980). Godolphin (1978) used the asymptotic covariance matrix of the residual correlations for a different improvement. For model selection, the informal approach of Box and Jenkins (1976) advocates selecting a tentative model (p), estimating its parameters, and 'diagnostic checking: performing a test for goodness-of-lit. Upon rejection, the process is repeated with a different model. One might formalize this to selecting the model (p) as the one that performs best on a goodness-of-tit test, while adjusting for the number of parameters, as with *AIC.* It should be noted that all of these proposals for estimating *(p)* presume that the parameters are either known or previously estimated. The first procedure, for determining *p* in pure AR models, implicitly proposes a method of estimating α . Akaike's method implies that maximum likelihood is the criterion for estimation.

For a given *(p)* several proposals have been made for estimating AR parameters. Estimators based on moments, such as solving the Yule-Walker equations [see Fuller (1978)] and/or regression have an obvious appeal because of the directness of the computation. Ansley and Newbold entertain three implicit estimators in their Monte-Carlo study: maximum likelihood, 'exact least squares', and 'conditional least squares'. Exact least squares ignores the effect of the AR parameters on the likelihood through the determinant of A_N. Conditional least squares uses the model with starting values a_{p+1-q} = . . . = a_p = 0 which requires much less computational effort. Although no procedure receives wide acceptance, Ansley and Newbold (1980) strongly recommend maximum likelihood as a result of their small sample(N = 50) simulation study.

One should note that none of the common iterative methods enforce explicitly the stationarity and identifiability conditions. Final estimates, however, are often adjusted to satisfy the conditions [see Ansley and Newbold (1980, pp. 162-163)]. Monahan (1980c) discusses methods for enforcing these conditions.

Finally, the work of Akaike (1979) in extending (in pure AR models) his MAICE procedure in a Bayesian fashion must not be overlooked. He first relates the modification of the term 2p in *AIC* to α_p to placing a geometric type prior on the order of the model. He then introduces a loss function based on prediction error to be minimized to find the best order of the autoregression. Although Akaike uses the term 'full Bayesian', it differs substantially from the Bayesian attitude of this paper. What is used as a likelihood is not averaged over the subsidiary parameters, nor approximated by the maximum, but an approximation based on solving the Yule-Walker equations using sample autocorrelations.

4. THE STRUCTURE OF THE PRIOR

Three things are required to perform a fully Bayesian analysis. The first requirement is to erect the structure for the parameterization of the problem. In time series, such a structure can be found in the AR model. Implicit in this parameter structure is the form of the joint prior distribution on all of the model parameters: p, α , μ, σ_e^2 Secondly, a vehicle is required to express information in the posterior distribution as completely as possible, emphasized by Box and Tiao (1973, p. 14). Finally, a method is needed to compute the necessary posterior densities and moments. The goal here is as much detail as is computationally feasible, whether in moments or in marginal densities of parameters or forecasts. Most of the computational effort is in numerical integration, and the intention here is to allow the greatest flexibility in specifying the prior, so that minor changes do not require extensive recomputation.

As previously mentioned, the AR model provides a structure for expression of the joint prior distribution on the parameters. This is done conditionally, beginning with the coarsest level of parameterization, the order of the model, (p). The prior distribution on M=m is given as probabilities,

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Pr (M = m) = Pr (x arises from an AR (p_m) process $\equiv$p(m),

on the discrete set of pairs of non-negative integers.

Conditional on M = m, the order of the model, a prior distribution on the AR parameters,

$$\Theta \equiv \left(\alpha_1,...,\alpha_p,\right)^T,$$

is specified; $\pi(\Theta|M = m)$ being a density on R^{Pm} with support on C_p,

By convention, $m = (p_m)(p_m + 1)/2$, *as* in the following table:

m (p)	m (p)
1 (0)	4 (3)
2 (l)	5 (4)
3 (2)	6 (5)

where

$$C_K \equiv \left\{y: \begin{matrix} all\ the\ roots\ of\ 1-\sum y_i w^i = 0 \\ exceed\ one\ in\ absolute\ value \end{matrix}\right\}$$

y' exceed one in absolute value '

This restriction expresses no prior information but only enforces a unique parameterization by insuring that α satisfy the stationarity and identifiability conditions. The remaining parameters are now μ, the mean of the process, and σ_e^2, the disturbance variance. A convenient reparameterization is $r \equiv 1/\sigma_e^2$ with *r* called the disturbance precision. While there is no conjugate prior for Θ, using the standard normal-gamma conjugate family for μ and r is quite useful,

and

$$\left(\mu \mid r,\Theta,M\right):\ N(\gamma,(\tau r)^{-1}), \qquad \ldots (6)$$

$$\left(r \mid \Theta,M\right):\ gamma\left(\alpha,\beta\right) \qquad \ldots (7)$$

Notice that the parameters of this joint prior may depend on Θ and M without causing further complications, thus prior information on, say, the series variance can be reflected in the prior on *r*.

With the prior now specified, recall the probability distribution for the data given in section 2,

$$\left(x \mid M,\Theta,\mu,r\right):\ N\left(\mu 1, r^{-1}A_N\right) \qquad \ldots (8)$$

Two useful marginal posterior distributions, both multivariate t, are

valuable.

$$\left(x \mid M,\Theta\right):\ t_{N,2\alpha}\left(\gamma^1{}_N,(\alpha/\beta)\left[A_N+\tau^{-1}1_N1_N^T\right]^{-1}\right) \qquad \ldots (9)$$

and

$$\left(x_F \mid x,M,\Theta\right):\ t_{n,2\alpha+N}\left(\gamma^* a+b,(2\alpha+N/\beta^*)\left[A_{nN}^*+\tau^{-*}aa^T\right]^{-1}\right), \qquad \ldots (10)$$

where

$$\gamma^* = \left(\gamma\tau + 1^T A_N^{-1}1\right)/\tau^*$$

$$\tau^* = 1/\tau^{-*} = \tau + 1^T A_N^{-1}1$$

$$\beta^* = \beta + (z-\gamma 1)^T (A_N + \tau^{-1}11^T)^{-1}(z-\gamma 1),$$

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and the vectors a and b are defined in (4).

The remainder of the Bayesian analysis now follows easily, beginning with the marginal of x,

$$f(x \mid M) = \int \pi(\Theta \mid M) f(x \mid \Theta, M)\, d\Theta \qquad \ldots (11)$$

where $f(x \mid \Theta, M)$ is the multivariate t density described in (9). This integration must be done numerically and will be described later. The posteriors now follow automatically:

$$\pi(\Theta \mid M, x) = \pi(\Theta \mid M)\, f(x \mid \Theta, M) / f(x \mid M) \qquad \ldots (12)$$

thus $f(x \mid M)$ is the normalizing constant in the posterior density of the AR parameters. For the posterior probability of $M = m$, $f(x \mid M = m)$ serves as a Bayes Factor,

$$p(M \mid x) = p(M)\, f(x \mid M) \Big/ \sum_j p(M = j) f(x \mid M = j). \qquad \ldots (13)$$

And the posterior density of the forecasts can be expressed by

$$f(x_F \mid x) = \sum_j p(M = j \mid x) \int f(x_F \mid x, \Theta, M = j)\, \pi(\Theta \mid x, M = j)\, d\Theta, \qquad \ldots (14)$$

where $f(x_F \mid x, \Theta, M)$ is the multivariate t density in (10). The relevant posterior distributions were derived in Monahan (1980a).

5. COMPUTATION AND EXPRESSION OF THE POSTERIOR

The thrust of this paper is the demonstration of the feasibility of a fully Bayesian analysis of AR time series models. The Bayesian approach is nearly always straightforward: once the model is specified, giving the likelihood, the prior then determines the posterior. In situations where conjugate families are available, this procedure is relatively simple. However, in this non-standard problem, three difficult computational problems arise: computing $f(x_F \mid \Theta, M)$ efficiently, numerical integration of (11) to obtain $f(x \mid M)$, and expressing as much of the posterior as computationally practical. The feasibility of a fully Bayesian procedure hinges on the solution of these problems.

The first computational problem involves computing $f(x \mid \Theta, M)$ which serves as the likelihood. Ansley's (1978, 1979) method for computing the exact likelihood in AR models cannot be directly applied since it does not admit a mean parameter and also because $f(x \mid \Theta, M)$ is not the likelihood function for the standard AR model. However, the principle of Ansley's method can be adapted to evaluate $f(x \mid \Theta, M)$ quickly.

Essentially, only bilinear forms need to be computed, since

$$f(x \mid \Theta, M) \propto \left[1 + \frac{1}{2\beta}(x - \gamma 1)^T (A_N + \tau^{-1} 1 1^T)^{-1} (x - \gamma 1)\right]^{-(\alpha + N/2)}$$

The technique hinges on following factorizations:

$$B_{m,N} A_N \left(B_{m,N}\right)^T = LDL^T = \begin{pmatrix} A_m D_1^T \\ D_1 C \end{pmatrix} \begin{matrix} m \equiv \max(p) \\ N - m \end{matrix}$$

Here $B_{m,N}$ is a triangular matrix composed of I_m in its upper left sub matrix and other rows of $-\alpha_p, \ldots, -\alpha_1, 1$ with the ones aligned on the diagonal and with zeros elsewhere. The matrix *D*, is mostly zeros and the entire far right-hand side above has a bandwidth of 2m+1. Hence the Cholesky factorization without square roots, LDL^T, results in a diagonal matrix *D* and a unit lower triangular matrix *L* with bandwidth *m*+ 1. The bilinear forms are then computed from

$$x^T A_N^{-1} y = x^T B_{m,N}^{-T} L^{-T} D^{-1} L^{-1} B_{m,N}^{-1} y$$

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$$= \left(L^{-1}B_{m,N}^{-1}x\right)^T D^{-1}\left(L^{-1}B_{m,N}^{-1}y\right)$$

Computation of the forecast covariance matrix, though not a bilinear form, utilizes these same factorizations. Monahan (1980b) gives the many details and a listing of the code (about 500 lines). The important point of the solution of this problem is that the effort, in both time and space, for computing $f\left(x \mid \Theta, M\right)$ is roughly proportional to N.

As previously stated, conjugate families are available for the parameters p and *r*. But none are available for ψ, hence its posterior, $\pi\left(\Theta \mid M, x\right)$, which requires normalization by $f\left(x \mid M\right)$ given by (1 l),

$$f\left(x \mid M\right) = \int \pi(\Theta / M)\, f(x \mid \Theta, M)\, d\Theta,$$

must be computed numerically. The effort required in this numerical integration depends substantially on two criteria: smoothness of the integrand and the number of dimensions.

Smoothness is not a major concern. A smooth prior would be expected and the likelihood, $f\left(x \mid \Theta, M\right)$ should resemble a normal density even for small sample sizes and near-non-identifiability of the parameters Θ. Notice also that the likelihood vanishes on the boundary of the region of integration, C_p

The dimensionality of the integration to obtain $f\left(x \mid M\right)$ brings out two problems. The first is the common 'curse of dimensionality', that the cost increases exponentially with the number of dimensions. For the accuracy required for this work, this means that integration in one and two dimensions can be done using a fixed quadrature rule. For three or more, the method of choice is Monte Carlo integration, whose error rate does not depend on dimensionality [see Davis and Rabinowitz (1975)].

The second problem is to restrict the region of integration to C_p. Note that C_1 =(-1, + 1) and C_2 is the interior of the triangle with vertices ($\pm$2 , - 1) and (1,0). For higher dimensions, C_k becomes unwieldy. How to integrate over C_k in high dimensions is explained in detail by Monahan (1980c). The crux of the technique is that every polynomial with real roots can be factored into linear terms and quadratics with positive discriminant. Thus every polynomial whose coefficients lie in C_k can be found from k/2 quadratics with coefficients from c_2,when k is even. If k is odd, a linear term is added. Thus there is a mapping G_k from $C_2 \times \ldots \times C_2 \left(\times C_1\right)$ to C_k that is continuous and differentiable almost everywhere. Since the mapping G_k is variably many-to-one, its index N_G must be computed, as well as the determinant of the Jacobian J_G. If, for example, (p)=(3) and the function to be integrated is g(P,θ), the transformed integral can be written as

$$\iint g\left(\alpha\right) d\alpha = \int_R g\left(G_3(x)\right) \frac{\left|J_{G_3}\left(x\right)\right|}{\left(N_{G_3}\left(x\right)\right)} dx$$

These operations are straightforward but tedious book-keeping, requiring additionally the coding of arbitrarily nested loops.

For practical considerations and for the implementation described here, the support of the prior distribution p(m) is restricted to the six smallest models. (0), (l), (2), (3), (4), (5). The first, the null model, requires no integration because no ψ parameters are involved. The next two require numerical integration in one dimension, for which the midpoint rule on C_1= (-1,+1) is used. The last three require integration over two dimensions. A product midpoint rule is selected for integration over C_1 x C_1, the square with vertices ($\pm$1, $\pm$1). For the remaining, (2,0) and (0,2), a triangular midpoint rule over the triangle with vertices ($\pm$ 2, -1) and (1,0) is used. The midpoint rule in its various forms is simple and it performs steadily in the face of uncertainty as to the shape of the integrand.

The final problem is to express the posterior in as much detail as computationally feasible without paying a prohibitive computational cost. The most detail that is available involves $\pi\left(\Theta \mid M, X\right)$ and the parameters of the conditional (on Θ) posteriors of μ, r, and the forecasts. The cost of storing this is enormous and its value suspect. Thus most of the information is expressed in posterior moments given only *M*. These will all be

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expectations with respect to $\pi(\Theta \mid M, x)$ of functions of Θ, such as $E(\mu \mid \Theta, x)$ and $\mathrm{cov}(x_F \mid \Theta, X)$. In all 51 integrals (for *m =4,5,6,* fewer for others) of the form

$$\int g(\Theta)\pi(\Theta \mid M)\, f(x \mid \Theta, M)\, d\Theta$$

are simultaneously computed in the current implementation, using n=5. These 51 are in addition to g(Θ)= 1 which corresponds to $f(x \mid M)$ The marginal densities of the forecasts, however, are more important and their values are computed for a grid of 33 abscissas, adding 5 x 33 = 165 functions to the 52 previously reported.

The values of these many integrals are written on a file for later use, for each of the models m= 1, 2...., 6. The reason is that the prior probabilities *p(m)* are nowhere involved in the numerical integration. Changing this part of the prior does not require extensive recomputation. The remainder of the prior, of course, is fixed by the integration $\pi(\Theta \mid M), \gamma, \tau, \alpha, \beta$. Thus each set of these items requires the many integrals be stored in a new file.

Finally, while the processing programs that produce tables and figures do primarily simple chores, in order to compute percentile points of the forecast marginal distributions or to plot them in detail, smoothing is done using natural cubic splines.

6. EXAMPLES OF MODEL SELECTION

Some examples are given here to best express what kind of inference this Bayesian procedure allows. Two time series were selected from the well known text by Box and Jenkins (1976). They are therein labelled Series A and Series D and are analyzed in detail in that book. Series A are 197 bihourly readings of a chemical process concentration. Series D are 310 readings of viscosity from a chemical process. The author, a fundamentalist Bayesian, will admit to some difficulty in selecting prior distributions on the parameters of these processes.

Most of the items in a Bayesian analysis are analogues to the Classical type: highest posterior density regions vs. confidence sets, standard deviations of the posterior vs. standard errors of parameter estimates. What is particularly novel here is how the model M is estimated. Since, as previously discussed, the prior probabilities *p(M)* do not affect the integration needed to compute $f(x \mid M)$, *we* need only report $f(x \mid M)$ as the Bayes factor needed to compute the posterior probabilities on the order of the model,

$$p(M = m|\mathrm{x}) = p(m)\, f(x \mid M = m) / \sum_i P(M = j)\, f(x \mid M = j).$$

The focus here is on how these Bayes factors which can then be used to make a decision regarding *M* are affected by, first, the sample size and, second, the other parameters in the prior. Making the Bayes decision regarding *M*, of course, is straightforward decision theory, given the loss function and the posterior probabilities on *M* given by the formula above.

For the analysis to follow, six sets of prior parameters ($\mu, \tau, \alpha, \beta,$) were selected to exemplify varying degrees of prior information. The first five, described by 'Diffuse' to 'Lucky', exhibit increasing concentration of probability mass about what appears to be the true values of μ and r. The last one, labelled 'Unfortunate', was selected to exemplify strong prior beliefs unsupported by the data. Thus the effect of the prior can be monitored. Also of interest is the sample size at which the prior is overwhelmed and Savage's (1962, pp. 20-25) notion of precise measurement applies.

In addition, throughout the following analysis, the prior on the AR parameters $\pi(\Theta \mid M = m)$ was taken to be uniform over the relevant region c_{pm}. However, any non-negative integrable function can be used in order to reflect prior beliefs that may be more easily expressed in, say, the (theoretical) auto and partial correlations. The only requirement is that normalization $\left(\int \pi(\Theta \mid M)\, d\Theta = 1\right)$ be done in advance.

Table-1: Prior parameters for series A (upper part)and for series D (lower part)

No.	Description	γ	τ	α	β
1	diffuse	12	1/254	1/254	1/254
2	weak	12	1/14	1/2	1
3	moderate	19	1	1/2	1

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4	close	19	6	1	6
5	lucky	17	30	1	6
6	unfortunate	22	1	14	14
1	diffuse	8	1/254	1/254	1/254
2	weak	8	1/14	1/2	1
3	moderate	11	1	1/2	1
4	close	11	6	1	6
5	lucky	12	30	1	6
6	unfortunate	14	1	14	14

All parameters on the AR parameters $\pi(\Theta \mid M)$ are uniform over c_p.

Table-2: Bayes factors for series A

Model	Prior 1	Prior 2	Prior 3	Prior 4	Prior 5	Prior 6	AIC
N=30							
0	0.0075	0.0422	0.0302	0.1817	0.1918	0.0129	54.127
1	0.3518	0.4466	0.3814	0.2773	0.2719	0.4509	46.829*
2	0.0245	0.0483	0.0536	0.1335	0.1375	0.0118	50.709
3	0.2754	0.2214	0.2212	0.1356	0.1307	0.3008	46.873
4	0.2754	0.1865	0.2287	0.1684	0.1658	0.2067	46.829*(tie)
5	0.0610	0.0516	0.0814	0.1010	0.1007	0.0125	48.370
N=62							
0	0.0456	0.1148	0.0772	0.2264	0.2012	0.0344	149.14
1	0.1876	0.2210	0.2184	0.2436	0.2488	0.1633	145.29
2	0.0558	0.0862	0.0747	0.1215	0.1145	0.0185	147.07
3	0.1775	0.1683	0.1738	0.1313	0.1437	0.4638	144.29
4	0.4815	0.3516	0.3940	0.2053	0.2201	0.3041	142.03*
5	0.0476	0.0556	0.0555	0.0666	0.0662	0.0104	146.07
N=195							
0	$<10^{-16}$	$<10^{-17}$	$<10^{-15}$	$<10^{-10}$	$<10^{-10}$	$<10^{-12}$	680.14
1	0.0002	0.0035	0.0013	0.0377	0.0419	0.0026	604.52
2	$<10^{-7}$	$<10^{-6}$	$<10^{-7}$	$<10^{-3}$	$<10^{-3}$	$<10^{-5}$	635.79
3	0.0782	0.1053	0.0976	0.2108	0.2206	0.5681	593.40
4	0.9189	0.8885	0.8984	0.7485	0.7344	0.4266	589.13*
5	$<10^{-5}$	$<10^{-4}$	$<10^{-4}$	0.0014	0.0014	$<10^{-4}$	615.23

Tables 2 and 3 indicate the effect on the Bayes factors for the two series, respectively, with varying sample sizes and six sets of prior parameters which are listed in table 1. In addition, the values of Akaike's adjusted information criterion (AIC) are given.

In the Bayesian framework, the problem of estimation takes the form of a decision problem of minimizing the expected posterior loss. In estimation the decision space is the same as the parameter space. For estimating M, let L(m,d) be a loss function on the integers 1,2,. .. ,*m** representing the (finite) support' of the prior on M, p(m). The Bayes estimates, then, of M is that d which minimizes

$$E\left(L(M,d) \mid x\right) = \sum_{m} L(m,d)\, p(m \mid x)$$

To illustrate how this can be used to determine *M*, consider first $L_1(m,d) = l - \delta(m,\ d)$. Then the expected loss is 'For the examples given here, m* = 6.

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Table-3: Bayes factors for series D

Model	Prior 1	Prior 2	Prior 3	Prior 4	Prior 5	Prior 6	AIC
N=60							
0	$<10^{-6}$	$<10^{-6}$	$<10^{-6}$	0.0031	0.0006	$<10^{-5}$	103.13
1	0.6952	0.6487	0.6544	0.5135	0.5443	0.6210	67.24*
2	0.0012	0.0003	0.0003	0.0271	0.0064	0.0002	83.06
3	0.1424	0.1623	0.1576	0.1958	0.2117	0.2001	69.11
4	0.1548	0.1723	0.1715	0.2029	0.2073	0.1750	69.13
5	0.0039	0.0110	0.0137	0.0522	0.0274	0.0012	70.54
N=160							
0	$<10^{-45}$	$<10^{-41}$	$<10^{-41}$	$<10^{-31}$	$<10^{-31}$	$<10^{-29}$	599.01
1	0.7477	0.7409	0.7547	0.7283	0.7312	0.8882	381.17*
2	$<10^{-28}$	$<10^{-25}$	$<10^{-25}$	$<10^{-16}$	$<10^{-16}$	$<10^{-17}$	495.65
3	0.1240	0.1280	0.1204	0.1345	0.1339	0.0516	382.55
4	0.1255	0.1284	0.1223	0.1345	0.1342	0.0575	383.59
5	$<10^{-16}$	$<10^{-15}$	$<10^{-15}$	$<10^{-9}$	$<10^{-9}$	$<10^{-13}$	443.34
N=320							
0	$<10^{-71}$	$<10^{-71}$	$<10^{-70}$	$<10^{-70}$	$<10^{-70}$	$<10^{-64}$	1462.2
1	0.8611	0.8572	0.8571	0.8344	0.8341	0.9802	1033.2*
2	$<10^{-46}$	$<10^{-43}$	$<10^{-44}$	$<10^{-33}$	$<10^{-33}$	$<10^{-32}$	1237.3
3	0.0644	0.0657	0.0663	0.0764	0.0767	0.0063	1036.1
4	0.0718	0.0744	0.0739	0.0866	0.0865	0.0118	1036.1
5	$<10^{-26}$	$<10^{-24}$	$<10^{-25}$	$<10^{-18}$	$<10^{-19}$	$<10^{-20}$	1138.3

"Asterisks designate model chosen using MAICE method.

$E\left(L_1(M,d)\,|\,x\right) = l - p(d\,|\,x)$. H ence the Bayes decision is that *d* which corresponds to the model with the highest posterior probability.

On the other hand, L_1 is not the only possible loss function. In fact, the problem at hand should dictate the appropriate loss function. Another possibility is the loss function given in table 4, with three parameters: a, *b, c*. The value of a represents the cost of overparameterizing a simple model; *b* reflects a misclassification cost; and c represents the cost of fitting with too few parameters. Accordingly, these values can be adjusted to reflect the importance of short-term or long-term forecasting, or the prospects for control, etc.

To illustrate the effects on estimating *M* of differing sets of prior parameters, different costs as reflected in loss functions, and different sample sizes, the resulting Bayes decisions are given in table 5 using Series A. These Bayes decisions minimize expected posterior loss, for which three loss functions were used. The first, L_1, was previously mentioned. The other two use the general form as given in table 4: L_2 uses a = *b* = *c* = 1, L_3 uses a = 3, *b* =2, *c*= 1. The same six sets of prior distribution parameters $\gamma, \tau, \alpha, \beta$ were used as before. Recall that the values in tables 2 and 3 are the (normalized)

Table-4: General loss function, L (m,d)

d / m	1 (0)	2 (1)	3 (2)	4 (3)	5 (4)	6 (5)
1 (0)	0	a	A	2a	2a	2a
2 (1)	C	0	B	a	a	2b
3 (2)	C	b	0	2b	a	a
4 (3)	2c	c	C+b	0	b	2b
5 (4)	2c	c	C	b	0	b
6 (5)	2c	C+b	C	2b	b	0

Bayes factors. These values will also be posterior probabilities if the prior probabilities p(m) on the order of the model are selected to be

$$Pr(M=1) = Pr(M=2) = \ldots = Pr(M=6) = \frac{1}{6}$$

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A second choice of prior probabilities is the following:

$$Pr\ (M\ =\ 1)\ =\ 0.3,\ Pr(M=2)=Pr(M=3)=0.2,$$
$$Pr(M=4)=Pr(M=5)=Pr(M=6)=0.1,$$

which reflects a belief in low-order models. These two sets of priors are selected only to show how the methodology works and what can occur.

Table-5: Bayes estimates of the order of the model; series A

Loss function	Prior parameter set					
	Prior 1	**Prior 2**	**Prior 3**	**Prior 4**	**Prior 5**	**Prior 6**
Prior on M : $p(m)=\frac{1}{6}, m=1,2,....6$						
N=40						
L_1	3	3	3	3	3	3
L_2	3	3	3	1	1	1
L_3	3	3	3	2	2	3
N=70						
L_1	4	4	4	3	3	5
L_2	4	4	4	3	3	5
L_3	1	1	1	2	2	3
N=200						
L_1	4	4	4	4	4	3
L_2	4	4	4	4	4	3
L_3	4	4	4	4	4	5
N=40						
L_1	5	5	5	5	2	5
L_2	5	5	5	5	5	5
L_3	5	5	5	2	2	5
N=70						
L_1	2	1	1	2	2	5
L_2	2	5	5	5	5	5
L_3	5	2	5	2	2	5
N=200						
L_1	4	4	4	4	4	3
L_2	4	4	4	4	4	3
L_3	4	4	4	4	4	5

Table 5 shows how it worked and what happened with Series A. Briefly put, everything had some effect, although the best candidates were clearly m = 5, (4). and *m* = 2, (1). Notice that costs reflected in the loss function can affect model selection. The large sample size of N = 195 had the anticipated effect of dampening the effects of other factors and gave strong support to the state *M =5.* For Series D, a table similar to table 5 is unnecessary, since all of its entries would be 2. That is to say, the selection of *m=2* (first-order autoregression) as the best estimate of the order of the process recorded in Series D is insensitive to a variety of priors and loss functions, for as few as 60 observations. The principle of precise measurement appears to apply here.

These results must be compared to classical methods. Akaike's MAICE method estimates Series A as (4) *(m* = 5) and Series D as (1) *(m* = 2). These are indicated by asterisks in tables 2 and 3. Box and Jenkins (1976, p.

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239) report their estimates (4) for Series A and (1) for Series D, but with some equivocation due to consideration of differenced models. Obviously, the

agreement is strong for the full samples which are long enough for asymptotics to apply.

While the likelihood analysis agrees well with the Bayesian for the full series, some differences appear when subsets of the two series are analyzed. Also, notice that the likelihood ratios do not give a good approximation to the Bayes factors for the diffuse Prior 1 in tables 2 and 3.

Next, Box and Jenkins report for Series A estimates for P_1 of 0.92, respectively, with standard errors of 0.04 and 0.08. Maximum likelihood estimates for Series A and the (4) model are $\hat{P}_1$ =0.908. Using Prior 1, the mean of the posteriors for P_1 are 0.904, with standard deviation 0.058 and correlation of 0.814.

7. CONCLUSION

The AR model is used only as a parsimonious approximation to a general stationary process. In that light, there is no belief that the true model is actually a given (low order) AR process. However, the choice of an AR model brings with it certain economic implications, in spite of the problem of near non-identifiability. Thus, a belief in a certain model of economic behavior can be expressed in prior distributions on the parameters (p). furthermore, the need for a parsimonious approximation in sampling-theoretic approaches is absent in Bayesian analysis; it is even possible to have more parameters than observations. Thus, for the general stationary process, the natural parameterization is with the spectral density. And while any Bayesian analysis with an infinite number of parameters must be done in a finite way, the important requirement is that any approximation error be essentially computational in nature and can be reduced arbitrarily by additional computation.

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GROWTH, XRD, FTIR ,THERMAL AND DIELECTRIC STUDIES OF ZINC TRIS SULFATE (ZTS) GROWN BY GEL TECHNIQUE

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ABSTRACT
Zinc Tris (Thourea) Sulfate (ZTS) is well known non –linear optical crystal which combines both organic and inorganic materials. ZTS crystals frequently grown by solution growth method and many more but very few try has been take place to grow this crystal by using single diffusion gel growth technique. Crystals were fairly good transparent and colorless. Grown crystals were analyzed by powder XRD and FT-IR study. Powder XRD shows orthorhombic crystal system with unit cell parameters a = 11.126 Å, b = 7.943 Å and c = 15.491 Å. And Dielectric Property Study is also explained . Thermal degradation studies have been carried out by TGA.

Keywords: ZTS single crystal , XRD ,FTIR , Dielectric Property, Gel technique,TGA, NLO.

I. INTRODUCTION

Zinc Tris (Thiourea) Sulfate (ZTS) is an efficient NLO crystal which combines both organic and inorganic advantages.Non Linear Optical (NLO) materials have received much interest from several researchers in present time due to its significant applications in coming optoelectronic as well as photonic technologies. Organic materials are found to possess better non linear optical properties compared to inorganic materials. Recently, there has been a widespread interest in the metal–organic coordination compounds, which are a combination of metal and organic ligands, having exciting NLO properties .

Zinc Tris (Thiourea) Sulfate (ZTS) is an efficient NLO crystal which combines both organic and inorganic advantages. Thiourea molecule is known to possess a large dipole moment and also has the ability to form a network of hydrogen bonds. It can coordinate with numerous metal ions to form stable coordination complexes. Centro symmetric thiourea molecule combines with inorganic materials, which turns into non centro symmetric complexes. It includes both organic and inorganic advantages which known as semi organic material. It also possess good mechanical properties. ZTS crystals has been synthesized by various techniques but it requires of sophisticated instruments. Present authors try to grow the ZTS crystals by using gel technique, because gel technique is comparatively inexpensive and also easy to apply it. Due to the unique advantage of suppression of nucleation centers in the gel medium, gel growth is a very effective technique for growing single crystals. Also defects found in gel grown crystals are less due to the absence of convection in the medium. These crystals were characterized by Powder XRD and FT-IR. And also explain Dielectric Property Study . Thermal degradation studies have been carried out by *TGA.*

II. EXPERIMENTAL

The crystallization of zinc Thiourea succinate was done using single diffusion gel technique. Reagent grade sodium metasilicate powder was dissolved in double distilled water and the resultant solution was filtered out. After making this solution at a particular specific gravity, the gel was set by acidification of Acitic Acid metasilicate solution by Acitic acid and thiourea so that the pH of the solution was brought to the desired value . This mixture was taken in glass tubes of internal diameter 20 mm and length 150 mm and kept idle for gelation. After setting the gel, zinc sulfate solution was poured over the gel along the sides of the test tube, without disturbing the gel. Small crystals in the form of spherical aggregates appeared near the interface and deep inside the gel within 48hrs. The growth was completed in 32 to 35 days . The following chemical reaction was expected to take place for the formation of the title compound

$ZnSo_4\ 7H_2O + 3CS(NH_2) \rightarrow Zn[CS(NH_2)_2]\ 3So_4 + 7H_2O$

Table-1: Optimum conditions for the growth of ZTS single crystals.

Growth Parameters	Optimum conditions
Gel Density	1.055
pH	5.5
Temperature Room Temperature	Room temp. ($27\text{-}30^0$c)
Concentration of Acitic Acid	2.0 M
Concentration of Zinc Sulphate	1 M

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Concentration of Thiourea	3 M
Gel setting time	2 days
Growth period	32 to 35 days

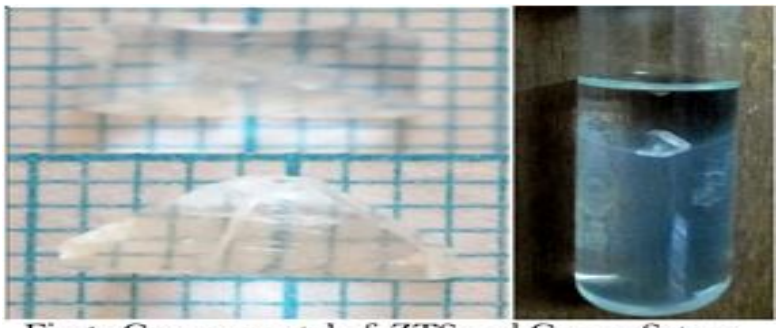

Fig.1- Grown crystal of ZTS and Grown Set up

After a growth period of 32 to 35 days the crystals were harvested and the structural analyses were carried out by X-ray diffraction method using Cu- Kα monochromator of wavelength 1.541A0. Thermo Nicolet Avatar 370 spectrophotometer was employed to obtain IR spectrum. The TGA analysis was done employing Perkin Elmer DSC 4000. LCR Hi TESTER 3532-50 was used to conduct the dielectric studies.

III. Characterizations

3.1. Powder X-Ray Diffraction Analysis

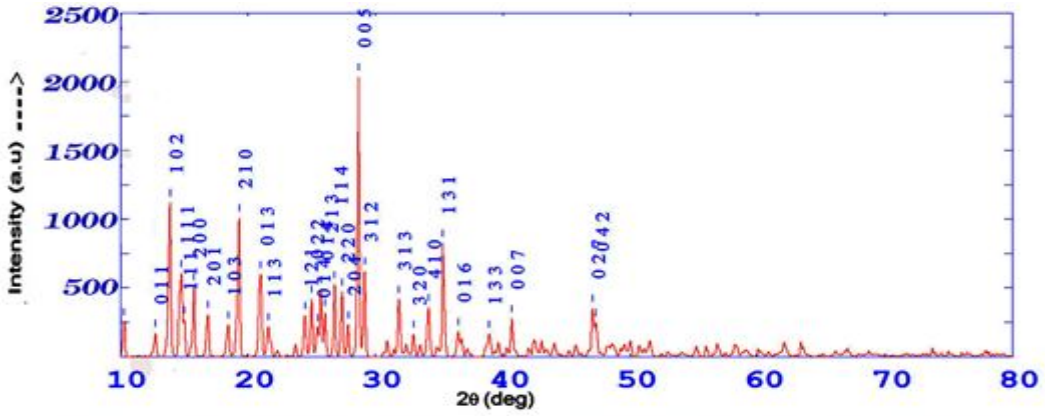

Fig.2-The Powder XRD diffractrogram of ZTS crystal

The *d*-spacing of different planes, the relative intensities of the observed peaks and FWHM data for each indexed plane are given in table 2. The crystal structure is determined as orthorhombic crystal system with space group Pca_2 and compared with the standard values in the JCPDS card (No 51-2305) and is found to be in close agreement. Unit cell parameters of the compound are a = 11.126 A^0, b= 7.792 A^0, c = 14.450A^0, α= 90^0, β = 90^0, γ = 90^0 and unit cell volume = 1252.72$(A^0)^3$ powder X-ray diffraction Indexed XRD pattern of ZTS crystal is shown in fig.2

Table - 2 Lattice parameter,Intensity and Comparison of theoretical and experiential d-values of ZTS XRD data

NO.	H K L	2Theta (Calc.)	2Theta (Exp.)	Intensity (Exp.)	NO.	H K L	2Theta (Calc.)	2Theta (Exp.)	Intensity (Exp.)	NO.	H K L	2Theta (Calc.)	2Theta (Exp.)	Intensity (Exp.)
1	1 0 1	10.026	10.308	253.27	13	1 2 1	24.968	24.995	419.55	25	4 1 0	34.201	34.172	356.3
2	0 1 1	12.898	12.757	170.78	14	1 0 4	25.91	25.459	214.92	26	1 3 0	35.462	35.29	823.87
3	1 1 0	13.864	13.896	1119.39	15	1 0 4	25.91	25.713	487.06	27	3 1 4	36.56	36.507	181.22
4	1 0 2	14.607	14.787	605.88	16	0 2 2	25.962	26.062	320.87	28	0 3 2	36.74	36.767	131.07
5	1 1 1	15.163	15.007	267.43	17	3 0 2	27.003	26.811	523.09	29	0 2 5	38.764	38.93	163.45
6	2 0 0	15.918	15.772	508.35	18	3 1 1	27.316	27.39	470.3	30	2 0 6	40.795	40.713	276.6
7	0 1 2	16.72	16.876	306.43	19	2 2 0	27.936	27.866	232.55	31	3 3 0	42.455	42.46	118.76
8	1 1 2	18.534	18.472	233.41	20	2 2 1	28.623	28.687	2036.13	32	3 3 1	42.935	43.046	113.54
9	2 1 0	19.591	19.306	1010.01	21	3 1 2	29.374	29.165	623.43	33	0 4 1	47.032	47.038	353.64
10	2 1 1	20.541	21.012	595.7	22	0 0 5	30.917	30.925	115.44	34	1 4 0	47.337	47.308	247.1
11	0 1 3	21.674	21.608	217.36	23	1 0 5	31.97	31.849	416.84	35	2 4 1	49.966	50.001	116.55
12	2 0 3	24.425	24.485	297.38	24	0 1 5	33.032	32.998	162.92	36	4 1 6	51.51	51.536	117.87

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3.2. FT-IR Analyses

The Infra Red spectroscopy is a powerful technique for identifying the functional group in a compound.

The FT-IR analysis of ZTS crystals was done in KBr medium using powered samples and shown in fig. 3, The FT – IR spectrum was recorded by using Thermo Nicolet - 6700 set up in the range from 400 cm^{-1} to 4000 cm^{-1} in KBr medium.The FT-IR spectrum at room temperature is shown in belowe fig.3

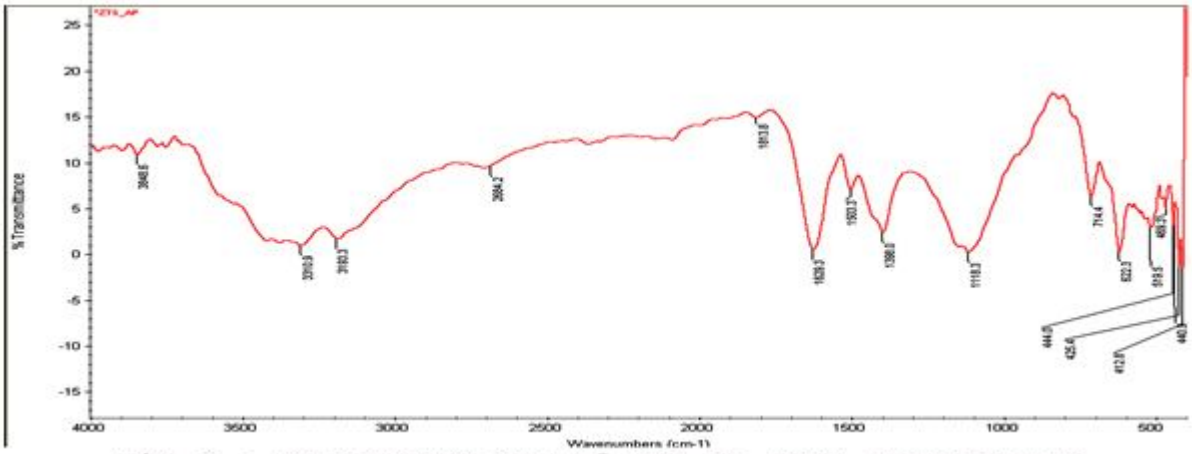

Fig.3 - FT-IR Spectrum of ZTS at room temperature

FT-IR spectrum is carried out to assign the chemical bonds present in the material are shown in table-3. Assignments are as below. Which are also in good agreement with Reference value.

Table - 3 FT-IR spectrum is assign the chemical bonds present in the ZTS

Wavenumbers (cm^{-1})	Peak Assignments	Wavenumbers (cm^{-1})	Peak Assignments
3848.6, 3310.9	O-H stretch	1503.3	C=Ostretch
3193.3	N-H stretching	1398	C-H bending (-CH_3)
2684.2	O-H stretch	1118.3	C-O stretching
1813.8, 1629.3	C=C stretch	520-440	Metal-Oxygen Bonding

3.3. Thermal Characterization

Thermal studies play a significant role in the development and characterization of different materials. The differential Scanning calorimery analysis was done with a heat flow from 25.00°C to 900.00°C at 10.00°C/min. The DSC curves of Zn ($C_4H_4O_4$) (ZTS) crystal is shown in Fig.4. The absence of any peak in this thermogram reveals that the compound is stable below 254.667°C without any loss of weight. The good thermal stability of the crystals ensures the suitability of this material for possible applications in lasers, where the crystals are required to withstand high temperatures

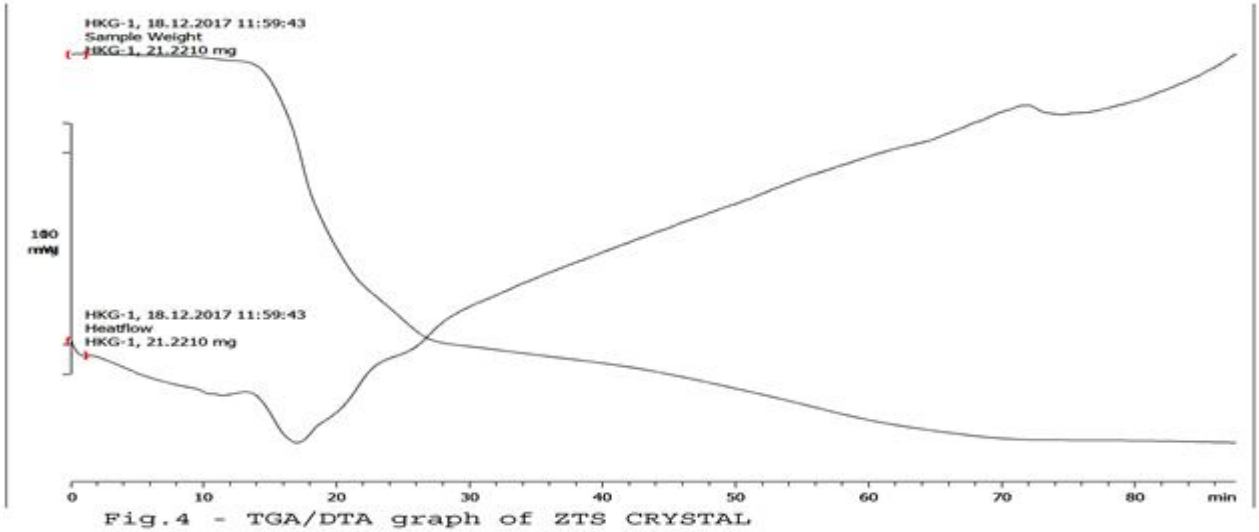

Fig.4 - TGA/DTA graph of ZTS CRYSTAL

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3.4. Dielectrical Property Studies

The study of dielectric constant (ε_r), dielectric loss (tanδ) and a. c. conductivity (ζac) & resinsivity as a function of frequency , help us to know the various polarization mechanisms in the material.

Electric field distribution within the solid is investigated in the dielectric studies. Dielectric properties of NLO materials are important for their fast switching action in electo-optic applications. The variation of dielectric constant as well as the a c conductivity of the crystal with frequency of applied field ranging from 20KHz to 20MHz is studied at room temperatures.

The samples were finely ground and made in the form of pellets using a hydraulic press. The dielectric constant (ε_r) is calculated using the relation $\varepsilon_r = C_d / \varepsilon_0 A$. Where C is the capacitance, d is the thickness, A is the area of cross section of pellet and tanδ is the dielectric relaxation of the sample. It is observed that the dielectric constant decreases with increasing frequency as shown in figure 5 respectively. Also in fig.6 the loss tangent is plotted against frequency. The peaks observed in this plot indicate the presence of relaxing dipoles in the sample. In fig.7 Variation of conductivity & resinsivity with log frequency

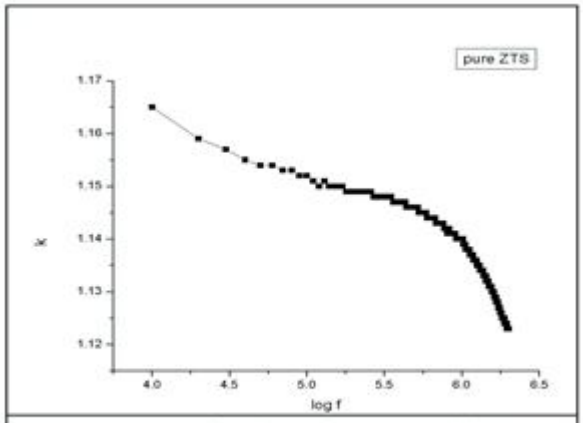

Fig. 5 Variation of Dielectic constant with log frequency

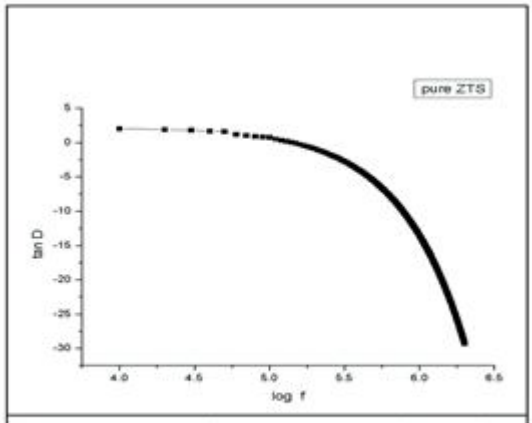

Fig. 6 Variation of Loss tangent with log frequency

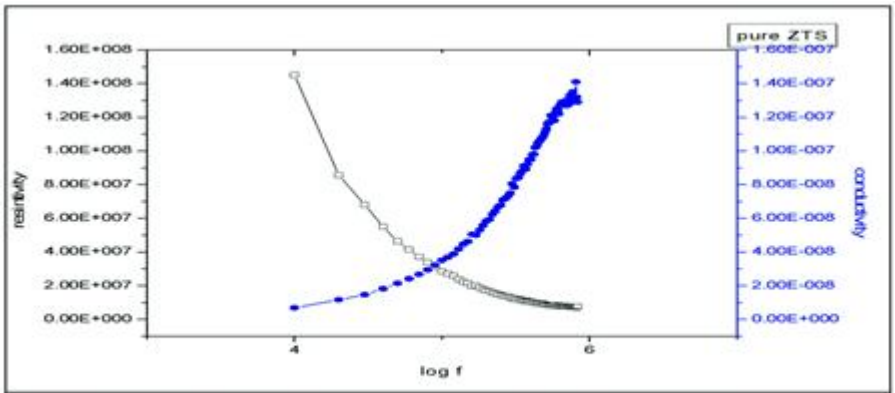

Fig. 7 Variation of conductivity & resinsivity with log frequency

V. CONCLUSION

ZTS crystals were grown successfully by gel growth method and good quality single crystal. Grown cystal was determined to be Orthorohmbic structure in XRD studies. The FTIR studies confirmed the major functional groups in the crystal. . The TGA analysis depicted that the crystal is thermally stable up to 254.66^{o}C. The dielectric constant is found to decrease with frequency, attaining a constant value at higher frequencies. The conductivity is found to be increasing with frequency .

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CASSIFICATION OF MALAYAN TRIBES: AN ANALYSIS

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ABSTRACT
Malayan is a Scheduled Tribe, found in the hilly regions of Ernakulum, Thrissur and Palakkad Districts of Kerala. Malayan Tribe can mainly be classified into three, Malayan, Nattumalayan, and Kongamalayan. Though all these categories are culturally well established, they are now getting endangered .This paper analyses the cultural features of the Malayan, Nattumalayan, and Kongamalayan, thereby identifying the similarities and dissimilarities between each of these social groups.

Keywords: Kongamalayan, Malayan Tribes, Nattumalayan, Tribal Culture Tribes of Kerala

1.1 INTRODUCTION

A tribe is a collection of families bearing a common name, speaking a common dialect, occupying or professing to occupy a common territory and is not usually endogamous though originally it might have been so (Majumudar 10). We can trace the imprints of our cultural legacies in the cultures of these clans. Slowly the unity and co-operation between each clan began to deteriorate, and well-marked cultural differences began to be evident, causing each clan to be a representative of its own culture. Also, the development in trade and commerce, migration etc. brought about changes in our traditional culture due to the influence of foreign culture, which in turn brought to various changes in our cultural heritage. It is mainly because of all these that the Anthropologists studied the cultures of each separate clan, to understand the cultural history of human community.

1.2 MALAYAN

Malayan means 'those who live on the mountains'. It is evident from the name that the Malayans are people who live in close association with the mountains. During the period 1957-58, A.A.D Luiz, Chairman of Kerala State Tribal Enquiry Committee, approved the usage of the term[1].

The Malayans are largely found in and around areas like *Chittar* in Pathanamthitta district, *Adimali*in Idukki district, *Vengoor, Kuttampuzha* and *Paippara*in Ernakulam district, *Thekkumkara, Chelakkara, Pazhayanoor, Nadathara, Panancheri, Puthur, Mattanoor, Varantharapilly, Kodasseri, Athirappily* in Thrissur district and *Kadambazhipuram,Mannarkadu, Thenkara, Nalleppalli, Perimati, Muthalamada,Pettancheri, Erimayoor, Kaavarasseri, Kizhakkancherry, Tharoor, Vadakkenchery, Kannambra* in Palakkad district. As per 1981 Census report, there were a total of 2394 Malayans in Kerala. The tribal population rate prior to this has been recorded by A.D.D Luiz in his book *Tribes of Kerala*[2]. As per 2008-2010 socio-economic survey conducted by The Department of Schedule Tribe, there were 5550 members in the Malayan tribal community (270-271).

The official records of Kerala State clearly indicate that *Malayans, Nattumalayan and Kongamalayan* come under their namesake tribal group, Malayan. It is also evident that there is a Schedule Caste community known as *Malayans in* Kannur and Wayanad districts, i.e., the Malayans in the Northern part of Kerala come under the Schedule Caste and those of the mid and southern parts of the State belong to Schedule Tribe community. Malayans living the northern part of Kerala are closely associated with the art form known as *Theyyam*. Malayans belonging to the Schedule Tribe community is divided into three sub-categories- Malayans, *Nattumalayan* and *Kongamalayan*. All these three sub-communities are generally known as *Malayans* and there are no official documents which classify these communities separately. Also the socio-economic survey (16) initiated by the Schedule Tribe Welfare Department of Kerala records that all the other *Malayans, Nattumalayans* and *Kongamalayans*, excluding the *Malayans* dwelling in the districts of Kasargode, Kannur, Wayanad and Kozhikode, come under a general clan known as the *Malayans*.

Some scholars, who have researched about the tribal clans of Kerala, had attempted to prove that the Malayans had two sub-groups and also to point out their general differences. The book *The Tribes and Castes of Cochin*, authored by Ananthakrishna Iyer in 1909, provides some information about the *Malayans*. The book *The Tribes of Kerala* written by A.A.D Louis records that the *Malayans* are further divided as *Konga* and *Nattumalayans* (173). It is also evident from the works of both these writers that the *Malayans* who migrated from Tamil Nadu are known as *Kongamalayans* and those native or aboriginals of Kerala are known as *Nattumalayans*. They have also noted that the language spoken by the *Kongamalayans* have Tamil influence while that of the *Naattumalayans* have the influence of Malayalam, the language of Kerala. Supporting Anandakrishna Iyer, Singh, in his work *The Communities* written in 1998, focuses that the *Malayans* of Kerala was studied as two

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separate categories- *Kongamalayans* and *Naatumalayans* (2145). The work *Handbook of Kerala* (2002), edited by T. Madhavamenon also points out that the *Malayans* are divided into two types. It also describes in detail about the cultural heritage of both the groups. Since most of the scholars did further research based on the studies of Anandhakrishna Iyer and A.A.D Louis, no new information can be extracted from later studies. Details about the Malayan clan, its sub-groups like *Nattumalayan* and *Kongamalayan*, their cultural importance etc, based on the former studies, has been given below.

1.2.1 Nattumalayan

There exist three different versions regarding the origin of the *Nattumalayans*. One is the *Malayans* are the descendants of *Lord Shiva* and *Parvathi*. They believe they originated from the union of *Lord Shiva* and *Parvathi* during their short stay in the forest to grant *Pashupathastra* to *Arjuna*. The second is that they originated from *Shoorpanaka*. They believe they are the descendants of a generation of men expelled from the *Nair* community due to their illicit and illegal relationship with women of the lower classes.

1.2.1.1Birth

No special birth ceremonies or rituals are followed by the community. The pre, during and post delivery stages are attended by the girl's mother and the elder women of the community. Separate secluded huts are temporarily put up for this purpose. After delivery, initially the mother is served a gruel made of *chama* (*little millet*). The first 15 days after child bearing is regarded as a period of defilement and the mother along with her baby is to stay in the secluded hut until the completion of this period. The naming ceremony of the baby is conducted either on the fifteenth day when the mother and child leave the hut and join their family, or on the twenty eighth day, as per convenience. Girls, on attainting puberty and during their menstruation period have separate secluded hut for a period of five to seven days.

1.2.1.2 Marriage

Decisions regarding marriage are taken by the parents. The choice or consent of the bride or groom is not taken into consideration. As a part of their engagement custom, either the mother or the sister of the groom ties a thread dipped in turmeric around the neck of the bride. They believe this thread should remain around the neck of the wife until the death of her husband. After this ceremony a convenient date is fixed on which the parents of the groom will formally approach the bride's house and the parents of the latter will hand over the girl to the groom which is followed by a grant lunch. It is on this day the groom presents clothes and other garments to the bride. The girl is expected to wear these clothes while starting a newly married life.

1.2.1.3 Death

In the case of death, they follow the burial system. If any member of the community expires, the body of the deceased is initially washed, dressed in white clothes and given a decent burial. The body is buried in the eastern side of the hut, with the head facing towards the east. The nephew of the deceased person places rice in the mouth of the departed for nourishment during their journey. Also they erect a pole on the burial ground. Currently they follow the cremation process.

1.2.1.4 Faith

The *Nattumalayan* worships deities like *Veerabhadra* and *Bhadrakali*, craved in stones. Throughout the *Mandalakalam*, from mid-November to December, they strictly followed certain rituals during the early morning hours. For this purpose one of the members of the family gets up early in the morning, bathes and lights an oil lamp. Hunting was considered a taboo during this period and hence they strictly followed vegetarian diet. Also, they sacrificed cocks on the final day of the fasting, inorder to please their deities. They also practiced black magic by worshipping a certain god named *Mallan*.

1.2.2 Kongamalayan

No information is known about the origin of the *Kongamalayans*. They are believed to have migrated from the districts of *North Arkot* and *Salem* to areas from *Chittoor Thaluk* to *Kolangode* forest area and also from *Palakkad Thaluk* to *Valayaar* forest area of Palakkad district.

1.2.2.1 Birth

They follow no special ceremony in association with child bearing or childbirth. Outside the house, a separate hut is constructed for this purpose. In case there is lack of facility to put up a separate hut, a corner of one of the main rooms in the house is used for the delivery process. No pollution is observed in connection with childbearing. Naming ceremony of the child is performed by the parents on any day according to their convenience, three months after delivery. On that day, the parents of the child gets up early morning, cleans themselves, wears new clothes and gets the child ready for the ceremony. The baby is placed on a plate filled with paddy grains and an oracle, on invitation arrives and names the baby.

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When a girl attains puberty, *Moopan*, the head of their tribal group, informs the matter to their Lord or the landowner, who in turn sends money and other gifts to the girl's family. During this pollution period, the girl is to send to a separate common hut for five to seven days where she is accompanied by other women in pollution.

1.2.2.2 Marriage

Groom's father makes decisions about matters concerning marriage. As per custom, if a girl is chosen for marriage, the groom's family has to give some sort of present to the girl. Later, on a suitable day, the groom, his family and other relatives arrive at the girl's house for marriage. A welcome party is arranged by the girl's family to welcome the groom and other guests, after which the groom ties a knot around the bride's neck using a yellow thread bearing *thali*. After marriage, the newly married couple is expected to lead an independent life away from their parents. So they leave their parents to stay in a separate house constructed for them, with all the necessary arrangements done by the landlord.

1.2.2.3 Death

On the departure of a person, relatives and other members of the community makes loud cries. This is to inform the members of the neighboring colonies. Apart from this, they used to drink and dance around the dead body in order to ease their sorrow in the departure of the person. This was done to fulfill their responsibility to the deceased person. They place the body in a coffin made of bamboo and buries it a few kilometers away from the house. After burial food and drink is served, followed by dance. Once in a year, on a convenient date, they perform a general *pooja* in honor of all their departed ancestors.

1.2.2.4 Faith

They worship deities like *Karumala Moopan, Kali, Mallampara Andan, Manakaadamma, Paliyamma* etc. conscecrated into stones and placed under the trees. A *pujari* was also there to worship the deities. The oracle being representative of the god and pronounce as a deity. They even worshipped *Muniyappan*, another deity, and also took part in the religious festivals of their aristocratic landlords. They even sacrifices and offers blood, milk and raw rice to the deities.

Naattumalayans and *Kongamalayan* did not encourage inter-community marriage and inter-community feast. Either of the communities dwelling places as well as their language differed. T. Madhavan remarks, expect for the term *Malayan*, either of the communities share no cultural traits in common (247).

1.2.3 Malayan

No much information is available about the origin of the *Malayans*. *Idamalayar*, also known as *Idiyaramala*, is believed to be the ancestral place of the *Malayans*. They collectively stayed in the forests of *Idamalayar*. The difficulties that arouse due to the construction of dam led them to migrate to different place. Their tremendous efforts and hardwork enabled them to clear the forest areas of *Ponginchuvadu, Thalamkandam, Thavalakkuzhippara*, into dwelling places. Hence they regard *Idamalayar* as their ancestral land.

1.2.3.1Birth

The Malayans do not observe any special rites in relation to pregnancy or childbearing. Usually when a girl becomes pregnant, her parents are informed first. Then a few days before child birth, the husband himself takes her to her parental house. The girl's parents take care of girl's delivery. A temporary hut is set up for this purpose, away from the actual house. The mother observes pollution for 28 days after delivery. After this the mother and the baby is brought home. During this time, the wife is not even allowed to touch her husband. The chief food given to the pregnant woman include baked roots like *Balikizhangu, Kanjakizhangu* (different kinds of yams) etc. Also for almost the first six days after delivery, the mother is given chutney made of pepper, *Kodampuli (Garciniagum migutta)* and salt inorder to detox her tummy. In the ancient days they were even given curry made of *udumbu* (monitor lizard) to regain health. But now this custom is considered illegal. The baby, upto six months, is given *Koovanooru* (the paste of arrowroot). 28 days after birth, the *charadukettu* function of the baby is observed. The mother and the child returns to the husband's house 40-90 days after child birth. In the ancient days, the aged people of the house would take the baby only after the first birthday.

1.2.3.2Marriage

If a man finds a girl suitable for marriage, he informs his parents and they officially propose the girl and fix a convenient date for the marriage. In the olden days the *Malayans* preferred to marry only from their neighboring same clans (*Kudis*). But this practice has now come to end with the advent of love marriages. On the day of marriage, both the bride and the groom take bath along with their friends, gets ready and reaches the wedding ground. As a custom, the bride brings two dhotis along with him. He hands over one to the bride and with the other they cover their head. With this they get married. The couple then goes to the kitchen and put down the boiling *sarkarachoru* (jaggery rice) from the fire place, this mark the end of their wedding rites. Then a grand

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feast follows. In the ancient days, for the feast, they used only the products cultivated by them. During the marriage they sing songs accompanied by musical instruments like *chenda* (drums) and *oothu* (whistle). These songs are known as *Kalyanapaattu.* After the wedding, on the same day itself they go to the groom's house and stay there for 3-4 days. The bride's parents and other relatives then go to the groom's house, invite the couple to their house and take them home. The couple stays there for the next 3-4 days, after which the groom's parents come and take them back home. With this all the customs related to marriage comes to an end. Currently a lot of change has occurred in these customs. The prime wedding custom of covering the head with dhoti has now been replaced by the system of tying the wedding knot.

1.2.3.3 Death

The *Malayans* follow the custom of burying their dead. They dig the burial ground in the east-west direction of the southern part of the house and spread a plank made of reeds. The dead body is placed on top of this and tied with the reeds in such a way that the body appears to be placed in a coffin. The major items used by the deceased person are placed by the side of the dead body. After this the body is covered with the leaves of reeds in order to prevent mud from falling on the dead body. It is on top of these leaves that the mud is put and the body is buried.

Usually the husband performs the burial rites for the wife and the wife performs it for her husband. Though the children are alive, they do not perform any burial rites for their deceased parent. *Pula* (Death Pollution) is observed by the person who performs the burial rites and all the other related *karmas* or rituals are performed only after the burial. The person who observes *pula* rotates 7 times, morning and evening, by holding, in palm, a certain leaf called *Narkala,* shaped into a container. He/she sits on a piece of cloth known as *Virimundu,* torn from the cloth with which the dead body is covered. As per custom, this cloth could not be folded and for the next forty days, everyday, this person is to wear the *Virimundu* after bath and observe fasting by sacrificing food. He/ she could only consume the watery content of rice gruel without adding any salt. This was how the pula is observed. Also, during this time the *Viripaya*, the spread mat, was not to be folded. Presently this custom has been reduced from forty to sixteen days. On the sixteenth day, the pula is ended by taking an oil bath.

1.2.3.4 Faith

Since the *Malayans* depend on the woods for a living, lot of fallacies and beliefs prevail among them in association with the impending dangers of the forests. They consider the woods as a sacred place. Hence the entry into the forest with lack of purity and the practice of any sort of evil or unholy deeds within the forest area is strictly prohibited. They consider the *Edamalayar* region as the holiest place, as it is their ancestral place and even believes that their forefathers will protect them from any danger while working in those areas.

The *Malayans* consider it as an omen and even cancels the journey if someone calls them from behind while initiating a journey into the forest. But if this happens while waiting for the arrival of a co- traveller, then it is not considered an omen. They believe they will be attacked by wild animals if menstruated or polluted woman enter the house without completing the cycle. Similarly, they expect mishaps if such woman touch the oracle .The frequent encounter with wild animals, while in the forest collecting forest produce, is regarded as a signal from the Mountain Gods that some danger has happened in their hut.

Image-1: Malayan Temple @ Thavalakkuzhippara Tribal Colony

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Similarly they believe some danger will occur if a person sneezes while in the eastern part of the house and will escape danger if sneezed while in the western part of the house. They also believe there will be family dispute if they eat beef and that the medicinal plants will disappear if their names are revealed to any outsider. Hence they do not share the names, uses or benefits of any of the medicinal plants to people of any other community. They also believe and expect the presence of guest if the crow caws and regards the call of the eagle as a harbinger of death. They believe that the cat will be in trouble if an owl flies over it and a person will meet with accident if he goes out after hearing the cry of the lizard from the east-west corner of the house. They believe those who learned the mantras should take babies only after the infant's first birthday. They do not give honey to their kids. They suppose that the kids should taste honey only by taking it with their own hands if they want. They believe they would hear the pathetic cry of a beast from the interiors of the forest if someone else gives it to the child, and the child would fall ill. On the contrary, initially if he tastes the honey own his own, it is believed that he would be blessed with long and healthy life. A lot of such beliefs, connected to wild beasts, entangle the life of the Malayans. They worship their ancestors as deities and *Mala Daivam* (God of hill) (image 1), apart from this they also worship *Lord Sastha*, *Lord Karuppa Swami*, and believed in *Devi* carved in stones. They build temple with bamboo along with elephant bamboo (India read bamboo).

1.3 CONCLUSION

Scholars who have researched about the tribes of Kerala had attempted to classify the *Malayan* into two sub groups, namely *Nattumalayan* and *Kongamalayan* . The above data clearly proves that the Malayan tribe have three sub groups namely *Malayan, Nattumalayan* and *Kongamalayan* .Though the *Kongamalayans* bear no cultural similarities with the *Nattumalayans* and the *Malayans,* the *Malayans* and the *Nattumalayans* do bear many similarities and dissimilarities. But compared to the *Malayans, Nattumalayans* are more refined. The life and culture of *Malayans* depict the cultural legacy of the tribal groups. The three subgroups of *Malayan* tribes are themselves different in their culture. Their languages also differ according to their dwelling places. Anthropological, sociological and linguistics studies on *Malayan* tribal group are the only way to explore the cultural identity and affinity.

END NOTES

1. The name Malayan connotes that they are *AL* (people) of the *Malas* (Hills). (Luiz 172)
2. Malayans are included in the list of scheduled in the list of Scheduled tribes maintained by the Union and Kerala Governments. In 1901 their population was recorded as 2,263 for Travancore, 2 for Cochin, and 6,505 for Malabar. The 1911 census gives no figures for Malabar, but indicates the Cochin total to be 2,461. In 1921 the Cochin total drops to 594 and Malabar increases to 7,883. In 1931 no figures are available for Malabar, and the Cochin total is 3,185. The total for Cochin in 1941 is 3,011 and the figures for Malabar drops to 48. A rough estimate of their population would be seven thousand. (Luiz 173)

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EMPLOYER BRANDING: AN EMPIRICAL STUDY OF ITS IMPACT ON ORGANISATIONAL ATTRACTIVENESS AND RETENTION

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ABSTRACT
The purpose of this study is to explore the impact of employer branding on organisational attractiveness, retention and productivity of employees in IT companies of Haryana. Descriptive research design was elected for this research study. 300 employees were selected from top three IT companies (Infosys, Wipro and TCS) of Haryana. Data was collected with the help of questionnaire method. Stratified random sampling method was implemented in the research study. Regression analysis was implemented to identify the factors of employer branding that positively impact on organisational attractiveness and retention of the employees. The result of the study indicates that employer branding has a significant effect on organisational attractiveness and retention of the employees. Thus, it is recommended that the organisation should provide good working environment to their employees so that the employees feel safe as well as comfortable with the culture and with the strategy of the organisation and decide to continue working with that particular organisation.

Keywords: Employer branding, attraction, retention, Productivity, IT sector.

INTRODUCTION
Brands of the organization attain numerous tasks. Brand is a tool that makes its own identity in the market which differentiates the product and services from its competitors and also maintains a brand loyalty. American Marketing Association define brand as a "name, term, sign, symbol, or design, or combination of them which is intended to identify the goods and services of one seller or group of sellers and to differentiate them from those of competitors". Kotler & Lee (2008) define Branding as "a process of developing an intended brand identity. Basically branding is used to distinguish the products and services in form of building economic value".

Armstrong (2006) defines employer branding as the formation of organisational brand image in the mind of prospective employees. Employer branding is affected through the reputation of the firm, in the form of business or services provider and their reputation as an employer.

EMPLOYER BRANDING
Employer branding is a new term in HRM for recruiting and retaining talented applicants for the organisation. Initially, the concept of employer brand was originated by Simon Barrow who was the chairman of "People in Business and Tim Ambler", and a senior fellow of London Business School, in the Journal of Brand Management in December 1996. Ambler and Barrow (1996) define Employer branding as a "package of functional, economic and psychological benefits provided by employment, and identified with the employing company". The organisations need theoretical and practical understanding of this subject .This is because the organisations like IT sector companies want talented employees as they are the most precious assets of the organisation (Ewing et al., 2002). According to Sullivan (2004) employer branding may be defined as a targeted, long term strategy to manage the awareness and perceptions of the employees, potential employees and related stakeholders with regards to particular firm. Mosley (2007) declared that employer branding involvement is managed due to increasing demand of talented applicants by organisations to ascertain their organisational goals. Thus, organisations must distinguish from their competitors to engage and retain the employees in the organisation (Lievens and Highhouse, 2003).

A conceptual employer branding framework was provided by Backhaus and Tikoo (2004). In this model, strategy of marketing and human resource management is described. According to this model, employer branding produces two principal assets i.e. brand associations & brand loyalty. Employer brand associations shape employer image that transforms into employer attractiveness by potential and existing employees. Another by product, employer brand loyalty is affected through organisation identity & culture of the organisation. Ultimately, the employer brand loyalty helps in uplifting employee productivity. Conference Board (2001) have observed that employer powerful employer branding assists competitive advantage, aids employees' value of the company internalize and also helps in employee retention.

Backhaus and Tikoo (2004) revealed that "Employer branding is quite a modern concept for recruiting and retaining the ideal human capital from the labour market". The aim of the employer brand is basically building and developing brand image in the mind of current and prospective employees and also in employment agencies

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at domestic and global level. In marketing product brand helps in creating, attracting and retaining the customers. Just like product brand employer brand also creates, attracts, develops, utilizes and retains the employees towards a particular employer. Employer branding helps in developing an emotional bond between employer and employees in the labour market, which establishes and forms reputation of the organisation's as a most selected employer. Barrow and Mosley (2005) believe that a strong employer brand assists an organisation to attain its targets that cover to enhance customer satisfaction, lower costs and also positive return on profitability and investment. Collins and Stevens (2002) proposed that a strong employer brand engage better candidates for the organisation and also form expectations towards employment (Lievens and Highhouse, 2003).

According to Berthon et al. (2005), five steps recommended by researchers for developing strong employer brand are as such (i.) Know about your organisation, (ii.) Create captivating brand promise to employees so that those promises match to the brand promise for customers, (iii.) Develop standard to evaluate the achievement of brand promise, (iv.) With hard hearted arrange all practices of people to support and strength brand promise and (v) finally, implement the measures.

Organisational attractiveness is a concept which is very common in the field of human resource management. Moreover the term employer branding includes some extra elements in the concept of employer branding. Highouse et al. (2003) defines organisational attractiveness as individual's attitudinal and affective opinion towards a particular organisation as a good place for employment.

Buenger (2006) explained that the central point of the retention is to keep the talented employees that help in the success of the organisation. The term retention has become familiar subject matter in the literature of HRM. Employees feel comfortable in shifting from one job to another and also in switching jobs after globalisation and liberalisation, so it is a challenging task for firms to retain the employees in the organisation (Chhabra and Mishra, 2008). The main character of employer branding is to present logical framework to clarify and emphasise on the priorities of the management, enhance productivity, and to raise recruitment commitment and retention (Backhaus and Tikoo, 2004). Ritson (2002) reported that the importance of employer branding is to reduce the cost of recruitment, improve employer and employee relation and also to increase the retention of the employees in the organisation. Sound employer branding companies also provide lower salaries to their employees as compare to weak brand companies.

In spite of, increasing marketability of the employer branding practice, educational research is very limited on this theory.

The objective of the research study is to explore the impact of employer branding on attraction, retention and productivity of the employees in IT companies of Haryana. Thus, on the basis of the literature review, we construct hypothesis of the study:-

H1: Employer branding has a significant impact on organisational attractiveness.

H2: Employer branding has a significant impact on retention of the employee.

METHODOLOGY

The purpose of the study is to explore the impact of employer branding on attraction and retention of the employees. The research study is descriptive in nature. The research study sampled all the organization which are come under the list of market capitalization ideal population for the research study is comprised with employees who are working in IT companies of Haryana. Top 3 companies were selected for the research study on the basis of their market capitalization i.e. TCS, Infosys and Wipro. Total 300 respondents were selected for the research study by using Stratified random sampling method. 100 employees each from these 3 IT sector companies of Haryana were adopted as a sample for the research study. The candidates for the research study were randomly selected from the employees of these organizations by applying simple random sampling technique.

TOP 5 IT SECTOR COMPANIES ON THE BASIS OF MARKET CAPITALIZATION

A formal list of questionnaire was constructed for the research study. The questionnaire contained 41 closed ended questions, whose objective was to get the information related to employer branding, organizational attractiveness and retention of the employees. In the questionnaire 13 questions were related to Employer branding, 14 questions were related to organizational attractiveness and 8 were retention questions. 5 point Likert-scale (strongly agree to strongly disagree) was used in the questionnaire to get the responses of the all the items of the questionnaire. SPSS was used for analyzing the result of the questionnaire.

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EMPIRICAL RESULTS AND INTERPRETATION

Statistically, analysis the data which were collected for the research study. Descriptive statistics and frequency distribution method were applied. Firstly, reliability analysis was used on scale data, then after, testing hypothesis was used by using regression analysis method, to know the impact of employer branding on retention and productivity of the employees.

Among 300 respondents, 171 were males (57%) and 129 were females (43%). Mean and S.D. value of gender of the respondents was obtained as 1.43and .496 respectively. 235 respondents were below 30 years, 60 respondents were 30 – 40 years and the rest 5 respondents were above 40 years who took part in the research study. Mean and S.D. value of age of the respondents was calculated as 1.23and .461 respectively.

The reliability of the scale was checked out by Cronbach's alpha in SPSS. Churchill (1979) proposed that the value of coefficient alpha is good to fit when it exists between .62 and .77. The value of Cronbach's alpha was found to be .959 through SPSS, which is very good value of alpha, which shows that the scale is good to fit for the research study.

STATISTICAL ANALYSIS AND EMPIRICAL RESULT

Regression analysis is applied to examine the relationship between employer branding and organisational attractiveness and retention of the employees. Result of Linear regression analysis is demonstrated in table.

H1: Employer branding has a significant impact on organisational attraction.

For testing the above hypothesis regression analysis was implemented. The value of R is .690 and R^2 is .476, which shows that the model explains 47.6% variation in attraction of the employees towards organisation. Moreover, the result of multi-collinearity shows that there is no interrelationship between factors as VIF value is less than 10 and the value of tolerance is greater than .10. In the regression equation, organizational attraction was considered as a dependent variable and factor of Employer branding i.e. organizational attributes and job attributes were considered as two independent variables. The result of the study explains that both the factors of employer branding have significant impact on the attraction of the employees towards organization. The value of β for organizational attributes and job attributes came to be .507 and .293 respectively. Table: 1 shows that both organizational attributes and job attributes have significant impact on organization attraction (p<.05).

Table-1: regression analysis: impact of employer branding on organisational attraction

Independent variables	Unstandardized Coefficients β	Std. Error	Standardized Coefficients Beta	VIF	Tolerance
Organizational attributes	.507	.042	.454	1.591	.628
Job attributes	.293	.035	.312	1.591	.628
R=.690 **R^2=**.476 **Sign. Value=** .000 **Durbin Watson=**1.707 P.<.05, significant at 95%					

H2: Employer branding has a significant impact on retention of the employees.

In order to prove this, the above hypothesis regression analysis has been worked out. The value of R is .640 & R^2 is .406 which demonstrates that model explains 40% variation in employees' retention. Moreover, the result of multicollinearity shows that there is no interrelationship between factors, as VIF value is less than 10 and the value of tolerance is greater than .10. Retention of employees was treated as dependent variable and factors of Employer branding i.e. organizational attributes and job attributes were considered as two independent variables. The result of the study explains that both the factors of employer branding have significant impact on the retention of employees. The value of β for organizational attributes and job attributes are obtained as .330 and .346 respectively. Table: 2 shows that both organizational attributes and job attributes have significant impact on retention of the employees (p<.05).

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Table-2: Regression analysis: Impact of employer branding on retention of the employees.

Independent variables	Unstandardized Coefficients β	Std. Error	Standardized Coefficients Beta	VIF	Tolerance
Organizational attributes	.330	.054	.341	1.555	.643
Job attributes	.346	.051	.375	1.555	.643

R=.640
R^2=.410
Sign. Value= .000
Durbin Watson=1.711
P.<.05, significant at 95%

DISCUSSION AND IMPLICATIONS OF THE STUDY

According to Schneider (2003) Employer branding is a targeted, long term strategy to manage the awareness and perceptions of employees, potential employees and related stakeholders with regards to a particular firm. Employer branding can be performed to manage recruitment, productivity efforts of the management and retention. Beck (2008) revealed that Employer branding is a powerful tool used for retention of the employee & productivity of the existing employees attaching them to firm employees for work. Sokro (2012) in the research study found that organisation brand significantly effect the decision of employees to join and retain in the organisation. Dell and Ainspan (2001) also argue that Employer brand builds the identity of the organisation as an employer by containing the value of the firm, systems, behaviour and policies so that it could attract, motivate and retain the existing and potential employees of the firms. The employees think those employers as good employers who behave fairly towards the employees. It is important to have a good relationship between employee and employer. Employer branding is a technique which help in attracting, retaining and also in increasing the productivity of the employee. Employer branding also assists in attracting and retaining the best talent for the organization that perform well, are committed and stay loyal. Such talents are valuable for the organization. According to Economist, employer branding is a tool used by the organizations to make employee loyalty in a labor market by using fruitful practices of recruitment and retention.

According to Backhaus and Tikoo (2004) Employer branding is imagined on the basis of the assumption that talented staff of the organisation gives firm value and also with talented staff the performance of the organisation could get increased. Ritson (2002) recommended that the organisation having effective employer brand can promissory lower the acquisition cost of the employee, enhance employee relations, strengthen retention of employees and also provide lesser salaries to the staff as compare to the weaker employer brand.

Now a days, attracting and retaining talented employees in the organisation is very important for its success, which is done only by those organisation which is having strong employer brand. According to Barrow and Mosley (2005) Employer branding contributes an important role in the overall success of the organisation. A sound employer branding helps an organization to provide best of all obtainable services, to simplify the goals of the organization, boost up the employees, distinguish it from the competitors and to have a competitive advantage in long-run and also add stakeholders values. By providing an isolate experience of branding, external employer branding benefits are acquired in order to minimize risks. Internal employer branding benefits is comprised with strategic tool which help in managing the integrated relationship of brand and employee and also in delivering the experience of consistent brand all over the complete organization.

A sound employer branding aids to save the time of employee's recruitment process. Recruiting the employees for the organisation is lengthy and time consuming process. It can be done by the organisation in so many ways. Several organisations begin its search through appearing for fresh candidates by mailing. Separately, employer branding plays an important role in attracting the candidates to apply for vacant post in the organisation. Organisations can develop their reputation in the society by using different methods such as company newsletters, job alerts, and current updates of the organisation. Organisations can consider the review of candidates on social media regarding all the related information of organisation and can come to know the perception of candidates towards new letters and other updates of the organisation.

LIMITATION AND FUTURE IMPLICATION OF THE STUDY

The study was limited to the state of Haryana and any other state was not discussed in this study. Second limitation of the study was that only one services sector was taken in this study i.e. IT sector and the rest services sectors were not included in the research study. Another limitation is that the potential employees'

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perception was not considered in the study. In the future research study, researchers should identify the effect of same factors of employer branding on the retention and productivity of the employees in other sectors.

CONCLUSION

Today employees are selecting the organization for job on the basis of reputation of the organization in the society. The main purpose of the employer branding is to build an effective employer brand so that it will have a favorable influence on the performance of the organization. An effective employer brand develops a brand equity that helps favorably in enhancing attraction and retention of the employees. Literature solidly supports that engagement of the employees has a positive relation with increment in the retention rate of the employees in the organization. The purpose of employer branding is accurately communicate the culture of the organization in a labor market so that prospective employees willingly attract, engage and retain towards an organization.

A sound employer branding aids an organization to give all available services, to clarify the targets of the organization, boost up the employees and to distinguish from the competitors. An effective employer branding creates an image of organization so that the organization can engage and retain the talented human capital, improve job satisfaction, increase innovation and creativity, and allow making decision of organization and therefore enhancing attraction, retention and productivity of the employees.

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IMPACT OF EMOTIONAL INTELLIGENCE ON ORGANIZATIONAL COMMITMENT OF SECONDARY SCHOOL TEACHERS

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ABSTRACT
Organizational Commitment refers to a psychological frame of mind that motivates people to achieve a certain goal. It is an important tool for improving quality, productivity, profitability, as well as reducing defecits and costs. However, teachers are the founding stone of all other professions and they have to perform multiple roles which requires great physical, mental and emotional labour. For maintaining their enthusiasm, motivation, and to sustain in the teaching profession they must be committed towards the organization. There are many factors that affect teachers' organizational commitment but very few studies have been conducted on emotional aspect of the teachers' commitment. Since emotional intelligence determines the behaviour of an individual and is considered as the key of success in any profession particularly involving human relations hence it is essential to know its relationship with organizational commitment of the teachers. Therefore, this study was conducted to find out the impact of emotional intelligence on organizational commitment of male and female secondary school teachers. For this, a self-constructed Emotional Intelligence Scale and a standardised Organizational Commitment Scale were administered on 250 secondary school teachers of Aligarh District, (U.P.) Analysis of the data was done by applying step-wise multiple regression analysis and it has very relevant findings for teachers and policy makers.

Keywords: Organizational Commitment, Emotional Intelligence, Secondary School Teachers

INTRODUCTION
Teaching is one of the toughest job as it has the responsibility of the development of the nation by shaping the behaviour of the future generations and teacher is one of the most important, respectable, and responsible person of the society who provides direction to the future of the individuals, society and the nation. National Knowledge commission (2006) has considered teachers as the main factors of national development. According to the Commission, they are the founding stone of all other professions and perform various duties as guides, mentors, counsellors, facilitators, architects of the society as well as a nation builder. Teachers instruct as well as inspire the students. Teachers perform multiple roles which requires great physical, mental and emotional labour. They have to deal with diverse students, recognize the needs of the students, maintain discipline in the classroom and face day to day challenges of teaching learning process. For this they have to maintain their enthusiasm, motivation, and commitment for sustaining in the teaching profession.

ORGANIZATIONAL COMMITMENT
Organizational Commitment reflects the strength of the bond which employees feel towards their organizations (Dogan & Kilic, 2008). According to Mowday et al. (1979), organizational commitment can be defined in terms of these factors that include, (a) a strong belief in and acceptance of the goals and values of the organization, (b) readiness to exert considerable effort on behalf of the organization and (c) a strong desire to remain a member of the organization. Riecher (1985) defined it as a process of identification with the goals of organization's multiple constituencies and these constituencies include from top management to the public at large. It is a multi-dimensional construct. After analysing a number of one-dimensional models of organizational commitment, Meyer and Allen (1991) defined it as a psychological state that binds the individual to the organization and proposed a three-dimensional model of organizational commitment. This model comprises of three components: affective commitment or desire component, continuance commitment or need component and normative commitment or obligation component. Affective commitment refers to the employee's emotional attachment to be in the organization. Continuance commitment refers to an awareness of the cost associated with the organization. Normative commitment reflects a feeling of obligation to continue (Jamal, 2011). Mercurio (2015) extended this model by reviewing the empirical and theoretical studies on organizational commitment and regarded emotional, or affective commitment as the core essence of organizational commitment. Since committed workforce are the strength of any profession hence, teachers must be committed to ensure the quality of the education system.

Organizational Commitment of teachers has been related to job satisfaction (Hussain, 2014), occupational stress (Jamal, 2011), socio-emotional school climate (Jamal, 2012), self-efficacy (Coladarci, 1992; Chan et al., 2008; Klassen et al., 2013), self-esteem (Sentuna, 2015), workaholism (Narayan & Narashiman, 2016**;** Rakhshanimehr and Jenaabadi, 2015), and emotional intelligence (Anari, 2011; Shafiq & Rana, 2016; Tok,

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2017). Thus, there are many personal and environmental factors that affects organizational commitment of the teachers.

EMOTIONAL INTELLIGENCE

Emotions shape and provide directions to the thoughts of an individual. Whereas, emotional intelligence is the blend of mind and heart or connection of emotions and intelligence through which emotions can be used intelligently in dealing with various personal and professional problems. In other words, it refers to the ability to understand and regulate one's own emotions as well as the emotions of others to be successful in every sphere of life. Cooper and Sawaf (1997) defined emotional intelligence as the ability to sense, understand, and effectively apply the power and acumen of emotions as a source of human energy, information, connection, and influence. Goleman (2001) defines emotional intelligence as the ability to recognize and regulate emotions both within the self and others. Modern science is proving every day that it is emotional intelligence, not IQ or raw brain power alone that underpins the best decisions, the most dynamic organizations and the most satisfying and successful lives (Cooper & Swaf, 1977).

Emotional intelligence has been related with decision making (Chauhan & Chauhan, 2007), rural and urban school professional adjustment (Bose & Guha, 2018), self-esteem (Sahin, 2017), stress (Devi & Babu, 2015), teacher effectiveness (Mehta, 2013), occupational stress (Mehta, 2013), teacher performance (Wahyuddin, 2016) and teaching effectiveness (Tajudin et al., 2014; Hassan, 2015), etc.

RATIONALE OF THE STUDY

Committed teachers have positive outlook, self-motivation to work for the achievement of educational goals, desire to be good teachers, tendency to do extra effort to help the needy students, confidence to bring significant changes in students' lives, preseverence to deal with different circumstances effectively, as well as have obligation to be in profession. Therefore, it is necessary to know the factors that affect the organizational commitment of the teachers. However, emotional intelligence is considered as the basic requirement of any profession that is based on human relations and found to be positively related to the organizational commitment of the teachers. It helps in developing interpersonal as well as intra-personal relationship. It determines success and failure of the individual by regulating their behaviour. Since teaching is based on human relations and both organizational commitment and emotional intelligence are required for success in a profession hence they are of great importance. Moreover, there are a huge number of private schools in India. In these schools, teachers are over-burdened and paid less than the government teachers. But enrolment of students in these schools are increasing day by day. Although a few studies have been conducted to know the relationship of emotional intelligence and organizational commitment of teachers but researcher couldn't find a single study which studied the impact of Emotional Intelligence on Organizational Commitment of private secondary school teachers. Therefore, it is necessary to find out the answers of the following questions: Is there any relationship between emotional intelligence and organizational commitment of private secondary school teachers? Is there any impact of emotional intelligence on organizational commitment of private secondary school teachers? This study was conducted to get the answer of the above mentioned question empirically.

OBJECTIVES

The study was conducted with the following objectives

1. To know the correlation between emotional intelligence and organizational commitment of male and female secondary school teachers.
2. To know the impact of various components of emotional intelligence on organizational commitment of male and female secondary school teachers.

HYPOTHESIS

1. There would be no significant correlation between emotional intelligence and organizational commitment of male and female secondary school teachers.
2. There would be no significant impact of various components of emotional intelligence on organizational commitment of male and female secondary school teachers.

METHODOLOGY

In this study, organizational commitment was the dependent variable whereas emotional intelligence was the independent variable.

Sample

In this study, 250 teachers were taken from the private schools of Aligarh out of which 51 teachers were male and 199 teachers were female.

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Tools
Two scales namely Organizational Commitment Scale by Jamal and Raheem (2014) and Emotional Intelligence Scale developed by the researcher were used. The description of these two scales are as given below:

Organizational Commitment Scale
Organizational Commitment Scale (OCS): to measure the Organizational commitment of the teachers, researcher used Organizational Commitment Scale developed by Sajid Jamal and Abdul Raheem which was published by National Psychological Corporation, Agra in 2014. It is a 5-point scale and responses are recorded in the form of 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree'. It is a Likert type scale consisting 42 items based on four components namely commitment to school, commitment to teaching work, commitment to work group and commitment to teaching profession. Among 42 items, 21 are positive and 21 are negative in nature. For the scoring of the recorded responses in case of positively phrased items 5 will be assigned to 'strongly agree', 4 to 'agree', 3 to 'undecided', 2 to 'disagree' and 1 to 'strongly disagree' and the scoring procedure is reversed in case of negatively phrased items. The scale was highly reliable and valid as the authors claimed that the Chronbach Alpha was found to be 0.91.

Emotional Intelligence
Emotional Intelligence scale was developed by the researcher. It is a five-point Likert-type scale consisting 38 items based on five dimensions namely understanding one-self (7 items), self-control (7 items), empathy (6 items), social skills (7 items) and achievement orientation (11 items). The reliability of the scale was ascertained by obtaining the value of Cronbach Alpha i.e. 0.827 which was highly significant. The items of the scale were phrased negatively as well as positively. The respondents were required to put a tick mark against the most suitable answer in the form of 'Never', 'Rarely', 'Sometimes', 'Often' and 'Always'. For the scoring of the responses provided, 1 mark will be assigned to 'Never', 2 to 'Rarely', 3 to 'sometimes', 4 to 'Often', and 5 to 'Always' in case of positive items whereas 5 marks will be assigned to 'Never', 4 to 'Rarely', 3 to 'sometimes', 2 to 'Often', and 1 to 'Always' in case of negatively phrased items.

Statistical Techniques
In this study, Pearson product moment correlation and step-wise multiple regression was used to analyse the data.

ANALYSIS OF THE DATA
Pertaining to the first objective of the study correlation coefficient between organizational commitment scores and emotional intelligence scores was calculated and presented in the following table:

Table-1: Correlation between Emotional Intlligence and Organizational Commitment of Secondary School Teachers

Total Sample	Male Sample	Female Sample
.529**	**.576****	**.511****

It is evident from the above table that the correlation between OC and EI is significant at 0.01 level. In other words, an increase in emotional intelligence leads to an increase in organizational commitment of the teachers with the same proportion and vice-versa. In this way the first hypothesis of the study is rejected and it is concluded that there exists a positive correlation between Emotional Intelligence and Organizational Commitment.

Pertaining to the second objective of the study the stepwise multiple regression analysis was used and the data for the total sample, male sample and female sample are presented in the following tables 2, 3, & 4:

Table-2: Result of step-wise multiple regression analysis for the total sample

Predictive Variables	R	R^2	R^2 Change	F Change
Self-control	.467	.218	.218	110.819**
Self-control, Social Skills	.539	.291	.073	81.353**
Self-control, social Skills, Understanding Oneself	.549	.301	.011	56.963**
Self-control, social Skills, Understanding Oneself, Achievement Orientation	556	.309	.008	44.191**
Self-control, social Skills, Understanding Oneself, Achievement Orientation, Empathy	.558	.311	.002	35.600**

**significant at .01 level

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It is evident from the above table that the most important predictor for the organizational commitment of the teachers is self-control causing 21.8% variance followed by social skills 7.3%, understanding oneself 1.1%, achievement orientation .8% and empathy 0.2% respectively.

Table-3: Result of step-wise multiple regression analysis for the male sample

Predictive Variables	R	R^2	R^2 Change	F Change
Self-control	.613	.376	.376	60.259**
Self-control, Empathy	.647	.419	.043	35.652**
Self-control, Empathy, Understanding Oneself	.664	.441	.022	25.752**
Self-control, Empathy, Understanding Oneself, Achievement Orientation	.665	.442	.001	19.175**

**significant at .01 level

It is evident from the above table that the most important predictor for the organizational commitment of male teachers is self-control causing 37.6% variance followed by empathy 4.3%, understanding oneself 2.2%, and achievement orientation 0.1%.respectively.

Table-4: Result of step-wise multiple regression analysis for the female sample

Predictive Variables	R	R^2	R^2 Change	F Change
Social Skills	.468	.219	.219	83.165**
Social Skills, Self-control	.537	.288	.069	59.657**
Social Skills, Self-control, Achievement Orientation	.552	.304	.016	42.864**
Social Skills, Self-control, Achievement Orientation, Understanding oneself	.555	.308	.004	32.655**
Social Skills, Self-control, Achievement Orientation, Understanding oneself, Empathy	.555	.308	.000	26.050**

**significant at .01 level

It is evident from the above table that the most important predictor for the organizational commitment of female teachers is social skills causing 21.9% variance followed by self-control 6.9%, achievement orientation 1.6%, and understanding oneself 0.4%. Interestingly empathy 0.0% not has been found a significant predictor of Organizational Commitment of female teachers. Thus, the second hypothesis of the study is also rejected as there is a significant impact of emotional intelligence on organizational commitment of teachers and it is concluded that components of Emotional Intelligence have significant impact on organizational commitment of male teachers, female teachers and total sample.

DISCUSSION OF THE RESULTS

Findings of the study revealed that there is a significant and positive correlation between emotional intelligence and organizational commitment of private secondary school teachers and emotional intelligence significantly predicts the organizational commitment of secondary school teachers for male, female and total sample. It implies that teachers will be committed to their students, work, teaching and institution if they are emotionally intelligent. In other words, if teachers are emotionally intelligent they will be aware about their stengths and weaknesses as well as they will be open to students' feedback, others' criticism, ready for self-improvement, certain about their own capabilities, besides being self-confident, self-motivated, self-assured, and accountable for their works. They will be focused under pressure, have control over their actions and reactions in the classroom. They can handle different types of challenges of teaching learning process effectively as well as they will have strong bond with students and can recognize the need of the students, respond accordingly and inspire them easily. They have strong presence and persistence in difficult situations, have optimistic approach and do extra effort to help the needy students.

EDUCATIONAL IMPLICATIONS FOR THE TEACHERS AND POLICY MAKERS

- Since emotional intelligence can be improved hence organizational commitment of teachers can also be improved by emproving their emotional intelligence.
- For getting commited teachers in teaching profession it is necessary to pay special attention to the emotional intelligence besides focusing only on cognitive aspect of students at the time of their admission into teacher training courses. For this few questions of emotional intelligence should be asked in the B.Ed and M.Ed entrance tests.
- Emotional intelligence should be paid due consideration at the time of recruiting the teachers as it is one of the predictor of teachers' organizational commitment. For this interview should be a better tool to test the emotional intelligence of the teachers.

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- For improving the level of emotional intelligence and consequently the level of organizational commitment teacher trainees should be provided with a wide range of experiences in different social context during their practice teaching.
- If teachers develop their emotional intelligence it will make them committed by coping with emotional challenges.
- It reduces the tendency of teachers' burnout and turnover by enabling them to understand the students, develop better interpersonal relationship with them, understand their needs, maintain discipline and deal with students effectively.

SUGGESTIONS FOR FURTHER RESEARCHES

Due to paucity of time, researcher has taken only 250 private secondary school teachers teaching different subjects at Aligarh. It can be replicated on government school teachers and on a large sample.

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USER SATISFACTION REGARDING LIBRARY SERVICES: A REVIEW

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ABSTRACT
There is a deteriorating trend regarding utilization of library services. Online publications and plethora of information material has added to the woes of the user. The user becomes more confused. In view of the above facts a review paper has been written to understand the information needs of the user as well as to have an in depth insight into the service quality which will enhance user satisfaction. The review will further help to focus on the specific dimensions which will help to reduce the gap between the information sought by the user and the delivery of the same.

Keywords: Library, User Satisfaction, Library Resources, Service Quality

INTRODUCTION
Library is the store house of knowledge which is made up of collections of books, periodicals, films, recordings, computer databases and other media. The user is the most important person in the services provided by any library. The focus must be on how to make the user satisfied regarding library services. According to Nawarathne and Singh[1] understanding of the user needs is very important factor in providing information services in any library. The objectives of any library as per Aslam and Seher[2] are the identification and fulfilment of the needs of the users and to meet their satisfaction. The performance of any library can be evaluated on the basis of the extent of satisfaction of the users. Competitive pressures, information availability an increasingly aware and selective population mandate that libraries become more user focused. Salauddin[3] calls for a better understanding of the specific needs of library users in order to provide the appropriate type and level of service that meets those needs. Hence, there is a need to conduct the user surveys and researches more often to evaluate the existing resources and services.

REVIEW OF LITERATURE
A number of studies on the user satisfaction with library resources and service performance have been carried out by students and academic staff of various institutions all over the world. Beecher, Bren, Davis, Koose and Topp[4] undertook a survey to find out the level of University library users' satisfaction. The majority of the students, faculty and teaching academic staff who responded to the survey indicated satisfaction with the library's staff, resources, services, and facility. The areas receiving the highest percentages of satisfaction ratings from both faculty/staff and students were the staff (both demeanor and knowledge) and the facility (cleanliness and comfort). Areas receiving lower percentages of satisfaction were the quality of the collection, the library website, ease of finding and using electronic resources, ease of finding physical materials, and noise in the library. Bhat[5] has made an attempt to make the dimension-specific assessment of the SERVPERF instrument in the educational institutional libraries, and to measure the quality of library services in the library of University of Kashmir, Srinagar. The results of the study brought to light the interpretable service quality dimensions for libraries as empathy, access, reliability, understanding and responsiveness and tangibility. The overall qualities of library services provided by the library of University of Kashmir to its users are by and large satisfactory. Hassanain and Mudhei[6] have attempted to present the findings of an indicative assessment of the major technical and functional elements of performance, carried out on the main academic and research library of King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, Saudi Arabia. The study has determined the values of the satisfaction indices obtained for the 22 elements of performance, and identified the corresponding degree of satisfaction with each of the elements. Sahu[7] has attempted to explore the perceptions of the users of Jawaharlal Nehru University (JNU) Library, New Delhi, with regard to the quality service provided by it. A questionnaire was used as the data gathering instrument. SERVQUAL as a diagnostic tool was used to measure service quality. This study suggests that the users of JNU Library were largely satisfied with various aspects of services quality except responsiveness and communication. Gomathi and Dhanavandan[8] in a study evaluate the user's satisfaction of Government Engineering College, Salem. In this study most of the respondents were satisfied with the services. This paper reports the results of a survey of 178 patrons of an engineering library which demonstrate that (1) the construct is potentially useful for evaluating the performances of services within a library; (2) since the construct is affected by the demographic characteristics of the users, it should not be used to compare presumed levels of performance for libraries serving different communities, and (3) the construct is not related to the user's degree of library use. Mohindra and Kumar[9] in a study aim to assess library service quality (LSQ) associated with user satisfaction of AC Joshi Library, Panjab

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University, Chandigarh. A modified SERVQUAL instrument was used to examine perceived LSQ and level of user satisfaction. The data was collected through questionnaire consisting items related with different library service attributes. The study considered a number of critical elements of service quality assessment. It was found that library environment and library services significantly predict the user satisfaction. The level of quality of different attributes, i.e., library environment, collection, staff, and services were significantly different across academic discipline of respondents. Tiemo and Ateboh[10] investigated users' satisfaction with library information resources and services at the College of Health Sciences (CHS) library Niger Delta University, Nigeria. The objective was to determine the level of users satisfaction with library information resources and services. 2 (two) research questions were formulated to guide the study. The survey research design was adopted, using a population of 687 registered users in the College of Health Sciences Library. The sample size of 180 was selected through random sampling technique. The instrument used for data collection was a self-designed questionnaire. Among the results of the study showed that users were satisfied with the lending services of library, renewal of library materials and longer hours of internet services in the library. It was also revealed in the study that users were dissatisfied with the limited reference materials in their various subject areas, national and international journals because they were not up to date. Veena and Kotari[11] examined the user's satisfaction in library facilities, resources and services of the students of SDM College Library, Ujire. 300 questionnaires were distributed among students to collect relevant data. The findings of the study shows that 177(59.0%) of respondents have the habit to visit to the library daily, majority 260(86.7%) of respondents are highly satisfied with the collection of general books, majority 210(70.0%) are highly satisfied with collection of text books 160 (53.3%) respondents considered circulation services as excellent. The study suggested that college library should carry out user studies at regular intervals, in order to identify user's information needs and their information gathering behaviours. Singh and Kuri[12] investigated the user's satisfaction with library resources and services in IIT libraries in India. A survey research method was adopted to address the research questions. 800 questionnaires were distributed among final year graduate students, postgraduate students, research scholars and faculty members of 7 IIT libraries to collect relevant data regarding their satisfaction. 758 filled-in questionnaires were received and analyzed. On the basis of finding, some suggestions have included in this study to increase user's satisfaction from libraries. Ayanda, Ayanda and Ayangbekun[13] analysed user's satisfaction with the reference service in National Library of Nigeria, Lagos. The simple random sampling technique with questionnaire instrument was used for data collection on 100 users in the studies library, out of which 95 responded. The response rate accomplished was 95 percent. This study shows that the surveyed library (National Library of Nigeria, Lagos) provides services and facilities for its users. The study reviewed some of the studies carried out by dignified authors and researchers on reference services. The study also revealed that as much as possible the reference resources of the library are untimely utilized by users. The attitude of the library staff to the library users was excellent as shown in the research work. However, the areas where the library is lagging were also identified and recommendations proffered on how best to improve on the laxities. Maina, Masese, George, and Makwae[14] examined the usage and user satisfaction of library resources in Kisii University Library, Kenya. With the advent of mobile and computer technologies coupled with information proliferation, interest has been shifted to addressing changing users' needs. The target population comprised of all librarians and all registered library users in Kisii University. It employed ex-post facto research design. The study sample comprise of one hundred and ninety five (195) out of a population of one thousand six hundred and twenty five (1625). Questionnaires were used in data collection. The findings suggest that the both library staff and users to embrace automation, better marketing of library resources and user training to be done. According to Aslam and Seher[2] users are the significant component of any library. The identification and fulfilment of their needs and to meet their satisfaction are the objectives any library. Since the role of public libraries in rendering such goals is difficult to deny. This paper mainly focuses on the services provided by Liaquat Memorial library and satisfaction level of these services from user's perspective. The study focuses to help the librarians, information managers and the management in identifying the potential users of library as well as their information needs. It also help in making it clear how to perform relevant duties and serving the best possible way to satisfy their ultimate users attaining their satisfaction level and by diminishing the unsatisfactory elements of library. The study thus designed a Descriptive Survey and applied random Sampling Technique over 300 users of library. The questionnaire was used as a tool to collect data, where 250 questionnaires were received from respondents. Descriptive statistical methods were used to analyze the data where tables with frequencies and percentages are represented along with. It was discovered by the study that the library is playing vital role at some extent but many areas need to be revised to meet the expectation and intellectual needs of society. Jhamb and Ruhela[15] identify the level of satisfaction among the users of Delhi Public Library (DPL) towards its services, collection, staff, building and environment. To conduct fruitful study a survey method was adopted in which structured questionnaire was distributed randomly among the group of

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users. The data was analysed and interpreted with the help of Ms-Excel. It was found that majority of the users are satisfied with the different facets of the library and are of the view that other non-users may be encouraged to become the users of this library. So many studies have been conducted on Public library, there does not seem to be anyone covering the user's satisfaction level among the users of DPL, which works on imparting information and as local culture centre of the society. Salauddin[3] calls for a better understanding of the specific needs of library users in order to provide the appropriate type and level of service that meets those needs. The survey sought information on users' views of the Library's collections, resources, equipment, facilities, services and operation. This paper describes a comprehensive user survey carried out in Tagore Library, University of Lucknow Libraries as part of a strategic initiative to engage with library users to identify, evaluate and improve university library services. Two major user groups' full-time students and academic staff were surveyed and instrument was a hardcopy questionnaire. Overall, the library has received positive response from the participants. The paper suggests that for any reliable library effectiveness study, all factors associated with user satisfaction should be investigated together.

CONCLUSION

The review of papers brings us to the conclusion that there is a gap between the user expectations and library services offered. Various instruments like SERVQUAL and SERVPERF have been used to gauge the same and bring forth the point that in order to reduce the gap the various dimensions of library services have to be qualitatively improved. Fulfilling expectations will enhance customer satisfaction and loyalty. There is room for improvement in all dimensions i.e. increasing the sources of information, convenient access to these sources, relevant and useful information, good and ambient infrastructure. The library staff has a crucial role and need to develop empathetic attitude in order to make available the resources to the users and also ensure users' satisfaction by seeking clarity of the needs of the varied interests of the users. Improvements in library services will definitely improve the reading habits and help in the development of a knowledge society.

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E-LEARNING IN MODERN DIGITAL ENVIRONMENT: A PRAGMATIC PERSPECTIVE OF EDUCATION INSTITUTIONS

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ABSTRACT
E-Learning is the latest form use of Information and communication technology (ICT) to improve and expedite teaching and learning in education era. So education has reached most parts of the world and ICT has become an integral part of human life. For understanding and the real time access information E Learning provides quick reaction learner. E learning covers a wide set of application and accessibility is 24/7 of E- learning any person can attend class from anywhere and anytime via different communication protocols. This paper relates about three dimensions of e learning, advantages and disadvantages of E-learning and the future of E-learning. E-Learning has opened new avenues to education in India and has changed the dynamics of educational content.

Keywords: eLearning, Higher education, ICT, Internet.

SCOPE OF E LEARNING
E-Learning is very popular and significant subset in education technology because it offers an online learning and teaching platform to specific knowledge through the help of Internet technology in all over the world.(Brahma. 2017) The father of modern management Peter Drucker said that E-Learning is one of the fastest growing sectors in the world. E-Learning is very vast and it totally transform the education era. MOOC can't replace a college degree completely and it would not provide all the ability and talent which develop in actual environment. However a future expecting without classroom learning is undoubtedly conceivable. (Digit. 2018) Albert Einstein once said, "Education is what remains after one has forgotten what one has learned in school." While Einstein's words may have been intended in good humour, they aptly reflect the fact that effective education is, indeed, constant and always evolving. In fact, the face of education has experienced a sea change over the decades. Once characterized by the traditional classroom model, education today has metamorphosed into learning that is instant, online, self-driven and on the go. The journey of education in India, too, has been dotted with innumerable milestones—most recently, e-learning. Today, with moving times, basic education is also taught through computer in urban as well as rural villages and has helped to enhance the knowledge of children to get exposed from primary levels of education.

INTRODUCTION
E-learning is that form of learning which uses a network for delivery, interaction or facilitation. E-learning is comprised of the following elements.

1) Content delivery methods which have three methods i.e. live broadcasting, video on demand and interactive communications.

2) Authoring tools which are software products to create content and

3) Learning management systems which allows learner to check and assess individual progress and performance.

Thus, the use of modern technology such as satellite communication, internet and electronics is the only alternative available to enhance and improve the quality of higher education. However, the application of technology does not change how people learn, it changes the way in which they can be taught (Horton, 2000).

There are some advantages of e-learning, that unit of measurement connected to today's structure, the stylish methodology of life and economic state of affairs. These positive characteristics one will even mention in today's fast adaptation to promote place desires, the quick innovation of data content, the short communication with big target groups and their employment. Regarding the economic facet, e-learning could also be a very effective kind. Jointly positive feature is that in today's data society, changed teacher and student roles, and manage digital citizenship innovative ways in which. Though the first on-line course provided via satellite transmission are typically derived back to 1985, in 1993 Jones International University became the first university that existed completely on-line. However, the online education trend didn't catch up until rich later, once in 2009 varied very little schools across the world started giving degrees that may be earned with nothing but an internet association.

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DIMENSIONS OF E-LEARNING

E-Learning is dependent on ICT and digital technology can enable the students to join same common classes from any part of countries and they can questions and answers about their query. The digital technology bring student's performance in better ways to create possibilities beyond the limits of our current imagination. Here describe the three major dimensions for E-Learning such as.

- **Digital Devices:** a digital device is also any electronic technology such a Computer, laptop, tablet, smartphone, as well as helpful technology, that students use to support learning. Device is also closely-held by the code or provided by the establishments. Each and every student has access to a digital device to support their learning at a standard time. Digital device initiative permits access extends on the far side the classroom whereas students will use their device for learning anyplace, anytime.
- **Internet: Tim Berners -** Lee introduced the "World Wide Web" obtainable to the general public since the web has already become integral a part of way of life for many of the world's population. The worldwide future is developing through communications, collaboration and innovation all of that square measure addicted to technology. The web is currently a worldwide marketplace, a worldwide space and a worldwide facility from any a part of countries with multiple laptop systems will share societies to society's information and study the globe.
- **Cloud:** cloud computing technology will function a reservoir of knowledge that students will access after they square measure connected through their own mobile devices or PCs. the employment of cloud of E-learning permits the learners to access the training applications and courses while not the necessity of any installation on their own devices. The users now have to be compelled to worry concerning maintenance or upgrades as those square measure handled by the cloud vendors. Cloud based mostly E-learning could be a safe choice as a result of the package also because the knowledge reside on remote while not the trouble of maintaining an oversized server and knowledge storage farm.

ADVANTAGES AND DISADVANTAGES

- **E-Learning Advantages**

E-Learning helps to educational institutions and students because Colleges don't have to provide students with space for learning and student don't have to travel somewhere to gain education.

All recorded lectures can be used for a long time and easily available on online repository when the need comes.

E-learning allowing students to complete courses created by world's best universities, who cannot coming from the other country for certain courses. Students are also able to interact with everyone online and also clear their doubts if any.

Due to its convenience and flexibility, students can study from any place at any time they find comfortable and they can organize their time more effectively. Training can be provided in small digestible chunks right at learner's fingertips

E-learning reduces overall cost once it developed, the course can be run as many times, at as many locations and for as many learners

At the point of view from learner they can be taken in one go or in parts; also any parts that are not understood can be run again & again for better understanding.

- **E-learning Disadvantages**

For E-learning people have required infrastructure such as computers, internet access and that are powerful enough to sustenance online streaming. Sometime lack of relevant technical skills in learners would greatly obstruct success of an E-learning courses.

For some students they cannot be socialize with other students, cannot make new friends, and to learn something more from their professors. That's why some students might feel lonely and depressed of support.

The feedback is one of the mirror of students' growth. They still might not have enough time to work with them properly, this could lead to some students falling behind, having gaps in their knowledge, and not completing the course successfully enough.

disadvantages of eLearning is, you get knowledge only on a theoretical basis and when it comes to placing to use whatever you have learnt, it may be a slight different. The face-to-face learning experience is missing, which may matter to some of you.

The authenticity of a particular student's work is also a problem as online just about anyone can do a project rather than the actual student itself.

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Start-up cost involved in designing, developing and deploying a course despite these, eLearning continues to grow in popularity and is considered as an effective training delivery method. Face-to-face training will certainly be more.

E-LEARNING TECHNOLOGIES

In current trends there is four services will be the pillar of e learning in future: Smartphones, Social Media, Cloud and Information. These services create demand for IT infrastructure and it will affect the trends, initiatives, plans and programs. Hear the e-learning technologies of future:

- **M-Learning**

As computers and the internet become necessary educational tools, the technologies become more handy, affordable, operative and easy to use. M-learning the terms refers to the use of mobile and hand held IT devices, such as individual digital assistants mobile, smartphones and tablet, PC technologies, in teaching and learning.. This offers many opportunities for spreading participation and access to ICT, and in particular the internet. Mobile learning presently very useful as an enhancement to ICT, web learning and traditional learning techniques.

- **Cloud-based learning**

Cloud-based is a term that refers as services or resources which are available to users on demand through the Internet from a cloud computing provider's servers. Generally hardware and software are used in Cloud Computing to deliver a service over an Internet. User can get their files and document from any device through internet. The future of cloud computing is a unique planning based on the Computing Cell that constantly delivers best-of-breed software infrastructure, including encryption, validation, network division, data reliability and data management across multiple public clouds.

- **SaaS authoring tools**

Yet another hot trend on the rise. SaaS is basically enterprise software hosted in a cloud, which translates to easily downloadable software, virtual updates, massive savings in costs and time and so much more. According to a recent survey by Mint Jutras, more than 45% of all software will be SaaS by the year 2023.

- **HTML5**

According to Gartner, within 2014 “improved JavaScript performance will begin to push HTML5 and the web browser as a mainstream enterprise application development environment”. The benefits include, but are not limited to, better performance, multimedia and connectivity. The use of HTML5 in was 100% increase in 2013 compared to 2012.it eradicates the need for multiple application HTML5 appears very famous platform in mobile creators.

- **Tin Can API, aka xAPI**

One of the foremost thoroughly analysed topics amongst learning professionals nowadays. It allows the gathering of information a few big selection of learning experiences an individual goes through. It depends on a Learning Record Store, and it overcomes the bulk of limitations of SCORM, that was the previous commonplace. For additional info regarding what you'll be able to do with the Tin will API please see Discover easy Communication with Tin will API? I think its incalculable sensible implementation aspects and can evolve even more, revolutionizing the method we have a tendency to learn, making additional personal and richer learning environments. Perhaps is that the technological resolution for the individualised Learning Plans in eLearning. Last however not least, I extremely encourage you to browse the however Tin will is creating Tools higher, along article.

EXPLORING THE SCOPE IN INDIA

The quick growth in Internet connectivity in the last few years has been a significant catalyst for the growth of e-learning in India. Indian enterprises are implementing e-learning platforms at a rapid pace to support both short term courses and qualification-focused learning objectives among their staffs. Indian Internet users estimated to reach 250 million this year, equalling the US and second only to China, India’s likely as a huge market for e-learning is enormous. India’s education system, already one of the largest in the world with a network of more than one million schools and 18,000 higher education organisations. Moreover, a huge number of new users are accessing the Internet for the first time from their smartphones, which is a best, custom-made and commerce-enabled platform for e- learning acceptance. Another important advantage is that people living in minor towns and cities can get access to the best possible learning resources from across the world, at a very affordable price.

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BENEFITS OF ELEARNING FOR STUDENTS

Today's learners need relevant, mobile, self-paced, and personalised content. This would like is consummated with the web mode of learning; here, students will learn at their own comfort and demand. Let's have Associate in nursing analytical check out the benefits of eLearning learning.

The online methodology of learning is best fitted to everyone. This digital revolution has crystal rectifier to exceptional changes in but the content is accessed, consumed, discussed, and shared. eLearning courses is also preoccupied by geographical point goers and housewives too, at the time that suits them. Looking forward to their availability and luxury, many people choose to learn at weekends or evenings.

At the time of revision once making ready for Associate in nursing communicating, with eLearning you'll be able to access the content of lectures a limitless variety of times. As compared to ancient room pedagogics eLearning may be a thanks to give fast delivery of lessons, means that the time needed to find out it reduced

Students will prefer to study specific in their relevant spaces of the training material while not specializing in each area. If they are doing not need to find out on some areas they will skip and move. Through eLearning the learners get higher degree of coverage to flow into the message to focus on audience. In compare to ancient learning eLearning is incredibly value effective learning system. Thanks to the price effectiveness is additionally helps in enhancing the profit of a corporation

CONCLUSION

As eLearning may be a paperless method of learning it protects the setting to tons of extent. As per a study done on eLearning courses, it's been found that distance-based learning programs consumed around ninetieth less power and generated eighty fifth less quantity of greenhouse emission emissions as compared to ancient campus-based instructional courses. With eLearning, there ought not to cut trees for getting paper. Thus, eLearning may be an extremely eco-friendly method of learning. In underdeveloped and developing countries, e-learning raises the extent of education, literacy, and economic development. This can be very true for countries wherever technical education is pricey, opportunities are restricted, and economic disparities exist. Due to the wide set of advantages it offers to students, eLearning has become quite common and appreciated among students everywhere the planet. All these will mean one issue solely. The long run of eLearning is bright. All we've to try to is encourage new eLearning strategies to flourish and older eLearning techniques to evolve.

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RISING SKEPTICISM TOWARDS DAMS: A STUDY OF THE BEGINNING OF ANTI-DAM MOVEMENT IN ASSAM

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INTRODUCTION

According to sociologist Charles Tilly, "social movements are a series of contentious performances, displays and campaigns by which ordinary people make collective claims on others. Social movements are a major vehicle for ordinary people's participation in public politics". Sidney Tarrow defines a social movement as "collective challenges (to elites, authorities, other groups or cultural codes) by people with common purposes and solidarity in sustained interactions with elites, opponents and authorities." Sociologists John McCarthy and Mayer Zald define as a social movement as "a set of opinions and beliefs in a population which represents preferences for changing some elements of the social structure and/or reward distribution of a society."

The current boom in construction of dams worldwide and the failure to mitigate their negative impacts like dam-induced displacement, flashfloods etc have led to anti-dam movements throughout the world. The movements against building of hydropower projects started worldwide in the mid 1980's. These movements are mainly headed by environmentalists, social activists and the common masses that bear the brunt of displacement due to development induced projects. The Mulshi Satyagraha referred to as the world's first[1] anti-dam movement took place in the 1920's. The protest was organized in Pune, India by the peasants of Mulshi Peta against the construction of a dam which was being built with government support by the industrial house of the Tatas. There have been worldwide anti-dam campaigns especially in India, Myanmar, Thailand and Southern Brazil. The Narmada Bachao Andolan[2] of India headed by Medha Patekar is considered one of the most powerful mass movements worldwide. Northeast India too has faced a series of social movements against a gargantuan network of almost 200 dams being encouraged in the region. Assam, Arunachal Pradesh, Manipur, Sikkim and Tripura had faced protests against state government's policy of building large dams organized by different organizations in the respective states. The anti-dam movement in Assam organized by peasant and student organizations was the strongest among all. Some have considered that it has surpassed even the Narmada Bachao Andolan in terms of numerical strength. This paper seeks to locate the anti-dam movement in Assam, its emergence and how it gained momentum eventually. It also proposes to look into the environmental and social impacts that the dam has caused and also its probable impact in the long run.

METHODS

A case study method was chosen as a research design to analyze the anti-dam movement in Assam. To develop a narrative regarding the movements presented in this paper, structured interviews were conducted with anti-dam activists involved with the movement in Assam. NGO reports, Assam Assembly debates have also been used. The Lower Subansiri Hydroelectric project site was also visited which also helped in getting some observations. Along with those secondary sources like books, articles, magazines and newspaper cuttings have also been used.

ANTI-DAM MOVEMENT IN ASSAM

In order to build the 30m high Gumti Dam constructed across the river Gumti in upstream of Tripura's Tirthamukh district, a fertile valley area of approx 50kms was submerged. The dam which would produce 10MW electricity had displaced 2558 families according to official records while according to unofficial records around 8000-10,000 families were displaced[3]. Due to the commissioning of another project, the Dambur Hydroelectric Project, large arable areas inhabited by tribals in Raima valley was also submerged. Thus protests against the dam were started as early as 1976[4]. According to the orders of the Supreme Court with regard to the Lower Subansiri Hydroelectric Project, the NHPC would have to ensure that during the construction phase of

[1] The Hindu, "The World's First Anti-dam Movement", July 06, 2008. Accessed on 23/11/2018

[2] Narmada Bachao Andolan (NBA) is a social movement consisting of adivasis, farmers, environmentalists and human rights activists against the number of large dams being built across theNarmada River, which flows through the states of Gujarat, Madhya Pradesh and Maharashtra initiated by its spokesperson Medha Patekar and Baba Amte.

[3] Dams, Rivers and People: Update on Related Issues, SANDRP, February 2003. p. 7.

[4] Ibid. p.7

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the dam there cannot be any siltation down the Subansiri River. Also the spillage and diversion channels would have to be maintained as 'fish ladder'[1]. "A fish ladder is a structure on or around artificial and natural barriers (such as dams, locks and waterfalls) to facilitate diadromous fishes' natural migration" (Wikipedia). In spite of the order passed by the Supreme Court, traces of siltation were observed in the Lower Subansiri River. Furthermore according to locals residing in and around the area, certain species of fishes were no longer available, for passage of fishes was hampered after the construction of the dam, let alone facilitating natural migration of fishes. Aquatic species, especially fishes living downstream of the dam have more chances of being washed away due to sudden release of water for generation of power. The Subansiri Basin which is rich in fish and other aquatic animals will be adversely affected due to the construction of the dam as it would obstruct the migration of fishes thus posing a great threat to aquatic life of the Subansiri Basin. "Any development process without taking into cognizance the environmental safeguards may cause irreversible damage to the region"[2]. The Subansiri Basin is a storehouse of a number of aquatic species, fishes, river dolphins, turtles etc and is the habitat to a wide and diverse range of species. "The river Subansiri is considered as a safe haven for the river Gangetic Dolphins (Platanista Gangetica), declared as a State and National Aquatic Animal in 2008 and 2010 respectively. In certain areas, local fishermen take help of these dolphins for co-operative fishing- a Traditional Indigenous Knowledge System (TICS) technique where both fishermen and dolphins complement each other and benefit accrues to both the fishermen and the dolphins"[3]. The Subansiri River has 169 varieties of fishes and a number of migratory birds and is also home to the Gangetic Dolphins, the National Aquatic Animal[4]. According to a newspaper report[5] the residents of Assam fear that in order to produce electricity the 116m high Lower Subansiri Hydroelectric Project would bring grave danger to the areas of Dhemaji, Lakhimpur, Majuli and Jorhat in future. The report says that on 28th January, 2008, due to a landslide in the dam site, a tunnel got blocked. Official record shows 3 workers died inside the tunnel after blockage while unofficial record claims the number of death to be six. Along with that the landslide caused the L.N.T Cement factory located in a hill to collapse into the Subansiri River. In spite of the decision to keep construction of the dam at halt as decided in the tripartite meeting held among experts from Gauhati University, Dibrugarh University and IIT Guwahati, due to the state government's carelessness, NHPC restarted the construction work which has ultimately led to the death of those workers. According to another newspaper report, due to incessant rainfall, a 200m concrete of the Lower Subansiri Dam broke off and was washed away in the river. During the same time slope failure was also observed in the dam site[6]. Slope failure in the dam site can be a big threat to the dams. Slope failure causes accumulation of silt in the ground level which might create trouble in the catchment and the probability of malfunctioning of dams becomes high in such cases. The deposit of silt may lead to ground loss which in turn might increase the bed level of the reservoir and thus create hindrance in power generation. Due to the increase in water level, has to be released from the spillway which might inundate certain areas or might also create flash floods in the downstream areas, depending on the intensity of water. In 2002, the All Assam Students' Union (AASU) and a few other NGOs rallied against the construction of mega dams in Assam. They were able to pressurize the government to take up an expert study on the dam site. According to the expert study report, "The selected site for the mega-dam of the present dimension was not appropriate in such a geologically and seismologically sensitive region. Therefore, it is recommended not to construct the mega-dam in the present site" (Sharma, 2002)[7]. But the Assam government completely ignored the report and its probable downstream impacts and continued with the construction of the dam. On December, 2011, almost 3000 activists led by

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1 SC order on Lower Subansiri, 19-04-2004. Source: Tularam Gogoi, anti-dam Activist, Assam.

2 Sudipto Chatterjee (et. al), "Biodiversity Significance of North East India for the study on Natural Resources, Water and Environment Nexus for Development and Growth in North Eastern India", WWF-India, 172 B Lodi Estate New Delhi, 30 June, 2006, p.7

3 BEFORE THE NATIONAL GREEN TRIBUNAL EASTERN ZONE BENCH, KOLKATA . ORIGINAL APPLICATION No. 346/2013/PB/9/EZ WITH M.A. NO.1088/2013/EZ & M.A.06/2014/EZ M.A. NO. 85/2015/EZ & M.A. NO.828/2016/EZ p.5 , Source: Tularam Gogoi, social activist.

4 Ibid p.5-6

5 Dainik Jagaran, "Namoni Subansiri Jolbidyut Prakalpat Bhumiskholon: Mritokor Honkya 6jonloi Briddhi", January 31, 2008.

6 Dainik Jagaran, "Uti Gol Namoni Subansiri Jalbidyut Prakalpar Okangkho", 15 June, 2008.

7 Sharma, Tanmoy March 2002 "Fighting India's Mega Dams". https://www.chinadialogue.net/article/show/single/en/4799-Fighting-India-s-mega-dams Accessed on 15/10/2018

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KMSS and AASU held protest[1] in the Lower Subansiri Dam site and blocked the vehicles carrying equipments towards the dam site. The intensity of the movement was so high that the government was forced to come down to negotiation with the agitators. After several meetings, the construction of the Lower Subansiri Dam was decided to be put at halt since 2011.

MOVEMENT LEADERSHIP AND ORGANIZATIONS

No single activist or organisation can be attributed to have been more instrumental in the campaign but a joint effort of a number of organisations led to the success of the movement. The peasant organisation called Krishak Mukti Sangram Samiti (KMSS)[2] played a vital role in organising non-violent protests against the Lower Subansiri Hydroelectric Project. The student organization All Assam Students Union (AASU)[3] has also been vehemently opposing the construction of big dams in Assam. Some of the other organisations who have played a major role against the construction of dams in Assam are All Assam Students' Union, All Assam Tribal Youth League, Mising Mimag Kabang, All Bodo Students' Union, All Rabha Students' Union, All Mising Students' Union, All Tiwa Students' Union, Tiwa Youba Chatra Parishad, All Tai Ahom Students' Union, All Dimasa Students' Union, Assam Tea Tribes Students' Association, All Koch-Rajbangsi Students' Union, All Assam Motok Youba Chatra Sanmilan, All Assam Moran Students' Union, All Assam Deori Students' Union, All Karbi Students' Association, All Assam Adibashi Students' Union, All Assam Chutia Students' Union, All Assam Gorkha Students' Union, All Assam Sonowal Kachari Students' Union, All Assam Sarania Kachari Students' Union, N.C. Hills Indigenous Students' Forum.

DISCUSSION

A gargantuan network of 168 dams to generate hydropower is coming up across Arunachal Pradesh which is expected to generate almost 100000 MW of power in the entire northeast region. In the peak hour, 450 MW(approx) of electricity would be essential in running all the industries and lighting almost 26000 villages for 24hours. In fact, in order to electrify the entire northeast India, maximum of 20,000 MW of electricity would be essential[4]. So that explains that the political bodies and the elitists would be reaping the benefit of these hydropower projects by selling off electricity to other mainland states. Thus the elite class is putting the lives of the common people at stake for their own benefit by completely brushing aside social and environmental impact of these dams. Northeast India is seismically one of the six most active regions of the world. It is placed in zone 5, the highest zone, of the seismic zonation map of India.[5] The region has also experienced huge earthquakes including the 1950 Assam earthquake which was one of the most powerful earthquakes of the 20th century whose epicenter was in Tibet. The earthquake left its trail in the Subansiri River by causing deluge and inundating several villages. But now both the government of India and China are hell bent in building a network of dams in and around the same area by completely brushing aside its negative impact. Besides, the location of the dam in the Siwalik Mountains of the Eastern Himalayan foothills makes it unsuitable for construction of a dam of such high magnitude. The loose soil of the mountain makes the probability of breakage or any malfunctioning of the concrete quite high.

CONCLUSION

If we trace back history we will realize that the strongest social and environmental movements in India have centred on dams and displacement. Around 40 to 80 million people have been displaced worldwide due to the construction of dams, the majority of them in China and India[6]. Jawaharlal Nehru, the first Prime Minister of independent India had called dams as the 'Temples of Modern India' since it was believed to have brought development to the newly independent nation. Some of those who had been displaced in the name of dam building during Nehru's regime have yet not been rehabilitated till date. Besides, dams have serious

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[2] Krishak Mukti Sangram Samiti (KMSS) is a peasant organization based in Assam, formed by Akhil Gogoi in 2005.

[3] All Assam Students' Union or AASU is a students' organization in Assam, India.

[4] Information given by Kamal Kumar Medhi, a social activist in a structured interview conducted on 12/03/2018

[5] R.P. Tiwari, "Status of seismicity in the northeast India and earthquake disaster mitigation" Envis Bulletin Vol10(1): Himalayan Ecology, January, 2002.

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environmental and ecological impact, impact on migration of fishes and other aquatic lives. Dams also hamper the traditional livelihood pattern of indigenous and tribal people and force them to disrupt their link with nature and therefore they consider dams as a threat to their socio-cultural fabric. Therefore large dams soon came to face resistance and criticism from local people, environmentalists and activists.

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IPO UNDER-PRICING AND POST LISTING PERFORMANCE- AN ANALYTICAL STUDY ON INDIAN IPOs

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ABSTRACT
Investing in Initial Public Offering (IPO) can open a numerous finance gates for any business .It is a route for companies to raise money from public to meet their capital requirement or for debt payment. Once these securities are issued it will get listed in the stock market and start getting traded. It gives the investor a chance to directly buy the shares from the hands of the company. The price difference between investors willingness and companies price decision usually results in under-pricing.It also tries to evaluate the long term performance of the IPOs. The thesis opted for an explanatory study using the secondary data. The study finds that the extent of under-pricing can be identified by analysing subscription rate. Also it reveals a positive correlation between initial gains and long term performance.

Keywords: Initial Public Offer, Under-pricing, Subscription Rate, Wealth relative.

INTRODUCTION
The prime need of an IPO arises when a company requires money to expand and grow. This is done by borrowing or issuing shares and if the company decides to issue shares, it must invite public investors to buy its shares. This is known as the company's first public invitation in the stock market and is thus called the Initial Public Offering. The Securities and Exchange Board of India (SEBI)controls and manages the complete process of IPO..IPOs market is witnessing tremendous growth which is an indication of growing economy. Research on IPO in different markets for different industries has focused on under-pricing and shows that the under pricing is evident in case of book building route. Under-pricing and overpricing are phenomenon that usually take place in an IPO. Under-pricing is a situation when the offer price is lower than the price of the first trade whereas overpricing is a situation where offer price exceeds the closing price. When the markets are in an uptrend or growth trajectory it becomes very difficult to identify fundamentally strong companies when everything sells like a hot cake. Therefore , timing of an IPO is a very important factor .One should find out which stocks to invest in. Stock selection in investing becomes more complex and important because the investment horizon is too long usually more than a year or so and fundamentally to identify the trend reversal is always very difficult. This is the reason why stock selection has left many investors with burnt fingers even in long-term investment, so it is important to analyse and understand the performance of IPO of different companies under different sectors. It gives the investor an idea as to which sector is performing well.

Difference between first day closing price and the offer price occur mostly due to the wrong pricing decision of the shares.So, the most important concept in IPO is the valuation. If the IPO is overvalued it might result in under subscription and if its undervalued it will give huge initial gains.Fair valuation is important to create faith and trust in the investors. Several studies has been undertaken on the topic under-pricing and IPO mispricing. Also, there is need to look into the long term performance of the IPOs. There is general misconception that the IPOs usually underperform in long run. So it is important to look into long term performance and the causes for the underperformance.

REVIEW OF LITERATURE
1.Edward Wong Sek Khin,(Malaysia,2016) tries to find the relationship between size of the offering,market volatility between reciprocal of the IPO subscription price and the underpricing.The primary purpose of this paper is to analyse the existence and magnitude of the under-pricing phenomenon and postlisting performance of IPOs listed in Bursa, Malaysia from 2008 to 2016.Moreover,this study aims to provide an insight into the relationship between IPO initial and long-term stock performance and the four main determinants influencing under-pricing, namely IPO size, market volatility,underwriter status and the reciprocal of IPO price. The study concluded there is under-pricing in the Malaysian market.

2. Bala G Dharan and David L,(New York, 2006) tries to find out the reason behind long run negative drift in American stock market and re examine the nature of post listing returns controlling for biases which may affect post listing performance. The post listing drifting is larger in magnitude and longer in duration and concludes that the negative trend is more visible in smaller firms that are not widely held by institutional investors.

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RESEARCH METHODOLOGY

The study was undertaken to analyse the financial performance of IPO companies and sector wise performance. Public offers made through NSE from the period April 2014 to March 2015 under the book-building process was considered. There were 25 IPOs through the NSE during the period from April 2014 to March 2015.In this study, selected the IPO during this time because it helps in measuring both long term and short term performance. The data was collected from secondary sources of information, mainly from websites of NSE.Websites which provided reliable data was also referred to countercheck the data during the study. The study was mainly analytical and partly descriptive in nature

OBJECTIVES OF THE STUDY

- To identify the extend of under-pricing in Indian IPO market
- To assess the long-term performance of IPOs in India
- To identify the factors contributing towards the success of IPOs

DATA ANALYSIS

Sales and Gross Proceeds of Sample offers Categorized by Industry

Gross proceeds mean the amount of money raised by the company from public as part of the IPOs. Both Sales and Gross proceeds are expressed in crores.The below table shows the quantum of fund raised by different sectors from primary market in the year 2015 and their sales numbers

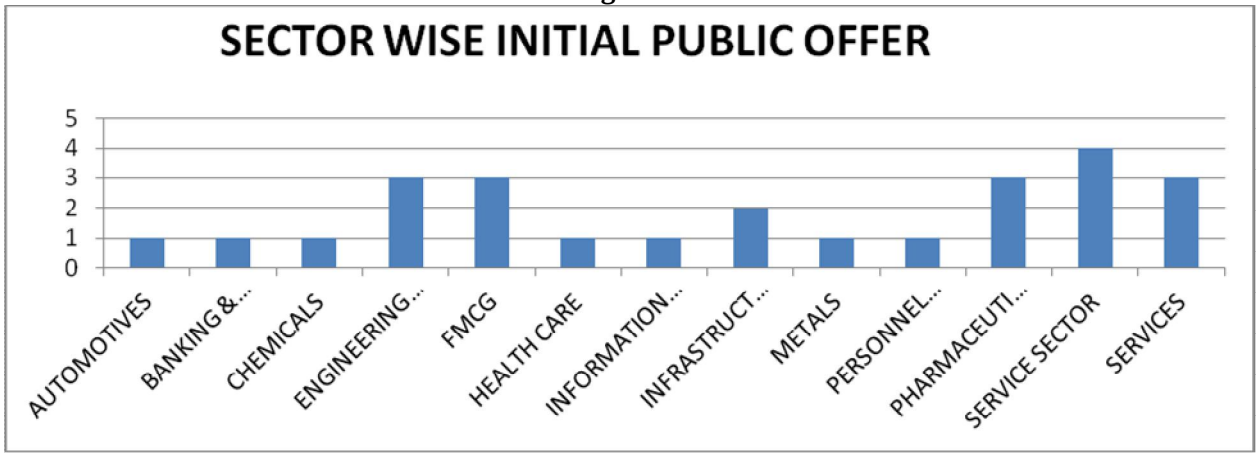
Table-1

Industry	No. of offers	Annual Sales (in Cr.)	GrossProceeds (in Cr.)
Automotive	1	426.85	410
Banking & Financial services	1	1698	2159
Chemicals	1	360.88	70
Engineering & Capital goods	3	2672.76	1043.22
FMCG	3	5921.45	1850
Health Care	1	2117.64	613
Information Technology	1	289.73	450
Infrastructure	2	5582.76	749
Metals	1	540.94	156.19
Personnel care	1	1027.74	200
Pharmaceuticals	3	8467.35	2537.6
Service Sector	4	7374.25	1835.56
Services	3	22723.28	4067
Grand Total	**25**	**59203.63**	**16140.57**

Maximum listing has happened in the Service sector .The least quantum of fund is raised by the chemical sector. In total ,25 companies have raised a gross amount of 16140 crores from the IPOs market in the year 2015

SECTOR WISE INITIAL PUBLIC OFFER

Figure-1



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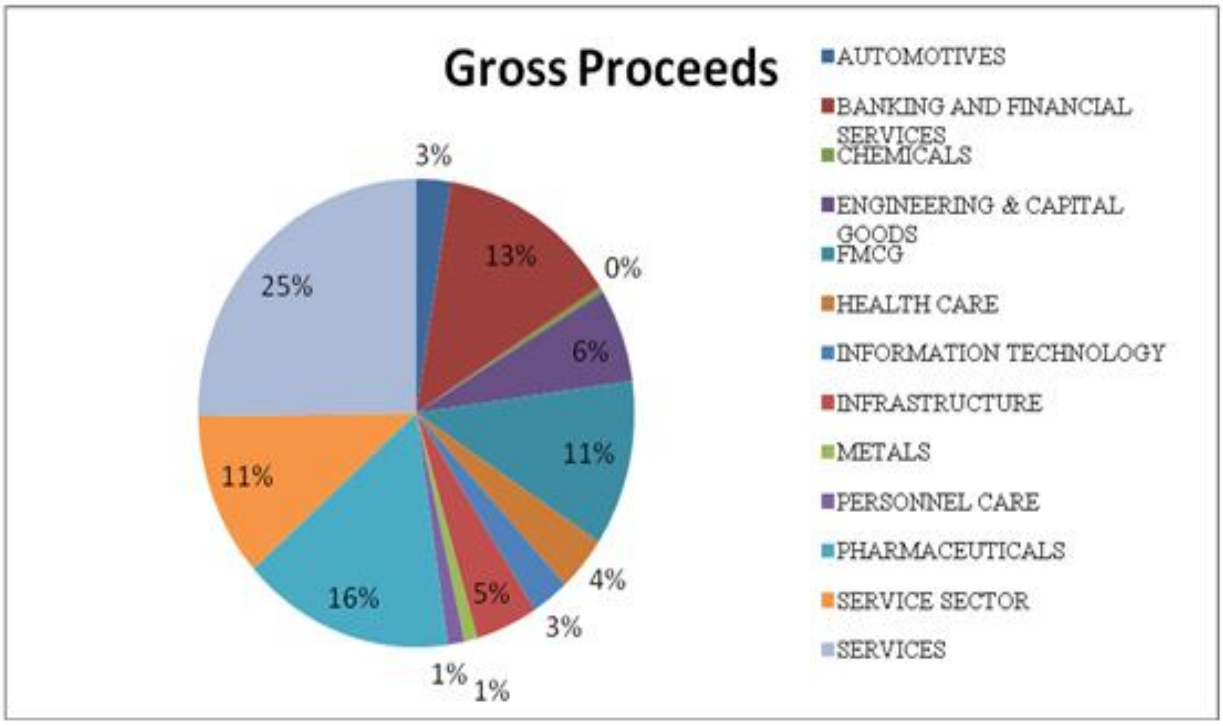
SECTOR WISE GROSS PROCEEDS

Figure-2



Ordinary Least Square regression results with the market adjusted initial return as the dependent variable

Return=b0 + b1SB + b2BM + b3Rev + b4SubRate + el

Return is the Market adjusted initial return. Market adjusted return is calculated by subtracting market return on the listing day from the initial gains.SB stands for Size of the business which tells about the total market capitalization at the time of listing. BM stands for the business model given as value for companies having established business model and a proven track record of performance before listing.Rev is the total revenue of the firm at the time of listing.Subsription Rate stands for the number of times issue got subscribed at the time of listing.

DESCRIPTIVE STATISTICS

Table-2

	Mean	**Std. Deviation**	**N**
Initial Gains	2.52	1.610	25
Size of business	3.08	0.640	25
Business Model	0.72	0.458	25
Revenue	1.80	0.866	25
Subscription Rate	2.24	0.779	25

MODEL SUMMARY

Table-3

Model	**R**	**R-Square**	**Adjusted R-Square**	**Std.Error of the Estimate**
1	0.699	0.489	0.479	1.439

The table provides R and R-square values represents the simple correlation whose value is 0.699 which indicates correspondingly high degree of correlation-Square value indicates how much of the total variation in the dependent variable i.e., initial gains can be explained by the independent variables(Subscription Rate, Business Model,Revenue,Size of Business)whose value is 0.489 which is considerably small. In the case of multiple regression, Adjusted R-Square is more appropriate to use than the R-Square. The Adjusted R-Square tells that only 47.9% of variance in initial gains is impacted by the independent variables.

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COEFFICIENTS

Table-4

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std.Error	Beta		
(Constant)	-2.943	3.270		-900	.379
Size of Business	.646	.791	.257	.817	.042
Business Model	-.049	.689	-.014	-.071	.944
Revenue	1.058	.570	.569	1.856	.078
Subscription Rate	.717	.385	.347	1.860	.048

Dependent Variable: Initial Gains

The coefficient table helps us to predict initial gains from Subscription Rate, Business Model, Revenue, Size of Business. The coefficients provide the values for b0, b1, b2, b3 and b4 for this equation. Expressed in terms of the variables used in this model, the regression equation is

Return= -2.943+ .646(SB) -.049(BM) +1.058(Rev) +.717(Sub Rate)

AFTER MARKET PERFORMANCE CATEGORIZED BY INITIAL RETURN

Initial gains are the difference between the listing price and the offer price of an IPO. Here, taken the closing price on the day of listing as the Listing price. Then adjusted the initial gains along with the performance of the nifty during the time and arrived at the average adjusted initial return. There is tendency for firms with high adjusted returns to perform badly in the long-term.This is due to the fact that the over optimism in market results in huge listing gains and subsequent underperformance of company results in erosion of wealth. But the sample taken prove it the other way around. It says that there exists a positive correlation between initial gains and the long term performance. It has shown a positive correlation of 0.36

Table-5

Average Adjusted Initial return	No. of offers	IPOs 2-year total return	Matching firm 2-year total return	Wealth Relative
-20- -6.94	1.00	-56.73	21.00	-2.53
-6.94- -4.94	1.00	22.19	37.10	0.61
-2.94- -0.93	8.00	28.25	55.14	0.52
-0.93-19.06	7.00	45.16	33.49	1.34
19.06-39.06	6.00	64.00	12.53	4.80
39.06-59.06	2.00	81.97	0.35	61.46

Among the sample taken, the stocks which have given initial gains above 40% have performed well in the long term. The stocks which have given positive listing day gains have continued to perform better and created good amount of wealth for its investors. The stocks which have given negative listing continued to perform badly. So, the initial gains in the market cannot be over reaction, it clearly predicts the future and the performance of the company in the long run.

Table-6

	Segmented Gross Proceeds(in crores)		
Adjusted Initial Return	0-1000	1000-2000	2000-3000
-20.94 - -6.94	-2.53		
-6.94 – 4.94	0.61		
-4.94 – 0.93	0.33	-0.11	
-0.93 – 19.06	0.73		3.29
19.06 – 39.06	-1.77	5.59	0.62
39.06 – 59.06	0.55		

The above cross sectional analysis tries to explain the long run performance of the IPOs. In this table, firms are segmented by the gross proceeds they raised and the initial returns. Wealth relative is a performance measure used to understand the long-term performance of the share compared with the performance of the matching firms. The wealth relative value of the above one indicates the scrip has outperformed the matching firms. The maximum performance has seen where gross proceeds is between 1000-2000 and the initial return is 20-40%.These scrips have created three times more wealth compared to the matching firms. The firms which raised fund between 2000-3000 and seen listing gain of 0-20% has performed really in long term. The firms which

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raised less than 1000 crores and witness negative listing continued to perform do bad and eroded the wealth of the investors. The study indicates that the firm raised between 0-1000crores has generated wealth but underperformed compared to the sectoral indices. Even the firms with the highest adjusted initial gains and small offer underperformed in the long term. All small offers have displayed long term under performance.

CONCLUSION

From the selected determinants of IPO of Indian Companies (Business Model, Gross Proceeds, Revenue,Size,Subscription rate), for both manufacturing and service IPOs, Subscription rate is found to be the most important factor. The Companies which raised fewer amounts of funds from primary markets underperformed in long run but the companies from higher notches performed well in long run. The study revealed under pricing is a common phenomenon in the Indian IPO market. The findings reveal that under pricing is related to the subscription rate and this is evident.IPO market is in an upward trend and witnessing lot of new listing. This can actually result in erosion of wealth if they are not prudent.

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MOBILE BANKING SERVICES: A STUDY WITH REFERENCE TO COASTAL KARNATAKA

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ABSTRACT
In the advent of Information Technology (IT), Indian banking sector is transforming in its structure, work culture, systems and procedure. Different technological advancements have changed the face of banking business where electronic system, in terms of different e-channels draw banker and customer attention to experience innovative services. Among these, mobile banking is almost untouched area in Indian banking context. Present study is an attempt to study the mobile banking services in Private and Public Sector Banks. The paper concludes that mobile banking services are at its infancy which has a great deal of room for improvement. Mobile banking is not as much popular as ATMs, Credit cards and Internet banking areas because of lesser facilities, low data transmission. Customers are not much satisfied from these services.

Keywords: Modern Banking, Mobile Banking, M-Commerce, Technology Banking, Digital Banking

INTRODUCTION
Due to changing environment, banks are competing to gain customers especially loyal ones and for this purpose, the banks are working on introducing better and innovative services but it is the most challenging task for the banks to meet the international competition. Today, banking system is shifting from manual to electronic banking and Indian banking industry is in the midst of IT revolution, with the advent of technology, the customers get empowered due to wide choice of services, available with banks. They can access banking anywhere, anytime at competitive cost. Today's e-banking is the most convenient service where customers are served to through ATMs, credit cards, internet banking, mobile banking, tele-banking etc. New private sector and foreign banks have an edge over public sector banks as far as adoption of technological advancements is concerned. Now, technological innovations serve as tool to gain competitive edge in international market. It is a challenging task for the banks especially public sector banks to upgrade skills, technology advancement and draw policies to be withstand the international competitive environment. A strong technological base helps the banks to gain competitive ability where various e-channels play an important role. Mobile banking helps the customers to perform a lot of wide range of transactions on cellular phones. To avail the facilities of mobile banking, customer can ask either through SMS or by using WAP (Wireless Application Protocol) technology, which allows online access of the web using mobile device. This technology serve to check details, issue new cheque book, payment of bills, instruction to stop payment, other value added services etc.

LITERATURE REVIEW:
M-banking refers to provision and ailment of bank related financial services with help of mobile telecommunication devices. The scope of offered services may include facilities to conduct bank and stock market transactions, to administer accounts and to access customized information (Tiwari, et al., 2006). By harmonizing services offered by the banking system, such as ATMs, smart cards, point-of-sale networks, and internet resources, the mobile technology offers a convenient additional method for managing money without handling cash (Karjaluoto, 2002). Financial institutions, which have had difficulty in providing profitable services through traditional channels to poor clients, see m-banking / m-payments as a form of branchless banking (Ivatury and Mas, 2008), which lowers the costs of serving low-income customers. As recently, the Reserve Bank of India, to enable, 'Safe, Secure, Sound and Efficient Payments and Settlement System,' has on September 19, 2008 issued draft operating guidelines on mobile banking transactions in India for the safe and secure mobile banking services. RBI has mandated that only banks who have implemented the core banking solution can offer mobile banking services and these services are restricted only to customers who hold banks' credit/debit cards (IAMAI, 2009). Scholarly research on adoption and impacts of mobile banking in the developing world is scares (Maurer, 2008). In India also, there is lack of research on mobile banking that adequately address implementation and adoption of mobile banking in India. This research gap inspires to investigate the issues and problems of adoption and usage of mobile banking services among Indian customers.

OBJECTIVES
1. To study the trends and growth of mobile banking branches in India and evaluate its' impact on profitability of Indian banking industry.
2. To study and analyze the customer perspective towards mobile banking services.

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HYPOTHESIS

1. Mobile banking has insignificant impact on profitability of Indian banking industry.

RESEARCH METHODOLOGY

Respondents' Profile: Among the 128 customers, 37.50 percent are between 26 and 35 years of age and 35.93 percent are below 25 years. 40.63 percent customers are those having Rs.1 to 2 lakhs annual income and 39.06 percent are the rich ones while rests have less than Rs.1 lakh annual income. Occupation based sample is more concentrated towards service class i.e. 50.00 percent respondents while businessmen and professionals are 20.31 percent and 29.69 percent respectively. Overall, survey signifies mixture of different categories where youngsters, rich people, servicemen cover the major part of the survey.

Table-1: Respondents' Profile

Groups	Sub-Groups	Numbers	Response%
Bank Groups	Public	64	50
	Private	64	50
Age (Years)	Up to 25	46	35.93
	26-35	48	37.50
	36-45	21	16.41
	Above 45	13	10.16
Annual Income (Rs. In Lakhs)	Up to 1	26	20.31
	1-2	52	40.63
	Above 2	50	39.06
Occupation	Service	64	50.00
	Business	26	20.31
	Professional	38	29.69
Total Sample Size		128	100.00

Source: Field Survey Data

To study the trends and growth of mobile banking branches is analyzed among four bank groups i.e., G-I (Public Sector Banks), G-II (Old Private Sector Banks), G-III (New Private Sector Banks), G-IV (Foreign Banks) and On Industry level.

To check the impact of mobile banking on profitability, profitability ratio (net profits as percentage of working funds) has been calculated for the selected bank groups and impact of mobile banking is analyzed through correlation and regression analysis with help of SPSS The data is divided into two parts; pre and post-e-banking period to analyses the change in contribution of mobile banking in profitability.

To study and analyze the customer perspective towards mobile banking services, questionnaire survey was conducted in Costal Karnataka. 128 customers with three or more years of relation with banks were surveyed. The questionnaire consists of questions related to mobile banking. The data is analyzed through percentage method, Weighted Average Score (WAS) is also calculated to draw the overall results from the survey. Chi-square, f-test and co-efficient of contingency are also calculated to test the hypothesis.

FINDINGS

Status of Mobile Banking Branches: Table 2 highlights the major findings where G-III steals a look with 31.85 percent average comparatively G-I & II and industry view just 2 percent average during pre-e-banking period. Post-e-banking period shows improvement incase of all bank groups where G-III again takes a lead with 70.29 percent average about 5 to 7 times more than G-I, II and industry. Combined average also foresees an explosive gap between partially IT-oriented and fully IT-oriented banks that can't be ignored. Gap between pre and post e-banking period signifies growth in mobile banking services in post-e-banking period, where also fully IT-oriented banks capture a look reporting more than 30 percent growth but partially IT-oriented banks demonstrate not even 15 percent growth. Rather partially IT-oriented banks are far behind by way of 5 to 7 times lesser average mainly due to greater variations along with other factors.

Table-2: Mobile Banking Branches as percentage of Total Branches (Percent)

Period	Parameters	G-I	G-II	G-III	G-IV	Industry
Pre- e-banking	Average	1.60	1.84	31.85	21.50	2.02
	S.D.	1.32	3.01	25.41	11.90	1.00
	C.V. (%)	82.50	163.59	79.78	55.35	49.50

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Post- e-banking	Average	11.60	14.92	70.29	51.59	10.29
	S.D.	7.79	5.97	8.25	13.22	7.84
	C.V. (%)	67.16	40.01	11.74	25.63	76.19
Combined Average		7.05	8.97	52.82	37.91	6.53
Average Technology Gap		10.00	13.08	38.44	30.09	8.27

Source: IBA Mumbai

Mobile banking and profitability: Table 3 shows the relationship between mobile banking and profitability of four bank groups and banking industry. Mobile banking has negative impact on profitability of whole banking industry in pre-e-banking period while in post-e-banking period, G-IV and industry as whole have been succeeded to turn the impact to positive though it is insignificant. Hypothesis is accepted because mobile banking has insignificant impact on profitability of whole banking industry rather it is negative in partially IT-oriented banks. It is important to note that mobile banking has improved the contribution in post-e-banking period though it is not significant whereas G-III shows the poor results with largest negative impact of mobile banking on profitability which is an indication of poor management of IT. Therefore, partially IT-oriented banks demand grater attention to improve mobile banking and overall IT advancements because poor management and inappropriate use is worst than not to use.

Table-3: Correlation Co-efficient between Profitability and Mobile Banking

Period	Variables	Mobile Banking	R^2
Pre- e-banking	G-I	-0.506	0.2560
	G-II	-0.094	0.0088
	G-III	-0.980**	0.9604
	G-IV	-0.866	0.7500
	Industry	-0.708	0.5013
Post- e-banking	G-I	-0.161	0.0259
	G-II	-0.381	0.1452
	G-III	-0.205	0.0420
	G-IV	0.258	0.0666
	Industry	0.088	0.0077

Source: IBA Mumbai Note: ** Correlation is significant at the 0.01 level (2-tailed)

Adoption of mobile Banking among Customers: The internal consistency of total 128 responses is tested by computing Cronbach's Alpha with the help of SPSS 17.00 which is based on the average correlation of items. In the analysis, value of alpha for all the items is 0.699 which is above 0.60. Therefore, the proposed items are sound enough to measure the customer perception about e-banking and hence, can be used for further analysis.

Awareness of Mobile Banking: WAS below 1 reflects meager awareness of mobile banking among the customers. Statistical value of chi-square is significant only in case of occupation which means that customers' perception depends on occupation where business class has immense awareness as WAS is 0.64. Co-efficient of contingency also signifies enormous association among the perception of customers from different occupation. But, insignificant value of f-test results in acceptance of null hypothesis which means that there is insignificant difference between customers' perception with respect to each category. Table 4 shows 0.52 overall WAS which reflects the facts that customers are not much aware of mobile banking. Hence, the banks should plan some effective strategies to popularize mobile banking among the customers especially young, poor and service class.

Table-4: Awareness about Mobile-Baking
(Percent)

Group / Sub Groups		Very Little	A Little	UD	Some Extent	Large Extent	WAS	Chi-square, C, F-test
Bank Group	G- I	9.38	14.06	11.72	53.12	11.72	0.44	7.79
	G- II	7.03	17.97	10.94	44.53	19.53	0.52	0.14
	G-III	9.38	12.50	10.16	45.31	22.66	0.59	0.55
Age Wise (Years)	Up to 25	5.07	18.12	11.59	47.10	18.12	0.55	10.15
	26-35	11.81	12.50	12.50	47.22	15.97	0.43	0.16
	36-45	6.35	11.11	7.94	53.97	20.63	0.71	1.02
	Above 45	12.82	17.95	7.69	41.03	20.51	0.38	
Income	Less than 1	7.50	13.75	20.00	47.50	11.25	0.41	12.76

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(Rs. In Laks)	1 - 2	9.74	14.29	9.74	49.35	16.88	0.49	0.18
	More than 2	8.00	16.00	7.33	46.00	22.67	0.59	0.64
Occupation Wise	Service	8.38	13.61	13.61	51.83	12.57	0.47	17.96*
	Business	6.41	20.51	2.56	43.59	26.92	0.64	0.21
	Professionals	10.43	13.04	12.17	43.48	20.87	0.51	0.59
Overall Results		8.59	14.84	10.94	47.66	17.97	0.52	

Source: Field Survey Data

Note: Chi-square and f-test is Significant at 1% (p=0.01) level *Chi-square and f-test is Significant at 5% (p=0.05) level

Preference of E-Channels among the Customers: Among all e-channels, ATM is the most preferred e-channel among the customers. Table 5 reveals that credit cards with 58.49 average score are at second rank followed by online banking (average score 53.54), though the difference between average scores is very high. But mobile banking (37.14 average score) and tele banking are not much preferred among the customers because these channels have gained very low average score. Awareness of these e-channels is also very little (deduced from table 4) which is a major cause of concern. Hence, the banks should frame out effective strategies to make these e-channels popular among the masses.

Table-5: Preference of E-Channels among the Respondents

Item	Average Rank	Average Score	Rank
ATM	1.59	78.23	1
Credit Card	2.58	58.49	2
Mobile Banking	3.64	37.14	4
Online Banking	2.82	53.54	3
Tele-Banking	4.35	23.02	5

Source: Field Survey Data

Functions through Mobile Banking: Mobile Banking is also of much practice for balance enquiry while bill payment request is at second rank though average score is lower (Table 6). View of last three transactions and account statement request are in succession but view fixed deposit details is the least preferred function through mobile banking. Therefore, the customers like better mobile banking for balance enquiry where a foremost cause for the same is less awareness of mobile banking among the customers.

Table-6: Functions Preferred by the Customers through Mobile Banking.

Item	Average Rank	Average Score	Rank
Balance enquiry	2.51	78.84	1
Request for bill payment	3.83	58.43	2
Cheque book request	5.18	41.50	7
Account statement request	4.53	49.67	4
View last three transactions	4.35	51.82	3
Enquiry for cheque status	4.74	46.97	5
Stop payment on cheque	4.98	43.98	6
View fixed deposit details	5.88	32.81	8

Source: Field Survey Data

Satisfaction from Mobile Banking Services: Although 64.33 percent customers are satisfied from mobile banking services still others are not even 20.31 percent unable to decide. Table 7 shows 0.58 overall WAS which is an indication of meager satisfaction among the customers even though the perception varies with respect to bank groups (deduced from significant value of f-test) and e-banks (G-II & III) have more satisfied customers of mobile banking technology but customers have almost similar opinion with respect to age, income and occupation because f-test shows insignificant value in these cases. Chi-square demonstrates significant value in case of bank groups and occupation which means that customer perception significantly depends on their respective bank groups and occupation but in case of age and income, variations are due to sample fluctuations.

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Table-7: Satisfaction from the Performance of Mobile Banking
(Percent)

Group / Sub Groups		HDS	DS	UD	S	HS	WAS	Chi-square, C, F-test
Bank Group	G- I	3.91	18.75	23.44	44.53	9.38	0.37	20.77**
	G- II	0.78	7.81	21.09	62.50	7.81	0.69	0.23
	G-III		14.84	16.41	54.69	14.06	0.68	5.30**
Age Wise (Years)	Up to 25	2.17	12.32	23.19	50.72	11.59	0.57	13.71
	26-35	1.39	10.42	20.83	57.64	9.72	0.64	0.19
	36-45	1.59	25.40	17.46	49.21	6.35	0.33	2.34
	Above 45		12.82	12.82	58.97	15.38	0.77	
Income (Rs. In Laks)	Less than 1		12.50	28.75	46.25	12.50	0.59	8.95
	1 - 2	1.95	13.64	21.43	53.25	9.74	0.55	0.15
	More than 2	2.00	14.67	14.67	58.67	10.00	0.60	0.11
Occupation Wise	Service	0.52	12.57	22.51	56.02	8.38	0.59	22.39**
	Business	2.56	21.79	5.13	55.13	15.38	0.59	0.23
	Professionals	2.61	10.43	26.96	49.57	10.43	0.55	0.09
Overall Results		1.56	13.80	20.31	53.91	10.42	0.58	

Source: Field Survey Data

Note: **Chi-square and f-test is Significant at 1% (p=0.01) level; Chi-square and f-test is Significant at 5% (p=0.05) level

Solutions to Aware Customers of E-Channels: It is a major problem explored in fourth table that customers are not greatly aware of mobile banking. Table 9 describes some suggestions to aware the bank customers about e-channels. Among all, advertisement is the most effective source to create awareness in the opinion of majority customers whereas conducting training for customers is at the second rank with 54.06 average score. Information and demo at the counter is at the third rank having 50.42 average score whereas others like demo fares and personal contact programmes are in succession but not much significant (deduced from low level of average score). In general, advertisements and customer training are the most effective source of creating awareness of e-channels.

Table-9: Solutions to Make the Customer Aware about E-Channel

Item	Average Rank	Average Score	Rank
Conduct customer trainings	2.80	54.06	2
Demo-fares	3.15	46.98	4
Information/Demo on counter	2.98	50.42	3
Advertisement	2.73	55.47	1
Personal contact programmes	3.35	43.07	5

Source: Field Survey Data

RECOMMENDATIONS

As the empirical results show that customers are not much aware of mobile banking even majority customers are not satisfied from mobile banking services rather preferred for balance enquiry and request to bill payments at the most. In the light of these drawbacks, the following, recommendations have been suggested:

Awareness: Only 50 percent customers are aware of mobile banking that too is to some extent which is a major cause of concern. The banks must arrange seminars and demo activities to aware the customers about mobile banking services.

Cost Effective: As high charges is major problem, the banks must fix the charges for mobile banking services to the affordable extent especially for young, poor and service class customers.

Improve Speed: Data transmission is low through mobile banking in customer views. Make the services fast and provide timely and accurate information to the customers.

Innovative Schemes: The banks must employ some special schemes for different category customers as per their requirements.

Security: The banks must confirm secure transactions through recent technological advancements. Mobile banking service should fulfill certain safety criteria e.g. confidentiality, automation, data integrity, non-disputable to ensure customer acceptance.

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FUTURE AREAS OF RESEARCH

- ✓ A Comparative study of all e-channels can also be an advantage for analyzing the success and failure of these channels in different areas.
- ✓ A study for cost differences of banking through different e-channels will also be appreciated.

CONCLUSION

It is concluded that post-e-banking period is steadier with the utmost effect on G-III. This is due to encouraging contribution of IT, the most productive stick of competition. IT, along with other factors is managing tool of transformation that lacks in partially IT-oriented banks. The use of mobile phones is remarkably increasing world over. Indeed, across the developing world, there are probably more people with mobile handsets than with bank account (Porteous, 2006). But, mobile banking is not as much popular as ATMs, credits cards and internet banking areas, because of lesser facilities, low data transmission. Customers are not much satisfied from these services. Mobile services are still in their infancy which has a great deal of room for improvement. The need of the hour is to develop mobile banking by spreading maximum awareness, providing services as per customer requirements and solve their problems immediately to satisfy them. In the advent of IT revolution, innovative and quality services are the only survival factor to pace with global competition.

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THE SUBSISTENCE OF AFFINE MOTIONS IN KAEHLERIAN RECURRENT SPACES OF SECOND ORDER

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ABSTRACT
The objective of this paper, authors has defined and studies the subsistence of affine motion in Kaehlerian recurrent spaces of second order and some theorems have been established.

Keywords: Kaehlerian, Affine motion, Recurrent, Symmetric and Space. 2000MSC: 32C15, 46A13, 46M40, 53B35, 53C55.

1. INTRODUCTION

An **n** real dimensional Kaehlerian spaces $\mathbf{K^n}$ is a Riemannian space which admits a structure tensor field $\mathbf{F^h_1}$ satisfying the relations.

(1.1) $F^i_j F^h_i = -\delta^h_j$,

(1.2) $F_i^s F^t_j g_{st} = g_{ij}$

And

(1.3) $\nabla_j F^h_i = 0$,

Where the ∇_j being the operator of covariant differentiation with respect to the Christoffel-symbol $\Gamma^{\ h}_{ij}$ formed metric tensor g_{ij} of the Riemannian space.

We take following some formulae and definitions are:

(1.4) $F_{ij} = F^h i\, g_{hj}$,

(1.5) $F_{ij} = -F_{ji}$

(1.6) $\nabla_k F_{ij} = 0$

The Riemannian curvature tensor, which we denote by R^h_{ijk}, is given by

$$R^h ijk = \partial i\, \Gamma^h jk - \partial j\, \Gamma^h ik + \Gamma^h il\, \Gamma^l jk - \Gamma^h jl\, \Gamma^l ik$$

Whereas the Ricci-tensor and the scalar curvature are respectively given by

$R_{ij}=R^h_{ijh}$ and $R=R_{ij}\, g^{ij}$

This implies, $F^a_i R^i_a = 0$, If we define a tensor S_{ij} by $S_{ij} = -F^a_i R_{aj}$,

Then we have, $S_{ij} = -S_{ji}$.

We use the following

Definition (1.1): A space K_n is said to be a Kaehlerian recurrent space of second order in the following condition is satisfied Singh (1971-72):

$$\nabla_m \nabla_n R^h_{ijk} = \lambda_{mn} R^h_{ijk},$$

Where λ_{mn} is a non-zero and in general, non-symmetric covariant tensor of second order. It will be denoted briefly by $\mathbf{2K_n}$-space.

(1.9) $\overline{x}^i = x^i + v^i(x)\, \delta t$,

of special types we have studied on the essential properties of the space [Lal and Singh (1971)].

As a continuation of our study in this paper, we shall try to investigate on the space admitting an affine motion (1.9) of $\mathbf{^2K_n}$-spaces, characterized by

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(1.10) $\nabla_m \nabla_n v^i = K_{mn} v^i$,

Where, in general, we assume that $K_{mn} \neq \lambda_{mn}$ being (1.9) an affine motion, it is characterized by

(1.11) $\pounds_v \Gamma^h_{ij} = \nabla_i \nabla_j v^h + R^h_{ijk} v^k = 0$.

Here $\pounds_v$ denotes the Lie-derivative with regard to (1.9).

2. SUBSISTENCE OF AFFINE MOTION IN KAEHLERIAN RECURRENT SPACES OF SECOND ORDER

If the space $^2\mathbf{K^n}$ admits affine motions, the condition (1.10) must be integrable and, as integrability condition we have.

(2.1) $\pounds_v R^h_{ijk} = 0$

According to a method by E. Cartan, taking $\nabla_i v^h = R^h_{ijk} F^{jk}$, for a non-symmetric tensor condition (2.1) may be replaced by

(2.2) $V^a \nabla_a R^h_{ijk} = C R^h_{ijk}$

Where, $C = A_{mn} F^{mn}$ and $A_{mn} = \lambda_{mn} - \lambda_{nm}$

Under the subsistence of affine motion (1.9), from (1.10) and (1.11) we have,

(2.3) $K_{ij} v^h + R^h_{ijk} v^k = 0$

Multiplying (2.3) by v^i summing over j and taking $R^h_{ijk} v^i v^k = 0$,

Because of $v^1 \neq 0$, we have

(2.4) $K_{ij} v^j = 0$

Putting h = j summing over j in (2.3) and using (2.4) we get,

(2.5) $R_{ij} v^j = 0$

From the Bianchis first identity on the curvature tensor, we have

$R^a_{ajk} = - R_{jk} + R_{jk}$

So contraction on **h** and **I** in (1.11) yields

$\nabla_j \alpha = (R_{jk} - R_{kj}) v^k$

Where we have defined α by $\nabla_a V^a$ consequently, in view of (2.5)

We have

(2.6) $\nabla_j \alpha = - R_{kj} v^k$

From which follows, by repeated covariant differentiations, that

$\nabla_k \nabla_i \nabla_j \alpha = - \lambda_{ik} R_{aj} v^a - \nabla_i R_{aj} \nabla_k v^a - \nabla_k R_{aj} \nabla_i v^a - R_{aj} K_{ik} v^a$

Making a commutator on the indices I and k, from the above relation, we get

$(A_{ki} + K_{ki} - K_{ki}) R_{aj} V^a = - R^a_{jik} \nabla_a \alpha$

Multiplying the above equation by v^k and summing over the index K, according to (2.3) and $v^a \nabla_a \alpha = 0$, following from (2.5) and (2.6), we have

$(A_{ki} + K_{ki} - K_{ki}) v^k R_{aj} v^a = 0$

In this way, we get the following:

If the $^2\mathbf{K_n}$-space admitting an affine motion (19) from (1.10), then the following two cases must be considered:

(i) $(A_{ki} + K_{ki} - K_{ki}) v^k = 0$

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(ii) $R_{aj}\, v^a = 0$

Thus, we have the following

Theorem (2.1): When the **$2K_n$**-space under consideration admits an affine motion (1.9) of $2K_n$ from (1.10), there exists a case of $(A_{mn} + K_{mn} - k_{mn})\, v^m = 0$. In this case, under $\nabla_j \alpha \neq 0$. Ricci tensor R_{ij} is resolved as $\lambda_i \nabla_j \alpha$ with use of a covariant vector λ_i

Proof: By virtue of (2.4), we have

$n_i + K_{ki}\, v^k = 0$

Putting $n_i = A_{ki}\, v^k$.

Owing to $K_{ki}\, v^k = \nabla_i \nabla_k v^k = \nabla_i \alpha$, the last equation is rewritten as $n_i = \nabla_i \alpha$

However, as we have

$- \nabla_i \alpha = - \nabla_i \nabla_a v^a = R^a{}_{aik} = (- R_{ik} + R_{ki})\, v^k = R_{ki}\, v^k$.

The last equation becomes $n_i = R_{ki}\, v^k$.

Therefore, our preliminary condition becomes to be rewritten as

(2.7) $(R_{ki} + K_{ki})\, v^k = 0$

Differentiating (2.7) covariantly two times, we have

$(\nabla_n \nabla_j k_{mk} + \lambda_{jn} R_{mk})\, v^m + (\nabla_j K_{mk} + \nabla_j K_{mk})\, \nabla_j R^m + (\nabla_n K_{mk} + \nabla_n R_{mk})\, \nabla_j v^m = 0$.

From this equation, considering a commutator on j and n, we have

$-K_{ak} (\nabla_n \nabla_j v^a - \nabla_j \nabla_n v^a) - R^a{}_{kjn} . K_{ma} v^m + A_{jn} R_{mk}\, v^m = 0$,

i.e.

$- K_{jn} K_{jn} v^a + K_{nj} K_{ak} v^a - R^a{}_{kjn} K_{ma} v^m + A_{jn} R_{mk}\, v^m = 0$

Substituting (2.7) into the left-hand side of the above equation, we have

$(A_{jn} + K_{jn} - K_{nj})\, n_k + R^a{}_{kjn}\, n_a = 0$

Multiplying the above equation by v^i in view of

$R_{mk}\, v^j = - R^a{}_{knj}\, v^i = \nabla_n \nabla_k v^a = K_{kn} v^a$ and $n_a v^a = 0$.

We obtain

$(A_{jn} + k_{jn} - K_{nj})\, v^i\, n_k = 0$

Hence, when and only when $n_k \neq 0$, we have our preliminary condition. That, is under $n_k \neq 0$, the preliminary condition (2.7) are equivalent with each other. Here we have the fact that $n_k \neq 0$, mean $\nabla_k \alpha \neq 0$. In what follows, we shall this fact. Equation (2.1) yields.

$£_v R_{ij} = 0$, say $C R_{ij} + R_{aj} \nabla_I v^a + R_{ia} \nabla_j v^a = 0$

Where we have used (2.2) applied to Ricci tensor R_{ij} operating to the above equation, we have

$R_{ij} \nabla_k C + C \nabla_k R_{ij} + \nabla_k R_{aj} \nabla_i \nabla_i v^a + k_{ik} R_{aj} v^a + \nabla_k R_{ia} \nabla_j v^a = 0$

Where we have used

$R_{ia} \nabla_k \nabla_j v^a = R_{ia} K_{jk} v^a = K_{jk} R_{ia} v^a = 0$

Derived from (1.10) and (2.5) making use of (2.7) this becomes

$R_{ij} \nabla_k C + C \nabla_k R_{ij} + \nabla_k R_{aj} \nabla_i v^a + \nabla_k R_{ia} \nabla_j v^a + K_{ik} \nabla_j \alpha = 0$.

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Covariant differentiation gives

$R_{ij}\nabla_m\nabla_k C + \nabla_k C\nabla_m R_{ij} + V_m C\nabla_k R_{ij} + K_{im}v^a\nabla_k R_{aj} + K_{jm}v^a\nabla_k R_{ia}$

$-\nabla_m K_{ik}\nabla_j \alpha - K_{ik}\nabla_m\nabla_j \alpha = 0$

Where we have neglected vanishing term $\lambda_{km}\, £_v R_{ij}$ appearing in the left-hand side. From the above equation by contraction, we make the next relation

$(v^k \nabla_m\nabla_k C + C\nabla_m C)R_{ij} + K_{im}C\,(-\nabla_j\alpha) - v^k\nabla_m K_{ik}\nabla_j \alpha = 0$

From we have $£_v C = v^k \nabla_k C = 0$, $v^k\nabla_k R_{ij} = CR_{ij}$

Derived from (2.2), (2.5) and (2.6). That is, we have the relation,

(2.8) $(v^k\nabla_m\nabla_k C + C\nabla_m C)\, R_{ij} = (CK_{im} + v^k \nabla_m K_{ik})\, \nabla_j\alpha$

Under the basic supposition $\nabla_j \alpha \neq 0$ this obtained relation (2.8) suggests the resolvability of Ricci tensor of the form

$R_{ij} = \lambda_i\nabla_j \alpha$

Now, we shall discuss this point. For this purpose, let us suppose that

$v^k \nabla_m\nabla_k C + C\nabla_m C = 0$

Holds, and hence the desire decomposition of R_{ij} is impossible. As we have $v^k \nabla_m\nabla_k C+\nabla_k C.\ \nabla_m v^k = 0$ Derived from $£_v C = v^k \nabla_k C = 0$

By covariant differentiation, this supposition is rewritten as

(2.9) $C\nabla_m C = \nabla_k C.\ \nabla_m v^k.$

Being $\nabla_j \alpha \neq 0$, from (2.8) we have

$C K_{im} + v^k \nabla_m K_{ik} = 0$

Making use of (2.4), this is rewritten as

(2.10) $C K_{im} = K_{ik} \nabla_m v^k$

Furthermore according to

$K_{im}v^i = \nabla_m\nabla_i v^1 = \nabla_m\alpha,$

From the condition (2.10), we find

(2.11) $C \nabla_m \alpha = \nabla_k \alpha.\ \nabla_m v^k.$

Multiplying (2.11) by non-vanishing scalar function C, changing indices suitably and differentiating the last relation covariantly, we have

(2.12) $2C\nabla_m C\nabla_a\alpha + C^2 \nabla_m\nabla_a \alpha = C \nabla_m\nabla_b \alpha.\ \nabla_a v^b + \nabla_m C.\ \nabla_a v^b$

Where, in the right-hand side, we have neglected vanishing term

$C\nabla_b \alpha\ \nabla_m\nabla_a v^b = C K_{am} v^b\ \nabla_b \alpha = 0.$

Let us take notice of $v^a\ \nabla_b \alpha = 0$

And $v^i\ \nabla_j v^h = v^i R^h_{jmn} F^{mn} = F^{mn}(\nabla_n\nabla_m v^h - \nabla_m\nabla_n v^h) = F\, v^h$

Where $F = (K_{mn} - K_{nm})\, F^{mn}$

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Then contracting (2.12) with v^a, we have

$C^2 v^a \nabla_b \nabla_a \alpha = C F v^h \nabla_n \nabla_b \alpha.$

Because of $F \nabla_m C. v^b \nabla_b \alpha = 0$

On the other hand, as we get

$v^a \nabla_m \nabla_a \alpha = \nabla_m(v^a \nabla_a \alpha) - \nabla_a \alpha. \nabla_m v^a = - \nabla_a \alpha. \nabla_m v^a,$

The above condition becomes

$C(C - F) \nabla_a \alpha. \nabla_m v^a = 0.$

However, in general $C \neq 0$ and $C \neq F$ so from this conclusion we see $\nabla_a \alpha. \nabla_m v^a = 0$ introducing this conclusion into (2.11), we have

$C \nabla_m \alpha = 0$

This contradicts with the basic assumption $\nabla_m \alpha \neq 0$ by this reason we cannot set up the condition (2.9), so we must have

$v^k \nabla_m \nabla_k C + C \nabla_m C \neq 0.$

On this resolvability of Ricci tensor, without use of (2.10), we can consider another proof. For this purpose, it is sufficient to show the non-vanishing property of coefficient vector of R_{ij} in the left-hand side of (2.8).

Let us suppose that

$v^k \nabla_m \nabla_k C + C \nabla_m C = 0$

From this supposition, in a simple manner, we can derive the absurdity. First of all we have (2.9), from which by covariant differentiation, we find

$\nabla_n C. \nabla_m C + C \nabla_n \nabla_m C = \nabla_n \nabla_k C. \nabla_m v^k$

Then multiply the above relation by v^m, then using

$v^m \nabla_n \nabla_m C = - C \nabla_n C,$

We have

$C(C - F) \nabla_n C = 0.$

Generally, this conclusion is an absurd one. This completes the proof.

Theorem (2.2): A **$2K_n$**-spaces having affine motion (1.9) of $2K_n$ space from (1.10) does not admit a case of $R_{aj} v^a = 0$.

Proof: In this case, we have not only

$\nabla_j \alpha = \nabla_j \nabla_a v^a = - R^a{}_{ajk} v^k = -(-R_{ji} - R_{kj}) v^k = 0.$

Followed from (1.11) and (2.5), but also

$\nabla_j \alpha = \nabla_j \nabla_a v^a = K_{aj} v^a$

Hence, we have

(2.13) $K_{ij} v^i = K_{ij} v^i = 0$

On one hand, in the present spaces, the next equation has been found.

(2.14) $A_{ma} R^a_{ija} = \lambda_{ka} R^a_{kji} - \lambda_{ja} R^a_{mki} - \lambda_{ki} R_{mj} + \lambda_{ji} R_{mk} - A_{jk} A_{mi}.$

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By contraction of v^m, from the both sides of (2.14), we have

$$n_a R^{a}_{ijk} = \lambda_{ka}(\nabla_i\nabla_j v^a - \nabla_j\nabla_i v^a) - \lambda_{ja}(\nabla_i\nabla_k v^a - \nabla_k\nabla_i v^a) - A_{jk} n_i,$$

$$(2.15)\quad n_a R^{a}_{ijk} = (K_{ji} - K_{ij})\lambda_{ka}v^a - (K_{ki} - K_{ik})\lambda_{ja}v^a - A_{jk} n_i,$$

Multiplying (2.15) by v^k, we have,

$$(2.16)\quad n_i n_j = (K_{ij} - K_{ji})\lambda_{mn} v^m v^n,$$

For we have

$$n_a R^{a}_{ijk} v^k = - n_a \nabla_j\nabla_i v^a = - n_a K_{ij} v^a = 0 \text{ and } (2.13)$$

In (2.16), talking case of the symmetric property of the left-hand side on the indices i and j and the alternating property of the right-hand side on the same indices, we conclude that

$\lambda_{mn}v^m v^n(K_{ij}-K_{ji})=0$ and $n_i=0$

Consequently, there exists two cases to be discussed. The first case is given by

$K_{ij}=K_{ji}$ and $n_i=0$

And the second one is composed of $\lambda_{mn} v^m v^n=0$ and $n_i=0$. In the first case is

$$\nabla_k\nabla_j v^h - \nabla_j\nabla_k v^h = (K_{jk} - R_{kj})v^h = 0$$

That is,

$$R^{h}_{mjk} = 0$$

Consequently, the vector field v^h may be considered to be degenerate into the contra-field. By this reason, the first case should be rules out of our study.

Let us consider the second case. Now, we have

$$v^m \lambda_{mn} R^{h}_{ijk} = v^m \Delta_n\Delta_m R^{h}_{ijk} = \Delta_n(v^m \Delta_m R^{h}_{ijk}) - \Delta_m R^{h}_{ijk}\Delta_n v^m$$

$$= \Delta_n(CR^{h}_{ijk}) - \Delta_m R_{ijk}\Delta_n v^m$$

That is,

$$(2.17)\quad v^m \lambda_{mn} R^{h}_{ijk} = R^{h}_{ijk}\nabla_n C + C\nabla_n R^{h}_{ijk} - \nabla_m R^{h}_{ijk} - \nabla_m v^m$$

Hence, under the condition $\lambda_{mn}v^m v^n = 0$ from (2.17) we can find with case

$$C(C - F) R^{h}_{ijk} = 0$$

Being $C \neq 0$, $C \neq F$ and the space a non-fiat one, this conclusion is an irrational one.

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A STUDY ON AWARENESS ABOUT GREEN PRODUCTS AMONG TODAY'S YOUTH

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ABSTRACT
Environmental pollution and degradation is a major challenge before India today. Most of our population is not aware of the degrading environment and depletion of natural resources. People are required to be sensitized for the environmental problems. Today there is a need of developing a population who is concerned about the environmental and allied problems. The population who have knowledge of its solution and willing to work for its betterment. Today's youth can play a vital role in the environment protection. The present study attempted to explore how much today's youth are aware about green products. Convenience sampling method was used to select 160 students of Mulund College of commerce, Mumbai. Descriptive statistics and quantitative analysis were used to quantify the attitude of respondents towards green products. Findings of the study revealed that the respondents had high level of awareness about green products. But though the awareness level was high people did not consider green products for shopping in the same proportion. There is a need of collective efforts from all i.e. government, industries media, and the educational institutions to enhance the knowledge, attitude and concern for the environment.

Keywords: Green product, Environmental pollution, Youth, Awareness

INTRODUCTION
The environment is simply defined as the natural surroundings of living things. The environment is a precious gift of the nature which is invaluable. We human beings have spoiled the environment in many ways for making our life more comfortable but in turn we are doing nothing to protect it. Environmental problems are increasing day by day. Environmental pollution and degradation is a major challenge before India today. Most of our population is not aware of the degrading environment and depletion of natural resources. People are required to be sensitized for the environmental problems. Today there is a need of developing a population that is concerned about the environment and allied problems. The population who have knowledge of its solution and willing to work for its betterment. Today's youth can play a vital role in the environment protection. Today's young generation have tremendous power to change the entire picture if they are educated and sensitized. Today's upcoming generation need to educate for the environmental protection. Many laws, rules, regulations are made to protect the environment but they are not implemented effectively. In such circumstances we need to put in some efforts to do our bit to save our mother earth. If today's youth adopt green ways of life and change their consumption habits it can help to reduce the pressure on the environment in our day to day life. Therefore, there is a great need of using green products by today's youth. A green product refers to a product that is typically nontoxic, originally grown, recycle/reusable, not tested on animals, not polluting the environment and minimally packaged and contains natural ingredients, recycled content and approved chemicals (Pavan, 2010). Present study attempted to explore how much today's youth are aware about green product.

SIGNIFICANCE OF THE STUDY
People all around the world have started showing great concern for the environmental issues. Environmental problems have become everybody's problem today. There is a great need to change our consumption pattern which is deteriorating the environment and encourage people to use green products which is nonpolluting in nature. Today's population should understand the importance of using green products. It is required to educate and encourage people to use green products. Majority of our population consist of the young youth therefore creating awareness about green products among today's youth is very crucial.

OBJECTIVES OF THE STUDY
1) To study awareness about green products among today's youth.

2) To examine the perception of today's youth about green products.

2) To investigate the purchase intention of today's youth for green products.

3) To analyze the factors preventing today's youth to use green products.

HYPOTHESES
1) Today's youth is aware of green products.

2) Today's youth have right perception of green products.

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2) Today's youth intent to buy green products.

3) Certain factors prevent today's youth to use green products

LIMITATIONS OF THE STUDY

1) The study is limited only to the students (youth) of one college in Eastern Suburb of Mumbai.

2) The study is restricted to selected variables only.

REVIEW OF LITERATURE

Sanjeev Kumar and et al (2012), in the study authors have attempted to investigate the consumer perception and purchase intention towards green products. The data has been collected from 120 youngsters of different areas of Delhi NCR. The researchers concluded that the respondents have high intentions to buy green products but they were not aware as to what constitutes the environmentally friendly products.

Jaganath R. (2016), in his article the researcher has studied green purchasing behaviour of young consumers and their attitude towards green products. 130 young consumers of green products in the age group of 18–25 years in Mettupalayam (Coimbatore) are selected as sample. The findings of the studies revealed that 'Consumer Beliefs', 'Environmental Attitude', and 'Social Influence' have a positive influence on green purchasing behaviour of young consumers

Mathew Lawrence (2016), in his research paper the researcher threw light on green marketing and its impact on youth. The researcher conducted the study of the environmental awareness, knowledge and perception of consumer towards green marketing and difficulties faced by consumers in adopting green marketing. The findings of the study revealed that respondents are ready to accept green marketing and ready to pay attention and read whenever they come across any information related to green marketing.

Khalid Ismail & Nawawi Ishak(2014), have conducted the study on 288 customers of supermarket to examine consumer's perception, purchase intentions and actual purchase behaviour and the interrelationship between them in the context of organic food products. The result of the study revealed that intention to purchase organic food was significantly influenced by the consumer's perception of safety, health, environmental factors and animal welfare of the products.

Ursil Makhdoomi & Ulfat Nazir (2016), the study was conducted to understand the variables affecting the consumer buying behaviour of green products. The study was conducted in the city of Srinagar with 80 respondents. The study revealed that the demographic factors do no influence the buying behaviour of consumer. The buying behaviour of consumer is positively influenced by the satisfaction which they get from green products.

RESEARCH METHODOLOGY

The present study is a descriptive cum exploratory in nature and is based on primary data and secondary data. The primary data has been collected with the help of a well structured questionnaire. The population comprised of male and female students belonging to the age group of 17-22 studying in Mulund College of commerce, Mumbai. Convenience sampling was used to select 160 students of Mulund College of commerce, Mumbai. Out of 160 students 157 questionnaires were received and analyzed to assess the level of awareness about the green products among today's youth. Secondary data has been collected from websites and journals. The study mainly used frequency, cross tabulation, chi square test to quantify the attitude of respondents towards green products.

SOCIO ECONOMIC BACKGROUND OF THE RESPONDENTS

Green products are consumed by all strata of the society i.e. across all the age groups, gender, geographical areas etc. Since the study was conducted on youth of the college. It was needed to identify the socio economic background of the sample size.

Table no-1: Socio-Economic Factors of the Respondents

Respondents :157						
Age(years)	**Frequency**	**Percent**		**Educational Level**	**Frequency**	**Percent**
17-18	76	48.7		First year	60	38.2
19-20	76	48.7		Second year	57	36.3
21-22	3	1.9		Third year	40	25.5
No Response	2	.6		**Total**	**157**	**100.0**
Total	**157**	**100.0**		**Geographical area**	**Frequency**	**Percent**
	Frequency	**Percent**		Mumbai	42	26.9

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Gender				Thane	82	52.22
Female	119	75.8		New Mumbai	8	5.1
Male	38	24.2		No response	25	15.92
Total	**157**	**100.0**		**Total**	**157**	**100.0**

Result in table 1. showed the socio economic background of the respondents which includes age, gender, educational level and geographical area of the respondents. Age of the respondents was grouped in three categories i.e. 17-18, 19-20, and 21-22. As per the table majority of the respondents were in the age group of 17-18 and 19-20 both these groups had same number of respondents. Female respondents were majority in number (75.8%). Majority of the respondents were studying in first year. The table showed that majority of respondents were (52.22%) belong to Thane region.

RESULT AND DISCUSSION

Awareness about green products among today's youth

The consumer who have knowledge about the environmental issues are more likely to go for green purchase (Ursil Makhdoomi & Ulfat Nazir, 2016). Therefore the response of the respondents who represented today's youth was examined by asking them the questions related to their awareness of green products and their opinion that green products protect the environment.

Table no-2: Awareness about green products among today's youth.

Variables	Yes	%	No	%	No response	Total
Awareness of green products						
Female	114	96	5	4	0	119
Male	33	87	5	13	0	38
Total	147	94	10	6	0	157
Green products protect the environment	156	99.35%	0	0	1	0.65%

The result in table 2. revealed that out of 157 respondents 94% respondents said that they are aware about green products. Out of 119 females 96% females said that they are aware about green products. Out 38 males 87% said they are aware about green products. It shows that females were more aware than males this may be because they are more involved in the household shopping than male. 99% respondents felt that green products is important to protect the environment. It showed high level of awareness about green products and concern to protect the environment by using green products.

Association between awareness about green products among the respondents and demographic features

Since the youth selected for the study were having varied demographic features with respect to gender, geographical areas, age groups etc. It necessitated to test the whether the awareness about the green product among the respondents were equally high across their demographic characteristics or was there any difference.

Table no-3: Test of Awareness about green products among today's youth across demographic features
Pearson Chi-Square

Variables	Value	df	Asymptotic Significance (2-sided)
Educational Level	2.844[a]	2	.241
Age	3.952[a]	5	.556
Geographical Area	1.607[a]	3	.658
Gender	3.874[a]	1	.049

Table 3. indicated the result of Pearson Chi-Square tests that was conducted to identify the awareness about green products among today's youth across the educational level, age, geographical area and gender. The result of Chi-square test showed that there was no significant relation between the education level, age, geographical area, gender and awareness level i.e. educational level, age, geographical area and gender did not have any bearing on the awareness level about green products. The awareness level was high across all educational levels, ages, geographical areas and genders

PERCEPTION OF THE RESPONDENTS ABOUT THE GREEN PRODUCTS

To get the deeper insight about the perception regarding green products it is essential to know consumer awareness of green products and what they understood by green products. (Sanjeev Kumar et al, 2012). To understand what the respondents meant by green products they were asked that what comes to their mind on hearing the term 'Organic', 'Green' or 'Eco friendly' whether it is Environmental friendly, Bio degradable, Recyclable or Energy saving.

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Table no-4: Perception of the respondents about the green products

	Perception of green products	Frequency	Percent
1	Environmental friendly	84	56
2	Environmental friendly, Bio degradable	8	5
3	Environmental friendly, Bio degradable, Recyclable	8	5
4	Environmental friendly, Bio degradable, Recyclable, Energy saving	18	11
5	Environmental friendly, Bio degradable, Energy saving	1	0.5
6	Environmental friendly, Recyclable	11	7
7	Environmental friendly, Recyclable, Energy saving	2	1
8	Environmental friendly, Energy saving	1	0.5
9	Bio degradable	7	4
10	Recyclable	10	6
11	Recyclable, Energy saving	2	1
12	Energy saving	5	3
	Total	157	100.0

It was evident from table 4. that 56% respondents felt it is environmental friendly. 5 % respondents said it is environmental friendly and bio degradable, for 5% it was environmental friendly, bio degradable and recyclable. 11% respondents said it is environmental friendly, bio degradable, recyclable and energy saving also. 0.5% said it is environmental friendly, bio degradable and energy saving, 7% respondents were in the opinion that it is environmental friendly and recyclable. 1% said it is environmental friendly, recyclable and energy saving. 0.5% responded it is environmental friendly and energy saving. 4% said that it is biodegradable. 6% responded it is recyclable. According to 1% it was recyclable and energy saving. 3% said it is energy saving. If we look at the table 133 respondents knew green product is environmental friendly product (sr no 1 to 8). Since the green product is a product that is environmentally preferable relative to comparable products (Sanjeev Kumar et al, 2012**)** Majority of respondents (133) i.e. 85% knew what green product is.

TYPES OF GREEN PRODUCTS PURCHASED BY THE RESPONDENTS

After knowing the opinion of the respondents about their belief about what green product is. The respondents were further asked about the type of green products they had purchased so far. The finding in the table 5. gave the detail about the type of green products purchased by the respondents.

Table no-5: Types of green products purchased by the respondents

Product Name	No of respondent	Product Name	No of respondent
Bags	1	Decorations	1
Organic fertilizers	4	Earthen pots	1
Books	6	Crackers	1
Recyclable plastic	1	Food(wheat, rice floor,oil,pulses)	23
Ganesh Idol	11	Fruits	9
Cloth bag	3	Vegetables	8
Organic colours	7	Soap and hand wash	1
Cosmetics	5	Patanjali product	7
Mehendi	2	Green tea	1
Paper bags	5	Tulsi ginger tea	1
Lemon grass	2	Honey	4

Table 5 indicated the result of green products purchased by the respondents. Majority of the respondents gave preference to green food item in their green product purchase decision. There is need to encourage people to buy other category green products also.

INTENTION OF TODAY'S YOUTH TO BUY GREEN PRODUCTS

Intention of consumer to buy green product can have positive impact on the purchase of green product. Therefore the intention of respondents to buy green product was checked by asking them that do they consider green products while shopping.

Table no-6: Intention of today's youth to buy green products

	Yes	%	No	%	No response	%
Preference to green products while shopping.	103	66	51	32	3	2

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The findings in table 6 showed that 103(66%) respondents consider green product while shopping. Majority of the respondents considered green product while shopping. Considering green product for shopping can be the first step of the respondents to purchase green product.

Association between awareness of green product among respondents and their preference to purchase of green product and actual purchase

Green awareness has a positive and significant effect on consumers' purchase intention of environmentally friendly products (Ayodele et al, 2017). Therefore Pearson Chi-Square test was conducted to identify the association between awareness about green product of the respondents and their preference to purchase green product as well as association between awareness about green products and actual purchase of green product.

Table no-7: Test of (a) awareness of green products among respondents and their preference to purchase of green products (b) awareness of green products and actual purchase of green products.

Pearson Chi-Square

Variables	Value	df	Asymptotic Significance (2-sided)
Association between awareness of the respondents about green product and their response related to their preference to purchase green product.	7.218[a]	2	.027
Association between awareness of the respondents about green product and their response about purchase of green product	23.568[a]	52	1.000

The findings in table 7. showed the result of test that revealed there was a significant relation (0.027) between the awareness and preference to purchase green products. It showed that the respondents those who were aware of green products gave preference to buy it.The test was also administered to examine the association between the awareness about green product and their response to purchase green product. The test revealed a statistically insignificant relation (1.00) between two. It revealed that the respondents who were aware of green products did not purchase green product in the same proportion.

ASSOCIATION BETWEEN INTENTION TO PURCHASE GREEN PRODUCT AND ACTUAL PURCHASE

Purchase intention is positively affect the probability of a customer decision that he/she will buy green products (Khalid Ismail & Nawawi Ishak, 2014). Therefore Pearson Chi-Square test was conducted to examine the association between the intention of respondents to buy green product and actual purchase.

Table no-8: Test of intention to purchase green product and actual purchase

Pearson Chi-Square

Variables	Value	df	Asymptotic Significance (2-sided)
Association between intention to purchase green product of respondents and actual purchase of green product by respondents	28.657[a]	2	.000

The test revealed that there was a significant relation (0.000) (table 8) between the intention and actual purchase. The intention of purchasing green product of respondents had positive influence on their purchase of green product. The result in table 7 and 8 revealed that all the respondents who were aware of green product did not necessarily purchase green product. But awareness of green product influenced the intension to purchase green product of the respondents and intention to purchase green product had positive influence on the purchase of green product.

FACTORS PREVENTING TODAY'S YOUTH TO PURCHASE GREEN PRODUCTS

Since table 7. showed a statistically insignificant relation between the awareness of green products among the respondents and actual purchase of green products by the respondents , it indicated that there might be certain factors preventing today's youth for purchasing green products and therefore the respondents were asked their opinion on the factors preventing them to buy green products such as whether green products are not available in the store, whether people lack knowledge of green product, whether the quality of green product is inferior as compared to nonorganic product, whether the promotion of green products by the companies are superfluous etc.

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Table no-9: Factors preventing today's youth to purchase green products

	LOCATION OF THE RESPONDENTS								
	42		82		8		25		
	Mumbai		**Thane**		**Navi Mumbai**		**No response**		
Variables	No of respondents	%	No of respondents	%	No of respondents	%	No of respondents	%	Total
Non availability in the the store	4	9.52	30	36.59	2	25	9	36	45
Non availability in the the store , Lack of knowledge	3	7.14	3	3.66	1	12.5	0	0	7
Non availability in the the store , Lack of knowledge, Green products are costly	1	2.38	0	0.00	0	0	0	0	1
Non availability in the the store , Lack of knowledge, Quality is inferior	0	0.00	0	0.00	0	0	1	4	1
Non availability in the the store , Lack of knowledge, Promotion by companies is superfluous.	0	0.00	2	2.44	0	0	1	4	3
Non availability in the the store, Green products are costly	2	4.76	3	3.66	0	0	0	0	5
Non availability in the the store, Green products are costly, Promotion by companies is superfluous.	1	2.38	0	0.00	0	0	0	0	1
Non availability in the the store, Quality is inferior	0	0.00	1	1.22	0	0	0	0	1
Lack of knowledge	11	26.19	9	10.98	1	12.5	0	0	21
Lack of knowledge , Green products are costly	0	0.00	1	1.22	0	0	0	0	1
Lack of knowledge , Quality is inferior	1	2.38	0	0.00	0	0	0	0	1
Lack of knowledge, Promotion by companies is superfluous.	0	0.00	1	1.22	0	0	0	0	1
Green products are costly	6	14.29	10	12.20	1	12.5	4	16	21
Green products are costly, Quality is inferior	0	0.00	1	1.22	0	0	0	0	1
Quality is inferior	1	2.38	0	0.00	0	0	2	8	3
Promotion by companies is superfluous.	1	2.38	0	0.00	1	12.5	1	4	3
no resp	11	26.19	21	25.61	2	25	7	28	41
Total	**42**	**100**	**82**	**100**	**8**	**100**	**25**	**100**	**157**

Findings in table 9. showed that 45% respondents said that non availability in the store prevented them from buying green products. 7% respondents said that non availability in the store and lack of knowledge hindered them from buying green products. 1% were in the opinion that non availability in the store, lack of knowledge and high cost of green products these were the problems faced by them for buying green products. 1% respondent felt that non availability in the store, lack of knowledge and inferior quality these were the obstacles they encountered in buying green products. 3% respondents were in the opinion that non availability in the store, lack of knowledge and superfluous promotion by companies were the problems faced by them. 5% respondents believed that non availability in the store and high cost of organic product prevented them from buying green product. 1% respondents felt that non availability in the store, high cost of green products and superfluous promotion by companies hindered them from buying green product.1% respondents were in the opinion that non availability in the store and inferior quality prevented them from buying green products. 21% respondents said that lack of knowledge obstructed them to buy green products. 1% respondents said that lack of knowledge, and high cost of green products were the problems for them to buy green products. 1% respondents said that lack of knowledge and inferior quality prevented them to buy green products. 1% respondents said that because of lack of knowledge and superfluous promotion by companies they could not

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buy green products. 21% respondents were in the opinion that organic products are costly. 1% said organic products are costly and also the quality is inferior. 3% respondents said that the quality of green products is inferior. 3% respondents said that the promotion of green product by companies is superfluous. 41% respondents did not answer this question. Above analysis showed that majority of the respondents were in the opinion that non availability of green products in the store prevented them to purchase of green products.

Since majority of the respondents felt that non availability in the stores prevented them from buying green product, it made researcher to identify the locality where this problem was more intense. With the help of cross tab it was found that 10% respondents in Mumbai region, 37% respondents in Thane region and 25% respondents in Navi Mumbai region felt most that non availability of green products in the store prevented people to buy green products. It showed that this problem was more intense in Thane region followed by Navi Mumbai. This problem was comparatively less intense in Mumbai region. Mumbai being more develop as compared to thane and Navi Mumbai regions had more availability of green products.

CONCLUSION

From the above analysis it can be concluded that respondents had high level of awareness about the green products and the awareness level was high across all educational levels, ages, geographical areas and genders. Majority of respondents knew what green product is. They believed that the use of green product can protect the environment. But though the awareness level was high people did not consider green product for shopping in the same proportion due to number of problems like green product is not available in the stores, lack of knowledge if its availability, it is costly, the quality of green product is inferior, green product by the companies is superfluous.. Majority of the respondents were in the opinion that non availability of green products in the store prevented them from purchasing green products. The analysis of the study showed that this problem was more intense in Thane region followed by Navi Mumbai. This problem was comparatively less intense in Mumbai region.

SUGGESTIONS

Today's youth should be educated and encouraged to buy green products and to adopt green ways of life. Today's youth being a link between present and future generation has tremendous power to influence them to adopt environmental friendly lifestyle by adopting green product in their day to day consumption. Educational institutions and policy maker should frame the pro environmental curriculum which can imbibe the importance of using green product in day to day life and saving environment. Government by making stringent rules and regulation should encourage the production of green product. Government should also promote the use of green product among people. Government can also think about the import of green product to make the people habituated to use green product. Media can also play an important role to create awareness among the people about the use of green product. All the efforts of government, media, and educational institutions will go in desired direction only if green products are produced and made available for people for purchase. Therefore the Organizations should work hard to produce and promote green products in the market. Organizations should work on the technology there by they can reduce the cost and improve the quality. Whatever claim made by the organizations through the advertising, packaging or through other means of communication should be genuine and it should not be green washing. There is a need of collective efforts from all i.e. government, industries, media, and education institutions to enhance the knowledge, attitude and concern for the environment.

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ANALYSIS AND CLASSIFICATION OF TWEETER DATA ON ACCIDENTS

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ABSTRACT
Analysing tweets to spot emerging issues, trends and to assess public opinion concerning topics political, social, sports, traffic, accidents, natural disasters, and entertainment – are having great scope for research. The aim of tweeter analysis is to bridge the gap between the massive potential information existing in the social media data and the need for accurate, inexpensive and relevant information. We are proposing the analysis and classification of tweeter data on accident/s using Finite Automata (FA). Finite Automata is a process of recognising pattern in text. We are classifying accident tweeter data in to seven main categories. They are car, bike, train, auto/taxi, and bus/truck, fatal and non-fatal using FA. Further we have classified car, bike, train, auto/taxi, bus/truck into fatal and non-fatal sub categories for each. Accident tweeters are extracted using Twitter Application Program Interface (API) by keyword accident & #accident in various geo-locations.

Keywords: Tweeter, Analysis, Classification, SVM, Fatal and Non-Fatal Tweets.

INTRODUCTION
The recent advancements in web technologies have attracted a large number of internet users to use online social networks like Facebook and Twitter for varied purposes, including events, updates and data sharing. Social media sites sharing short messages, such as Twitter, have become a powerful and inexpensive tool for extracting information of all kinds. It has a fairly large user pool, much more diverse than a specific incident crowd sourcing tool. Also, a significant portion of its data is shared by individuals to the public, which can be acquired using Application Program Interfaces (APIs).

Data mining is the process to extract information and knowledge which are potentially useful from a large number of incomplete, noisy, fuzzy, random real data. In short, it is extracting or *mining* knowledge from the large amounts of data. Data mining technology has a powerful data analysis capability. According to road traffic accident data, it can find the potential accident information or rules through data mining method and provide data analysis support for the road safety research.

The real-time detection of incidents based on Twitter is challenging. The state-of-the-art text mining techniques cannot be applied directly to mine tweets since the tweet language varies considerably from daily language. Twitter is one such social media application with a large and rapidly growing user base. It has become the most popular micro-blogging social networking website in which users share their views in the form of very short message limited to 140 characters – called “tweets”. In 2009, a short-term study stated that 40% of the tweets are often considered as “pointless babble”, making it difficult to separate useful information from plain noise [1]. Along with events, updates and data sharing, Twitter is also being used for many other purposes, including product marketing, political campaign, and market research. In addition, Twitter is also being used by the users to express their opinions and views about prominent issues of day-to-day life that may be social, political, or entertainment. Analysing tweets to spot emerging issues, trends and to assess public opinion concerning topics and events are of considerable interest to various stakeholders, including government, companies, and security agencies.

However, performing such analysis is technically challenging due to unstructured nature of tweets. The opinions of the users are typically expressed as informal communications and are buried under the pile of vast and largely irrelevant data generated by the millions of users and other online content producers. One of the ground challenges in analysing Twitter data is their classification on the basis of the events under discussion, which is generally conceptualized using a set of significant terms embedded within the tweets.

Azam et. al., [6] proposed an *n*-gram based statistical approach to identify significant terms and use them for vector-space modelling of the tweets. Thereafter, a social graph generation method is proposed, considering tweets as nodes and the degree of similarity between a pair of tweets as a weighted edge between them. The social graph is decomposed into various clusters using Markov Clustering technique, wherein each cluster corresponds to a particular event. Ashktorab et. al., [7] introduce *Tweedr*, a Twitter-mining tool that extracts actionable information for disaster relief workers during natural disasters. The *Tweedr* pipeline consists of three main parts: classification, clustering and extraction. Classification phase uses a variety of classification methods (sLDA, SVM, and logistic regression) to identify tweets reporting damage or casualties. In the clustering phase, filters are used to merge tweets that are similar to one another; and finally, in the extraction phase, extract

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tokens and phrases reports specific information about different classes of infrastructure damage, damage types, and casualties.

The aim of tweeter analysis is to bridge the gap between the massive potential information existing in the social media data and the need for accurate, inexpensive, and accident incidence information. The reasons of choosing Twitter as a representative of social media sites are as follows:

- We have access to a reasonably large free online Twitter database. A portion of Twitter data is accessible by developers in the real time through Twitter's APIs, which allows us to develop real- time incident detection tools based on Twitter.
- Compared with Facebook, a portion of Twitter data is accessible. However, Facebook data is proprietary.
- Compared with Google+, Twitter offers versatile APIs for crawling, searching, and mining the Twitter data. The APIs offered Google+ have very limited functionalities and therefore, Google+ may not be a good source for real-time incident detection.

We propose accident tweeter data analysis and classification in this paper. Initial process is to acquire accident tweeter data in preprocessing, extract the text information, then classify the accident tweets into categories like car accident, bike, train, fatal, non fatal etc. later subcategorize these categories into fatal & non-fatal car accident tweets, fatal & non-fatal bike accident, fatal & non-fatal train accident tweets.

PROPOSED SYSTEM

The proposed system consists of four steps, they are: Initial crawling (tweeter crawling), Tweets Pre-processing and Tokenization, Feature Extraction, Categorical classification. The proposed work flow is showed in Figure 1.

A. Initial Crawling

We have developed a crawler using Twitter API to retrieve tweets from the server and store them on local machine for further processing. In addition to tweets, the crawler also retrieves various users and tweets related structural features and stores them in a structured format. The structural features can be clubbed with the contents to design a better tweets analysis system, which is one of our future directions of work. We have retrieved accident (key word: Accident and #Accident) tweets from various geo-locations and eliminated the duplicate tweets that matches with the same screen name and later stored on local machine.

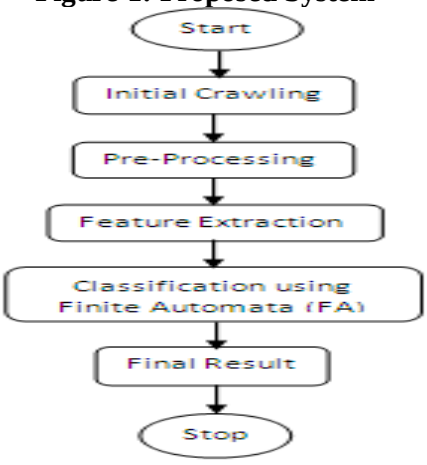
B. Tweets Pre-processing

Tweets pre-processing aims to filter out unwanted constituents like special characters, emoticons, URLs, etc. associated with each tweets. We have extracted tweet text by splitting each tweets by "," & "/" and stored in local storage unit.

Table-I: Extracted Features

Incident Type	Unique Keywords
Car Accident	Car, collision, 4-wheeler, four wheeler, ola, uber, taxi, sedan
Bike Accident	Bike, 2-wheeler, two wheeler, motor bike, scooter
Train	Train, rail, railway, station
Fatal	Died, die, passed away
Non-Fatal	Broken, Injured, Serious, Scratches, Flesh wound
Auto/Taxi	Auto, 3-wheeler, three wheeler, taxi, uber-auto, ola-auto, juguno
Bus/Truck	Bus, Truck, carriage, 6-wheeler, six wheeler, 10-wheeler, ten wheeler, lorry, goods vehicle

Figure-1: Proposed System



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FEATURE EXTRACTION

The goal of this module is to map the crawled traffic-related tweets into a proper space where further classification could be performed. A preliminary feature space is the space of all the words in the accident-related dictionary.

Incident type and unique keywords to classify type of accident occurred are showed in Table I, but not limited.

CATEGORICAL CLASSIFICATION

The goal of categorical classification is to determine what category (Car Accident, Bike Accident, Train Accident, Auto, Fatal, Non-Fatal, Fatal car accident, non-fatal car accident, fatal and non-fatal in bike accident, fatal and non-fatal in train, fatal and non-fatal belongs to auto accident) the tweets belong to. These classifications are categorized by using finite automata. Finite automata is a simple idealized methods used to recognize patterns within input taken from some character set or alphabet C. The job of an FA is to accept or reject an input depending on whether the pattern defined by the FA occurs in the input. FA consists of: a finite set S of N states, start state, final state, a set of transaction T from one state to another, labeled with characters C.

The classification of tweets for car accident category used by FA is shown in Figure. 2. The sub categories in car accident tweets that belong to fatal and non-fatal car accident tweets are classified using FA, shown in Figure. 3.

Figure 4 and 5 shows the classification of bike accident tweets and fatal, non-fatal bike accident tweets respectively by using FA technique. Similarly, for train, fatal, non-fatal, auto/taxi, fatal train, non-fatal train, fatal auto/taxi and non-fatal auto/taxi using the unique keywords defied in Table I.

Twitter text dictionary has the words {A, B, C …}, a finite automaton has *n* states, q_1, q_2, q_3, …., q_n. Then the query, in pseudo code is:

for all tweets
{
String q_1<-If (tweet.text HAS (A OR B OR C OR …);
String q_2<-If (q_1.text HAS (M OR N OR O OR …);
. . . . .
. . . . .
String final <- If (q_N.text HAS (X OR Y OR Z OR …);
include tweet in the query results.
}

EXPERIMENTAL RESULTS

We have extracted several accident tweets from various geo-location using tweeter API by using key word ‘accident’ and ‘#accident’. These tweets contain text field, created date and time, screen name, longitude, latitude, status source and many more fields. We have applied our proposed technique and processed on text field. In our proposed system we have mainly classified accident tweets into seven categories (car, bike, train, auto/taxi, bus/truck, fatal, non-fatal) shown in Figure 6 with total of 29092 tweets. Two sub categories for car, bike, train, auto/taxi, bus/truck (i.e. car-fatal, car non-fatal, bike-fatal, bike non-fatal, train fatal, train non-fatal, auto/taxi fatal, auto/taxi non-fatal, bus/truck fatal, bus/truck non-fatal) shown in Figure.7 with total of 14546 tweets. The number of accident tweets belongs to each category and sub categories along with percentages are shown in Table II and Table III.

CONCLUSION

We have extracted accident tweeter data using Twitter API from tweeter server and stored in client system. The extracted accident tweets are classified into major and sub categories by using finite automata pattern matching. The major accident categories are car, bike, and train, auto/taxi, bus/truck accident tweets, fatal and non-fatal accidents tweets. Fatal and non-fatal accident tweets are considered as sub categories. The experimental results shows that the car accident and non-fatal accident tweets are large in the number and the number of people died due to car accidents are more than other vehicle accident.

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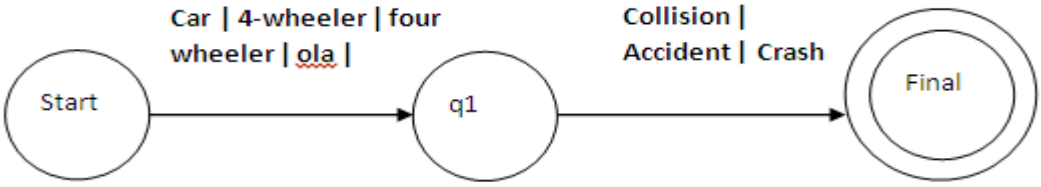
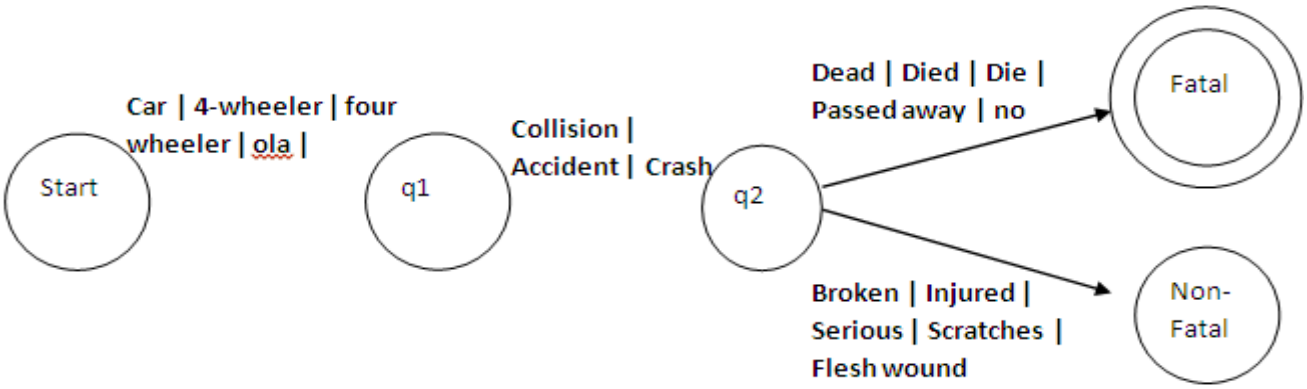


Figure-2: Classification of car accident tweets



Figuire-3: Classification of car accident tweets belongs to fatal and non-fatal

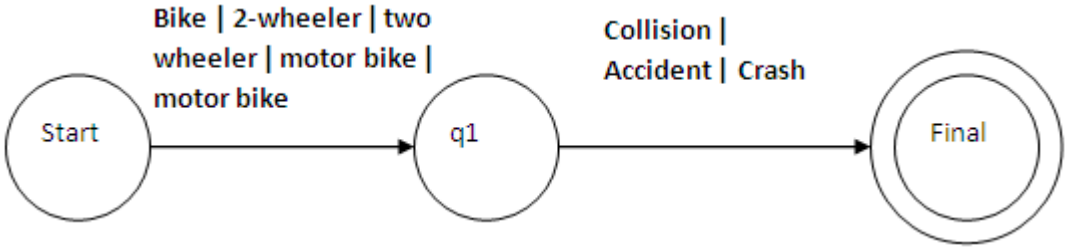


Figure-4: Classification of Bike accident tweets

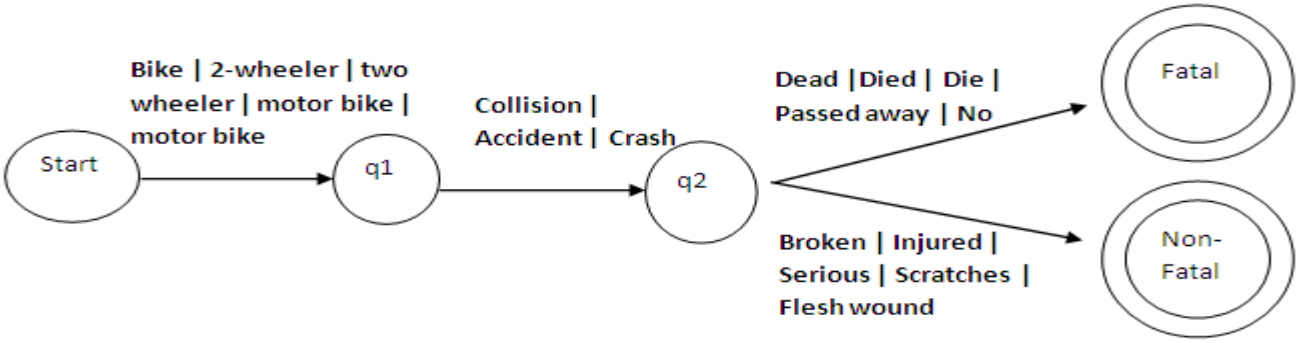


Figure-5: Classification of Bike accident tweets belongs to fatal and non-fatal

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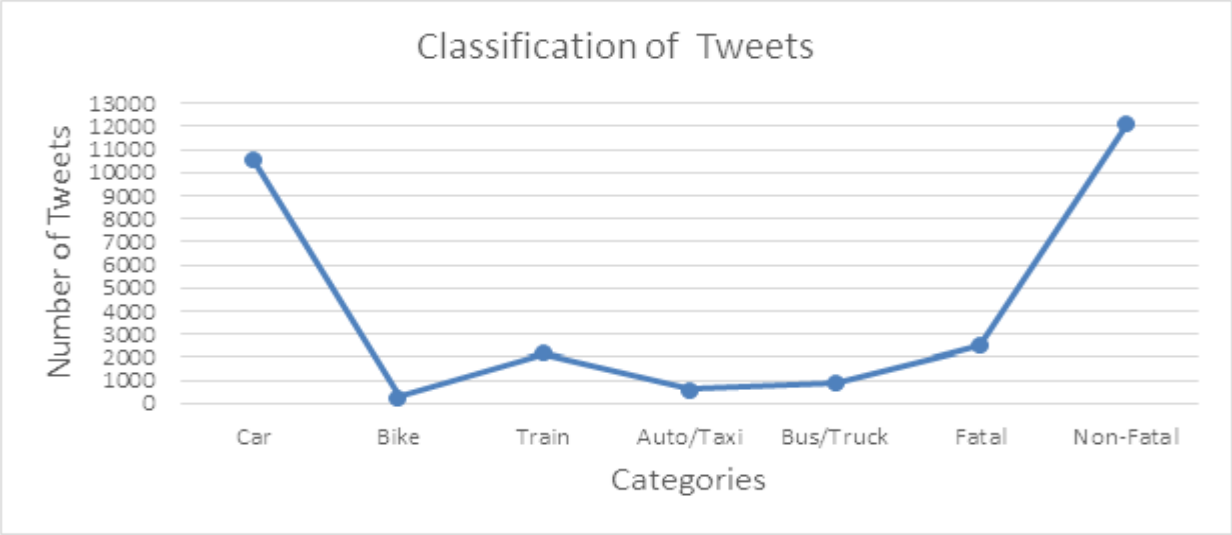

Figure-6: Classification of 7-category accident tweets

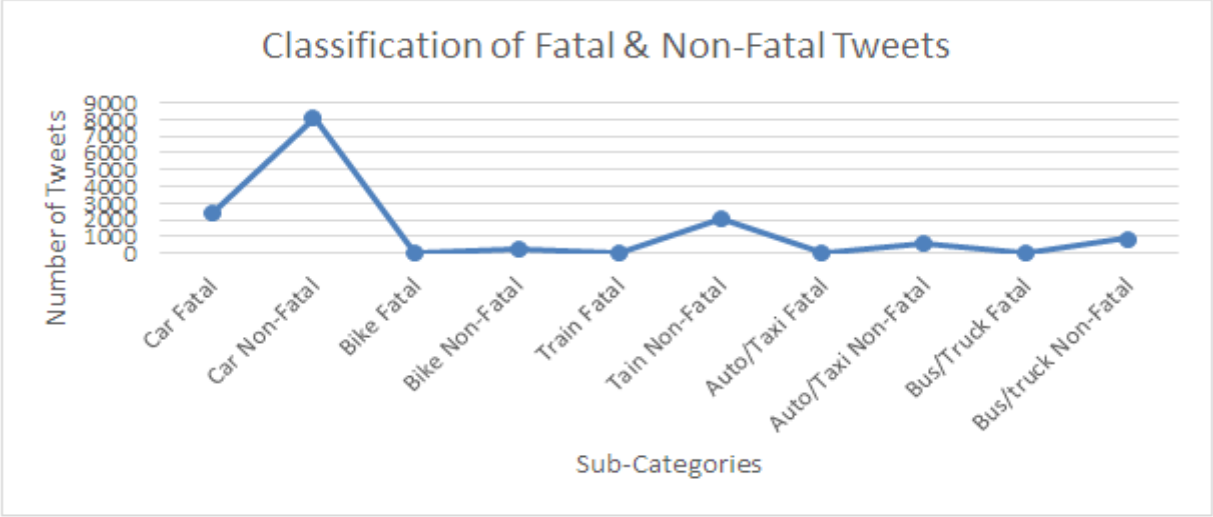

Figure-7: Classification of sub-category (Fatal & Non-Fatal) accident tweets

Table-II: FA Analysis For Accident Tweets (7-Categories)

Categories	Number of Tweets	Percentage (%)
Car	10585	36.38
Bike	293	1.00
Train	2162	7.43
Auto/Taxi	604	2.07
Bus/Truck	902	3.10
Fatal	2511	8.63
Non-Fatal	12035	41.368

TABLE III: FA ANALYSIS FOR ACCIDENT TWEETS (SUB-CATEGORIES)

Categories	Number of Tweets	Percentage (%)
Car Fatal	2449	16.83
Car Non-Fatal	8136	55.93
Bike Fatal	3	0.02
Bike Non-Fatal	290	1.99
Train Fatal	33	0.22
Train Non-Fatal	2129	14.63
Auto/Taxi Fatal	11	0.07
Auto/Taxi Non-Fatal	593	4.07
Bus/Truck Fatal	15	0.10
Bus/Truck Non-Fatal	887	6.09

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FINANCIAL PARAMETERS AND SELECTION OF STOCKS

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ABSTRACT
Selection of stocks in the stock market from the stand point of investors is a puzzling affair. Apart from limited well established stocks it is quite strenuous task to ascertain the status that can be expected of the other good stocks as the fundamental analysis and discussion of financial parameters seldom appears in newspaper or websites. However, data regarding financial performances of various companies are available in almost all reputed stock related websites.

Some investors are keen to have good dividend while a section look for handsome return from the growth of stock price. The information associated with former option can be had from various websites connected with stock market. But to ascertain the growth prospect of the price of stock usually entails detail analysis of various parameters associated with the concerned company which may not be available easily or readily.

Here attempts have been made to evaluate a process by which one can develop a fair idea of a group stocks in respect of their various financial parameters so that an order of preference can be projected. For this study five well known stocks have been selected at random namely, ITC Ltd, Reliance Industries Ltd, Power Finance Corporation, BHEL, Larsen & Toubro.

The focus has been made on parameter like return on equity (ROE), earning per share (EPS), compounded annual growth rate (CAGR) of both ROE and EPS, debt equity, interest to earning before interest and tax (EBIT) ratio, equity profit ratio, equity reserve ratio etc to arrive at a conclusion.

Each parameter has a specific function and highlights a few areas. While one parameter may highlight one particular point another parameter may focus the strength and weakness of that particular point. This is specially needed to develop a cautious approach in connection with a decision.

Here attempts have been made to evaluate a process by which one can develop a fair idea of a group stocks in respect of their various financial parameters so that an order of preference can be projected.

Various analyses focus different order of preference; the formidable task is to project a general sequence of priority status of financial parameters that can throw a modest, if not perfect, idea of the situation.

Keywords: stock, price, dividend, analysis, preference.

INTRODUCTION
The selection of stocks often poses a challenging task to an investor in view of his/her financial requirements. Dividend requirement is a preferred subject to one section of people while some people seek growth of investments. The former group is more concerned with secure and steady return with growth of stock while the second section of people are more aggressive and risk taking. As growth of stock price may suffer on many counts even for a few years for companies with proven track record, thus the task is quite complex and tough for second group of people. Even those who focus on dividend, certain points are to be analysed whether probability of maintenance and growth of dividend how far is practicable from the past trend of the company.

OBJECTIVE OF THE STUDY
Only on the basis of one or two parameters decision on investments is quite risky job. Here attempt has been made on the basis of some analysis so that a rational approach can be made, of course, within some limitation, for preferential selection of stocks. It segregates from a group of stocks, in order of priority, to two sections -- order of priority for dividend and the same for growth stock.

METHOD OF STUDY
Study requires analysis of various ratios with critical review of the factors in association with other factors.

Tables have been developed for each stock on parameters like

a) Return on equity (ROE), Reserve, Earning per share (EPS), Profit, Growth of ROE, Reserve and EPS, Price / Earning ratio, Price / Book value ratio etc

b) Equity / Reserve ratio table

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c) Dividend yield ratio table

d) Equity / Profit ratio

e) Debt / Equity ratio

f) Equity / Reserve ratio

g) Interest / EBIT ratio

Finally a comparison table has been prepared to get an idea of the status of various stocks in each different area.

Following tables have been prepared in this paper to study the preference of share holders from the stand point of (1) dividend receipt option (2) stock price growth option.

Here five reputed stocks have been selected at random and data have been collected. These are (1) ITC Ltd (ITC), (2) Reliance Industries Ltd (Reliance), (3) Power Finance Corporation (PFC), (4) BHEL (Bharat Heavy Electricals Ltd), (5) Larsen & Toubro Ltd (LT).

Sources of data: Data have been collected from secondary reliable source like indiabulls.com, moneycontrol.com, equitymaster.com

Following five tables have been prepared for each company with necessary or requisite parameters

ABBREVIATION
(FV = face value, EPS= earnings per share, ROE = return on equity, EBIT = earning before interest and tax, INT = interest, CAGR= compounded annual growth rate)

ITC Ltd	Equity in billion ₹ FV ₹1/-	Reserve In billion ₹	% growth Of	Book Value(₹)	%growth Of book Value	Basic EPS in ₹	% of Growth	Price/ Book value	Price/EPS	Profit in Billion	ROE
2014	7.98	263.42		34.46		11.22		9.7	29.6	89.91	32.8
2015	8.02	308.42	17.1	39.83	15.60	12.11	7.9	7.5	29.9	97.66	30.53
2016	8.05	418.75	35.8	53.36	34.00	11.6	-4.2	5.9	26.6	94.92	21.89
2017	12.15	451.98	7.9*	38.45(57.7)	-27.9 (8.1)	8.5(12.75)	-	6	29	104.71	21.07
2018	12.20	512.90	13.5	43.30 (65)	12.6 (12.6)	9.26(13.89)	8.9 (8.9)	7	32	118.45	20.47

In the bracket mentioned is the value had there been no bonus. * reserve growth low due to bonus in 2016, 1bonus for 2 shares, Rs1 billion = Rs 100 Crore

Reliance Ind Ltd	Equity in billion ₹ FV ₹10/-	Reserve In billion ₹	% growth of reserve	Book Value(₹)	%growth of book Value	Basic EPS ₹	% of Growth of EPS	Price/ Book value	Price/EPS	Profit Billion ₹	ROE
2014	32.32	1938.42		672.97		76.50		1.3	11.1	224.58	11.37
2015	32.36	2147.12	10.8	739.18	9.84	80.10	4.71	1.4	12.1	235.22	10.82
2016	32.40	2277.65	6.1	793.99	7.41	100.97	26.05	1.2	9.4	296.25	12.89
2017	32.51	2598.76	14.1	898.14	13.12	101.33	0.36	1.3	11.2	299.41	11.37
2018	63.35	2875.69	10.7	501.59 (1003.18)	-44.15 (11.69)	60.94 (121.88)	-39.86 (20.28)	2.5	20.1	360.21	12.29

In the bracket mentioned is the value had there been no bonus. Bonus in 2017, 1bonus for 1 share

Power Finance Corp.	Equity in billion ₹ FV ₹ 10/-	Reserve In billion ₹	% growth of reserve	Book Value(₹)	%growth of book Value	Basic EPS ₹	% of Growth of EPS	Price/ Book value	Price/EPS	PROFIT In billion ₹	ROE
2014	13.20	262.02		208.5		41.38		0.93	3.7	54.61	19.84
2015	13.20	310.91	18.7	245.53	17.76	45.49	9.93	1.11	5.6	58.84	18.52
2016	13.20	347.08	11.6	272.93	11.16	23.43(46.85)	2.99	0.63	4.6	61.84	17.16
2017	26.40	342.04*	-1.5	139.36	2.12	8.47(16.94)	-16.94	1.05	20.6	22.36	6.06
2018	26.40	375.61	9.8	152.27	9.26	22.12(44.24)	44.24	0.56		58.44	14.53

In the bracket mentioned is the value had there been no bonus. * Reserve growth decelerated due to bonus in 2016 and write-off of NPA, 1bonus for 1 share EPS growth calculated on no bonus concept to arrive at real situation

Source: indiabulls.com, moneycontrol.com, equitymaster.com (detail given in reference)

(http://contentlinks.dionglobal.in/IB/FinalCompanyProfile.asp?txtCompanycode=12150008)

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BHEL	Equity in billion ₹ FV ₹2/-	Reserve In billion ₹	% growth of	Book Value(₹)	% growth of book Value	Basic EPS	% of growth of EPS	Price/ Book value	Price/EPS	PROFIT Billion ₹	ROE
2014	4.89	326.67		135.48		14.31		0.93	10.8	35.02	10.6
2015	4.89	337.17	3.21	139.76	3.16	5.93	-58.56	1.11	39.8	14.50	4.4
2016	4.89	318.24	-5.61	132.03	-5.53	-2.88	-148.57	0.63	-66	-7.21	-2.2
2017	4.89	318.99	0.24	132.33	0.23	1.86	164.58	1.05	76.4	4.78	1.4
2018	7.34	316.01	0.93	88.06 (117.4)	-33.45 (-11.3)	1.19 (1.79)	-36.02 (-3.2)	0.56		8.28	1.4

In the bracket mentioned is the value had there been no bonus issue. *One bonus for two shares in 2017,

Larsen & Toubro	Equity in billion ₹ FV ₹2/-	Reserve In billion ₹	% rise of reserve	Book Value (₹)	% rise of book Value	Basic EPS ₹	% of rise of EPS	Price/ Book value	Price/EPS	Profit Billion ₹	% growth of Profit	ROE
2014	1.85	375.06		406.6		52.97		3.13	18.7	48.54		13
2015	1.85	407.07	8.5	440	12	51.33	-3.1	3.9	30.6	49.93	1.63	11.65
2016	1.86	439.94	8.1	505	2.4	45.48	-11.4	2.56	30.3	55.34	12.18	9.58
2017	1.86	498.76	13.4	575	13.7	64.8	42.5	2.94	19.9	68.80	24.32	12.06
2018	2.80	552.19	10.7	436 (654)	-24.1 (13.8)	52.62 (70.2)	-18.8 (8.3)	3.31	25.8	84.40	22.67	13.27

In the bracket mentioned is the value had there been no bonus. Bonus in 2017 one bonus share for two equity shares.

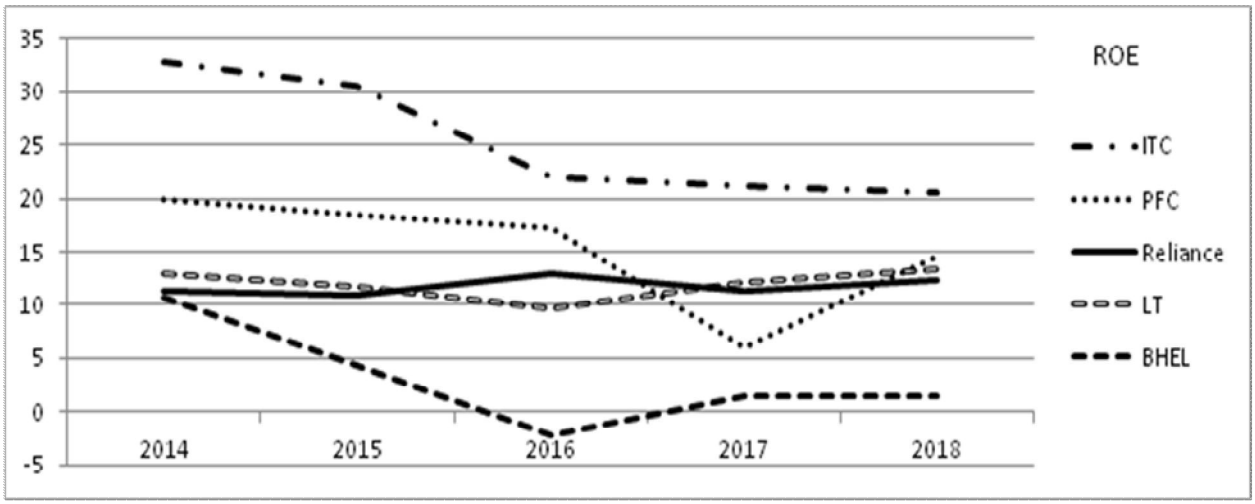
Calculations have been made on the basis of no bonus issue concept to arrive at a rational decision.

Source: indiabulls.com, moneycontrol.com, equitymaster.com (detail given in reference)

(http://contentlinks.dionglobal.in/IB/FinalCompanyProfile.asp?txtCompanycode=12150008)

From the afore said data following graphs and interpretation have been made.

ROE Graph



On the basis of ROE, performance order of companies as shown here below. In other words it describes the return per rupee of capital employed by share holders. It is also the mother of all parameters. It also describes how efficiently the fund of share holders are being utilised in the enterprise.

ITC > PFC > Reliance, LT > BHEL.

However CAGR (compounded annual growth rate) of ROE says Reliance (1.6%) > LT (0.40%) > PFC (-6.00%) > ITC (-8.90%) > BHEL (-33%) (The compound annual growth rate (CAGR) is the mean annual growth rate of an investment over a specified period of time longer than one year. The compound annual growth rate isn't a true return rate, but rather a representational figure. It is essentially a number that describes the rate at which an investment would have grown if it had grown at a steady rate, which virtually never happens in reality)

CAGR can be written as follows

$$CAGR = \left(\frac{\text{Ending Value}}{\text{Beginning Value}}\right)^{\left(\frac{1}{\#\text{ of years}}\right)} - 1$$

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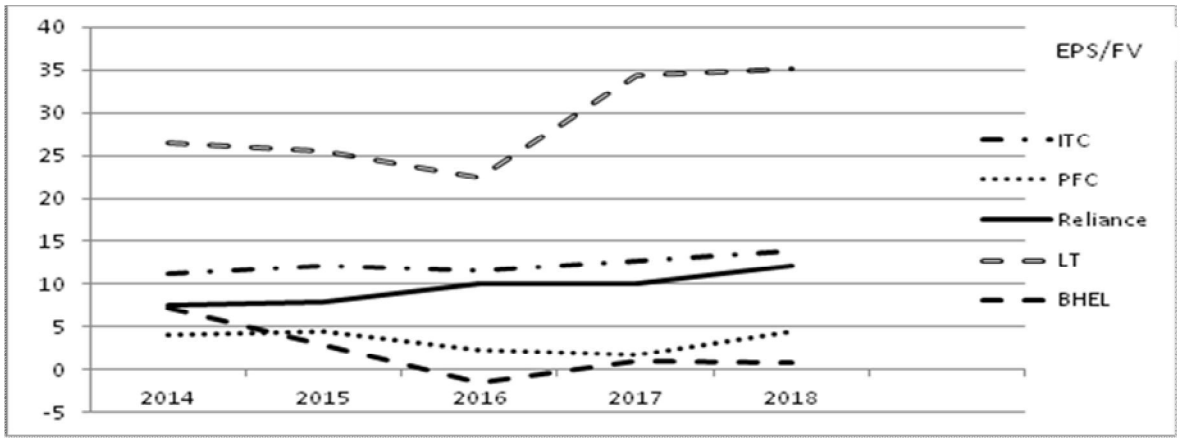
Table-1

ROE	ITC	reliance	PFC	BHEL	LT
	32.8	11.37	19.84	10.6	13
	30.53	10.82	18.52	4.4	11.65
	21.89	12.89	17.16	-2.2	9.58
	21.07	11.37	6.06	1.4	12.06
	20.47	12.29	14.53	1.4	13.27
CAGR	-0.08998	0.015683	-0.0604	-0.33294	0.00412

This simply signifies that amongst these companies Reliance has been using most progressively and efficiently utilising the shareholders fund followed by LT, PFC, ITC, BHEL. Though ITC hs baeen offering highest return to its share holders but it has been declining progressively. Investors growth must who seek notice this factor.

The scenario of EPS. EPS Graph



On the basis of EPS, performance order of companies as shown here below (we have chosen EPS per unit face value for uniform comparison as face value of shares are different).

LT> ITC > Reliance > PFC > BHEL

The CAGR of EPS exposes a different picture Reliance (9.7%) > LT (5.8%) > ITC (4.3%) > PFC (1.3%) > BHEL (-34%).

From long term perspective, Reliance is more attractive than LT as it is maintaining steady and progressive growth rate.

Now let us see what debt equity (D/E) reveals as debt component exposes danger to EBIT level and subsequently the EPS of the companies.

Table-2

D/E	year	ITC	PFC	Reliance	LT	BHEL
	2014	0	5.22	0.67	2.13	0.13
	2015	0	5.22	0.68	2.01	0.05
	2016	0	5	0.71	1.99	0
	2017	0	4.82	0.69	1.88	0
	2018	0	5.73	0.61	1.94	0

Source: indiabulls.com

(http://contentlinks.dionglobal.in/IB/FinalCompanyProfile.asp?txtCompanycode=12150008)

Debt Equity level most favourable for ITC, then BHEL, then Reliance , then LT, then PFC

D/E level reveals degree of potential threat to EBIT. A critical insight requires regarding maintenance of D/E level. D/E throws light on the fact that if adverse changes in EBIT occur, the impact of interest component arising out of leveraging may pose threat to earning power (EPS). If interest/EBIT is very high the profitability and in turn EPS will be affected much under adverse situation. The following table explains the EPS vulnerability in the context of interest component in the business with respect to EBIT. Following tables show Interest/EBIT status.

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Table-3

ITC	EBIT Billion ₹	Interest Billion ₹	INT/EBIT (%)	RELIANCE	EBIT Billion ₹	Interest Billion ₹	INT/EBIT (%)
2014	130.58	.06	0.0	2014	325.09	38.36	11.8
2015	144.30	0.24	0.2	2015	343.12	33.16	9.7
2016	149.04	0.54	0.4	2016	376.18	36.91	9.8
2017	160.44	0.24	0.1	2017	439.91	38.49	8.7
2018	170.78	0.90	0.5	2018	563.32	80.52	14.3

Table-4

PFC	EBIT Billion ₹	Interest Billion ₹	INT/EBIT (%)	BHEL	EBIT Billion ₹	Interest Billion ₹	INT/EBIT (%)
2014	213.80	137.56	64.3	2014	52.17	1.33	2.5
2015	246.50	163.24	66.2	2015	22.90	0.92	4.0
2016	258.12	166.45	64.5	2016	-8.17	3.60	-44.1
2017	220.31	167.68	76.1	2017	9.60	3.51	36.6
2018	259.01	175.41	67.7	2018	18.61	2.55	13.7

Table-5

LT	EBIT Billion ₹	Interest Billion ₹	INT/EBIT (%)
2014	102.90	31.41	30.5
2015	97.20	28.50	29.3
2016	145.47	67.01	46.1
2017	154.67	67.01	43.3
2018	190.74	75.58	39.6

Source:(indiabulls.com(http://contentlinks.dionglobal.in/IB/FinalCompanyProfile.asp?txtCompanycode=12150008)

The tables speak that even a significant change in EBIT, say 10%, may have little effect on profitability or EPS of ITC because of virtually nil debt component (profit may be affected by around 10% if all other parameters remain unaffected); however Reliance amongst other companies is in quite comfortable position, as for the company, this ratio is quite low and may sustain the adverse effect on EBIT in short term (a probability of around 14% of profit may be wiped out provided all other parameters remain same, say, debt component). The situation for PFC is not comfortable as EBIT is not increasing at a pace like Reliance. The business of the company is totally different from others as it provides long term finance to power sector and resorts to borrowing. A high D/E is inevitable. Adverse effect on EBIT (say 10%) may cause wide swing to profitability or EPS. In fact 50% of profit may be wiped out. The case of LT is somewhat better. However 10% change in EBIT may cause 24% decline in Profitability when other parameters remain constant.

The situation is better for BHEL, as with low or almost nil D/E. A 10% change in EBIT may wipe out only 22% of profit. However, above 20% change in profit is quite significant.

Thus on the stand point of D/E, preference is as follows: ITC > Reliance > BHEL > LT > PFC.

While taking a decision simply on the basis of EPS may expose the investor to a problem if debt equity matter is not taken into account. The lower will be this ratio (interest/EBIT) the more comfortable will be the situation.

From the stand point of Reserve and EPS growth we can evaluate a process to understand why in spite of rising EPS a company may face gradual reduction of ROE.

We know, EPS x no. of shares = PAT, again ROE x Net worth = PAT (ROE in percentage)

EPS x no. of shares = ROE x Net worth = ROE x (Reserve + equity)

EPS x k = ROE x (Reserve + k_1) , so long k is fixed, k_1 is also fixed

Or ROE = (EPS x k)/ (Reserve +k_1) ...Equation A.

Or ROE is directly proportional to EPS but inversely proportional to Reserve within some limitation.

Here in this stage if growth rate of Reserve > growth rate of EPS, ROE declines and vice versa. Excessive growth of reserve has the propensity to suppress ROE, if PAT is not proportional.

For ITC the growth rate of reserve normally is greater than growth rate of EPS. The declining ROE may have resulted from it. Maximisation of welfare of shareholders is affected. For others it is fluctuating. Attention should be more given to this factor that growth rate of reserve should be kept below the growth rate of EPS. To

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strike a balance, dividend should be suitably adjusted to keep growth rate of reserve below the growth rate of EPS. It can be noted in majority of cases whenever growth rate of reserve exceeds growth rate of reserve return on equity (ROE) suffers. Situation of PFC is much better than BHEL as EPS growth rate usually greater than reserve growth rate. ROE of PFC is better than BHEL.

In view of declining ROE of ITC, dividend rate though adequate may be enhanced to keep ROE at suitable level. For Reliance there is ample scope for enhancement of dividend rate, same is true for LT. Dividend track record in years under consideration is better for PFC than BHEL. However, last two are nowhere near to ITC or LT.

If reserve grows bonus prospect brightens and stock price energised. Here one thing is to be remembered, too much bonus creates a body heavy equity base which poses threat to both bonus and dividend prospect in future if profitability is affected and price of stock may reach a point of stagnation. Investors lose interest in the stock as growth prospect of price suffers.

The CAGR of Reserve shows the following order of preference.

LT (7.9%) > Reliance almost Zero > ITC (-7.6%), > PFC (-19.4%), > BHEL (-33.8%)

CAGR of EPS Reliance (9.7%) > LT (5.8%) > ITC (4.3%) > PFC (1.3%) > BHEL (-34%).

This indicates out of profit LT transfers more fund (in %) to reserve than Reliance (very much steady). ITC comes next (declining), then PFC (declining sharply), then BHEL (declining sharply).

Dividend Table -6

year	ITC %	RELIANCE %	PFC %	BHEL %	LT %
2014	600	95	78	141.5	712.5
2015	625	100	50	58	812.5
2016	850	105	139*	20	912.5
2017	475 (713)*	110	50 (75)	79	700
2018	515 (773)	60 (120)*	78 (117)	91	1200

*PFC bonus in 2016, BHEL bonus in 2017, ITC bonus 2016, LT bonus in 2017, RELIANCE bonus 2017. In the bracket is the value had there been no bonus.

Thus preference is LT > ITC > Reliance > PFC > BHEL (from dividend stand point).

Dividend yield ratio Table-7

Year	ITC	RELIANCE	PFC	BHEL	LT
2013				2.4	
2014	1.8	1.1	5.9	1.8	1.4
2015	1.7	1.0	3.3	0.5	1.0
2016	2.7	1.1	6.2	0.2	1.2
2017	1.9	1.0	2.9	0.6	1.5
2018	1.7	0.5	5.7	NIL	1.1

While dividend rate reveals one picture the dividend yield projects a different picture. Dividend yield refers to yield (in percentage) of dividend received with respect to market value of share, in other words it reflects, from stand point of those who prefer dividend, the earning as dividend per rupee of investment in the stock or equity share.

Dividend yield = (dividend in ₹ / market value of share in ₹) x 100 %

Here order of preference is PFC > ITC > LT > Reliance > BHEL.

This dividend yield ratio points out to the fact that except PFC, dividend amount per share with respect to price of the stock is very low. This clearly expresses the fact that the prices are quite high with respect to face value as evident from P/E ratio which indicates high growth prospect of these companies and investors prefer more on growth of stock prices rather than dividend.

The aforesaid analysis describes the fact that ITC, Reliance, LT are held mainly for capital gain purpose though they offer good dividend with poor dividend yield.

Equity-Profit relation is given here below

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Table-8

Equity / profit (%)					
year	ITC	Reliance	PFC	BHEL	LT
2014	8.9	14.4	24.2	14	3.8
2015	8.2	13.8	22.4	33.7	3.7
2016	8.5	10.9	21.3	-67.8	3.4
2017	11.6	10.9	118.1	102.1	2.7
2018	10.3	17.6	45.2	88.5	3.3
RANGE	8-10	11-17	21-118	(-68)-102	3-4

Source: indiabulls.com

(http://contentlinks.dionglobal.in/IB/FinalCompanyProfile.asp?txtCompanycode=12150008)

It is most favourable for LT followed by ITC, Reliance, PFC, BHEL. Actually it shows the scope for dividend growth, Reserve growth, and to what extent effect of adverse variation of profit may affect dividend matter. Even bonus decision can be associated with it. LT and ITC have paid more stock dividend than others. From 2005 to 2017, these two companies have made 3 bonus issues.

EQUITY-RESERVE RELATION SHIP

Table-9

Equity/Reserve in %					
year	ITC	Reliance	PFC	BHEL	LT
2014	3.00	1.70	5.00	1.5	0.49
2015	2.60	1.50	4.20	1.45	0.46
2016	1.90	1.40	3.80	1.54	0.42
2017	2.70	1.30	7.70	1.53	0.37
2018	2.40	2.20	7.00	2.32	0.51
RANGE	1.9-2.7	1.3-2.2	4-7.7	1.5-2.3	0.4-0.5

Reserve position with respect equity is very high for LT followed by Reliance and BHEL, ITC, PFC. This signifies even under falling EPS the companies will be able to pay or maintain dividend for a few years and even declare bonus. This also indicates that P/E ratio gets extra momentum or impetus whenever EPS is energised as future bonus issue probability usually brightens.

Power Finance Corporation declared bonus in 2016-17 in which its performance was affected because of bad debt write off. Temporarily the stock price was affected but recovered moderately in subsequent period. In 2017-18 its profit again bounced back. In 2016 dividend was 139%, in 2017 dividend was 50% (after bonus), in 2018 dividend 78%. Moser Baer, in spite of loss or negative EPS in 2008 to 2010, declared dividend.

Table-10

Moser Bayer Year	**2011**	**2010**	**2009**	**2008**
EPS ₹	-50.43	-23.41	-21.61	-12.05
Cash EPS ₹	-18.62	10.14	8.79	14.48
Dividend in %	0	6	6	10

Kesoram Industries in 2011 reported negative EPS (₹ -45.95) but the cash EPS was positive to the extent of ₹ 13.64. The company paid dividend @55% at par with previous years.

Though dividend is expected to be paid out of current year's profit, however there is no legal compulsion for a company to declare dividend out of previous years' profits and other income which are lying as reserves. In such cases share holders' consent is required.

From 2005 ITC declared three bonus issues, from 2006 four bonus issues were declared for LT, from 2005 only two for Reliance, only one in 2016 for PFC, only two bonus issue since 2007 for BHEL.

From dividend and price growth stand point preference is more for LT> ITC> Reliance, BHEL > PFC.

Here one point is clear these shares/stocks, though offer huge dividend, the choice is more for growth of price of the stock. Dividend is the extra bonus.

In most companies retention of earning is quite high; whenever good profit is generated almost over 70% is retained in the business. This enhances the book value and subsequently the price as bonus offer brightens and growth of dividend also is expected.

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Table-11
Final comparison chart

Parameters for Price growth prospect of stock								
ROE on the basis of CAGR	EPS/face value on the basis of CAGR	ROE	EPS/face value	Leveraging-- Debt / Equity	Effect of leveraging-- INTEREST/ EBIT	Final effect of leveraging-- EQUITY/ PROFIT	Bonus Prospect-- EQUITY/ RESERVE	Effect of growth-- BONUS STATUS
Reliance	Reliance	ITC	LT	ITC	ITC	LT	LT	LT
LT	LT	PFC	ITC	BHEL	RELIANCE	ITC	BHEL	ITC
PFC	ITC	Reliance	Reliance	RELIANCE	BHEL	RELIANCE	RELIANCE	RELIANCE
ITC	PFC	LT	PFC	LT	LT	PFC	ITC	BHEL
BHEL	BHEL	BHEL	BHEL	PFC	PFC	BHEL	PFC	PFC

Order is down wards- more preferable to least preferable

Table 12

Parameters for Dividend Prospect			
Dividend rate	**Dividend yield**	**EPS/Face Value**	**ROE**
LT	PFC	LT	ITC
ITC	ITC	ITC	PFC
Reliance	LT	Reliance	Reliance
PFC	RELIANCE	PFC	LT
BHEL	BHEL	BHEL	BHEL

Order is down wards- more preferable to least preferable

DISCUSSION

Two comparison charts are equally important for an invesrtor. Only dividend prospect chart may push the investor to wrong path if other parameters in the growth prospect chart is not analysed. Because when growth prospect is satisfactory dividend prospect automatically brightens.

The order of preference of stocks is given here below on the basis of analysis

Preference No. 1 (LT) ---- Parameters of LT stand tall as the company is balancing almost all parameters. The dividend yield is comparatively low in spite of huge dividend as stock price is very high with respect to face value of share (₹ 2/-). Opportunities for bonus issues are still there because of very low equity base and equity / reserve ratio (best amongst all). The EPS status is also best; however CAGR is lower than Reliance. The company is maintaining D/E status at higher level and extracting the leverage effect to the fullest extent as evident from equity / profit ratio status. If the company can lower the Debt by 50%, the D/E ratio and the interest / EBIT ratio will be significantly improved and the EPS will be flared up. This is most promising growth share amongst this group. Good for both investment and dividend. Bonus issues in recent years are in conformity with above facts.

Preference No. 2 (Reliance)----From the stand point of growth of stock price emphasis will be given more on Reliance as the most fundamental aspect ROE concerning performance of a company centres around this one. Regarding EPS though it is behind LT but CAGR of this parameter is better for Reliance. However D/E status and its related interest/EBIT, equity /profit and equity / reserve ratios are its points of concern. Body heavy equity base prohibits the company to declare huge dividend like LT and ITC. However, the company is maintaining steady growth in dividend. More bonus issues may play spoil sport. Investors looking for good dividend and steady growth of stock price may stick to this counter.

Preference No. 3 (ITC) -----The case of ITC is unique in the sense that leveraging is missing here and company relies on its own fund generated over years. The company has highest ROE in the group, but it is declining steadily. This is causing concern. The EPS position is next to LT and superior to Reliance. But CAGR of EPS is declining quite alarmingly. Profit / equity ratio is next to LT. Equity / reserve ratio is quite comfortable. The stock price with respect to face value provides better dividend yield than LT or Reliance. Bonus issues in recent years are in conformity with aforesaid facts.

Preference No.4 (PFC) ----Though ROE of PFC is next only to ITC but CAGR of ROE is adverse but better than ITC and BHEL. In other words ROE is declining. EPS status is inferior to above three companies. Dividend yield is most favourable as price is quite low. For financially weaker investors such stock is preferred.

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Company's activity requires huge investment in power sector companies and PFC naturally maintains high debt equity. It is quite difficult to extract huge return on equity under high D/E and equity / profit or equity / reserve ratios are inferior to above three companies. Naturally growth prospect is inferior to above three companies.

Preference No.5 (BHEL) -----Except D/E status, BHEL is in all respect underperformer with respect to other companies.

The price correlation coefficient with respect to Sensex is given below
ITC 0.9, Reliance 0.8, PFC 0.8, BHEL 0.8, LT 0.7

This relation actually expresses the relationship of the two parameters. Stock price of ITC, Reliance and PFC is very much influenced by the Sensex movement and move in the same direction.

Beta or volatility coefficient: Reliance 1.5, PFC & BHEL 1.4, ITC1.2, LT 0.8; this indicates if Sensex moves by 10% Reliance stock price moves by 15% etc. (Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the entire market or a benchmark)

This indicates stock movement with respect to Sensex is very high for Reliance. For speculative trading Reliance is more ideal than others. LT is less susceptible with respect to others in connection with Sensex behaviour.

CONCLUSION

From the above discussion it is clear that investor can put their money in order of preference i.e. LT > Reliance > ITC > PFC > BHEL for the purpose of growth of price. For dividend PFC still now is a better option.

It is to be remembered there are many socio-economic processes which can stand in the way of performance of a company. A global oil problem may play havoc with Reliance Industries, terrorist activities in the country may temporarily cause major setback to hotel business of ITC etc.

Therefore the suggestions that have been envisaged may be true for the time being or at best for a short term of two years. It is to be reviewed continuously

In this way we will be able to develop relative preferability of various other stocks also.

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FUTURE OF WOMEN WORKERS IN GARMENT INDUSTRY IN INDIA: AN ECONOMIC EVALUATION

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INTRODUCTION

India has 397 million labours out of which 125 million are women who constitute 31.23percent. A maximum of 106 million woman employees are belonging to rural areas and who also comprised of 26.70 per cent and the remaining 18 million work in the urban areas. Only 10 per cent of labour work force is in the organized sector, which includes workers on regular salaries in registered companies and firms. The rest of 93 percent labour force is in unorganized of informal sector. The female work participation rate (W R) has increased from 19.7 per cent in 1981 to 25.8 per cent in 2011. As for as manufacturing industries is concerned, about 1.1 percent of total workforce are women employees in 2005, out of the total 19 per cent of the total organized sector constituted by women workers.

The garment textile contributes 17.63% to the International trade earnings of India and it employs over 4.5 million labours. There are five different garment production hubs in India. all specialize in different types of garment production. Bangalore is one of the centers of production of garment and has somewhere around 1300 big, small and medium sized garment factories. A review of garment industries revealed that, it is one of the largest manufacturing sectors in India. It accounts for nearly 20% of India's Industrial Output and 37% of India's Exports. Karnataka is known for being the apparel destination in the Global Market.

THE PERFORMANCE OF INDIAN TEXTILE INDUSTRY

India is the highest producing of cloth and cotton after China. And third largest producer cotton in India among the world.. The textile industry continues to be the second largest employment generating sector in India. It offers direct employment to over 35 million in the country. The share of textiles in total exports was 11.04% during April–July 2014-2015, as per the Ministry of Textiles. There were 2,500 textile weaving factories and 4,135 textile finishing factories in all over India. In the production of fabrics the decentralized sector accounts for roughly 94 percent while the mill sector has a share of only 6 percent. Being an agro-based industry the production of raw material varies from year to year depending on weather and rainfall conditions.

GARMENTS INDUSTRY IN PERSPECTIVE AND ITS PRESENT SCENARIO- IN BANGALORE

The present study the Bangalore City has been selected as there is a concentration of industries located and women workers both skilled and unskilled being employed. Namely Dasarahalli, Penya Nelamangala, KR Puram Magadi, Road and Laggere In these area women are predominantly employed in textiles, plantations, garments, weaving, and other related industries. Today overseas buyers view Bangalore as an important location for sourcing of garments after Mumbai and Delhi.

In Bangalore, Development of garments units was started in 1970s onwards to lead the promoting of exports like Gokaldas and Ashoka export, Gokaldas Images, continental exports, Leela Fashions, Exports Overseas etc. Later, small industries (fabricators) were started by taking the orders from large scale.

The economy of Bangalore is contribute up with that of readymade garment.More 30 per cent of the Garments of the country are made in this region.The industry started flourishing and Most of Garment Industries are concentrated in Peenya industrial estate.,goraguntepalya, and laggere .Nelamangala.

More than 3512 Garments units around in Bangalore as per recent survey report of 2014-16. Most of the buying agencies in the world have established their branch office in the city. Apart from this, Apparel Park, at Doddaballapur has started functioning in a big way. In Bangalore, garment units are mainly concentrated in the following area:. Bommanahalli,. Bommasandra, Peenya, Yeswanthpur, Rajajinagar Industrial Estate and Industrial town.

Table-1: Present status of women workers in Ready Garment Factory 2009-2016

Year	Females	Females as % of total
2009-2010	1165043	87
2010-2011	1257807	88
2011-2012	1350001	89
2012-2013	1365000	90

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2013-2014	1448102	91
2014-2015	1450004	93
2015-2016	1460008	93

Source: CMIE Report 2014-16

In the above table-1 Represent to the present status of women workers in garment factory in Karnataka in the above table shows the at beginning of the 2009-2010 around 1165043 females workers existing it 87%in the same 2015 to 2016 sum of 14,60008 females are represent in the percentage 93% but table shows rapidly increases in the female workers are migrate to the city.

REVIEW OF LITERATURE

A review of literature was added to this study by referring to different journal and studies conducted by different individuals to show relevance to socio –economic status of women workers in Garments Factory.

Hate (2000) in her book stated that there is positive change in the political, economic and social status of middle class working and non-working women living in four cities in Maharashtra with the advent of independence.

Styles. Kapur (2004) his shown that the twin roles of women cause tension and conflict due to her social structure which is still more dominant .In her study on working women in Delhi, she has shown that traditional authoritarian set up of Hindu social structure continues to be the same basically and hence. Women face problem of role conflict change in attitudes of men and women according to the situation can help to overcome their problem.

Rosen and Jerdee (2007) in their study stated that women were seen less favorably in terms of the knowledge, aptitudes, skills, motivation, interests, temperament, and work habits that are demanded in most managerial roles.

Sandhu and Singh(2008) reported that motivation factors viz. feeling of achievement, ability utilization, recognition and rewards, creative work freedom of expression and scope for professional growth contributed comparatively more to job satisfaction than factors like behavior of immediate officers, job security and advancement, adequacy of salary, administrative setup and social status attached to the job.

Drucker (2012) in his book stated, that the labor force participation of married women under age fifty is now just as high as that of men. It is therefore unlikely to rise any further. But a very large number a women in the labour force the of those who entered when the inrush of women began are now reaching their mid-thirties. And also he states that most of the married women stay in the labour force after first child.

Julia (2013) in her study that 'by focusing on women's careers the short -term objectives has been to correct the gender imbalance, but long-term objective must be to develop theoretical concepts and explanation which the gender neutral and inclusive of both men and women. Second the changes currently under way in work organization and professions will as well be referred to as providing new difficulties for women's careers as wells as presenting an opportunity for the re-conceptualization of the 'successful' career.

Amartys Sen. (2014) calls it, a sector of 'co-operative conflict', where there is different interest, expectation, contributions, needs and degrees of control.

Reddy and Venkateswarlu (2015) in their study concluded that farm scientists valued creativity and independence most in carrying out their tasks. They did not prefer to work in rural areas. The other work valves of scientists differed slightly according to their age and experience.

The Review of this study reveals that the implications of Garment women Workers in Bangalore City. The Analysis of women's perceptions as factory workers shows that they are exploited on the factory floor in different ways and experience new forms of patriarchal domination beyond their family.

ORIGIN RESEARCH PROBLEM OF THE WOMEN WORKERS IN GARMENTS FACTORY

Two thirds of the garment workers are women and they have to struggle to make ends meet while putting up with the harsh daily reality of forced overtime, job insecurity and harassment at the factory work floor. Although all major brand companies have set up codes of conduct and audit mechanisms to ensure compliance with basic labour standards. The ground floor reality has not changed for the better and even seems to deteriorate as work pressure is rising due to growing demand. Therefore, in order to improve the socio, Economic status and working conditions of women workers in the garment industry, they need to be

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empowered. So in This research paper to Examines Socio-economic status of women workers in Garments Industry with special reference to Bangalore city.

OBJECTIVES OF THE STUDY

The proposed research work consists of the following objectives

- To study the working pattern and wages earnings of women workers in Garment industry.
- To study the job satisfaction and problems faced by women at the Work place.
- To study socio- economic condition of women workers in common life.
- To study about the economic benefits derived by working women in their work place of industries.

1.8 RESEARCH METHODOLOGY

The present study is based on Simple Random sampling method. The study is based on primary and secondary sources. The sample consist of women respondents from different industrial area of Bangalore city. Total of 2500 samples have been selected for the study. In order to get more meaningful and useful respondents the tested questionnaire was used as a schedule and entries were made by the interview respondents answered the questions.

The secondary data compilation also taken into consideration from Government reports, labour magazines, labour chronicle, labour review, Government Bulletins, State Government Reports.

1.9 RESEARCH DESIGN

The present study the Bangalore City has been selected as there is a concentration of industries located and women workers both skilled and unskilled being employed. Namely Dasarahalli, Penya Nelamangala, KR Puram Magadi, Road and Laggere In these area women are predominantly employed in textiles, plantations, garments, weaving, and other related industries. These workers are paid very negligible wages and no social security. It is very interesting to study the social, economic and educational status of women workers in these industries, and their problems. Hence in this particular field 150 textiles industries and plantation related industries were selected for interview and to enquiry about their existing problems. The development of social and economic status of the working women and their employment in the industries, and its impact on the family life of the working women has been considered for investigation. The size of the sample for primary survey is. 2500 working women.

STATISTICAL TOOLS

The data and information has been analyzed with the help of statistical tools such as averages, percentages, simple and compound growth rates and multiple regression analysis for both secondary and primary data of the study.

LIMITATION OF THE STUDY

The present study is restricted for the need, scope and objectives. It has also certain conditions. Since there is no systematic, maintenance of records, data collection was difficult and data was not available for the recent years of women workers of different selected industries.

The study is based on questionnaire and the responses for women workers could be causal in nature. The accuracy of information provided by the respondents in the personal data could not be established. As based on the survey to the following findings and measures are discussed.

MAJOR FINDINGS OF THE STUDY

- Realising the need for quality data on garment workers, it was decided to conduct a sample survey of garment workers in Bengaluru city. A large sample of 2500 workers was drawn from the list of registered garment manufacturing units and the total number of workers employed in these units which was made available at the Office of the Commissioner of Labour, Govt. of Karnataka. As per the list there are 854 registered garment manufacturing units. Total number of workers employed in these units is 1,95,943 of which 64,045 are men and 1,31,898 are women. 1 per cent of the total number of workers which comes to 2500 is the sample size of the survey. Simple Random Method was employed to select the workers for the purpose of collecting information by means of holding interviews. Certain conclusions have emerged out of this survey.
- Overwhelming majority of workers in garment industry is women. 72.8 per cent of the sample is women and 27.2 per cent are men. Similarly large majority of workers are rural migrants. Out of the 2500 sample, 1859 have come from within Karnataka. 31.1 per cent have come from Bangalore rural

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district. 35.4 per cent have come from the neighbouring districts of Chikkaballapur, Kolar, Ramanagaram and Tumkur. 24.63 percent come from Hassan,

- Mandya and Mysore. Garment workers come from almost all castes though 21.6 percent are SC's; 5.6 percent are ST's; 6.8 percent belong to Category - **I.** Large percentage of 35.7 come from Category - IIIA. However Brahmins are excluded. The average size of the family of garment workers ranges from a minimum of 3 to a maximum of 5.
- Three members could be the average size of the family Little less than 50 per cent of the sample i.e., 43 per cent has studied upto S.S.L.C. Only 2.2 per cent are graduates. 71.1 per cent live in rented houses. As far as possible they take house near to the place of work. 91.6 per cent reported to have toilet facilities at home.
- Nearly 50 per cent do not have safe drinking water tap connections at home while little more than 50 per cent reported to have that at home. 50 per cent of the workers reported having land though of low-size land-holdings which means majority of the workers having land are marginal and small farmers. Nearly 50 per cent reported not having land. The average size of the land holding would be around 2 acres.
- Employment conditions are another issue looked into in some detail. Unlike the workers in the organized sector, garment workers seem not to bother much about their status. They look at work in garment factory as the sole source of livelihood. As many as 67.6 per cent are temporary workers, followed by 2.5 per cent of contract workers, less than 1 per cent casual workers and 29.1 per cent are those who have some stability of job if not job security.
- As many as 56.9 per cent of the sample is highly skilled workers, followed by 23 per cent are the unskilled workers, 12.05 per cent are the skilled workers and 8 per cent are semi-skilled workers. Little more than half of the sample represents highly skilled workers i.e., those who engage themselves in tailoring, cutting and designing. Given the informal nature of employment in garment industry.
- Little more than half of the sample secures jobs through informal social network like friends, relatives and well-wishers followed by 41.7 per cent reported to have got jobs through direct interviews. of the sample reported to have worked continuously for upto 5 years. With regard to the mode of transport overwhelming majority of workers i.e., 91 per cent of the workers depend on any and every means of transport like BMTC, auto rickshaw. As many as 41.3 per cent go to work by walk and a least of 9 per cent reported to go by company vehicles.
- A large majority i.e., 80 per cent of the sample have come from villages while little more than 20 per cent are locals. 85 per cent of the workers reported to work 8 hours per day, 98 per cent reported to get lunch break and 69.5 per cent reported to have got canteen facilities. Regarding paid sick leave, little less than 50 per cent reported that they get paid leave while another 51 per cent said negatively. 75 per cent of the workers reported to get compensation in case of accidents at work place.
- 99.9 per cent reported they have got toilet facility and the perception of the quality of the toilet facility is good. 73 per cent of the workers reported they experience difficulties while performing their job. Increasing work pressure has been reported by 78.3 per cent times. Strangely abuse by supervisors seems to have reduced as it was mentioned only 17.5 per cent times. Workers seem to be happy with the wages they are getting.
- Compliance of government measures is extremely poor except that 90 per cent of the workers reported to be getting daily wage of up to Rs.250, far more than the daily wage fixed by Government of Karnataka. Yet majority of the workers i.e., 62.8 per cent are not aware of the minimum wages fixed by the government. 53.1 per cent are getting their wages through cash and 47 per cent are getting through cheque and ATM's. 81.6 per cent of workers have subscribed to provident fund scheme though they do not know exactly how to get the benefit under the scheme.
- Trade union movement in garment industry in Bangalore city is weak and a large number of workers i.e., 73 per cent reported that unions do not exist. Management not permitting the workers, lack of proper information and fear of victimization has been mentioned as significant reasons for not having unions. The question of settlement of demands hardly matters as the management seems to decide everything and implement the decisions through an executive order. Workers are not able to protect themselves because of lack of unions and low awareness of the unions.

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SUGGESTIONS

- The conclusions are mixed. Barring payment of wages, workers in garment industry hardly get any fringe benefits. A plethora of legislations and government schemes exists to ensure that workers are provided with minimum benefits of welfare and well-being like paid-leave, maternity benefit, medical and educational facilities. There is a need, therefore, to sensitize all the stake holders: employers, government officials and trade unions towards the plight of the unorganized workers in general and garment industry in particular. Gender sensitization needs to be created. For this educational, research institutions, NGO's and trade unions must carry on a sustained campaign through seminars, workshops and street plays.
- There is a need to strengthen the government departments concerned with labour. eficiency, if any, in man-power has to be made good by filling up the vacancies.
- There is a need for change of heart on the part of the mainstream trade unions. Sooner they come out of the ideological baggage in which they have been trapped the better for the workers and trade unions.
- The government departments must work out sound procedures and mechanisms to identify the beneficiaries among the workers in order to ensure that the benefits under the government schemes do reach the needy. There is, therefore, a need to create a database of unorganized lab our. The present survey is a modest attempt in that direction.

CONCLUSION

Recognition of women workers and providing proper jobs to suit their qualifications and experiences providing equal rights and wages under labour economy is in practice in advanced countries, which is the issue to be implemented in the new millennium in developing country like India. It is an emerging issue which will be given due consideration by both the State and Central Governments for upliftment of women work force in particular society, in general and for the total development of National Economy as a whole.

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TIME SERIES MODELS IN CONTROL CHARTS – A REVIEW

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ABSTRACT
In this paper, an attempt is made to review the applications of time series models, viz., AR, ARMA and ARIMA models, in control charts techniques. When the data have autocorrelation structure.

Keywords: Control Chart, AR, ARMA, and ARIMA models.

1. INTRODUCTION

In statistical process control, a state of statistical control is identified with a process generating independent identically distributed random variables. Once a state of statistical control is attained, departures from statistical control may occur. Statistical Process Control (SPC) techniques are widely used for monitoring and improving quality of the production in many areas of practical applications.

The objective of the Statistical Process Control (SPC) is to detect changes in a process that may affect the result from uncontrollable and unpredictable causes at unknown times. The most important tools for monitoring data are control charts. In principle, a control chart is a decision rule which signals that the process has changed if the control statistics lies out- side the control limits. The first control charts were introduced by Shewhart. Since from this pioneering work, many other control schemes have been introduced, such as the Cumulative Sum (CUSUM) chart and the Exponential Weighted Moving Average (EWMA) chart.

Many authors have compared the moving average, geometric moving average, and cumulative sum control chart procedures. More details can be found in Amin and Venkatesan (2017). Kermer and Schmid (1997) have analyzed two Shewhart type charts, the modified Shewhart type chart and the classical Shewhart chart applied to the residuals. Especially, it is discussed how the modified Shewhart chart behaves if similar control limits as in the case of independent variables are used.

Zhang (1998) has proposes a statistical control chart for stationary process data. It is simple to implement, and no modeling effort is required. Comparisons are made among the proposed chart, the residual chart, and other charts. He has shown that when the process autocorrelation is not very strong and the mean changes are not large, the new chart performs better than the residual chart and the other charts.

Reynolds and Lu (1997) have evaluate and compared various types of exponentially weighted moving average (EWMA) control charts based on the original observations or on the residuals from a fitted time series model. The observations from the process are modelled as an autoregressive process of order one (AR (1)). The problems of detecting a change in the process mean, a change in the process variance, or a simultaneous change in the process mean and variance are considered. Alwan and Roberts (1988) have discussed the time series model with SPC methods used control charts and correlated observations, given that the assignable cause to be detected is a shift in the process mean.

The developments in control chart are summarized in this paper as a review in the following sections.

The organization of the paper is as follows Section 2 presents the CUSUM control chart and Section 3 presents the concept of EWMA control chart and time series models in quality control techniques are presented in Section 4. Conclusion is presented in Section 5.

2. CUSUM CHARTS

CUSUM control chart is introduced by Page (1954). Shewhart control chart is based on last point plot and therefore it is not more sensitive to detect the small changes and therefore Cumulative Sum of all the points are used, which is more efficient.

The CUSUM control chart has been proposed as good alternatives to the Shewhart control chart for detecting small changes in process means.

Their main advantage is a very quick detection of relatively small shift in the process mean. This detection is significantly quicker than by the Shewhart´s control charts. The sequential sums of deviations from θ_0 are used for the CUSUM control chart construction. If θ_0 is the target value for the process means and if X_j is a sample mean then the CUSUM control chart is constructed by plotting of variables of the,

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$$S_i = \sum_{j=1}^{i}(X_j - \theta_0) \quad (1)$$

Sample number i. S_i is called the cumulative sum up to and including the i^{th} sample.

The tabular CUSUM works by accumulating deviations from θ_0 that are above target with one statistic S^+ and accumulating deviations from θ_0 that are below target with another statistic S^-, more details can be obtained from Montgomery (1991). They are computed as follows:

$$S_I^+ = max[0, x_i - (\theta_0 + K) + S_{i-1}^+] \quad (2)$$

$$S_I^- = max[0, (\theta_0 - K) - x_i + S_{i-1}^-] \quad (3)$$

Where the starting values are S_I^+ and S_I^-, K is reference or slack value and it is often chosen about halfway between the target θ_0 and the out-of-control value of the mean θ_1 that we are interested in detecting quickly.

$$K = \frac{\delta}{2}\sigma = \frac{|\theta_1 - \theta_0|}{2}$$

If either S^+ or S^- exceeds the decision interval H, the process is considered to be out control.

3. EWMA CHARTS

The EWMA control chart was introduced by Roberts (1959). Lucas and Saccucci (1990) have evaluated the properties of an EWMA control scheme used to monitor the mean of a normally distributed process that may experience shifts away from the target value. A design procedure for EWMA control schemes is provided.

It is usually used to monitor and detect a small change in a process mean. The EWMA control chart is based on a weighted average of current and previous data. There are many situations in which the process, so it needs to be monitored by appropriate control charts. It is based on the sequence obtained as follows; more details can be obtained from Montgomery (1991),

$$Z_t = (1 - \lambda)Z_{t-1} + \lambda X_t, \quad t \geq 1. \quad (4)$$

Where $0 < \lambda \leq 1$ is a constant and the starting value is the process target, so that $Z_0 = \theta_0$ and therefore, $Z_0 = \bar{X}$.

The EWMA Z_t is a weighted average of all previous sample means; one may substitute for Z_{t-1} on the right-hand side of equation (4) to obtain

$$Z_t = (1 - \lambda)Z_{t-1} + \lambda X_t$$

$$Z_t = \lambda X_t + (1 - \lambda)[\lambda X_{t-1} + (1 - \lambda)\lambda X_{t-2}]$$

Continuing to substitute recursively for $Z_{t-j}; j = 2,3,\cdots,k$, one can get

$$Z_t = \lambda \sum_{j=0}^{t-1}(1 - \lambda)^j X_{t-j} + (1 - \lambda)^t Z_0$$

The weights $\lambda(1 - \lambda)^j$ decrease geometrically with the age of the sample mean, furthermore, the weights sum to unity, since

$$\lambda \sum_{j=0}^{t-1}(1 - \lambda)^j = \lambda\left[\frac{1-(1-\lambda)^t}{1-(1-\lambda)}\right] = 1 - (1 - \lambda)^t$$

If the observations λX_t are independent random variables with variance σ^2, then the variance of Z_t is

$$\sigma_{Z_t}^2 = \sigma^2\left(\frac{\lambda}{2-\lambda}\right)[1 - (1 - \lambda)^{2t}] \quad (5)$$

The EWMA control chart would be constructed by plotting Z_t versus the sample number t. The limits are,

$$UCL = \theta_0 + L\sqrt{\frac{\lambda}{2 - \lambda}[1 - (1 - \lambda)^{2t}]}$$

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$$LCL = \theta_0 - L\sqrt{\frac{\lambda}{2-\lambda}[1-(1-\lambda)^{2t}]}$$

Further $[1-(1-\lambda)^{2t}] \to 1$ as $t \to \infty$ then the control limits.

$$UCL = \theta_0 + L\sqrt{\frac{\lambda}{2-\lambda}} \quad (6)$$

$$CL = \theta_0$$

$$LCL = \theta_0 - L\sqrt{\frac{\lambda}{2-\lambda}} \quad (7)$$

4. TIME SERIES MODEL IN CONTROL CHARTS

Even if the process is in control but there exists a time series pattern autocorrelated in the ploted points and therefore it is better to use the time series approach to monitor the quality control to detect the change. First, in this section it is assumed that the pattern follows the AR model and the related methodology were used in the following,

Autoregressive model

First Order Autoregressive Model is defined by,

$$X_t + aX_{t-1} = \varepsilon_t \quad (8)$$

Where a is a AR parameter, and $\{\varepsilon_t\}$ is a purely random process and is stationary if $|a| < 1$, The mean and variance of the First Order Autoregressive can be obtained as follows, more details can be obtained from Priestly (1981),

$$E[X_t] = \mu_\varepsilon(1 + a + a^2 + \cdots + a^{t-1}) = \mu_\varepsilon\left(\frac{1-a^t}{1-a}\right) \quad (9)$$

and

$$\sigma_X^2 = var\{X_t\} = E[\varepsilon_t + a\varepsilon_{t-1} + a^2\varepsilon_{t-2} + \cdots + a^{t-1}\varepsilon_1^-]^2$$

$$= \sigma_\varepsilon^2(1 + a^2 + a^4 + \cdots + a^{2t-2})$$

$$\sigma_X^2 = \sigma_\varepsilon^2\left(\frac{1-a^{2t}}{1-a^2}\right) \quad (10)$$

The control limits are constructed using the mean and variance of the model, using which one can identify the out -of control points.

The control limits based First Order Autoregressive Model, is given by,

$$UCL = \mu A + L\sigma\sqrt{A} \quad (11)$$

$$CL = \mu A$$

$$LCL = \mu A - L\sigma\sqrt{A} \quad (12)$$

Where $A = \left(\frac{1-a^t}{1-a}\right)$

Autoregressive Moving Average Model

The most popular family of time series models are autoregressive moving average process (ARMA). Since both AR and MA models have been found to provide useful description of real life processes in a large number of cases, it is natural to try to combine the two in order to construct model of a general nature. This combination is obtained as follows,

A process $\{X_t\}$ is said to be an autoregressive moving average process of order (p, q), denoted by ARMA (p, q), if it satisfies an equation of the form,

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$$X_t + a_1 X_{t-1} + a_2 X_{t-2} + \cdots + a_p X_{t-p} = b_0 \varepsilon_t + b_2 \varepsilon_{t-1} + , \cdots, b_q \varepsilon_{t-q} \quad (13)$$

That is,

$$\emptyset(B) X_t = \theta(B) \varepsilon_t$$

Jiang et.al (2000) have introduced the monitoring method with using ARMA (1, 1) control charts and application of the proposed chart to autocorrelated processes and the new monitoring the mean of stochastic processes are considered .

Suppose that we are monitoring an iid process, $\varepsilon_1, \varepsilon_2, \cdots,$ with normality, an in-control mean of 0 and variance σ_ε^2. We wish to detect the shifts in the mean of the process. The successive values to be plotted on an ARMA chart are defined to be the result of a generalized first- order autoregressive moving average [ARMA (1,1)] process applied to the iid process; that is,

$$X_t = b_0 \varepsilon_t - b_1 \varepsilon_{t-1} + a_1 X_{t-1}$$

$$= b_0 (\varepsilon_t - \beta\ \varepsilon_{t-1}) + a_1\ X_{t-1}, \quad (14)$$

Where a's are autoregressive parameter and b's are moving average parameter $\beta = b/b_0$ and b_0 chosen so that the sum of the coefficients is unity when X_t is expressed in terms of ε_t's; that is, (B=1)

$\frac{b_0 - b_1 B}{1 - a_1 B} = \frac{b_0 - b_1}{1 - a_1} = 1,$

Where B is the backshift operator, defined by $B^n \varepsilon_t = \varepsilon_{t-n}$. The guarantee that the monitoring process is reversible and stationary, we have the constraints that $|\beta| < 1$ and $|a_1| < 1$.

Standard ARMA (1, 1) process, it is easy to show that the steady-state variance and the first-lag autocovariance of the monitoring statistics are,

$$\sigma_X^2 = \left[\frac{2(b_1 - a_1)(1 + b_1)}{1 + a_1} + 1\right] \sigma_\varepsilon^2; \quad (15)$$

and

$$\gamma(1) = \frac{(1 + b_1)(1 - a_1)(a_1 - b_1)}{1 + a_1} \sigma_\varepsilon^2$$

The control limits of the ARMA (1, 1) model is given by,

$$UCL = L\sigma_\varepsilon \sqrt{\left(\frac{2(b_1 - a_1)(1 + b_1)}{1 + a_1} + 1\right)\left(\frac{\lambda}{2 - \lambda}\right)} \quad (16)$$

$$CL = 0$$

$$LCL = -L\sigma_\varepsilon \sqrt{\left(\frac{2(b_1 - a_1)(1 + b_1)}{1 + a_1} + 1\right)\left(\frac{\lambda}{2 - \lambda}\right)} \quad (17)$$

Using the mean and variance of ARMA (1, 1) model and if the LCL is negative, therefore it is taken as zero. Control limits using the above one can defect the out of control points in the production process.

Autoregressive Integrated Moving Average Model

More general model called ARIMA (p, d, q) as also used to construct the control chart with following classical Shewhart SPC concept assumes that the measured data are not autocorrelated.

Box and Jenkins (1970) have introduced an important class of models for which the d^{th} difference is a stationary autoregressive moving average process. These models are called autoregressive integrated moving average (ARIMA) models and are denoted by ARIMA (p, d, q). It should be noted that d is an integer in the ARIMA process.

Although non-stationary models are of value to represent explosive or evolutionary behaviour, the situations described in Box and Jenkins (1970) are not of this type. But the ARMA process is stationary if the roots of $\Phi(B) = 0$ lie outside the unit circle, and exhibits explosive non-stationary behaviour if the roots lie inside the unit circle.

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Box and Jenkins (1970) have considered the ARIMA models which are given by,

$$\Phi(B).\nabla^d.X_t = \Theta(B)\varepsilon_t \qquad (18)$$

Where $\Phi(B)$ and $\Theta(B)$ are as defined earlier and $\nabla^d = (1-B)^d$.

When d=0, the model (18) represents stationary ARMA (p, q) process. Box and Jenkins (1970) have discussed in detail the ARIMA models and their special case and also the relationship between random walk models.

The control limits are constructed using mean and variance of the ARIMA process and using the above control limits one can defect the out of control points in the production process.

5. CONCLUSION

In this paper, applications of time series model namely AR, ARMA and ARIMA with special reference to quality control methods have been revived.

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SOCIAL CAPITAL, POLITICAL PARTICIPATION AND SOCIAL MEDIA: A CONCEPTUAL FRAMEWORK

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ABSTRACT
This paper focuses on the theories related to social capital and how this term has been defined and interpreted differently by different scholars. The central argument of this paper is to map out the emerging trajectory of relationship that social capital has come to share with social media.[1] Social capital which is not a very recent concept. Much research has already been done and a lot has been written about it by different scholars. But the purpose of this present paper is to examine how social capital interacts within this new space of social media. And whether this interaction is leading to its decline as argued by Robert Putnam or if it is re-emerging within this new space provided by social media.

INTRODUCTION
The central premise of this chapter is to map out the emerging trajectory of relationship that social capital has come to share with social media.[2] Social capital is not a very recent concept. Much research has already been done and a lot has been written about it by different scholars. But the purpose of this present work is to examine how social capital interacts within this new space of social media. And whether this interaction is leading to its decline as argued by Robert Putnam or if it is re-emerging within this new space provided by social media.

The term social capital has been explained as an analogy which can be “borrowed from other types of capital. While physical capital indicates physical objects and human capital indicates the properties of individual, social capital is assigned to the interactions among individual’s social network and the norms of reciprocity and trustworthiness that arise from them".[3]

Social media creates social networks which are very different from the earlier networks produced from old form of communication and organization as argued by Robert Putnam in his very famous article "Bowling Alone". He argues that "decline in traditional forms of social networks has simultaneously leaded to the decline in social capital. This decline has deeply eroded the level of political participation in America. He accuses television as one of the major reason of this decline as with the advent of television people are busy watching it

and what they are missing is interactive communication". (Putnam, Bowling Alone: America,s Declining Social Capital January 1995). He basically argues that television is privatizing our leisure time. But the difference between the two mediums which is worth noticing is while watching television, people cannot communicate with each other but that's not same with social networking sites. As being active in these sites people can engage in interpersonal contact. Which is the most conventional difference between social media and traditional medium of communications?

The present work is been divided into three sections. The first section will focus on the theoretical understanding of the concept Social Capital. The second section will examine the traditional forms of social networks and people participation and the third section will move forward by analyzing how social capital and political participation are re-emerging in this new domain of social media. The question which it will address is

[1] Manual, Castells: Communication Power. 2009. Oxford University Publications. "In this work he has argued that Internet, the World Wide Web, and wireless communication are not like traditional mediums of communications. Rather, they are means of interactive communication. He further explains that the boundaries between mass media communication and all other forms of communication are turning obscure. The World Wide Web is a communication network used to post and exchange documents. These documents can be in any form of texts, audios, videos, software programs . In the presence of these SNS's anything can be digitized".

[2] Manual, Castells: Communication Power. 2009. Oxford University Publications. "In this work he has argued that Internet, the World Wide Web, and wireless communication are not like traditional mediums of communications. Rather, they are means of interactive communication. He further explains that the boundaries between mass media communication and all other forms of communication are turning obscure. The World Wide Web is a communication network used to post and exchange documents. These documents can be in any form of texts, audios, videos, software programs . In the presence of these SNS's anything can be digitized".

[3] Bowling together- applying Robert's Putnam's theories of community and social capital on public relations

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how can we understand social capital and what are the ways in which it is produced? What makes social capital relevant for political participation? How social networks do creates and sustains politically consistent social capital? Does the medium of social networks shares a complementary relationship with the creation and sustenance of social capital?

These are some of the questions which will be answered in the following sections.

UNDERSTANDING SOCIAL CAPITAL

There seems to be consensus among scholars that social capital is an important feature of vigorous democracies. But what becomes predominant to understand is what constitutes social capital?

The term social capital is flexible as it basically refers to the resources accumulated through the relationships among people. There have been various explanations of social capital by different scholars. "As argued by many scholars the term social capital has been widely used to attribute it to the accumulation of resources which are derived from the relationships among people within a particular social environment or network. The central idea of social capital is very simple as argues Putnam and Lin, that social capital are the resources which are available to people through their social interactions. It seems that individuals with a large and diverse network of contacts are thought to have more social capital than individuals with small, less diverse networks"[1].

The core "idea of social capital sees social networks as valuable asset. These networks provide a basis for social cohesion because they allow people to engage with one another and not only with people they know directly for mutual advantage. There are several definitions which define capitals in strictly economic terms. Their value was measurable and their worth could be added up and compared, the relationship between inputs and outputs were direct one, and any changes in the value for in terms of common currency".[2]

In the writings of Robert Putnam "Democracy in Flux" he pointed out the argument of Robert Wuthnow that in "United States social capital can be seen as a specific kind of relationship inside communities that could be used by the people in those communities to fortify the strength of their communities and also to mobilize resources needed to solve social problems, and to make their voices heard in larger political ground".[3] He also says that the most important transformations in American community life in recent years is not the blurring of social connections, but a shifting from steady, long-term relationships toward a more flexible, “loose connections".

There are three 'relatively distinct tributaries' in the literature on social capital**4**. And they have crucial differences between them. To introduce them briefly Bourdeiu ideas on "social capital shares with Marxism a concern with question of unequal access to resources and the maintenance of power". James Coleman approached the concept of social capital by pointing out the idea of individuals acting rationally in pursuit of their own interests and lastly Putnam defines social capital as inherited and he develops the idea of association and civic activity as the basis of social integration and well being. There lies prominent differences between these scholars, but all of them have considered social capital "as something which consists of personal connections and interpersonal interaction, together with the shared sets of values that are associated with these contacts"[5].

It is significant to understand these three approaches to have a clearer understanding of the concept of social capital.

BOURDEIU

Bourdeiu in 1970s and 1980s developed the notion of social capital. While defining his idea of social capital he was deeply implicated in the perseverance of social class and other ingrained forms of inequality. Originally, his position emerged through his effort to create a cultural anthropology of social reproduction. While working on Algerian tribes in 1960s, "he described vibrant development of structured sets of values and ways of thinking

[1] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group, 2008.

[2] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group, 2008.

[3] Robert D.Putnam, Editor. Democracies in Flux: The Evolution of Social Capital in Contemporary Society. Oxford University Press, 2002.pp 63

[4]Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group, 2008.

[5] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group Books, 2008. pp-15

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as forming what he terms as 'the habitus'. This acts like a bridge between subjective agency and objective position. While building his view of the habitus, he emphasized that groups were able to use cultural symbols as marks of distinction, both signaling and constituting their position in the social structure. He gave force to this sight by using the metaphor of 'cultural capital', indicating to the way in which groups deals with the idea of some types of cultural taste enjoy more status than others"[1].

In his early writings on Social capital "Bourdieu saw the status of agents in the social field as determined by the quantity and influence of their relative capitals, and by the specific approach they employ which accomplishing their particular goals"[2]. Bourdeiu argues that "capital defines itself in three fundamental appearances. First as economic capital, which he says is instantly and immediately convertible into money and may be institutionalized in the forms of property rights. Second is cultural capital, which is changeable, on certain conditions, into economic capital and may be institutionalized in the forms of educational qualifications. Third is social capital, which is made up of social obligations or connections, which is convertible, in certain situations, into economic capital and might be institutionalized in the forms of a title of nobility"[3].

The present chapter deals basically with the third form of capital, which is social capital. As pointed out in the work of John Field on "Social Capital" he says in Bourdeiu understanding, "social capital is possessed by a given agent depends mainly on the size of the network of connections he can efficiently mobilize and the amount of the capital which can be economic, cultural or symbolic possessed in his own right by each of those to whom he is associated" (Bourdeiu, 1986). "Social capital even though is relatively irreducible to the economic and cultural capital possessed by a given agent, or even by the whole set of agents to whom he is associated, it can never be completely independent of it because the exchanges instituting mutual acknowledgment assume the re-acknowledgment of a minimum of objective homogeneity, and it also wield multiplier effect on the capital he possesses in his own right"[4].

According to Bourdeiu, "Social capital is the sum of the resources, actual or virtual, that is accumulated by an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition. His main concern was understanding 'social hierarchy'. He argues that social capital functions to reproduce inequality, but does so partly independently of economic and cultural capital, from which it is he says, it is nonetheless inseparable"[5].

Bourdeiu in his work on "Forms of Capital" has defined social capital as "the aggregate of the actual potential resources which are linked to possession of a durable network of more of less institutionalized relationships of mutual acquaintance or recognition". For him depends on the size of network and the amount the of past accumulated social capital authorized by the agent. For him clear profit is the main reason for the actors engagement and in their maintains of links in networks. He has not defined "profit necessarily as economic, but to a certainextent it is reducible to economic profit. The actors potential for accruing social profit and control of capital are differentially distributed"[6]. This differential distribution of potential and control is a central notion in in Bourdieu's theories of "social reproduction and social space" (Tzanakis, 2013).

In his work on "Reproduction in Education, Society and Culture" he has illustrated "social space as complex congregation of actor's positions. Nevertheless he argues that "these positions cannot be expanded 'objectively'. The consequence which it will lead will be very limited and ambiguous because they would make unclear the complicated connections that occur between actors. The inequality among the actors predispositions is rooted in

[1] Pierre Bourdeiu, Richard, J. The Forms of Social Capital. 1986. Handbook of Theory and Research for the S Knowledge Policy. Sociology of Education. Westport: CT: Greenwood.

[2] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group Books, 2008

[3] Pierre Bourdeiu, Richard, J. The Forms of Social Capital. 1986. Handbook of Theory and Research for the S Knowledge Policy. Sociology of Education. Westport: CT: Greenwood.

[4] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group Books, 2008.

[5] Pierre Bourdeiu, Richard, J. The Forms of Social Capital. 1986. Handbook of Theory and Research for the S Knowledge Policy. Sociology of Education. Westport: CT: Greenwood.

[6] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group Books, 2008.

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the differential distributions of economic, cultural, social and symbolic capital. These predispositions act to legitimize the structure of differential awards and provide the means to perceive the structure" (Tzanakis, 2013).

Bourdeiu further proclaims "that all forms of capital, by being organically-related to positions in social space, acts in two ways simultaneously. The specific positions in social space reproduces "all forms of capital which are utilized as resources to ingrain the actor's position further. The positions of actors are both the cause and the effect of all forms of past accumulations of capital, particularly social capital" (Tzanakis, 2013). "Social capital can be seen as a 'credential' that perpetuates social inequality by providing dissimilar entitlements to credit"[1].

In the writings of John Field on social capital he argues that Bourdieu's thinking on social capital is based on his understanding of social hierarchy. In certain ways, he has engaged with a body of ideas that was deeply inclined by Marxist writings on sociology. For him "economic capital" is at the root of all other types of capital, and he has combined with other forms of capital to create and reproduce inequality. He explains "inequality by the production and reproduction of capital". For Bourdieu capital 'is accumulated labor' which 'takes time to accumulate'. He says capital does not only depends on economic terms. He argues that "cultural capital and social capital should be treated as assets, signifying the product of accumulated labor"[2].

Boudeiu's theory of social capital has been criticized as "reductionist for privileging economic capital as the ultimate source and eventual exchange form of all other capitals. He is abused for assigning human capital and rational action theorists, an interest-bound, utility-orientation in all human action" (Field, 2008). His theory of social capital remains vulnerable to many of the criticisms leveled at its inclination towards Marxism which he sought to have left behind. The major drawback of his theory is it remain inseparable from the economic capital. He certainly view social capital as the exclusionary property of elites, designed to secure their relative position. His only explanation for relations of the effect is that these lend durability to exchange; he consequently does not allow for the simple fact that some people like and dislike each other more than others, even though they move in same cultural world and share the same attitudes.[3]

JAMES COLEMAN

James Coleman argues that "social capital represents a resource because it involves the hope of reciprocity, and goes away from any given individual to involve wider networks whose relationships are governed by a high degree of trust and shared values"[4].

He was centrally concerned with recognizing the contribution of social capital to the development of human capital. His central focus was "less with evaluating the relative merits of social capital and human capital as concepts, instead he was interested in drawing dissimilarities between them and explore their interconnections"[5]. In his later writings he argued that "rather than being competing concepts, the two seems to to be interconnected and at the same time separate phenomena that he somehow believed were 'often complementary"[6].

In his work - "*The relationship between social capital and human capital*" he further defines "social capital as a useful resource which is available to actors in his or her social relationships". Social capital consists of "variety of entities". Coleman theorized them as some aspect of social structures, which promotes certain actions of actors whether persons or corporate actors "within the structure".

As pointed out by John Field that for Coleman, "human and physical capital, are usually considered as private good and whose possession and returns reside with individuals, social capital he characterizes as a public

[1] Pierre Bourdeiu, Richard, J. The Forms of Social Capital. 1986. Handbook of Theory and Research for the S Knowledge Policy. Sociology of Education. Westport: CT: Greenwood.

[2] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group Books, 2008.

[3] Read Michael Tzanakis article on Social capital in Bourdieu's, Coleman's and Putnam's theory: empirical evidence and emergent measurement issues. pg no 2, 3

[4] James S. Coleman. Social Capital in the Creation of Human Capital.1988-89. American Journal of Sociology.

[5] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group Books, 2008.

[6] James S. Coleman. Social Capital in the Creation of Human Capital.1988-89. American Journal of Sociology.

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good that is created by and may not only be essential those whose efforts are required to realize it, but to all who are element of that structure. So it commands cooperation between individuals who are nonetheless pursuing their own self-interest[1].

Coleman's definition of social capital somehow manages to come close to Bourdieu's concept but from absolutely different point of departure. For social capital "consists of some aspect of social structure, and facilitates certain actions of actors which can be both persons or corporate actors within the structure". He "embraced a middle way between the two theoretical traditions. The first is a 'functionalist' view of social action which is conditioned by social structure. The second is the "rationalist" view which suggests that actors goals are determined by utility-maximizing pursuit of their self-interest" (Tzanakis, 2013).

He argues that social capital is creative in the sense that "actors now can accomplish particular ends that would have been impossible without it. So it has its instrumental significance. Both Bourdieu and Coleman have defined social capital as a collective resource utilized by actors who are goal-oriented. Social capital requires an element of embeddedness in social structure. This is a notion that he has adopted from Granovetter theory of weak ties".[2] The concept of weak ties is also seen in Bourdieu's social space as defined by actors positions. Like Bourdieu, Coleman sees social capital as essentially residing in the social structure of relationships among people. This dimension separates it from both financial and human capital" (Tzanakis, 2013). Coleman on the other hand defines "social capital as a bonding mechanism which adds to the integration of social structure. For Coleman social structure anticipate the agent who can use ingrained social capital as a resource"[3].

The theory of social capital provided by Coleman is inclined towards functionalist views which makes his "formulation completely distinct from that of Bourdieu. His preoccupation with the notion of social capital as being largely a product of social structure has motivated him to look for such structural fundamentals so that he can ignore other issues like conflicts" (Tzanakis, 2013). As he argues that there is no provision for inequality which is caused by the differences in accumulation of social capital.

Another prominent difference between Bourdieu and Coleman as pointed out by John Field in his writings on social capital that for Coleman, "social capital acquires the nature of a public good which means direct contributions by actors will benefit the whole, strong families or communities will provide strong social bonding among members" (Tzanakis, 2013). But in case of Bourdieu, "social capital reproduces social inequality but it may increase integration within specific groups". Both Bourdieu and Coleman have to a certain extent created a pessimistic outlook for society but for different reasons. "Bourdieu sees social capital as a scarce resource. It is therefore a mechanism of class reproduction that perpetuates structured inequality". Coleman sees social capital as a potential public good. But he has some reservations because " internal community social links are weakening and they lack closure. And this resulted in less sharing of social capital as a public good. He now only relies on state-led formal organizations which are expected to become a substitute voluntary organizations" (Tzanakis, 2013) in the supply of social capital[4].

The ideas of James Coleman on social capital are not confined to the powerful, but could also provide real benefits to poor and marginalized communities. He defines "social capital by its function. He says that it is not

[1] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group Books, 2008.

[2] Mark S. Granovetter. The strength of Weak Ties. May 1973. The American Journal of Sociology. Volume 78, Issue 6.1360-1380. "In his theory he has demonstrated the strength of weak ties and their value for transfer of information across large social distances. Weak ties are an powerful way to access new ideas or for codifying information such as quick answers on an online discussion board or participation in a one-off field workshop. Weak ties allows easy codified information to travel quickly across social distance, because brief contact is often sufficient for the transfer of such information. The value of weak ties is not their capability but their numbers in which each weak tie contributes little information, but in aggregate, a large number of weak ties gives access to a large number of pools of knowledge, and a broader body of information".

[3] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group Books, 2008.

[4] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group Books, 2008.

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a single entity, but a variety of different entities having two characteristics in common which consist of some feature of social structure, and facilitate certain actions of individuals who are within the structure[1]".

His approach seems uneven because he has overstated the role of close and dense ties, and underestimated the importance of weak ties. His theoretical conduct of social capital focused especially on the rational choices about social exchange from which cooperative relationships and trust might emerge.

"Coleman's emphasis on closure as a precondition of the functionality of social capital based networks is another concept of his which has invited many criticisms" (Tzanakis, 2013). Based on Granovetter's notion of 'weak ties' in which he has clearly dismissed closure as a precondition for social capital[2]. The "closure is needed only in goal-specific pursuits of actors. When members are searching for and maintaining resources, closure is essential. But when members are searching and obtaining resources, they require bridges with other networks and so closure is neither needed nor is desirable"[3].

ROBERT PUTNAM

Putnam's initial input on social capital debate came towards the end of a study of regional government in Italy. Showing by the empirical data "Putnam has desired to recognize and then explain dissimilarities between regional administrations in the north and south of Italy". In his institutional approach for studying he has concentrated on the relative performance of public policy actors in north and south, and concluded that the northern regions have comparatively successful institutional performance as compared to south. He argues this is due to the fact that in the northern regions their lies a mutual interdependence between government and the civil society.

All the "theoretical assumptions suggested or implemented by Coleman have provided the main instrument for Putnam's formulation of social capital. For Putnam 'social capital refers to features of social organizations, such as networks, norms and trust that facilitate action and cooperation for mutual benefit"[4]. "Coleman's insights however become evident in Putnam's belief that social capital is a quality that can be a facilitator of interpersonal cooperation. As he puts it" (Tzanakis, 2013) working together is easier in a community blessed with a substantial stock of human capital"[5].

In his later writings he completely adopts Coleman's interaction which he drawn "between the lack of strong family and community ties and the intergenerational decline of social capital in the United States of America (USA). Putnam provided statistics that indicated rapidly declining rates of voting and membership in a number of voluntary organizations in the USA. He argued that that 'the national collapse in trust and engagement will continue in coming future'. According to him, the USA has been witnessing the rise of an 'uncivic' generation, which he identifies as the baby-boomers born after World War II"[6].

Putnam in his work on "Democracy in Flux" introduced a systemic distinction between two basic forms of social capital: one is bridging and the other one is bonding. "Bonding social capital is understand as an entity which reinforces exclusive identities and maintains homogeneity. On the other hand Bridging social capital tends to bring together people across diverse social divisions"[7]. Like for instance Bonding social capital brings together people who have something's in common which can be " ethnicity, age, gender, social class, and so on. While bridging social capital on the other hand refers to social networks that bring together people who are unlike one another. This makes them significantly distinct significant from one another. The external effects of bridging networks are in some way more positive rather than bonding networks which have limited are limited

[1] James S. Coleman. Social Capital in the Creation of Human Capital.1988-89. American Journal of Sociology.

[2] Mark S. Granovetter. The strength of Weak Ties. May 1973. The American Journal of Sociology. Volume 78, Issue 6.1360-1380.

[3] Michael Tzanakis article on Social capital in Bourdieu's, Coleman's and Putnam's theory: empirical evidence and emergent measurement issues. pg no 4, 5

[4] Robert. D. Putnam. Bowling Alone. The Collapse and Revival of American Community. 2000. NewYork: Simon and Schuster.

[5] James S. Coleman. Social Capital in the Creation of Human Capital.1988-89. American Journal of Sociology.

[6] Robert. D. Putnam. Bowling Alone. The Collapse and Revival of American Community. 2000. New York: Simon and Schuster.

[7] Putnam, Robert D.2002. Democracies in Flux: The Evolution of social capital in contemporary society.

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inside particular social environment and are at greater risk of producing negative externalities" (Bernd Kapplinger, 2014).

Putnam with his thick statistical data shows that "political participation, associational membership, religious participation, volunteering, charity, work-based socializing and informal social networks, are declined, from the peak in the mid-1960s" (Putnam 2002). "The membership records of some divergent organizations like PTA, the Elks club, the League of Women Voters, the Red Cross, labor unions, and bowling leagues depicted a image from which it is very reasonable to understand that participation in many conventional voluntary associations has decreased around 25% to 50% since the last few decades".[1]

Robert Putnam presents "social capital as essentially the quantity of 'trust' available as the main stock which defines political culture of modern societies. He argues that voluntary associations permits a horizontal linking of people which leads to the production of trust which is important for interpersonal bonding" (Tzanakis, 2013). However Putnam associates trust and its affiliated reciprocity to civic engagement. Ensuing from the Tocquevillian ideas, for him civil engagement surmise "civil virtue which in itself is a indicator of the strength of civil society. Putnam associates social capital with political involvement, specifically through voluntary associations. Therefore for Putnam social capital extends to a direct test of the democratic strength of American society" (Tzanakis, 2013).

TRADITIONAL SOCIAL NETWORKS AND PEOPLE'S PARTICIPATION

Robert Putnam in his work "Bowling Alone" has quoted Alexis de Tocqueville statement where he "has stressed the importance of America's vibrant associational life". "Many democratic theorists have also stressed the relationship between participation in voluntary associations and the development of norms that motivate a stable and effective democracy. Social capital is grounded in connections among individuals, which develop citizenship norms, tolerance and civic activity" (Miki Caul Kittilson, 2010).

This section of the chapter will explore what is comprises to make a capital politically relevant. Political capital facilitate political engagements and interactions. What makes a capital politically relevant is its particular kind of social capital that is produced as a result of political expertise and the level of information one communicates everyday within an individual's network of social relations. "Social capital which is politically relevant should strengthen the likelihood of individual engagement in politics which enables citizens to become engaged in ways they might otherwise not. Social capital effect to operate without any dependence on formal organizations, and independently of education and other measures of politically relevant human capital" (Ronald La Due Lake, 17 dec, 2002).

"There is a belief that social capital is produced through networks of relationships and the absence of those relationship will lead to a decline in the production of social capital. Politically relevant social capital on the other hand is produced as the result of political interaction within these networks" (Ronald La Due Lake, 17 dec, 2002). With these particular dimensions of social capital which have created intensive possibility for political relevance includes "individuals in one's network, the level of political knowledge and expertise among the people in an individual's network, and the level of political interaction with others in the network".[2]

Several studies have characterized a "recent decline in social group engagement in America, and which has led a simultaneous decline in civic norms and political participation. The manner in which Putnam has argued that memberships in fraternal groups, religious activities, union activities, and a host of other social associations, from bowling leagues to choral societies have declined strikingly during the last quarter of the twentieth century. This has produced awful forecasts about the vitality of American society and democracy because of the most probably negative consequences of declining social capital"[3].

Many research based on "traditional social networks have suggested the prominent role individual's social network plays in producing political engagement. As also explained by Putnam in his historical works on Social Capital, that how an individual's membership in civic organizations like the "Elk's, bowling leagues, and Rotary" acts as a channel for promoting political participation. Social networks which are developed in

[1] Putnam, Robert D. Dec 1995. Tuning in, tuning out: The strange disappearance of social capital in America. PS, Political Science and Politics.

[2] By Ronald La Due Lake and Robert Huckfeldt: Social Capital, Social Networks, and Political Participation.pg no 570,571

[3] Putnam, Robert D.2002. Democracies in Flux: The Evolution of social capital in contemporary society.

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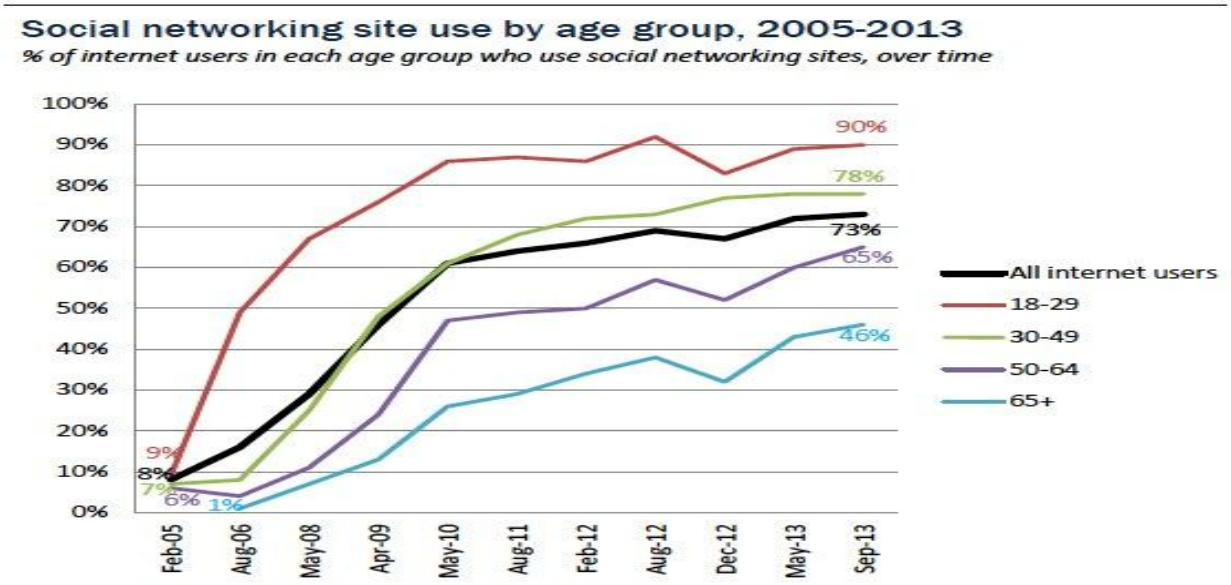
certain informal organizations like "bowling league, helps to fostering interpersonal trust and cooperation that spreads between and among individuals in these informal social networks from which originates the potentiality of civic and political engagement that serves community and democracy at large in the real world"[1].

There are several mechanism through which social capital can be produced. But some mechanisms are more beneficial for the vibrant democratic process as compared to others. Many social scientists have frequently stresses the significance of face-to-face communication networks which they argue are more likely to yield positive results like for instance the way Putnam has achieved in his leading work "Bowling Alone" that our "trust relationships and resilient communities frequently are formed through local personal interaction". Face-to-face communications are capable of creating stronger social capital effect "among members through the experience of personal engagement and by the norms of reciprocal interactions. The more frequently a person is involved in voluntary organizations, the greater will be their collaborative trust upon each other and their active participation in politics" (Miki Caul Kittilson, 2010).

There is a different set of discourse which asserts that though there is a decline in the traditional memberships among the people, as pointed out by Robert Putnam, interactions among people are not impotent they keep on emerging with time and creates new forms of social engagement. when analyzed from a more enduring historical lenses the blissful days of the "Elks and bowling leagues deliver only a enslaved picture of citizen interactions" (Miki Caul Kittilson, 2010).

While there are weakening of certain traditional forms of civic association, but with the advent of technological innovations the way people interact with each other has transformed. For instance the graph below positively explains the increasing level of people using online platforms[2].



[3]

SOCIAL CAPITAL AND POLITICAL PARTICIPATION IN NEW SPACE OF SOCIAL MEDIA

Coleman and Bourdeiu have not written anything about the impact of new technologies on people's connections. But Putnam in his book " Bowling Alone" has focused on this new technology and the its impact. He argues that the internet remove the obstruction to communication and thus facilitates new networks, but he remains somewhat skeptical about its influence (Field 2008).

[1] Juliet Carlisle, Robert C. Patton. Is social media changing how we understand Political Engagement? An Analysis of face book and the 2008 Presidential Elections. Sage Journals

[2] Pew Research Centre. Internet, Science and Tech. "The Pew Research Centre is an independent fact tank that update the people public about the issues, attitudes and trends shaping America and the world. It organizes public opinion polling, demographic research, media content analysis and other empirical social science research".

[3] Pew Research Centre . Internet, Science and Tech.

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As he proclaims technology is leading to digital divide between those who are connected and those who lacks the skills and equipment to enter cyberspace. Secondly he says that because online communication can also be causal, lacking the instant feedback of face to face encounters, it discourages reciprocity and facilitates cheating. Thirdly, for Putnam people who engage through online mediums associate themselves only with small group of people who likely to have same interests as they have and are hateful to those who have diverse opinions. Finally, the internet offers abundant opportunities for private and passive entertained.

"He further argues that in the U.S history with the occurrence of successful information revolutions a large percentage of the voting population has separated themselves from the political process. According to him engaging in the political process since few years has become less fascinating because of which voters feels alienated from its process"[1].

This is problematic as he completely ignores the fact that how the number of the users of these social media sites are increasing remarkably. As asserted by Manual Castells that engaging in social networking sites is not leading to the decline in interaction or segregation of the people from other people. Instead he argues that the people who are "active online are more social, have more friends and contacts, and are more socially and politically active than the people keep themselves isolated from this new medium. Moreover, the more they interact through internet the more they will engage in face-to-face interaction in all domains of their lives"[2]. Similarly, "new forms of wireless communication, from mobile phone voice communication. 'The Network Society' is a hyper social society, not a society of isolation. He says that our "world is a world of communication mediated by technologies such as the pencil, paper, the telephone, television and the Internet". And it continues to be a world of face-to-face communication".[3]

The people who gather political information through SNSs are more likely to participate, meaning that an opportunity is provided for candidates to benefit electorally if they can successfully campaign using SNSs by controlling flow of information.

Relationship between people are the glue of any society. For a democratic society especially to function, there are theories which sees "citizen's political participation as the product of their investment or relations within a society and with the people around them". The investment into those relationships produces social capital, which is flexible and generally inclusive term describing the value of the bonds created around an individual. Social capital is exclusively an acknowledgment of value in association, society, and civic engagement.

Depending solely on measures of the physical interactions of the people to account for civic engagement and social capital omits interactions through digital networks. The earlier indicators and measures which used to test civic and social engagement did not expect the degree that people would move so many activities online. Finding civic engagement at a bowling alley or service club is increasingly difficult. The production of social capital has moved in large part to online communities from the fixed locations where it was produced in previous decades. People can respond to each other and engage in political discussions at least as vigorous and contested as those that occur in face- to-face meetings. In 1994, online discussion forums were popular spots for political conversation and organization. "One of the social networking site "alt.politics.Clinton" almost received hundreds of postings every other day during the time of the presidential elections between Bill Clinton and George H.W. Bush".

The outcome of these new online communities have the potential to counter or perhaps even reverse the effect of traditional social capital decline on political participation by replacing the missing interactions measured by scholars such as Putnam. He included craigslist.com as an example of a thriving virtual community in his edited work Better Together: Restoring the American Community is the acceptance that internet networking can play an important role in community-building.

Important groups are formed online and those groups can have an influence on policy and elections. This can be seen during the early 1994 when the speaker when the Thomas Foley was driven from office because of impact of the political action committee that was organized online. Howard Dean's early success in the run-up to 2004

[1] Juliet Carlisle, Robert C. Patton. Is social media changing how we understand Political Engagement? An Analysis of face book and the 2008 Presidential Elections. Sage Journals.

[2] Manual, Castells: Communication Power. 2009. Oxford University Publications.

[3]Cardoso, Edited by Manuel Castells and Gustavo. The Network Society From Knowledge to Policy. . Centre for Transatlantic Relations, 2005.

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Democratic presidential primaries was fuelled by his campaigns efforts to organizing meetings, rallies, and even coffee discussions through online discussions forums. It not only helped him to raise money, it created enthusiasm and connected Governor Dean to an active, passionate, and engaged citizenry that worked for him largely as volunteers.

The well know liberal advocacy group Moveon.org also got its start as a Internet movement. Moveon.org was a email discussion group that started a petition to oppose the impeachment of then President Bill Clinton in 1998. Today, it continues to be based online and organizes citizens on behalf of progressive candidates, while raising millions of dollars to influence elections and policies. If the Internet and social networking sites in particular are bringing people together in not just social groups, but political ones, there is large potential for political actors to influence people and policy as well. A political actor online can interpret themselves directly into the conversation between a group members and their network of friends and acquaintances. they can influence members of the group and those members can further bring that influence to physical meetings of the group.

The internet ensures a platform which has in some respect eliminated the constraints and provided the people who earlier lacked the opportunity, to speak in the public sphere. It both allow and motivates political participation.

As argues Manual Castells in his writings on "Communication Power" that with the increasing development computer networking, the open source software and the rapid increase in expansion of digital switching and broadcasting capability of the telecommunication networks have led to the spectacular growth of the Internet after its privatization in the 1990s. He further argues that Internet is not a very recent technology. In 1969 it was deployed for the first time. But after almost 20 years later it started it diffusing with a vibrant energy because of many reasons. The changes which are introduced are "changes in regulations, greater bandwidth in telecommunications, the expansion of personal computers, user-friendly SNS's that made it easy to upload, access, and communicate content with the arrival of World Wide Web[1] server and browser in 1990's and the growing social demand for the networking of everything, arising both from the market world and from the people aspirations to construct their own communication networks".[2]

The online engagement through social networking sites [3] is expanding at incredible rates. The huge growth in the number of the people who are deploying these online communicating mediums to their uses, it will be less surprising if it had some impact on people's social capital. In recent times there is a substantial explosion of SNS's. Originally these sites mainly allow people to re-establish contact with people with whom they had relations and are not in contact but with time it has establish itself in a way that it both makes and maintains friendships online.

These social networking sites provides the ways in which the politically disengaged can be mobilize to become part of political process. These networks propose "convenience and accessibility for a larger number of citizens, with developed access to information, and provides online opportunities for political expression and political action and to identify and affiliate themselves with likeminded citizens"[4]. The structure of these SNS's can make more online interactions which can represent in those who are disenchanted with traditional modes of political participation.

[1] "World Wide Web" is defined as an information system based on the Internet which allows documents to be connected to other documents by hypertext links, and makes it easy for the user to search for information by moving from one document to another.

[2] Castells, Manuel. Communication Power. Oxford University Press, 2009.

[3] The term "social network site broadly is used to refer to Web sites that enable users to articulate a network of connections of people with whom they wish to share access to profile information, news, status updates, comments, photos, or other forms of content".

[4] Juliet Carlisle, Robert C. Patton. Is social media changing how we understand Political Engagement? An Analysis of face book and the 2008 Presidential Elections. Sage Journals.

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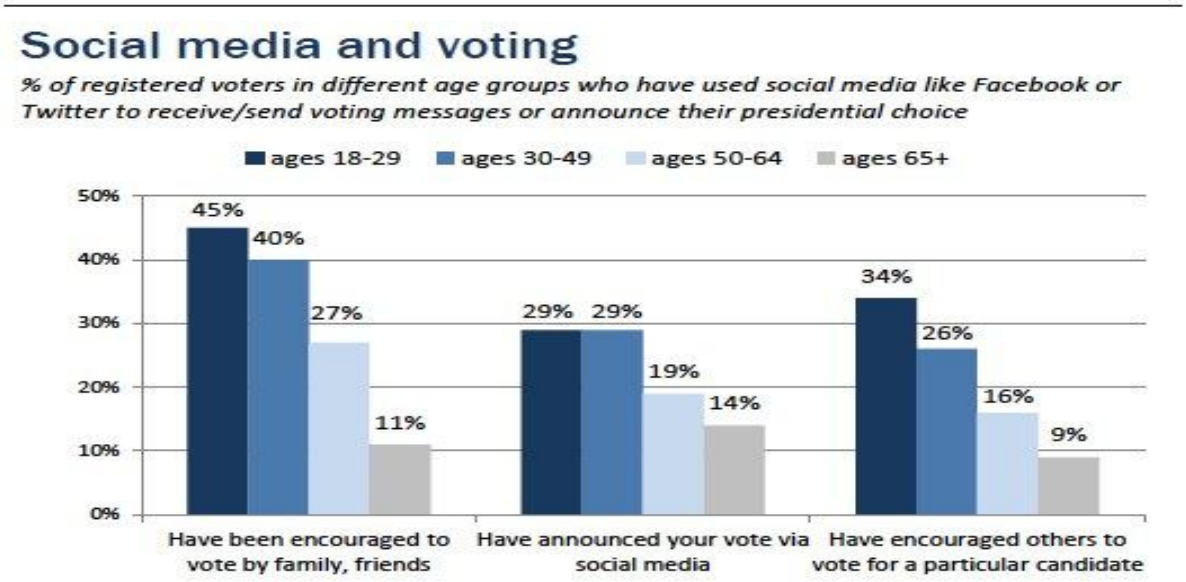

[1]

This above graph clearly shows that the Internet can make individuals participate into political life particularly with reference to providing them "to gather political information, make connections with others, mobilize, and recruit individuals to causes and actions on the ground as the Internet significantly reduces the costs of participation and it is less time taking to sign an online petition or make donations with just a click of button than to do it offline" (Juliet. Carlisle).

With the emergence of a "networked public sphere" through which according to Manual Castells, individuals can now take advantages of the new capacities which will make them greater participants in the conversation. He believes "that social media technology has these capacities that has fundamentally changed the backdrop in which the individual user or a political actor is engaged. Social media technologies such as Face book through there infrastructure provides tools to facilitate engagement" (Juliet. Carlisle). First, the technology allows individuals to build networks and simultaneously influence them which is visible from the above graph.

Social media is observed as a medium which stimulates positive change in people's lives by developing new forms of online interaction which on the other hand influences offline engagements. This provide people with common interests for a meeting space and overcomes their limitations of time and space. This understanding of space and time is addressed by Manual Castells in his concept of "space of flows"[2].

The truly incomparable capability of this medium is the "user control and decentralization of media ownership which it has introduced in the communications process". While in the traditional mediums there lies "competition between individual producers of information, in which the consumer is basically a passive beneficiary of news from a limited number of sources" (Rachel K.Gibson, 19 Nov, 2007). This platform of social media has however, capitulate information control to the individual consumer, who can actively search out the required information and can edit and gather the relevant news sources. Now we can say that consumer

[1] Pew internet Research centre

[2] Manual Castells . The Rise of the Network Society: The Information Age: Economy, Society and Culture. January 1996 VOI.1. Malden, MA, Oxford, UK: Blackwell. Manual Castells in his work on Network Society has given the concept of "space of flows". Space and time express the power relationships of the network society. "The space of flows refers to the technological and organizational possibility of organizing the simultaneity of social practices without geographical contiguity. Nonetheless the space of flows does include a territorial dimension, as it requires a technological infrastructure that operates from certain locations, and as it connects functions and people located in special places. But the meaning and function of the space of flows depend on the flows processed within the networks, by contrast with the space of places, in which meaning, function, and locality are closely interrelated".

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is not a passive beneficiary of information but now it has the capability of becoming active producer of information. The people with a little technical knowledge and small amount of money can promulgate their own material on Social Media. These features therefore initiates interactivity and allow citizens to debate with politicians or with other groups of citizens which are considerably far to engage physically.

There are many scholars who have highlighted the significance of "Internet-based linkages for the construction of weak ties, which lays the foundation of bridging social capital. Since online relationships may be supported by technologies like "distribution lists, photo directories, and search capabilities, it is possible that new forms of social capital and relationship building will occur through online social networking sites. Bridging social capital might be amplified by such sites, which support loose social ties, allowing users to create and maintain larger, scattered networks of relationships from which they could potentially draw resources. This is where one can theorize that SNS's could increasingly enhance weak ties one could form and maintain, because the technology is very much compatible for maintaining such attachments cheaply and easily".[1]

In his writings on Social capital John Field examines the relation between social capital and the emerging social networking sites. He argues that "most survey based evidences demonstrate that people who are most active online tend to have plenty of face-to-face connections, which are complementary in nature. He mentions that while doing one survey of visitors to a popular geographical website found that heavy users tends to show high levels of participation in voluntary organizations and political associations. They also found a relatively positive association between online interaction and offline participation. He says that Internet not only facilities weak ties but also allows the maintenance of spatially distant strong ties. By undertaking one relatively small survey among the college students in USA, he concludes that "Face book users showed strong levels of both bonding and bridging social capital, and were also keeping up what the authors called their 'maintained social capital".[2]

Usage of social networking sites in general can both increase and decrease social capital. Putnam's "time displacement hypothesis", as he argues that Internet use leads to a decline in individuals face-to-face interactions, which might shrink their social capital. Although in the later studies it has been found that "online communication has a positive role on individuals participation in community life, which encourages norms of trust and reciprocity". It is clear from these discussions that the "positive or negative effects of the Internet on social capital are contingent upon the way this medium is used".[3]

CONCLUSION

While concluding this chapter seeks to mention that social media is complementing face to face interactions and allowing individuals to widen their existing networks in manner which will enhance and strengthen their face to face interactions. Instead of marking this space of social media as creating a completely new departure, which perhaps is destroying reserves of social capital, it should be considered as one of many factors which are diluting certain kinds of social solidarity and promoting engagements which are based on open bounded and flexible in nature. Insofar Internet is may be helping to shift people's interactions away from those based on 'ascribed' characteristics such as gender, class or age and towards ' achieved' characteristics such as common lifestyles or hobbies, which as quoted by Field in "Giddens words **"promotes self reflexivity"** .[4]

Though there is possibly a decline in face-to-face or chapter-based organizations like unions etc which used to be the most capable groups for creating a movement for social change. But the manner in which the social media usage have surprisingly increased, possibly holds the promise to form the bases for new forms of social and political mobilization.

As to argue that we live in a 'participatory culture'. Which means a culture with "low barriers to creative expression and civic engagement, in which there is a strong support for creating and sharing one's creations and where it's members believe that their contributions matter, and sense some extent of social connection with one another."[5]

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[1] Nicole B. Ellison, Charles Steinfield, Cliff Lampe : The Benefits of Face book ''Friends:'' Social Capital and College Students' Use of Online Social Network Sites. pg 4

[2] Field, John. Social Capital Second edition. London And Newyork: Routledge Taylor and Franci Group, 2008.

[3] Nicole B. Ellison, Charles Steinfield, Cliff Lampe : The Benefits of Face book ''Friends:'' Social Capital and College Students' Use of Online Social Network Sites.

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[5] Komal H. Parikh : Political Fandom in the age of social media

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