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## BUDGETARY TRADE-OFFS BETWEEN MILITARY AND EDUCATION/HEALTH EXPENDITURES IN DEVELOPING COUNTRIES: A PANEL DATA ANALYSIS

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### ABSTRACT

*Though controversy remains among the defense economists about the nature of trade-off between military expenditure and other government expenditures, it is commonly believed, particularly in developing countries, that defense expenditures have an opportunity cost in terms of foregone other government expenditures. This paper examines empirically the existence of a budgetary trade-off among military, education and health expenditures in 14 developing countries for the time period 1999-2005 applying panel data analysis. The main findings of the article suggest that there is a positive association between military and education expenditure, and negative trade-off between military expenditure and health expenditure. Positive association between military and education expenditure indicates that government allocates the funds for defense and education sector independent of the government expenditures. Negative relationship between military expenditure and external debt growth indicates that defense sector's budget is fully funded by internal resources.*

### KEYWORDS

Trade-off, Military expenditure, Health expenditure, Education expenditure, External debt, Panel data analysis.

### INTRODUCTION

There has been widespread concern that the large military expenditures (miles) made by both developed and developing countries have substantial impact on economic growth. Military as an organized and disciplined forces helps in the process of modernization, provides technical skills, educational training and creates infrastructure necessary for economic development and also rescues the society when a country falls in trouble like natural disaster. In the absence of such dynamic considerations, however, it may compete for scarcely available human resources with the more productive civilian economy and so may have adverse effects. Crowding out may occur within the government budget so that miles reduces other items of net government spending. If there is a potential trade-off between defense and economic services, development may be retarded.

Health, education and military expenditure are the three major components of national budget of any country. Do countries with high military burden detract their social and economic welfare? This question may be severe, particularly in developing countries, where public demands exceed existing resources. Governments of developing countries face difficulties for allocating budgets in various public sectors owing to scarce resources. It is clear that governments of developing countries on any activity mean that those particular funds cannot be spent on others, possibly highly desirable activities. It has been widespread concern among researchers that large defense expenditures made by developing countries have substantial costs in terms of economic welfare. The use of any resource has an opportunity cost in the alternative instances that are foregone; it is a common thesis though that some burdens are more burdensome than others. Moreover, if the military expenditure of any country reduces health, education or other social services expenditures, it may hamper economic growth and development. It is likely that military expenditure may contribute to human capital formation particularly in developing nations as they conduct and administer many schools, colleges, universities, medical colleges as well as receive good physical training and various skills. However, the effect of this kind of human capital on the economy might be delayed and costly. If miles as a part of government expenditure reduces civilian consumption, more productive civilian investment, health and education expenditure and infrastructure development, and creates a balance of payments problem, these reduction effects of miles is termed as crowding out effect of miles. Miles may retard economic growth by crowding out effect. Negative impact of miles on the economy would indicate the presence of crowding out effect. Analyzing the trade-off relations between miles and other government expenditures would help to identify the nature of the crowding out effect.

This study is an attempt to broaden the scope of the literature, where the relationship among the health, education and miles in 14<sup>1</sup> developing countries for the time period 1999-2005 applying panel data analysis. The rest of the article is organized as follows. The second part of this article will present a literature review within the framework of budgetary trade-offs between miles and social expenditures of the government. The third part of this study will explain the econometric procedure, data source and interpret the empirical results. The final part will draw some conclusions.

### LITERATURE REVIEW

A number of researchers have examined empirically the extent, direction, and form of budgetary trade-off between military expenditure and other social expenditures of government like education, health expenditure etc. The first research regarding the trade-off between military expenditure and other social government expenditures begins with the study of Russett (1969) who finds a negative trade-off. After his work, number of researchers analyze in the context using time series, cross-section of individual country, group of countries applying various econometric techniques. Some find negative trade-off, some other find no trade-off and positive trade-off. Therefore, there is no consensus among the defense economists about the direction of trade-off. Peroff and Podolak (1979) investigate the trade-off relation between defense and health expenditure of the US economy for the period 1929-1974. They examine this relation by constructing equations emphasizing the following four:

- I) Years of peace and years of war,
- II) The size of the defense share of the budget,
- III) Different stages of the budgetary process (in the federal health and federal health research models only), and
- IV) The type of funding used to finance increased public expenditures (in the private health-defense models only).

<sup>1</sup>(Bangladesh, Burundi, Mongolia, Pakistan, (Low-income countries) Colombia, El Salvador, Iran, Morocco, (Lower middle-income countries) Peru, Lebanon, Oman, South Africa, Turkey and Cambodia (Upper middle income countries).

Overall, they find no trade-off between defense and health expenditure in the US economy. Verner (1983) examines empirically the trade-offs between education and defense expenditure using time series data over the period 1948-1979 for 18 Latin American countries. He finds that estimation output of 11 countries reveal statistically significant results. Among them, only one country indicates negative trade-offs. Remaining 10 countries reveal positive trade-offs. Finally, he suggests that the politics of the budgetary process in so far as education and defense is concerned, may differ considerably from country to country. Harris et al. (1988) tests the existence of trade-offs between defense and health/education expenditures in 12 Asian countries for the period 1967-1982 and find that these trade-offs are rare. Hess and Mullan (1988) investigate the trade-off between military and education expenditure for 77 LDCs using cross-section data. They find that these nations with greater milex tend to have a significantly larger share of GNP for education. Davis and Chan (1990) investigate the security-welfare trade-off in the case of Taiwan using time series data over the period 1961-1985. They find no evidence of any substitution between milex and social development as measured by physical quality of life index (PQLI). Apostolakis (1992) empirically tests the trade-off relationship between defense and other public needs for 19 Latin American countries for the period 1953-1987. Public needs include all public expenses allocated for health, education, social security and public works. In the time series and cross section analysis, estimation results dominate negative trade-off between milex and health, education and social security and welfare but positive trade-off between milex and public works. Frederiksen and Looney (1994) examine the effects of the changes of defense burden of Pakistan on budgetary allocations of economic services programs and administrative/social programs whether defense budgets have been increased or maintained either at the expense of economic and social programs using short-run impact and long-run adjustment models during the period between 1973 and 1986. They find that in the short-run and long run, there is a trade-off between expenditure on military and infrastructure program. However, in two cases, they find no trade-off between military expenditure and social programs. Ozsoy (2002) examines the existence of trade-off between education, health and military expenditure for Turkey using time 1925-1998. He argues that due to historical, economical, political and social differences among countries, time series analysis is more appropriate than cross-sectional analysis. All the estimated results reveal that the negative trade-off exists between defense and education and also defense and health expenditure. Sensen (2002) estimates the trade-off between security expenditure and non-security expenditures such as education, health, general administration, infrastructure and social services using time series data from 1983 to 1998 in Turkey. Internal and external security expenditures are considered as security expenditures. Defense expenditure is defined as external security expenditure. He finds no trade-off between security and non-security government services. Yildirim and Sezgin (2002) attempt to analyze the trade-off between defense spending and spending on education and health in Turkey using time period 1924-1996. The main findings of this article suggest that while military spending decisions are made independently of health and education expenditure, there are trade-offs between defense and welfare spending. While the trade-off is negative between defense and health, it is positive between defense and education. Moreover, it appears that there is a competition between education and health expenditure in the budgeting process. One argument behind the negative military-welfare trade-off is that government funded research and development is primarily concentrated in the military industry, while non-military research and development programs are much less amply funded. Hence, military expenditure retards innovation or the improvement in areas such as housing, education and health (Apostolakis, 1992). Support for the proposition of negative trade-off has been provided by, among others, Russet (1969), Debelko and McCormick (1977), Dickson (1977), Pluta (1979), Deger (1985), Harris et al. (1988), Apostolakis (1992), Frederiksen and Looney (1994), Ozsoy (2002), Yildirim and Sezgin (2002). Another argument suggests that there is no negative or even a positive relationship between military expenditure and social programs. Accordingly modern society moves towards a warfare-welfare state in which decision makers must buy off the electorate with welfare goods (Peroff and Podolok, 1979; Apostolakis, 1992). No trade-off and positive trade-off are reported among others Peroff and Podolok (1979), Harris et al. (1988), Hess and Mullan (1988), Davis and Chan (1990), Frederiksen and Looney (1994), Sensen (2002), Yildirim and Sezgin (2002). A short presentation of articles issued on the budgetary trade-off between military expenditure and other social services is given below:

**TABLE- 1: A SHORT PRESENTATION OF ARTICLES ISSUED ON THE BUDGETARY TRADE-OFF BETWEEN MILEX AND OTHER SOCIAL SERVICES**

Author	Date of Publication	Time Period	Region	Social services	Findings
Peroff and Podolok	1979	1929-74	USA	Health	No trade-off
Verner	1983	1948-79	Latin American Countries (18)	Education	11 countries indicate significant result. Among them, 10 countries reveal positive trade-off. Only 1 shows
Harris et al.	1988	1967-82	Asian Countries (12)	Education	6 countries reveal positive trade-off. 1 country reveals negative trade-off. 5 countries reveal no trade-off.
				Health	3 countries indicate positive trade-off. 3 countries show negative trade-off. 6 countries indicate no trade-off
Hess and Mullan	1988	1982-83	LDCs (77)	Education	No trade-off
Davis and Chan	1990	1961-85	Taiwan	Social Development (as indexed by the rate of change in its physical quality of life index (PQLI))	No trade-off
Apostolakis	1992	1953-87	Latin American Countries (19)	Health, Education, Social Security and Welfare	A statistically significant negative substitution prevails in 14 countries and 1 country indicates positive trade-off. 18 countries indicate negative trade-off between milex and education expenditure. 13 countries indicate negative trade-off between milex and social security and welfare. 13 countries indicate positive trade-off between milex and public works. 2 countries indicate negative trade-off between milex and public works.
				Public Works	Negative trade-off
Frederiksen and Looney	1994	1973-86	Pakistan	Total Economic Services	Negative trade-off
				Health and Education	No trade-off
				Public Services, Social Security / Welfare, Recreation / Religious Program	Positive trade-off
OZsoy	2002	1925-98	Turkey	Education and Health	Negative trade-off
Sensen	2002	1983-98	Turkey	Non-Security Expenditure (Health, General administration, Infrastructure, Social Services)	No trade-off
Yildirim and Sezgin	2002	1924-96	Turkey	Health	Negative trade-off for health
				Education	Positive trade-off for education

**METHODOLOGY OF THE STUDY**

**MODEL CONSTRUCTION**

For examining the trade-off relations between defense and other government sectors, an inter-temporal welfare function has been postulated. The model assumes that a country maximizes its intertemporal welfare function subject to constraints. Here, for the study, it has been assumed that the utility function of a country depends on civilian and military allocation of the government and output only.

The inter-temporal welfare function is given by,

$$W = \int_0^{\infty} e^{-\rho t} u(C, Y, M) dt \quad \text{----- (1)}$$

$u(\cdot)$  is utility function,  $\rho$  is rate of time preference. Note  $\frac{\partial u}{\partial C} = u_1 > 0, \frac{\partial u}{\partial Y} = u_2 > 0, \frac{\partial u}{\partial M} = u_3 > 0$  (assume),  
 $u_{11} < 0, u_{22} < 0, u_{12} > 0, u_{21} > 0, u_{12} = u_{21}$

Here,  $C$  = Civilian Expenditure (Health, Education, Infrastructure development etc.)

$Y$  = GDP (Gross Domestic Product)

$M$  = Military Expenditure

$Y$  = State variable,  $C, M$  = Control variable

Here, Harrod-Domar growth model is postulated for the constraint of the welfare function.

$$\Rightarrow \dot{Y} = \left(\frac{s}{\theta} - \sigma\right)Y \quad \text{Here, } s = \frac{S}{Y} \text{ (Savings rate)}$$

(A '•' represents time derivative)

$$\theta = \frac{K}{Y} \text{ (Amount of capital required to produce a single unit of output in the economy)}$$

$\sigma$  = Depreciation cost

$$\Rightarrow \dot{Y} = \left(\frac{I + G}{K} - \sigma\right)Y \quad \text{Here, } S = I + G$$

S= Savings, I= Investment, G= Government expenditure

$$\Rightarrow \dot{Y} = \left(\frac{I + C + M}{K} - \sigma\right)Y$$

$$\Rightarrow \dot{Y} = \left(\alpha + \frac{C}{K} + \frac{M}{K}\right)Y \quad \text{----- (2)}$$

$$\text{Let, } \left(\frac{I}{K} - \sigma\right) = \alpha$$

The country maximizes  $W$  given by (1), subject to equation (2), with  $C, M$  as the control variables and  $Y$  as state variable, using the Maximum Principle and forming the Hamiltonian.

$$H = e^{-\rho t} u(C, Y, M) + \pi \left(\alpha + \frac{C}{K} + \frac{M}{K}\right)Y \quad \text{----- (3)}$$

Here,  $H$  is maximized over the set of  $C$  and the following equation can be derived,

$$\pi = -\frac{e^{-\rho t} u_1 K}{Y} \quad \text{----- (4)}$$

Further, the equation of motion for the co-state variable  $\pi$

$$\dot{\pi} = -\frac{\partial H}{\partial Y} = -\left[e^{-\rho t} u_2 + \pi \left(\alpha + \frac{C}{K} + \frac{M}{K}\right)\right]$$

$$\Rightarrow \dot{\pi} = e^{-\rho t} \left(\frac{u_1 K \alpha}{Y} + \frac{u_1 C}{Y} + \frac{u_1 M}{Y} - u_2\right) \quad \text{----- (5)}$$

$$\pi = -\frac{e^{-\rho t} u_1 K}{Y}$$

From equation (4)

$$\dot{\pi} = \frac{\rho e^{-\rho t} u_1 K}{Y} - \frac{e^{-\rho t} u_{11} \dot{CK}}{Y} - \frac{e^{-\rho t} u_{12} \dot{YK}}{Y} - \frac{e^{-\rho t} u_{13} \dot{MK}}{Y} \text{----- (6)}$$

From equation (5) and (6),

$$\frac{\rho e^{-\rho t} u_1 K}{Y} - \frac{e^{-\rho t} u_{11} \dot{CK}}{Y} - \frac{e^{-\rho t} u_{12} \dot{YK}}{Y} - \frac{e^{-\rho t} u_{13} \dot{MK}}{Y} = e^{-\rho t} \left[ \frac{u_1 K \alpha}{Y} + \frac{u_1 C}{Y} + \frac{u_1 M}{Y} - u_2 \right]$$

$$\Rightarrow \dot{C} = \frac{\rho u_1}{u_{11}} - \frac{u_{12} \dot{Y}}{u_{11}} - \frac{u_{13} \dot{M}}{u_{11}} - \frac{u_1 \alpha}{u_{11}} - \frac{u_1 C}{u_{11} K} - \frac{u_1 M}{u_{11} K} - \frac{u_2 Y}{u_{11} K} \text{----- (7)}$$

In this respect, steady state equilibrium would be reached if millex, civilian expenditure and GDP growth are changed at the same rate. So, the steady state equilibrium is defined by

$$\dot{C} = \dot{Y} = \dot{M} = 0$$

$$0 = \frac{\rho u_{11}}{u_{11}} - 0 - 0 - \frac{u_1 \alpha}{u_{11}} - \frac{u_1 C}{u_{11} K} - \frac{u_1 M}{u_{11} K} - \frac{u_2 Y}{u_{11} K}$$

$$- u_1 \alpha - \frac{u_1 C}{K} - \frac{u_1 M}{K} - \frac{u_2 Y}{K} + \rho u_1 = 0 \text{----- (8)}$$

For a given value of  $C$ , taking total differentials of equation (8), the following equation can be derived,

$$\Rightarrow \frac{dY}{dM} = \frac{(\alpha - \rho)u_{13} + \frac{u_{12}}{K}}{u_{12}(\rho - \alpha) - \frac{u_{13}}{K} + \frac{u_{12}}{K} + \frac{1}{K}} \text{----- (9)}$$

From equation (9), the study finds that for examining the effect of millex on the output, it is needed to identify the trade-off relations between millex and other

$$(u_{13} = \frac{\partial C}{\partial M})$$

civilian expenditure of the government that is shown from the term

**METHODS OF ESTIMATION**

This study only investigates the budgetary trade-off between military, health and education expenditures. Developing country's budget remains incomplete without debt. Therefore, the present study considers external debt growth in the trade-off analysis assuming as an explanatory variable. The following three equations are used to investigate the budgetary trade-off applying panel data method:

$$H / G_{it} = \alpha_0 + \alpha_1 E / G_{it} + \alpha_2 M / G_{it} + \alpha_3 EDg_{it} + U_{it} \text{----- (I)}$$

$$M / G_{it} = \beta_0 + \beta_1 E / G_{it} + \beta_2 H / G_{it} + \beta_3 EDg_{it} + U_{it} \text{----- (II)}$$

$$E / G_{it} = \gamma_0 + \gamma_1 H / G_{it} + \gamma_2 M / G_{it} + \gamma_3 EDg_{it} + U_{it} \text{----- (III)}$$

Where,  $H / G_{it}$  = Health expenditure as a proportion of general government expenditure for country i and year t,

$E / G_{it}$  = Education expenditure as a proportion of general government expenditure for country i and year t,

$M / G_{it}$  = Military expenditure as a proportion of general government expenditure for country i and year t,

$EDg_{it}$  = External debt growth for country i and year t,

$U_{it}$  = Disturbances

**EMPIRICAL RESULTS**

The data for this study consist of military expenditure, health expenditure, education expenditure and external debt for 14 developing countries. The data for educational expenditures, health expenditures, military expenditures and external debt are taken from World Development Indicator (WDI). All data are converted to purchasing power parity form. In order to find out the trade-off relationship between millex and health and education expenditure balanced micro panel data of 14 countries over the period 1999-2005 are considered in this study. The two panel data estimation techniques are (i) the fixed effects model (FEM) and (ii) the random effects model (REM) or error components model (ECM). The two models can generate considerably different results. FEM is appropriate in situations where the individual-specific intercept may be correlated with one or more regressors. Again, FEM cannot estimate the effect of individual-specific fixed characteristics. Whereas, REM is appropriate in situations where the omitted effects are uncorrelated with the explanatory variables (Baltagi, 2005). Breusch and Pagan (BP) and Hausman tests can be used to decide between FEM and REM. Therefore, the study first examines model (I) which methods of panel data are appropriate for the model. Empirical findings of BP and Hausman tests of model (I) are shown in Table-2:

TABLE-2: SUMMARY RESULTS OF BP AND HAUSMAN TESTS OF MODEL (I) FOR TRADE-OFF ANALYSIS

Model	Null hypothesis	Tests	Results
$H/G_{it} = \alpha_0 + \alpha_1 E/G_{it} + \alpha_2 M/G_{it} + \alpha_3 EDg_{it} + U_{it}$	Ho : no individual effect	BP=220.92*** (6.63490)	Null hypothesis Rejected
	Ho : no correlation between the individual effects and other variables	Hausman=18.06*** (11.3449)	Null hypothesis rejected

\*\*\* denotes significant at 1%. Values in brackets are  $\chi^2$  statistic.

Based on BP and Hausman tests, we find that of the two alternatives the fixed effects model is the better choice. From the estimation output of fixed effects model, we observe that there is a negative association between health and millex but positive with education expenditure. We perform Wooldridge (2002) test for autocorrelation in panel data where indicate the presence of autocorrelation (results not reported here). Therefore, we finally estimate model (I) by panel corrected standard error (PCSE) method. The estimation output also indicates the existence of negative trade-off between health and millex. However, education expenditure is positively correlated with health expenditure. Stata output of panel corrected standard error (PCSE) method of model (I) is given below in equation form:

$$H/G_{it} = 0.0972563 + 0.0980265E/G_{it} - 0.0380394M/G_{it} - 0.0092808EDg_{it} \text{----- IV}$$

(0.0100643) (0.0554164) (0.0459239) (0.0123987)  
0.000 0.077 0.407 0.454

Here, values in brackets are standard error and values in parentheses are p-values.

Model (II) considers education, health expenditure and external debt growth as explanatory variables and millex as dependent variable. Again, to find out appropriate estimation method, the study performs BP and Hausman tests. Empirical findings of BP and Hausman tests of model (II) are shown in Table-3. Based on BP and Hausman tests the study finds that of the two alternatives the random effects model is the better choice.

TABLE-3: SUMMARY RESULTS OF BP AND HAUSMAN TESTS OF MODEL (II) FOR TRADE-OFF ANALYSIS

Model	Null hypothesis	Tests	Results
$M/G_{it} = \beta_0 + \beta_1 E/G_{it} + \beta_2 H/G_{it} + \beta_3 EDg_{it} + U_{it}$	Ho : no individual effect	BP=199.14*** (6.63490)	Null hypothesis rejected
	Ho : no correlation between the individual effects and other variables	Hausman=3.75 (11.3449)	Null hypothesis is not rejected

\*\*\* denotes significant at 1%. Values in brackets are  $\chi^2$  statistic.

From the estimation output of random effects model, the study finds that there is a negative trade-off between health expenditure and millex. But positive trade-off exists between education expenditure and millex as before. The study applies Feasible Generalized Least Square (FGLS) method that considers heteroskedasticity of the panel data and corrects autocorrelation simultaneously. The estimation output indicates that there is a negative trade-off between millex and health expenditure and external debt growth. Stata output of Feasible Generalized Least Square (FGLS) method of model (II) is given below in equation form:

$$M/G_{it} = 0.1952111 + 0.0196079E/G_{it} - 0.456870H/G_{it} - 0.0767372EDg_{it} \text{----- (V)}$$

(0.011159) (0.1154695) (0.0983124) (0.0215136)  
0.000 0.865 0.000 0.000

Here, values in brackets are standard error and values in parentheses are p-values.

For the third model, empirical findings of BP and Hausman tests of model (III) are shown in Table-4. Again, based on BP and Hausman tests the study finds that of the two alternatives, the fixed effects model is the better choice.

TABLE-4: SUMMARY RESULTS OF BP AND HAUSMAN TESTS OF MODEL (III) FOR TRADE-OFF ANALYSIS

Equation	Null hypothesis	Tests	Results
$E/G_{it} = \gamma_0 + \gamma_1 M/G_{it} + \gamma_2 H/G_{it} + \gamma_3 EDg_{it} + U_{it}$	Ho : no individual effect	BP=170.78*** (6.63490)	Null hypothesis Rejected
	Ho : no correlation between the individual effects and other variables	Hausman=16.29*** (11.3449)	Null hypothesis is not rejected

\*\*\* denotes significant at 1%. Values in brackets are  $\chi^2$  statistic.

Again, from the fixed effect estimation of model (III), the study finds that there is a positive relation between education expenditure and health expenditure and millex. In addition, the coefficients of these variables indicate statistically significant with desired level. The study performs Wooldridge (2002) test for autocorrelation in panel data where indicate the presence of autocorrelation (results are not reported here). Therefore, we finally estimate model (III) by panel corrected standard error (PCSE) method. The results of this method are shown in equation (VI) where it has been observed that there is a negative trade-off between education expenditure and millex. However, it is not statistically significant. Again, positive relation exists among education, health and external debt growth. Only the coefficient of health expenditure shows statistically significant result. Stata output of panel corrected standard error (PCSE) method of model (III) is given below in equation form:

$$E/G_{it} = 0.105504 + 0.3054845H/G_{it} - 0.0233337M/G_{it} + 0.0079484EDg_{it} \text{----- VI)}$$

(0.0168009) (0.1345733) (0.0654186) (0.0654186)  
0.000 0.023 0.721 0.670

Here, values in brackets are standard error and values in parentheses are p-values.

From the estimated equations, the study finds some statistically significant results. Equation (IV) indicates positive relation between education and health expenditure. The other two coefficients are not statistically significant. Estimated equation (V) indicates negative association between health and military expenditure and negative association between external debt growth and millex. The other coefficient is not statistically significant. The last estimated equation indicates positive association between health and education expenditure. The other two coefficients are not statistically significant. Therefore, the study finds the existence of negative trade-off between millex and health expenditure and negative influence of external debt growth.

**CONCLUSION**

This study has taken an attempt to provide an empirical explanation and a response to the ongoing trade-off between education, health and military expenditures debate by using data from 14 developing countries for the period 1999-2005. From the study, it has been observe that there is a negative trade-off between millex and health expenditures indicating that increase in military expenditure reduces spending on health expenditure. Additionally, there is a positive relationship between millex and education expenditure and education and health expenditure. The absence of a negative trade-off between education and millex may be explained by other factors as well. Negative relationship between external debt growth and millex indicate that military is fully funded by internal resources. From the investigation, it appears that government allocates the funds for defense sector independent of other government expenditures. Health and education expenditures share the remaining resources between themselves and other sectors of government expenditures. A substantial body of literature has shown that military expenditure may have growth depressing effect in developing countries. Negative trade-off relation between military and other social expenditures of the government may cause the depressing growth effect of the developing countries. It is clear that in order to identify growth effect of millex, it is needed to examine the existence of trade-off among government expenditures. Further research should concentrate on testing the trade-off relationship between millex and other government expenditures considering longer period.

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## AN ANALYSIS ON CRITICAL SUCCESS FACTORS FOR NEW PRODUCT DEVELOPMENT IN SMES OF IRAN'S FOOD AND BEVERAGE INDUSTRIES

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### ABSTRACT

*The purpose of this paper is analyzing on critical success factors (CSFs) for new product development (NPD) in Small - Medium Enterprises (SMEs) of Iran's food and Beverage industries, by the use of managers and experts who are involved. This study is a quantitative research that the questionnaire for collection data was developed by an extensive review of the related literature and also performing structural interviews. We have used the viewpoints of more than 50 managers and experts, related to NPD, from SMEs of food and beverage industries of Iran. The finding of the study revealed CSFs for NPD in SMEs and then specifies its critical success dimensions (CSDs) for NPD in SMEs that include technological, commercialization, marketing, organizational, internal, and supporting dimensions. The study also shows that there is a significant gap between current situation and ideal situation and then with identifying factors that cause such a problem, have presented a set of managerial solutions.*

### KEYWORDS

Critical success factors, NPD, SMEs, Iran's food and beverage industries, managers' viewpoints.

### INTRODUCTION

**M**inistry of Industries and Mines of Iran has divided Iranian industries into two main categories; Metal-based and nonmetal-based. Nonmetal-based industries have six subcategories, including food and beverage industries, pharmaceutical and health industries, polymer industries, cellulose industries and chemical industries.

Statistically, 27000 active industrial units are categorized into nonmetal-based industries, which are about 222000 billion Rials (approximately 22 billion dollars) of investment and over 646000 employees. 26 percent of value-added Iran's industries and mining part is categorized into nonmetal-based industries. (Quotation from Ministry of Industries and Mines of Iran, 2007)

Food and beverage industries of Iran are ranked first among Iran's nonmetal-based industries as a consequence of supplying life's basic needs, high value-added and large number of employees, reducing agricultural wastes and participating directly in the production of national income, diversity of products, and the number of active firms.

Statistic Center of Iran (2007) says that Iran's food and beverage industries have caused employment for 420000 people.

Iran's food and beverage industries has a value-added scale, 8 times more than Electrical Industries, 3 times more than Rubber and Plastic Industries, and 2 times more than textile and clothing Industries, so they have a significant importance in industry.

Although nonmetal-based industries' share in GDP of Iran is about 5 percent, food and beverage industry (including agricultural and non agricultural) owe about 2 percent of this share, and other nonmetal-based industries have about 3 percent of that. (Quotation from Ministry of Industries and Mines of Iran, 2007).

Having a vast number of active units, food and beverage industries will be at the center of our focus. We will study units, located in Fars industrial town, which is one of the leading provinces of Iran in industry.

Despite the large number of literature, dealing with the product development process in large-scale industries, unfortunately few studies have been done in the field of SMEs; however, this issue has an important role in survival and growth of SMEs.

This research has three main objectives:

- Identifying critical success factors (CSFs) of NPD in small - medium enterprises of food & beverage industries;
- analyzing critical success dimensions (CSDs) of NPD in small - medium enterprises of food & beverage industries;
- Identifying gaps between expectations and perceptions of these units from managers' viewpoint with respect to the critical success factors of NPD.

In the following study, first, two concepts (NPD and SME) are introduced, then the relevant studies from the literature are reviewed, and in the third section, the study questions are discussed. Fourth part deals with research's methodology, followed by data analysis and results in the fifth section. The discussions and managerial implications are mentioned in sixth section, and finally, the last part talks about limitations and future researches.

**DEFINITIONS**

**NEW PRODUCT DEVELOPMENT (NPD)**

Effective NPD has become the focal point of competitiveness in many industries, particularly those where product life has shortened, competition increased on a global basis, and customer demand for greater product variety has grown (Maylor, 1997; Pisano 1997). Recently, studies about NPD issue are being done in different organizations such as universities, consulting firms, and manufacturing companies, and in a wide range of fields such as technology management, business, marketing, engineering, etc. There are many different and various definitions for NPD, and that's because of its great abundance and complexity. Fuller (1994) believes a broad definition is the most useful and should encompass either the development or introduction of a product not previously manufactured by a company or the presentation of an old product into a new market. Product Development and Management Association (PDMA) defines new product development as "a series of defined and regular tasks, procedures and practices that describe natural goal of a firm for conversion of early ideas into final products and services". With respect to this definition it can be said that the entire NPD process itself may include several sub-processes and sub-stages (Griffin, 1997).

Dougherty (1990) supposed that NPD process is basically, of knowledge development, knowledge combination and blending activities, which comes from a current of non-routine and routine tasks performed by active individuals and groups in the organization.

In general, new product development is a complex process that requires participation of various functional parts of a firm. In fact, in order to implement NPD process adequately, the whole firm must be motivated and sensitive (Wheelwright and Clark, 1992).

**SMALL - MEDIUM ENTERPRISES (SME)**

There are lots of studies done in the field of SMEs, and this has caused various definitions in different countries with respect to age, population, cultural structure and etc.

SMEs have many similarities in many countries, but despite this, they don't have the same unit and definition in all countries. Each country has expressed a definition according to its special business conditions. For example, Europe Union defines companies under 250 employees as SMEs. (European Commission, 2003). In Table 1, you can see the definition of SMEs in Iran's industries.

**TABLE 1: DISTINCTION BETWEEN SMES AND LARGE COMPANIES IN IRAN BASED ON THE NUMBER OF EMPLOYEES** (Commerce Ministry of Iran, 2007)

Number of workers	Industry type
more than 150	Large
Less than 150	Medium
Less than 50	Small
Less than 10	Very Small

It should be noted that beyond the firm size categorization (based on numbers of employees), SMEs and large companies have significant differences in other categories like structure, policy, management and resources. Table 2 has presented some of these differences.

**TABLE 2: COMPARISON BETWEEN SMES AND LARGE COMPANIES** (Ghobadian and Gallear, 1997)

large companies	SMEs
Pyramidal structure with several layers	Flat structure with a few layers
Information flow and non-flexible structure	Information flow and flexible structure
Emergence of low innovative	Emergence of high innovative
Slow respond to environmental changes	Quick respond to environmental changes
High degree of formalization	Low degree of formalization
low Independency and authority of employees	High independency and authority of employees
Appropriate access to financial and human resources	Limited access to financial and human resources
High resistance of staff to changes	Minimal resistance of staff to changes
individual creativity is stifled	Individual creativity is encouraged
Non-intuitive and deliberative decision making by decision makers	Intuitive decision making by decision makers (usually owner)

**LITERATURE REVIEW**

Balachandra (1997) says that, goals of introducing more than 90 percent of products have not been possible in 1991. Cooper (2005) noted the failure rate of NPD projects in the world as about 33 percent. Morris believes that the cost of failure in food industry of America is estimated to be 20 billion dollars and that's because of the unsuitable development of new products. Also Booz, Allen and Hamilton (1982) expressed that, out of every seven ideas, almost four ideas enters the development phase and finally, only one idea converses to product and launches to market.

All the statistics above are expressing this point: it's a high percentage of failed NPD projects. In fact, the success of NPD projects was a vital challenge for managers in the past, and unfortunately, embraces today's managers. So, the necessity of researches in this area is clear, and that's because the percentage of success in NPD projects increases by correctly recognition and application of critical success factors of NPD.

A variety of researches has been done associated with the critical success factors (CSFs) of NPD, but the results of them are different and sometimes contradictory with respect to the type, size, and other variables of industries and companies being studied.

Kandemir, Calantone, and Garcia (2006) in an elaborative research, studied CSFs of NPD projects in biochemistry industries of several advanced countries. Their research results showed that the following factors can be considered as critical success factors for NPD projects:

- 1) Using multi-functional teams and focusing on specific teams;
- 2) Using detailed market researches;
- 3) Testing the market, initial assessment of the product, and also final customers;
- 4) Propaganda quality;
- 5) Degree or scale of the company in international markets;

Lynn, Valentine, and Wright (1996) have introduced a model of determining the successful development of new products which includes 11 factors as follow: Having a structured process, and a clear vision, refining a product after launch, having long-term vision, optimization of team members skills, understanding the market and its dynamics, support of top management, using lessons obtained from former projects, supplying appropriate team, and finally maintaining team members by experiences from product development projects.

Cooper (1999) noted that CSFs for NPD include: proper orientation to the market, attention to market, product orientation and customer orientation, focusing on presentation of a world level product, having an international orientation in design processes and development and marketing, attention to activities before entering to development of main project, and sharp and timely definition of product development project.

Researches about CSFs of NPD of industries located in China showed that four aspects in the process of product development are effective (Mu, Peng and Tan, 2007):

- A) Technological factor
- B) Marketing factor
- C) Administrative factor

D) Commercialization factor

Despite increasing attention to researches about CSFs of NPD, most studies done in this area are related to large companies and few studies have been done in relation with small and medium sized companies (SMEs) (Woodcock et al, 2000). Though issue of product development is considered as an important subject to maintenance, survival and growth of SMEs as a source of innovation and growth, unfortunately, small number of researches has been done in this field. Therefore, this is the reason why this study is important to be done.

After searching, in literature, most of studies related to this subject, CSFs of NPD have been introduced in table3.

TABLE 3: CRITICAL SUCCESS FACTORS OF NPD IDENTIFIED BY PREVIOUS RESEARCHERS

No	Critical Success Factors	Researcher/ Researchers
1	Attention to details in NPD Process	(1990)Gupta and Wilemon
2	Top management support	Lester (1998); Poolton and Barclay (1998); Lester (1998); Gupta and Wilemon (1990);Ernst (2002)
3	Having Strategic Think (long-term view)	Poolton and Barclay (1998); Gupta and Wilemon (1990);Ernst (2002); Lester (1998); Lynn et al(1999)
4	Attention to opinions of market retailers for designing and manufacturing product	Luo (2005)
5	Having necessary skills in the parts related to NPD	Mathieu (1996)
6	Personnel commitment to NPD	Mathieu (1996)
7	Using IT	Mathieu (1996)
8	Sharp, stable, and early product definition	Cooper (1999)
9	On time delivery to market	Shepherd and Ahmed(2000); Cooper and Edgett(2002); Cooper (1999)
10	Proper orientation to market	Sharma(2006); Cooper and Kleinschmidt(1995)
11	Having a structured and formal new product development process	Lynn et al. (1999); Griffin(1997a); Maidique and Zirger(1999); Page(1993); Voss et al(1998)
12	Existing creative and entrepreneurial environment in the firm	Cooper and Kleinschmidt(1995); Voss et al(1998)
13	Applying lessons obtained from previous projects	Lynn et al (1999)
14	Using Cross-functional teams	Sharma(2006); Lester (1998)
15	Integrating marketing activities and R&D	Maidique and Zirger(1999);(1990) Gupta and Wilemon; Biemans(1992)
16	Supplier involvement in NPD projects	Liker et al (1995)
17	Having a unique and differentiated product	Cierpicki et al (2002); Cooper(1999)
18	Being an attractive product for market	Link et al(1987)
19	Market understanding and its dynamics	Lynn et al (1999)
20	Top management acceptance of risk	Poolton and Barclay (1998); Cooper (1999)
21	Flexibility and responsiveness to change	Poolton and Barclay (1998)
22	Defining standards of expected performance	Cooper (1999)
23	Refining a product after launch	Lynn et al (1999)
24	Having a clear and shared vision on the team	Lynn et al (1999); Lester (1998)
25	Being extensive inter-organizational communications	Rothwell(1972); Montoya-Weiss, Calantone(1994)
26	Having a proper control system	Rothwell(1972)
27	Having a proper organizational structure	Cooper (1999)
28	Generating good ideas	Lester (1998)
29	Organization's attention to external markets	Luo (2005)

So, with respect to the topic of the research, research's questions and hypotheses are proposed as follow.

Research's questions:

1. What are CSFs of NPD from managers and experts' viewpoint, which are related to Small-Medium Enterprises (SMEs) of food and beverage industries of Iran?
2. What are critical success dimensions (CSDs) of NPD from managers and experts' viewpoint, which are related to Small-Medium Enterprises (SMEs) of food and beverage industries of Iran?

**RESEARCH'S HYPOTHESIS**

There is a significant gap between expectations and perceptions of managers in Small-Medium Enterprises (SMEs) of food and beverage industries of Iran with respect to the CSFs of NPD.

**RESEARCH METHODOLOGY**

**RESEARCH DESIGN**

Most of the previous researches have identified CSFs by causal correlation between candidate factors and NPD performance (Sun & Wing, 2005). But the design of this research is different from the other studies in this field, and that's because:

1. Our study under firms had no high life cycle and most of them don't have separable parts such as R&D or NPD project management.
  2. Evaluation of NPD performance by using item such as new product success represented to market, product share of market, etc is laborious for these firms.
- So to recognize high importance CSFs of NPD, we used opinions of the managers and experts who concern with NPD issue.

**METHOD OF DATA COLLECTION**

We have used a questionnaire in order to gather required data. Therefore, we created a comprehensive questionnaire regarding identified factors in Table3; review of literature about the subject of research, and also using same other questionnaires. After designing the primary questionnaire, in order to support the questionnaire's validity, we sent it to 20 experts of NPD, received their viewpoints, and then evaluated questionnaires. Most of the viewpoints focus on the questionnaire to be voluminous. So we conducted structure qualitative interviews with some of the selected managers of Iran's food and beverage industries, and asked them to answer to questions in two dimensions (more-effective or low-effective).

The results of these interviews showed that the factors of 1, 3, 6, 7, 10, 16, 23, and 27 from table 3 have low importance, so we didn't use them in new edition of the questionnaire.

Finally, the questionnaires were edited according to their opinions and were sent to other managers again and were confirmed. This is a summary of the received opinions:

Manager opinions of company A:

"... the competitor brands are effective for success on NPD projects as our more interest and better products, in compete with them have problem. Also, conjunct chain of suppliers, employees, managers, and customers are effective for success on NPD projects..."

Manager opinions of company B:

"... challenges of NPD are factors outside organization, that include: exiting saturation markets, being inappropriate for international markets, lack of support, by governmental enterprises (such as insurance, work office, etc), political tampers in industries level, exiting strong brands as competitors..."

Manager opinions of company C:

"... exiting impregnated markets and unsound compete atmosphere, lack of support by governmental enterprises, and their bureaucratic rules are really tormentor, and sometimes creates problems in production process. Firms compete discussion is an important and considerable issue that make more problems for NPD projects. Also, because of decreasing people's power, there isn't dynamic possibility on various products and implementation of these projects..."

Manager opinions of company D:

"... Successful new product development depends on a strong research team that is dominant to technical, marketing, and financial issues. In fact, companies that are successful in the field of identifying appropriate target market should be leader.

Also, the lacks of transparent management templates in macro-level of a country for supporting small and medium industries make timid managers accept the risk of creating new products..."

Generally, Questionnaire's items included four sections:

1. Demographic information of individuals, including 3 questions about sex, work background, and job;
2. General information of the firm, including 2 questions about the number of personnel and firm activity background;
3. Information about new products that was presented to market, including 4 questions about estimation of financial success, profit, sale and market share of new product in 5 last years;
4. Effective factors on NPD process success, including 21 two part questions. One part asks about the ideal situation and the other, about the current situation. In fact, these questions are perceptual– prospective.

The questions of this part are categorized in 4 aspects based on Mu, Peng and Tan Research (2007) in table4.

TABLE 4: CRITICAL SUCCESS DIMENSIONS (CSDs) OF NPD WITH RESPECT TO EACH QUESTION

Related questions	Dimensions
16, 4	Technological
13, 12, 11, 2	Marketing
21, 19, 18, 17, 14, 9, 8, 7, 3, 1	Administrative
20, 15, 10, 6, 5	Commercialization

QUESTIONNAIRE'S RELIABILITY

We used Likert spectrum to evaluate the questionnaire's items (minimum 1 to maximum 5) and selected Cronbach's acoefficient to assess the reliability. The results for 4 aspects are presented in table5, and show that the questionnaire is reliable.

TABLE 5: CRONBACH'S α COEFFICIENT FOR DIFFERENT ASPECTS OF THE QUESTIONNAIRE

Items	Cronbach's α coefficient
Items related to Technological aspect	0.764
Items related to Marketing aspect	0.725
Items related to Administrative aspect	0.913
Items related to Commercialization aspect	0.779

THE SURVEY

The statistical society of this study is managers of SMEs related to food and beverage industry located in industrial town of Fars (one of the provinces of Iran). NPD is a process that covers a wide range of organization's managers, so, in order to ask their ideas, statistical society was calculated as table6. After determining the population, 100 questionnaires were sent (to more than 60 percent of the target society) to managers of these firms, and finally, 85 questionnaires (85 percent) were returned during 3 weeks. Also in order to enhance the quality of the results, we divided them into two categories. The first group was those who had assessed their new products as successful products or relatively successful. Second group was those who had assessed their new products as unsuccessful products. So, we used 51 completed questionnaires from the first group (Table7). Also should be noted that the sampling method used in this study is stratified random sampling, due to a heterogeneous society.

TABLE 6: DETERMINING THE RESEARCH SOCIETY

Grouping Enterprises	No. active enterprises	No. selective managers	No. goal managers
Micro-Small	10	1	10)10(1x
Small	66	2	132)66(2x
Medium	6	3	18) 3x6(
Total	82	-	160

TABLE 7: DISTRIBUTION OF INFORMANTS RELATED TO THE GOAL QUESTIONNAIRES

Informants	No.	Percentage
<b>Gender</b>		
Man	38	74.5
Woman	13	25.5
<b>Job position</b>		
Senior Management	13	25.5
R&D Manager	5	9.8
Engineering & design Manager	3	5.9
Production Manager	9	17.6
Sale & Marketing Manager	3	5.9
Other managers	18	35.3
Total	51	100.0

**DATA ANALYSIS AND RESULTS**

At first, we did a test (T-test) on 21 questions related to section 4 of the questionnaires (CSFs of NPD). Running this test, we can answer the first research question. The result of statistical Analysis for 21 items (CSFs of NPD) are explained in table 8 (significant level is 0.05):

**TABLE 8: RESULTS OF T-TEST ON 21 ITEMS RELATED TO SECTION 4 OF THE QUESTIONNAIRES**

	Test Value = 3			95% Confidence Interval of the Difference		
	t	df	Sig. (2-tailed)	Mean Difference	Minimum	Maximum
Q1	4.225	45	.000	.60870	.3186	.8988
Q2	2.015	46	.050	.31915	.0004	.6379
Q3	3.720	48	.001	.51020	.2344	.7860
Q4	3.590	48	.001	.46939	.2065	.7323
Q5	1.910	47	.062	.22917	-.0122	.4705
Q6	2.746	49	.008	.40000	.1072	.6928
Q7	2.560	49	.014	.34000	.0731	.6069
Q8	4.432	46	.000	.63830	.3484	.9282
Q9	.274	44	.785	.04444	-.2819	.3708
Q10	.586	46	.561	.08511	-.2074	.3776
Q11	1.069	49	.290	.14000	-.1232	.4032
Q12	4.225	49	.000	.58000	.3041	.8559
Q13	2.460	45	.018	.36957	.0670	.6721
Q14	2.934	48	.005	.46939	.1477	.7911
Q15	2.990	49	.004	.36000	.1180	.6020
Q16	3.841	48	.000	.48980	.2334	.7462
Q17	3.934	49	.000	.48000	.2348	.7252
Q18	2.774	49	.008	.42000	.1157	.7243
Q19	4.287	49	.000	.60000	.3187	.8813
Q20	.693	49	.492	.14000	-.2660	.5460
Q21	2.483	49	.017	.36000	.0686	.6514

Finally, table 8 shows that questions number 5, 9, 10, 11, and 20 are not significant and with respect to the questions of the questionnaire, significant CSFs of NPD, from the perspective of managers and experts related to SMEs of food and beverage industries of Iran is shown in table 9.

**TABLE 9: SIGNIFICANT CSFs OF NPD**

Σ	Significant CSFs	Σ	Significant CSFs
1	Top management support	9	Existing creative and entrepreneurial environment in the firm
2	having Necessary skills in parts related to NPD	10	Having an attractive product for market
3	Market understanding and its dynamics	11	Having a clear and shared vision on the team
4	On time delivery to market	12	Flexibility and responsiveness to change
5	Attention to opinions of market retailers for product's designing and manufacturing	13	Define standards of expected performance
6	Top management acceptance of risk	14	Having extensive inter-organizational communications
7	Applying lessons obtained from previous projects	15	Having the proper control system
8	Having a structured and formal new product development process	16	Generating good ideas

**DIMENSION ANALYSIS**

In this part we can answer the second research question, finding critical success dimensions (CSDs) of NPD. Previously in part of 4.2 (see table 4), we introduced 4 dimensions with respect to the related literatures. In order to find out whether these dimensions cover all variables (CSFs of NPD), we used factor analysis and the Maximum Likelihood method.

Before running the factor analysis, we must be sure about the correlation between variables and also meaningfulness of data matrix. In fact, Partial Correlation Coefficient is a proper indicator to determine the intensity of the relationship between variables. We used KMO (Kaiser-Mayer-Olkin) test for this purpose. If the values of this index are close to 1, the relevant data are suitable for factor analysis, otherwise (usually less than 0.6) factor analysis results for the relevant data are not very suitable. In order to evaluate of the importance and meaningfulness of the correlation matrix, we used Bartlett's test. In fact, if significant level of Bartlett's test is smaller than 5 percent, the factor analysis for identifying the structure (a factor model) is appropriate.

**A) TECHNOLOGICAL DIMENSION**

This dimension covers two questions of section 4 of the questionnaire (questions 4 and 16).

Doing KMO test, because the index KMO value was 0.5 (less than 0.6), factor analysis for this set of variables (questions 4 and 16) was not suitable and we considered both in this aspect (no change).

**B) MARKETING DIMENSION**

This dimension covers four questions from section 4 of the questionnaire (questions 2, 11, 12, 13). Because question 11 was non-significant, it was removed from this collection and factor analysis was done for other three questions.

Doing KMO test, because the index KMO value was 0.634 (bigger than 0.6), it can be stated that the factor analysis for this set of variables (questions 2, 12, 13) is suitable.

Also results of the Bartlett test indicated (because 0.001 is smaller than 0.005) that implementation of factor analysis based on correlation matrix is justifiable.

Table 10 indicates that considering this three questions in a dimension is acceptable (with respect to amount of their loading, which is higher than 0.5). Also because one factor in the matrix has been suggested, factors rotation matrix is not defined for it. (This matrix is important for more than one factor).

**TABLE 10: ROTATED FACTOR MATRIX**

	Factor 1
Q2	.764
Q12	.502
Q13	.599
4 iterations required	

C) ADMINISTRATIVE DIMENSION

This dimension covers 10 questions from Section 4 of the questionnaire (questions 1, 3, 7, 8, 9, 14, 17, 18, 19, 21).

Because question 9 was non-significant, it was removed from this collection and factor analysis was done for other questions.

With respect to the obtained KMO value (0.864), it can be said that factor analysis is appropriate for these set of variables (for questions 1, 3, 7, 8, 14, 17, 18, 19, 21). Also results of the Bartlett test show (because 0.000 is smaller than 0.005) that the implementation of factor analysis based on correlation matrix is justifiable.

Table11 shows that considering these nine questions in one dimension is not very logical. (With respect to the amount of their loading which is less than 0.5). So with respect to the factors rotation matrix, we can consider these 9 questions in two dimensions include:

1. This dimension covers questions 7, 8, 14, 17, 18 and 19. With respect to the type of questions, we entitle this new factor as organizational internal aspect.
2. This dimension covers questions 1, 3 and 21. With respect to the type of the questions, we entitle this new factor as supporting aspect.

TABLE11. ROTATED FACTOR MATRIX

	Factor	
	1	2
Q1		.665
Q3		.915
Q7	.640	
Q8	.567	
Q14	.731	
Q17	.666	
Q18	.597	.571
Q19	.705	
Q21		.605
Rotation Method: Varimax with Kaiser Normalization.		
Rotation converged in 3 iterations.		

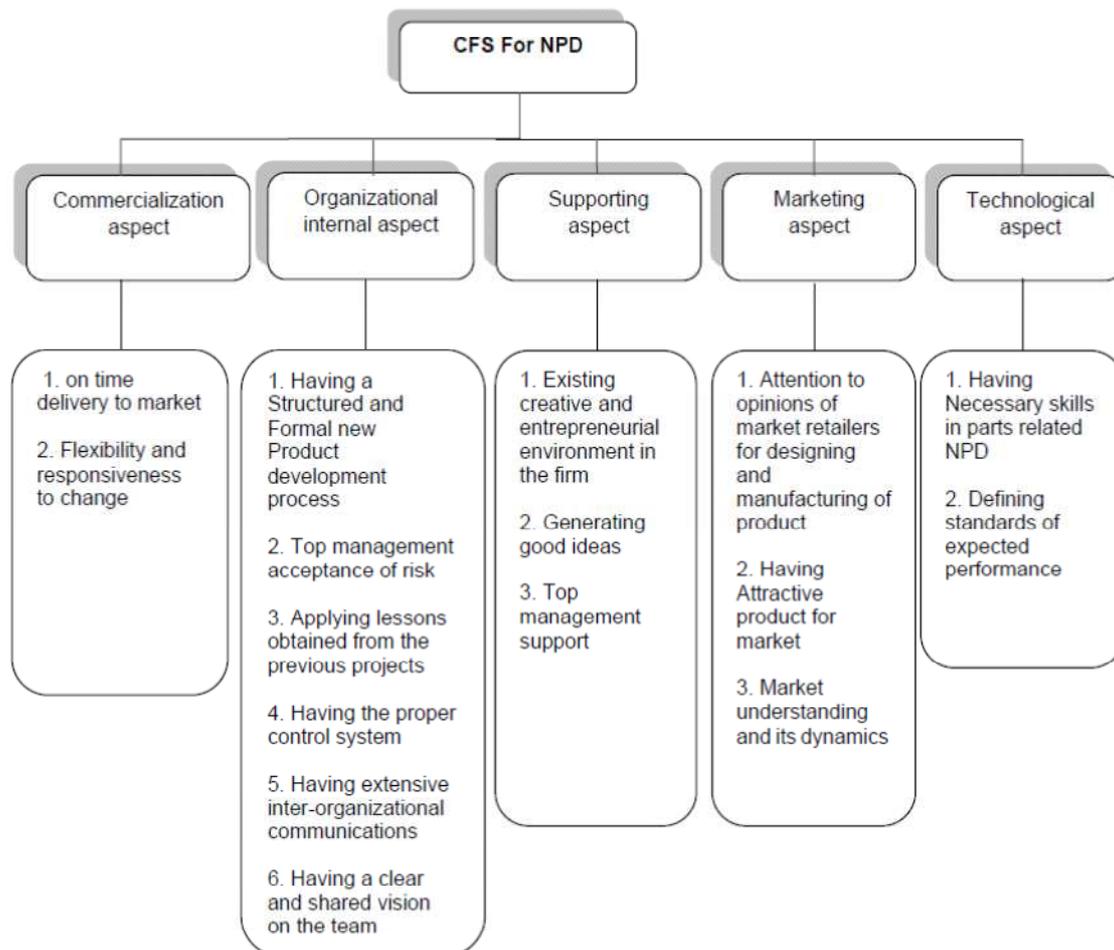
D) COMMERCIALIZATION DIMENSION

This dimension covers 5 questions from section 4 of the questionnaire (questions 5, 6, 10, 15, 20).

Because questions 5, 10 and 20 were non-significant, they were removed from this collection and factor analysis was done for other questions. Also with respect to the obtained KMO value (0.58, that is less than 0.6), it can be said that factor analysis is not appropriate for this set of variables (questions 6 and 15), and we consider these 2 questions within one dimension.

You can see dimensions and questions related to this section in figure 1.

FIG 1: TREE DIAGRAM OF QUINTUPLE EFFECTIVE DIMENSIONS, AND COMPONENTS RELATED TO EACH ASPECT



**GAP ANALYSIS**

At this stage, gap analysis is used to answer our research's hypothesis. Method of Gap analysis will be comparing the current situation (perceptual) and the ideal situation (prospective). Our research statistical hypothesis is as follow:

In connection to the CSFs of NPD there is a significant gap between expectations and perceptions of managers of small-medium enterprises (SMEs) of food and beverage industries of Iran. (There is no difference between mean of the current situation and mean of the ideal situation).

Responding to this statistical hypothesis, and examining data being normal, we did Kolmogorov - Smirnov test (K-S Test) (Table 12). Table 11's results show that data have %95 confidence level and normal distribution. (Because significant value (0.326) is larger than 0.05).

**TABLE 12: STUDYING OF BEING NORMAL**

Normal Parameters	Mean	3.4700
	Std. Deviation	0.82320
OST Extreme Differences	Absolute	0.135
	Positive	0.105
	Negative	-.135
Kolmogorov-Smirnov Z		0.951
Asymp. Sig. (2-tailed)		0.326

With respect to the data being normal, Paired Samples Parametric test were used for calculating statistic and critical values (Table12). The table's results show that our research's hypothesis is meaningful with %95 of confidence level, and there is difference between the mean of current situation and the mean of ideal situation. (There is a significant gap between expectations and perceptions in connection with the CSFs of NPD).

**TABLE 13: RESULTS OF PAIRED SAMPLES PARAMETRIC TEST**

Paired Differences	Mean	-.46000	
	Std. Deviation	.85619	
	Std. Error Mean	.12108	
	95% Confidence Interval of the Difference	Lower	-.70333
Upper		-.21667	
t		-3.799	
df		49	
Sig. (2-tailed)		.000	

**DISCUSSION AND MANAGERIAL IMPLICATION**

Searching about CSFs of NPD in SMEs, we proposed three main objectives and suggested two research questions and a hypothesis. With respect to the first research question, which is related to CSFs for new product development, results tell us that among 29 identified critical success factors for NPD by previous researchers (Table 3), 16 factors are significant (Table 8) and 13 factors are not significant. So we deleted the insignificant factors and used other 16 factors in order to answer the second research question.

For the second question, at first, we used research of Mu, Peng and Tan (2007) as the base, and then, by using methods of statistic, the analysis was done. Results showed that there were five effective aspects that help new product development process in SMEs of selected food and beverage industries of Iran, to be successful; Technological, marketing, organizational internal, supporting, and commercialization aspects.

With respect to the research hypothesis, results showed that there was a gap between the ideal situation and current situation (Table 12) so, we used scatter diagram (figure 2) to identify problematic factors (we used Excel software to draw this plot).

Vertical axis of figure 2 representing CFSS for product development in current situation and horizontal axis represents CFSS for product development in the ideal situation. figure 2 includes these 4 districts:

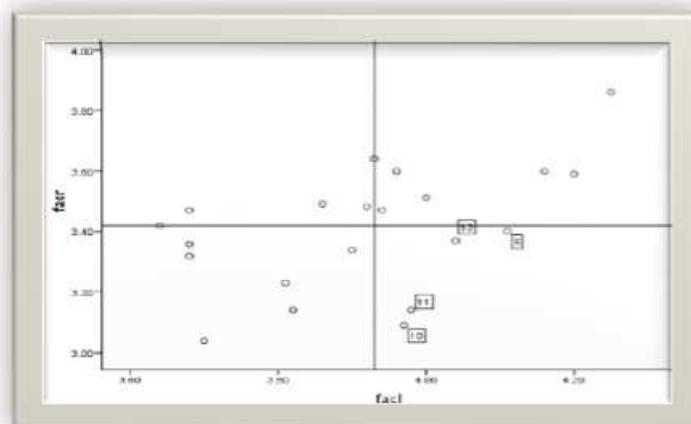
- A) Bottom of the left side which is the area of stabilized equilibrium;
- B) Top right side which is the area of growth equilibrium;
- C) Top left side which is the critical area;
- D) And bottom of the right side which is the problematic area.

Analysis of this diagram confirmed that components 6, 13, 11 and 10 of CFSS for new product development have problematic status. Namely, these components have high expectation status and low perceptual status (current situation). These components include:

- A) Introducing timely products to appropriate target market;
- B) Understanding market and its dynamics;
- C) Introducing differentiated products;
- D) Integrating marketing, research, and development (R&D) activities;

Therefore, we focused only on the problematic factors and provided solutions for using these factors.

**FIG 2: SCATTER PLOT OF CFSS FOR NPD.**



Considering the problematic factors discussed, solutions and suggestions for using these factors by managers, are as follows:

- 1) In order to use the factor of introducing timely products to appropriate target market in SMEs, sales and marketing units should have a constant connection with wholesalers, customers, distribution channels, and other market participants, in order to find a good time for launching the products to the market.
- 2) In order to use the factor of introducing differentiated products and understanding the market and its dynamics in SMEs, organizations should search all competitors' products, and opportunities of the market. Relying on the strength points of competitors' products, the organizations should receive feedback from customers and use self capabilities, and product's design, manufacture, and launch.
- 3) In order to use the factor of integration of marketing and R&D activities in SMEs, it should be done as follow:
  - A) Creating a suitable database from customers' feedbacks (even collect ideas that seem not to be applicable in present), and share it in all levels of organization for generating ideas.
  - B) Creating periodic meetings for these two units for interaction and exchanging opinions.

### LIMITATION AND FUTURE RESEARCHES

With attention to this fact that industries being searched had low to moderate technology, results cannot be generalize to high tech industries.(because of the different structure and condition of this industry).

In order to confirm content validity and modification of research questionnaire, we used the views of some scholars with assumption of their being familiar to the issue of NPDP, which can make potential errors in the research.

In this study, SMEs were identified from other companies with respect to the number of employees. Although using this method is common in most studies, there may be some other preponderant indicators for making distinction between these companies, including a financial turnover, productions' value, sales and etc.

We also proposed two suggestions in this section:

This research is typically a quantitative research. While the tendency towards qualitative researches in the field of management is growing, it is recommended to use qualitative perspective for future researches in order to make them deeper. Also using related strategies such as case study and action research is suggested.

With respect to be important subject of clusters, that's better a study have done in them and its results is compared with this paper.

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**COMPARATIVE STUDY AND NUMERICAL MODELING OF A CUPOLA FURNACE WITH HOT WIND**

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**ABSTRACT**

The cupola furnace is a vertical furnace used in iron and steel industry for the fusion of ferrous metals in order to obtain liquid cast iron, from a prototype set up by the Higher Teacher training school of Technical Teaching, (cupola furnace with hot wind), in this study, we evaluated the parameters characteristic of the system in order to determine the melting point of the cupola furnace. The made proposals related to:

- 1- Determination of the convection coefficient by the exchange of temperature in the cupola furnace (simulation with software MATLAB) and the proposal for some technological modifications.
- 2- the choice of a refractory material: the materials proposed presents a strong thermal inertia and locally has the advantage of being available.
- 3- The process of fusion: it is about the injection of oxygen and carbon on the level of the conduits during combustion; one thus improves heat exchange in the cupola furnace and one decreases the quantity of fuel used; much more the cast iron obtained is of better quality.

This furnace also presents an environmental stake because it can be average of valorization of the local biomass; the study is completed on the use potential of certain local fuels in the place of metallurgical coke. (fossil fuel is very pollutant) in this cupola furnace.

**KEYWORDS**

Cupola furnace with hot wind, cupola furnace with cold wind, blast furnace, thermal convection coefficient, mass fuel.

**INTRODUCTION**

The keen cast iron demand throughout the world involved a significant increase in its production during ten last years [1]. This increase in the production led all the foundries to become competitive.

World competition thus became such as the current foundries cannot be more allowed to be unaware of technologies conceived to reduce the costs, to improve quality, to increase flexibility and to respect the environment;

It is in this order of idea that it was to propose to us to make a critical and comparative study aiming to the improvement of the performances of the cupola furnace with cold wind carried out at the Higher Teacher training school of Technical Teaching. We thus carried out a critical study of the existing model and to present a series of recommendations aiming to:

- To increase the quality of the process of fusion,
- To increase the capacity of the cupola furnace,
- To reduce consumption of fuel, and fuel gases;

After we suggested techniques allowing to lower the volume of the gas emissions and to make energy saving; the work concerned three parts primarily:

Firstly the presentation of the existing model, in second position we made a critical study of this model compared to the existing model in the literature, thereafter we propose a model based on the principle with hot wind

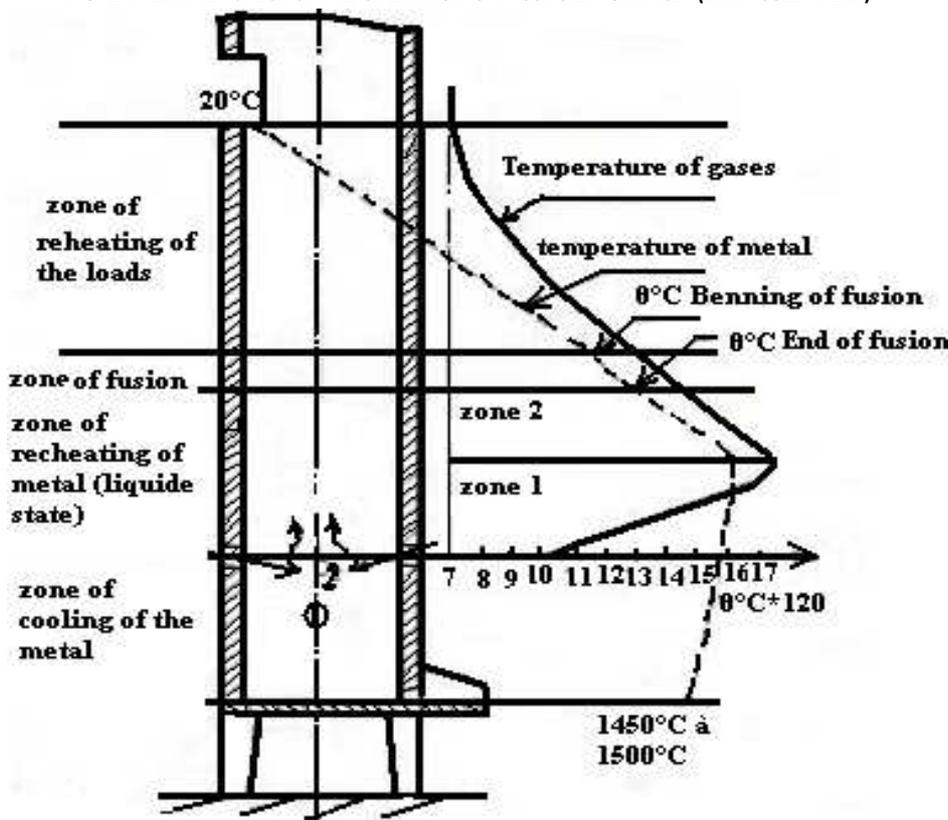
**PRESENTATION OF THE EXISTING MODEL (MODEL WITH COLD WIND)**

It shows the following characteristics:

- The Weight of the loads is axial;
- it is equipped with a mechanical variable speed transmission giving the aptitude to select the flows while varying the number of revolutions of the ventilator;
- the shape of its tank is truncated;
- collecting of the fume has is done laterally under the loud-voiced person;
- de-dusting partial of the fume is done by passage of the latter inside two boxes of de-dusting, before going to the chimney.
- time production:  $P = 153,6 \text{ kg/h}$  is  $0.1536\text{t/h}$
- volume of pre-heating:  $V = 38.25\text{L}$  is  $38.25 \times 10^{-3} \text{ m}^3$
- index of capacity of pre-heating:  $\text{ICP} = 0.25 \text{ m}^3 / \text{T}$
- Maximum duration of operation (daily): 3 hours
- Flow of wind: of  $130 \text{ m}^3 / \text{H}$  to  $190 \text{ m}^3 / \text{H}$

Pressure of wind at the exit of the conduits: from 5000 Pa with 6800 Pa

FIG. 1: THERMAL ASPECT OF THE OPERATION OF A CUPOLA FURNACE (WITH COLD WIND)



II<sub>1</sub> Determination of the Parameters of Operation.

a) Requirement out of fuel

Once the designed cupola furnace, it A was necessary to determine the parameters of operation which are as follows:

TABLE 1: MASS OF FUEL TO CHARGE COMPARED TO THE PERCENTAGE OUT OF CARBON

Fuel	Mass ( kg )	% of carbon
Coke	17,97	85
Coal of azobé	18,78	74
Nut of cabbage tree	27,90	51

TABLE 2: MASS OF FUEL TO CHARGE COMPARED TO THE NCV

Fuel	Mass ( kg )	PCI (kcal/kg)
Coke	17,97	7200
Coal of azobe	18,78	7000
Nut of cabbage tree	27,90	4700

b) Coefficient of convection

The first stage of this work consisted in determining the convection coefficient of gas in the cupola furnace; In the experimental model of the ENSET, one supposes that the convection coefficient had two constant values:

$h_1$  constant of the level of the conduits to the  $h_1=0,005$  straw mattress

$h_2$  constant of the down on the level of loading (blast furnace).  $h_2=0,345$

Using a program written in MATLAB; one could determine a polynomial of interpolation which gives the value of  $h$  according to the height of the furnace.

For that it was enough to know the value of the convection coefficient into different points of the cupola furnace.

Z	0	40	50	60	70	80	90	100	110	120	130
h	0.005	0.005	0.345	0.285	0.345	0.285	0.345	0.285	0.345	0.285	0.345

The execution of the program gives us the following equation:

II<sub>2</sub> Equation of the convection coefficient according to the height of the cupola furnace.

The polynomial obtained is:

Pour  $0 < z < 40\text{cm}$   $h=0.005$

Pour  $40 < z < 140\text{cm}$   $h= 0.0017z + 0.1292$

Z being the height of the cupola furnace

One obtains the values of  $h$  following:

$h = 0.005, 0.005, 0.1292, 0.1979, 0.2150, 0.2322, 0.2494, 0.2665, 0.2837, 0.3009, 0.3180, 0.3352, 0.3524, 0.3695.$

Once the polynomial obtained the convection coefficient is traced in the following figure:

FIG. 2: CONVECTION COEFFICIENT ACCORDING TO THE HEIGHT

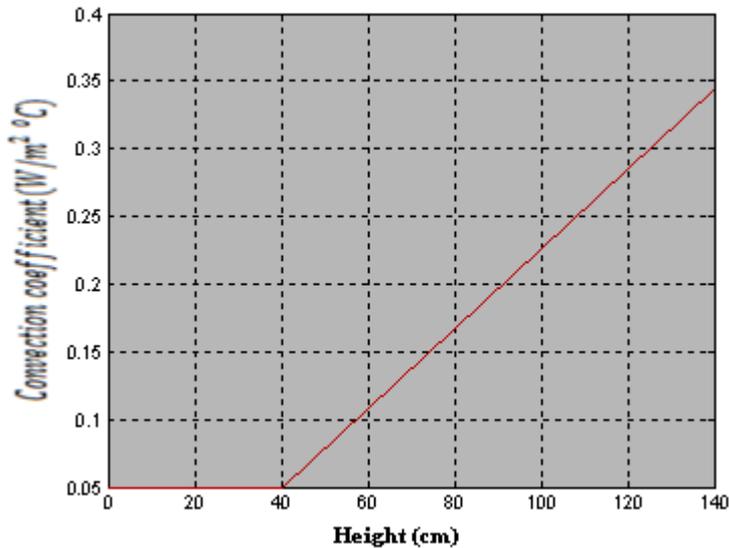
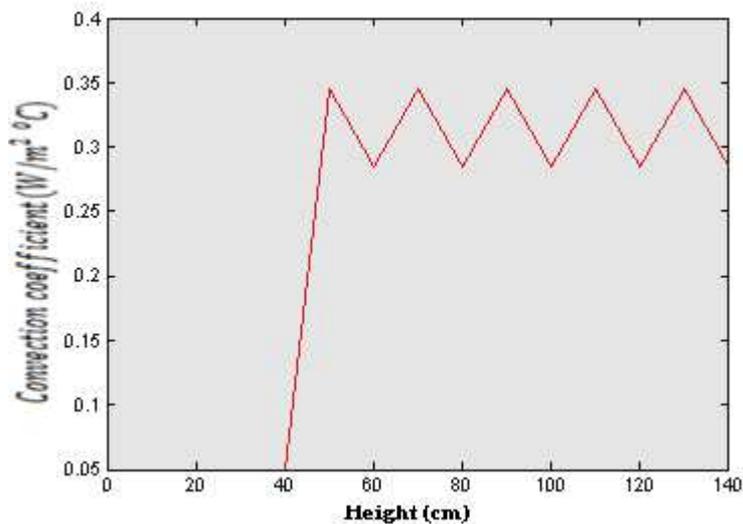


FIG. 3: CONVECTION COEFFICIENT IMPROVED ACCORDING TO THE HEIGHT



III PRESENTATION OF THE NEW MODEL (model with hot wind)

a) Assumptions

To model the operation of the furnace, we limit ourselves to the three last zones; i.e. center of the conduits up to the level of loading.

The study of the evolution of temperature in these three zones following assumptions:

- the temperature is supposed to be homogeneous in the radial direction ;
- the hot gases assemble center of the conduits up to the level of loading at constant speed  $V_g$ ;
- the speed of descent of the load  $V^m$  of the level of loading until the center of the conduits is constant;
- although the sizes  $\lambda, \rho, C^p$  are functions of the temperature, they are considered here constant;
- the solid load consists of only one type of material;
- the thermal losses through the walls of the furnace are neglected;
- the furnace is supposed to be cylindrical, of constant section;

The purpose of this first approach is to give us an idea of about size of a certain number of parameters.

b) Modelling

After materialization of the system, we obtained the heat balance concerning the matter of the cupola furnace below:

$$\lambda_m \left[ \left( \frac{\partial \theta}{\partial z} \right)_z - \left( \frac{\partial \theta}{\partial z} \right)_{z+\Delta z} \right] S^* + h(T - \theta)S - V_m \rho_m C_{pm} S^* [\theta(z) - \theta(z + \Delta z)] = \lambda_m C_m C_{pm} \frac{\partial \theta}{\partial t} S^* \Delta z \quad (1)$$

By supposing that we are in steady operation,

$$\text{Then, } \rho_G C_{pG} \frac{\partial T}{\partial t} S \Delta z = 0 \quad \text{and} \quad \rho_m C_{pm} \frac{\partial \theta}{\partial t} S^* \Delta z = 0$$

And the preceding system becomes:

$$\lambda_G \left[ \left( \frac{\partial T}{\partial z} \right)_z - \left( \frac{\partial T}{\partial z} \right)_{z+\Delta z} \right] S - h(T - \theta)S + V_G \rho_G C_{pG} S [T(z) - T(z + \Delta z)] = 0 \quad (2)$$

$$\lambda_m \left[ \left( \frac{\partial \theta}{\partial z} \right)_z - \left( \frac{\partial \theta}{\partial z} \right)_{z+\Delta z} \right] S^* - h(T - \theta)S^* + V_m \rho_m C_{pm} S [\theta(z) - \theta(z + \Delta z)] = 0 \quad (3)$$

In order to improve quality of the cast iron produced by the furnace, it is necessary to find  $T=T(z)$  and  $\theta = \theta(z)$ ; but these two functions depend of the rate of D-carburetion in produced metal. To solve the system, we proceed as follows:

We suppose known the gas-matter exchanges  $h(T-\theta)S$  according to the height; i.e. in each step  $\Delta z$ , nose of the conduits to the loud-voiced person ; We choose one of the equations (3) and let us discretized it; by using the method the finite differences [2], [3] Thus, let us discretized the equation, one can write:

$$\lambda^m \left( \frac{S^*}{\Delta z} \right) [(\theta^k - \theta^{k-1}) - (\theta^{k+1} - \theta^k)] + h(T^k - \theta^k)S$$

Or  $S^* = (1 - \epsilon)S^{tot}$  et  $S = \sigma \Delta z S^{tot}$  ;

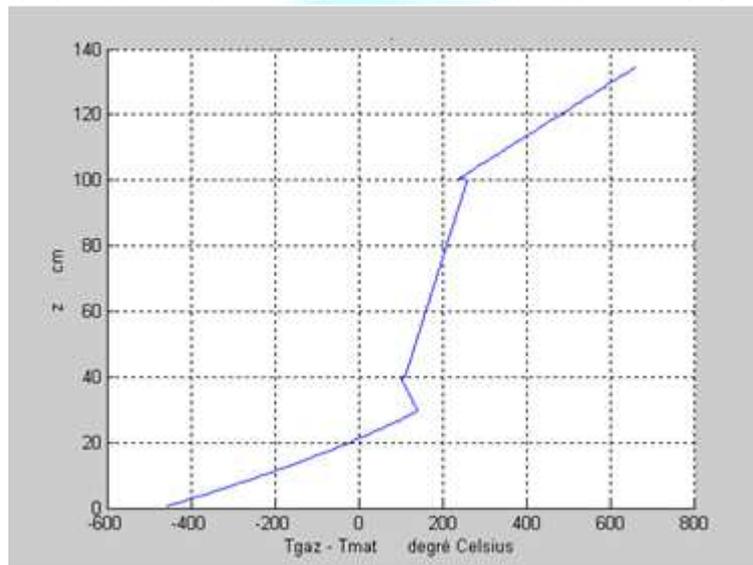
The equation becomes;

$$\lambda^m \left( (1 - \epsilon) \frac{S^{tot}}{\Delta z} \right) [(\theta^k - \theta^{k-1}) - (\theta^{k+1} - \theta^k)] + h(T^k - \theta^k)\sigma \Delta z S^{tot} - V_m \rho_m C_{pm} (1 - \epsilon) S^{tot} [\theta_{k-1} - \theta_k] = 0$$

$$\text{Soit : } \lambda^m \left( \frac{(1-\epsilon)}{\Delta z} \right) (-\theta^{k-1} + 2\theta^k - \theta^{k+1}) + h\sigma \Delta z (T^k - \theta^k) - V_m \rho_m C_{pm} (1 - \epsilon) [\theta_{k-1} - \theta_k] = 0 \quad (4)$$

- The equation being discretized, we write a law of variation of  $T^k - \theta^k$  according to  $k$ ; for that we impose an operation of the furnace similar to that presented in [4] where a in experiments checked law of variation of  $T^k - \theta^k$  is given.

FIG 4: EVOLUTION OF THE DIFFERENCE IN TEMPERATURE BETWEEN GAS AND MATERIAL FOLLOWING THE HEIGHT



It any more but does not remain us to determine certain sizes speakers in the constants A, B<sup>k</sup> and C; equation (5) of these values are given by the originator of the furnace are consigned in the following table 5.

TABLE 5: SOME SIZES DEPENDENT FOR THE USE OF THE TYPES OF FUELS

Fuel	Specific surface of exchange (σ)	Speed of descent loads (Vm)	Index of the vacuum (ε)	Height of Straw mattress HP
Coke	72 m <sup>2</sup> /m <sup>3</sup>	0,000285m/s	0,56	40 cm
Coal of azobé	68 m <sup>2</sup> /m <sup>3</sup>	0,000975m/s	0,50	47 cm
Nut of cabbage tree	54 m <sup>2</sup> /m <sup>3</sup>	0,000715 m/s	0,44	58 cm

**PROGRAM RESOLUTION**

Having thus the values of the various constants, the equation that is:

$$A(-\theta^{k-1} + 2\theta^k - \theta^{k+1}) + B^k f^k - C(\theta^{k-1} - \theta^k) = 0 \quad (5)$$

$$-A\theta^{k-1} + 2A\theta^k - A\theta^{k+1} + B^k f^k - C\theta^{k-1} + C\theta^k = 0$$

$$\text{Soit: } (A + C)\theta^{k-1} - (2A + C)\theta^k + A\theta^{k+1} = B^k f^k \quad (6)$$

It is a matrix system with K going of 2 up to 68. The boundary conditions are:

$\theta^{68} = 25$  °C inlet temperature of the loads and

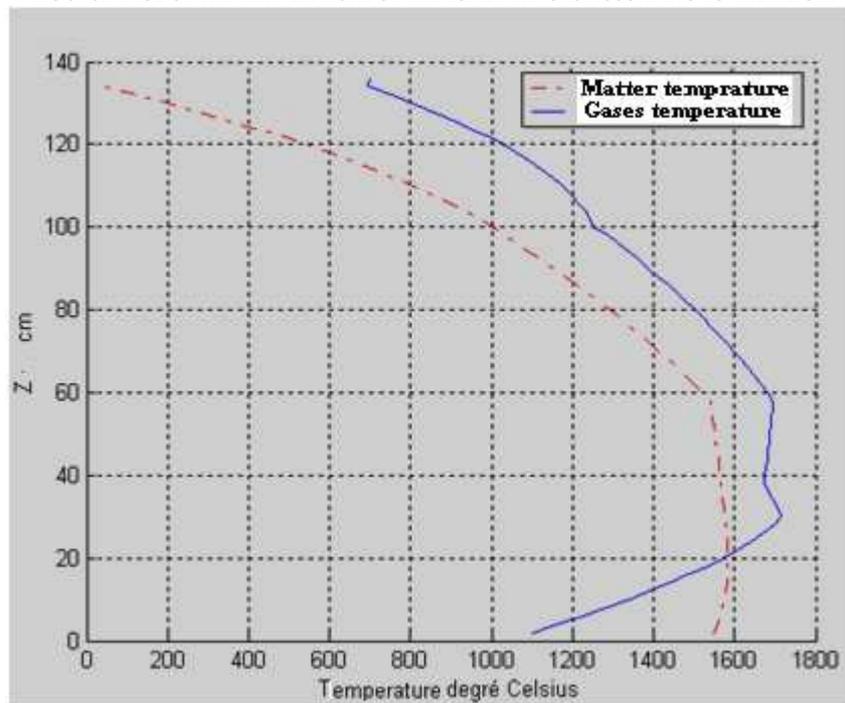
$\theta^1 = 1550$ °C temperature of the matter at the level of the conduits

- Inlet temperatures of gases T° entry =450°C

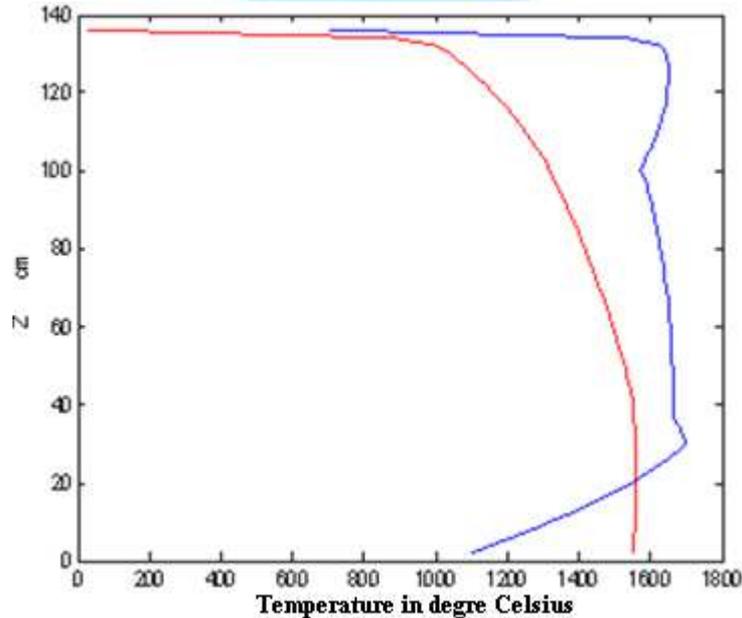
- Temperature of exit of the gases T° left =750°C

The curves obtained after simulation are:

FIG 5: CHANGE OF THE TEMPERATURE OF THE LOAD AND GAS ACCORDING TO THE HEIGHT



a): Temperature of entree of gases:  $t=25^{\circ}\text{C}$  ( cupola furnace with cold wind)



b): Temperature of entree of gases:  $t=450^{\circ}\text{C}$  (cupola furnace with hot wind)

**INTERPRETATION OF THE RESULTS**

The curve presents two zones:

- 1- A zone of pre-heating during which the temperature increases very quickly
- 2- A zone of fusion which occurs almost at constant temperature (1600°C)

In addition the temperature of end of fusion increases; it passes from 1450 °C (cupola furnace with cold wind) with approximately 1600°C.

These results show that the heat brought by hot gases was used to preheat the metal loads from where fast increase in the temperature of the loads in the first zone;

More heat brought is significant plus fusion is faster; this decreases not only the time of fusion but also the requirements out of fuel as well as the height for straw mattress;

On the other hand in a cupola furnace with cold wind fusion is progressive and slow; from where a significant contribution out of fuel and heat.

The increase in the temperature at the entry of the conduits is used for pre-heating of the metal load and decreases the time of fusion; it also makes it possible to obtain a cast iron at the end of the fusion with a higher temperature; this can support the addition of the alloy elements such silicon and others; energy saving thus is carried out because part of the heat rejected into nature (case of a cupola furnace with cold wind) is thus recovered (cupola furnace with hot wind). Therefore the cupola furnace with hot wind is more economic energizing.

**GENERAL CONCLUSION**

The work which was entrusted to us was a critical and comparative study cupola furnace with cold wind ,With the sight of the technological developments sudden by the cupola furnace these last decades we proposed certain improvements entitled to succeed to make significant energy saving and especially to improve the output of the experimental cupola furnace;

It acts in particular:

- Passage of the cupola furnace with cold wind with a cupola furnace with hot wind; this technology makes it possible to accelerate fusion and especially to standardize the temperature in the heart of mixture
  - The installation of a recuperate of energy at the exit of the blast furnace; this installation makes it possible to make significant energy saving.
  - The injection of oxygen and the carbon during the combustion drives thus to the reduction of the quantity of the fuel used and the gotten melting is good quality
  - This cupola furnace also presents an environmental stake because it can be a means of cleansing our environment by the recovery of scrap and waste;
- However several modifications can still be made with an aim of improving its output after that a modeling and a simulation of the operation of this cupola furnace is necessary when oxygen is added and of carbon.
- Our study does not have the claim to be completed but the implementation of these proposals can lead to prototype economy energy and especially reducing the pollutant emissions in the atmosphere.

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## AN ANALYSIS ON THE IMPACT OF QUALITY SERVICE PROVISION ON CUSTOMERS' SATISFACTION IN MICRO- FINANCE INSTITUTIONS IN RWANDA FROM THE CUSTOMER'S PERSPECTIVE - USING THE SERVQUAL MODEL

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### ABSTRACT

*Service quality is a concept that has aroused considerable interest and debate in the research literature because of the difficulties in both defining and measuring it with no overall consensus emerging on either. Customer satisfaction and service quality are often treated together as functions of customer's perceptions and expectations and research has shown that high service quality contributes significantly to profitability. Service quality is required to be the first measure in order to improve the quality of service in an organization. The aim of this study was to find the underpinning variables of quality service that contribute to customer satisfaction in the micro-finance institutions in Rwanda from the customers' perspective. The measurements used were based on the widely accepted SERVQUAL model which is the most common method for measuring service quality. Descriptive and co relational statistical analysis was used to evaluate the impact of service quality and its effect on customer satisfaction among the customers in the microfinance institutions in Rwanda. Data was collected through a self-constructed and statistically validated questionnaire, thus five commercial banks were used for the research. A sample size of 250 customers were used for the study. Convenience sampling technique was used to administer the questionnaires to the respondents. A total of 353 customers were approached to fill the questionnaires, out of which 250 were willing to give usable data for statistical analysis. The results of the study indicated that all of the service quality factors and all the customer satisfaction factors were important. The statistical results indicate that there was a significant relationship between quality service provision and customers satisfaction.*

### KEYWORDS

Expected service quality, perceived service quality, Service gap, SERVQUAL.

### INTRODUCTION

 Service quality is a concept that has aroused considerable interest and debate in the research literature because of the difficulties in both defining it and measuring it with no overall consensus emerging on either. Microfinance institutions are consequently put into a lot of pressure due to the immense increase in global competition. Various strategies are formulated to retain the customer and the key of it, is to increase the level of the quality of service provided (Mani, Kumar, & Prabhakaran, 2010). Research has shown that high quality service contribute significantly to profitability. Quality service is about ensuring customers, both internal and external, get what they want. Customer satisfaction is the feeling or attitude of a customer towards a product or service after it has been used. Satisfaction and quality of service are often treated together as functions of customer's perceptions and expectations. Customer satisfaction is determined by defining customer perceptions of quality, expectations, and preferences.

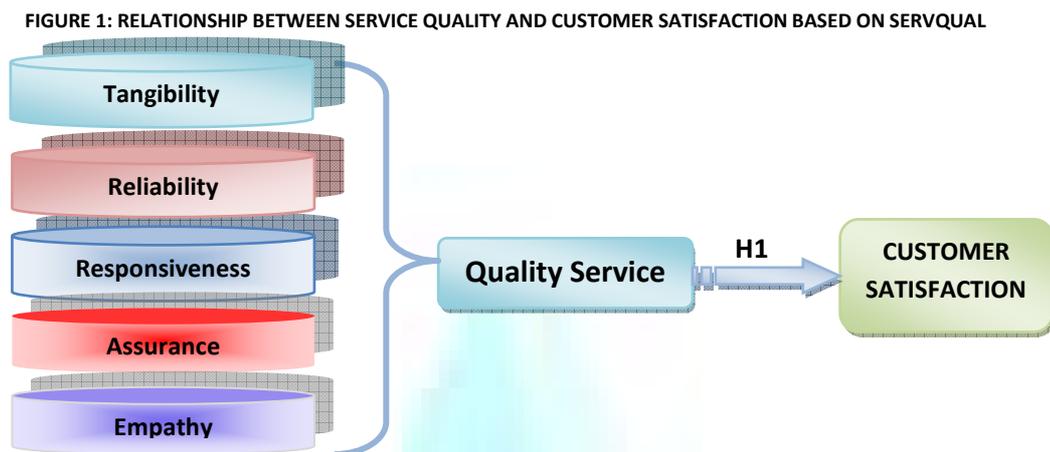
Prabhakaran, (2003) indicates that the customer is the king. Aggesti and Franklin, (2009), similarly indicate that the customer is an input resource for many service operations and thus not only do we need to know how to manage customers but also we need to understand what they expect from the operation. Most importantly, they are, in most cases the final judges as to how well the quality of the service matches up requirements and, by their continued support, determine its long- term success. This should be more than sufficient motivation for operations managers to ensure that there is a match between expectations and service delivery in order to satisfy or even delight customers.

According to Prabhakaran (2003), high customer satisfaction is important in maintaining a loyal customer base. To link the quality of service, customer satisfaction and customer loyalty is important. Bowen and Chen, (2001) state that quality service is considered to be the main determinant of customers' satisfaction in both manufacturing and quality of service provision. Those firms expecting to create and sustain advantages over competitors should be seeking to deliver a superior quality service. In other words those firms must be paying to and invest considerable amount on programs that help to increase the quality of service just in case they want to survive with their customers ( Sattari et al. 2010). Robert and David, Kurtz and Louis, (2006) define customer satisfaction as the result of customers' assessment of a service based on a comparison of their perceptions of the quality of service delivery with their expectations. If customers' perception of the service, the experience and outcomes match with their expectations, then they ultimately should be satisfied. If their perceptions of the service exceed their expectations, then they will be more than satisfied, even delighted. If, their perceptions of the service do not meet their expectations, then they may end up being dissatisfied, or even disgusted.

According to Kotler and Armstrong, (2008) satisfied customers buy again and tell others about their good experiences. Dissatisfied customers often switch to competitors and disparege the product to others, (Feurst 1999).

In the past decade, the financial institutions industry have undergone major drastic changes, which have resulted in creating market environment characterized with intense competition among the key players in the banking industry. The Government of Rwanda in its policy to attain vision 2020 target, it has moved to privatize and register a number of microfinance institutions, this has further aggravated the competition and complexity of operations among the key players in the industry. The institutions strive to survive by having a competitive advantage and providing quality services to the customers, which ultimately translate to their profitability and survival.. The main aim of this research is to assemble the underpinning elements of quality service delivery that ultimately influence customer satisfaction in the microfinance institutions in Rwanda.

The paper starts with the concept of service quality, customer satisfaction while focusing mostly on SERVQUAL approach, which is the most common method for measuring service quality. The purpose of the research is to find the most important service quality dimensions that affect customer satisfaction in the micro-finance institutions in Rwanda from the customers' perspective. The study employed the following conceptual model as illustrated in Figure 1.



### THEORETICAL AND RELATED LITERATURE REVIEW

There has been numerous research on exploring consumers cognitive and affective responses to the perception of service attributes by providing what consumers need in an effective and efficient manner. Consumer satisfaction (Churchill & Surprenant, 1982; Oliver, 1997) and perceived quality of service (Parasuraman et al, 1985, 1988; Rust & Oliver, 1994; Zeithaml et al, 1996) have been considered the primary intervening constructs in the area of service marketing because ultimately they lead to the development of consumer loyalty or re-patronization of a product or service (Mani, Kumar, & Prabhakaran, 2010). Much of the initial work in developing a model to define and assess the quality of service, was conducted by Parasuraman, Zeithaml, and Berry (1985) (referred to as PZB). According to Zeithaml, Parasuraman, and Berry, (1985) the measurement of service quality should be done with the purpose to identify the gaps between expectations and perceptions or the shortfalls in customers' perceptions of services' performance. In this respect they developed the SERVQUAL model, an approach that supposes the measurement of expectations and perceptions on five dimensions as follows: Assurance, Empathy, Reliability, Responsiveness and Tangibles. The SERVQUAL model is 'probably the best-known, universal scale designed to measure the perceived service quality' (Saxena, 2006). The model highlights the following five service quality gaps:

1. Gap1: Consumer expectations \_management perceptions of consumer expectations.
2. Gap 2: Management perceptions of consumer expectations \_ service quality specifications actually set.
3. Gap 3: Service quality specifications \_ actual service delivery.
4. Gap 4: Actual service delivery \_ external communications about service.
5. Gap 5: The final gap is the result of the four other gaps. (J. Cox and B.G. Dale, 2001)

The customer gap is the difference between customer expectations and perceptions. Customer expectations are standards of service that the customer has prior to the service situation and perceptions are assessments of the actual service experienced in the service situation.

Gap 1: "Not knowing what customers expect". This means there is a gap between the customer expectations and how the company understands those expectations. This gap results from lack of understanding the customers' needs and wants. If the company does not conduct customer satisfaction surveys or otherwise ask the customers of their wants and needs, it is likely that the company will experience this gap. Lack of communication between managers and customers is another cause for this gap. Managers need to ask questions about customer expectations. (Zeithaml et al. 2006)

Gap2: "Not having the right service quality designs and standards". Another requirement, in addition to understanding customer's needs and wants correctly, is that of having service designs and performance standards that reflect the existing customer expectations that are understood and enforced properly. Provider gap 2 is a result of the company having service designs that do not produce what the customers want. In addition to poor service design, the absence of customer-driven standards causes this gap. Thirdly, inappropriate physical evidence and services cape creates provider gap 2. Physical evidence refers to the physical tools that the service is provided with, such as business cards and other equipment. (Zeithaml et al. 2006)

Gap 3: "Not delivering to service designs and standards". After having designed and implemented the right service quality designs and standards; systems, processes and people are needed to ensure that the service delivered matches or exceeds the set standards. Provider gap 3 is inconsistency between development of customer-driven service standards and actual service performance of the company employees. Suitable resources and proper enforcement of the service standards need to be in place so that the service standard is delivered and the customer receives quality service. Poorly trained or poorly motivated workers can cause this gap to appear within the organization. Management needs to ensure that employees have the skills and the proper tools to perform their jobs. Employees need to know what the management expects of them. Ineffective recruiting, role ambiguity or conflict, poor appraisals and compensation, lack of empowerment and team work are reasons behind gap 3. (Zeithaml et al. 2006, )

Gap4: "Not matching performance to promises". Provider gap 4 is the difference between service delivery and service provider's the external communication; hence it is a communication gap. If a company makes promises through advertising and other means of communication, the customer expectations may grow and standard of quality expected to be provided by the company becomes higher in their eyes. In case the customer expectations are raised, it also affects the customer gap which is based on the customer expectations. When reality does not add up to the promised level, the customers perceive low service quality. Companies need to create realistic customer expectations through honest and accurate communication about what they can and will provide. (Zeithaml et al. 2006)

Kotler and Armstrong, (2008) noted that discrepancies existed between the firm's and the customer's perceptions of the service quality delivered. In investigating these discrepancies, PZB (1985) assert that service quality can be assessed by measuring the discrepancies or "gaps" between what the customer expects and what the consumer perceives he receives. In conceptualizing the basic service quality model PZB (1985) identified ten key determinants of service quality as perceived by the company and: the consumer reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding/knowing the customer and tangibility. They noted that discrepancies existed between the firm's and the customer's perceptions of the service quality delivered. In investigating these discrepancies, PZB (1985) assert that service quality can be assessed by measuring the discrepancies or "gaps" between what the customer expects and what the consumer perceives he receives.

Based on their review of the literature, PZB (1985) developed the SERVQUAL scale. The scale was designed to uncover broad areas of good or bad service quality and can be used to show service quality trends over time, especially when used with other service quality techniques. The SERVQUAL scale is based on a difference score between customer expectations of service and their perceptions after receiving the service. Initially PZB (1985) focused on the ten determinants of service quality. However, after two stages of scale purification, they reduced the ten determinants to five dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy (PZB 1988).

Service quality is undoubtedly an important input for customer satisfaction which in turn influences customers' behavior in terms of loyalty (it is expressed in customers' repurchase intentions, positive word of mouth or an increase in the number of performed banking operations), and thus enhance a bank's image and performance. Kotler and Armstrong (2009), define quality as the overall experience which a customer perceives through the interaction with the product and services; Evans (2005) defined quality as the totality of features and characteristics of a product or service that bears on its ability to satisfy given needs. The view of quality as the satisfaction of customer needs is often called fitness for use. Evans (2005) has captured the definition of quality as taken as a whole judgment. Service quality has been described as a form of attitude, related but not equivalent to satisfaction that results from the comparison of expectations with performance (Solomon, Marshall & Stuart, 2009).

Quality had a long term impact on the satisfaction of customers (Omachanu *et al.* 2008). Atalik and Arslan (2009) found that creating value and offering quality of service offered to customer creates loyal customers. Service quality is the result of the comparison that customers make between their expectations about a service and their perception of the way the service has been performed (Kotler & Keller, 2009). If the expectation is greater than the service performance, perceived quality is less than satisfactory and hence, customer dissatisfaction occurs. If perceived performance is equal or greater than expectations, the customer is satisfied (Michael, Greg and Elnora, 2009). Customer expectation means uncontrollable factors including past experience, personal needs, word of mouth, and external communication about service (Kotler & Armstrong, 2009). Service is defined as an act of performance that one party can offer to another, that is essentially intangible and does not result in the ownership of anything (Kotler & Keller, 2009).

Kotler and Keller, (2006), indicate that reliability is the ability to perform the promised service dependably and accurately. Foster, (2010) further indicates that reliability is the company's ability to perform the service dependably, accurately, and consistently keeping given promises on delivery, service provision, problem resolution and pricing. Keeping promises about service outcomes and core service attributes is the most significant factor in the eyes of the customers. Reliability is performing the service right the first time, as promised (Zeithaml *et al.* 2006). Kotler and Keller (2006), Foster, (2010) approve that reliable Service Quality dimension refers to how the company is performing and completing their promised service, quality and accuracy within the given set requirements between the company and the customer.

Bowersox and Cooper, (2008), evaluate responsiveness as being the willingness and ability to provide prompt service. They further indicate that it's the willingness of the service provider to be helpful and prompt in providing service. Foster, (2010) analyses responsiveness as being the willingness to help customers and to provide prompt service. From the customer's view responsiveness is seen to mean how attentive the company personnel are to customer requests, questions, complaints and problems. The level of responsiveness is judged based on the time these issues are dealt with. If the customers feel they have to wait a long time, the perception of responsiveness is weakened. This dimension of service also includes flexibility and ability for customizing particular customers needs (Zeithaml *et al.* 2006).

Saxena, (2006), refers to assurance as the competence of the firm in delivering the promised service, courtesy extended to the customer, firm's credibility, and the extent to which the customer feels secure. Foster, (2010), analyses assurance to refer to the knowledge and courtesy of employees and their ability to inspire trust and confidence. Assurance dimension is seen to be important to high-risk services such as banking, medical or insurance. The employees need to have a certain level of knowledge and skill to treat customers with respect and make them feel that they can trust their business to the company (Zeithaml *et al.* 2006). Assurance refers to the knowledge and courtesy of employees and their ability to convey trust and confidence including competence, courtesy, credibility and security. (Johnston & Clark, 2008). It also refers to means through which employees instill confidence in customers, making customers feel safe in their transactions, employees who are consistently courteous, employees who have the knowledge to answer customer questions (Kotler & Keller, 2006). The assurance Service Quality Dimension refers to the company's employees skilled workers who are able to gain the trust and confidence of the customers (Foster, 2010).

According to Saxena, (2006), empathy is the degree of caring and individual attention customers receive. In other words, the customer desires caring, individualized attention (Foster, 2010). Empathy refers to the provision of care, individualized attention to customers. Providing individual and personal attention to specific customers portrays empathy and lets the customers know that their needs are understood. Companies that provide this personal service are able to have a competitive edge against other companies that do not treat the customers as individuals (Zeithaml *et al.* 2006).

Kotler and Keller, (2006), indicates that empathy involves giving customers individual and personal attention, the employees need to deal with customers in a caring fashion, having the customer's best interest at heart, and understanding the needs of their customers. The empathy Service Quality Dimension refers to how the company cares and gives individualized attention to their customers, to make the customers feeling extra valued and special. The fifth dimension is actually combining the second, third and fourth dimension to a higher level. If the customers feel they are individualized and given quality attention there will be a very big chance that they will reciprocate by returning to the company to do business, and further authoritatively promote the image of the organization (Foster, 2010).

Zeithaml *et al.* (2006) argue that tangibles refer to the appearance of physical facilities, equipment, personnel, and communication materials, which may physically represent the service quality that customers evaluate. This dimension is especially important when it comes to new customers. Tangibles might be used to enhance the company image, provide continuity and signal quality to the customers but often tangibles have to be paired with another service dimension. For example, if no attention is paid to the appearance of tangibles such as the physical facilities, the responsiveness factor will have little effect on the customer's perceptions. A company should want all their customers to get a unique positive and never forgetting first hand impression, this would make them more likely to return in the future. (Kotler & Keller, 2006)

Repeat purchases have been recognized to be the indicator of satisfied customers because unsatisfied customers switch to competitors. Henkel *et al.* (2006) found satisfied customers to have higher extent of usage and intentions to repurchase in future. The greater the level of satisfaction of customers the greater will be the repurchase chances and reduced customer whip (Iqbal *et al.* 2008).

Customer loyalty as expounded by Saxena, (2006) is when a customer over time engage one company to satisfy entirely, or a significant part, of her needs by using the company's products or services". Loyalty is an outcome of the customer's faith or confidence in the company's offer. According to Kotler and Keller (2006), customer loyalty is a deeply held commitment to re-buy or re-patronize a preferred product or service in the future despite situational influences and marketing efforts having the potential to cause switching behavior. Customer loyalty means that the customer is loyal to the company and only turns to a competitor in exceptional cases. Customer loyalty is not a permanent thing. If the customer value decreases to such a level that it becomes obvious to customers that offers from competitors are better, customers will engage in the others instead; According to Saxena (2006), customer loyalty is created only when customers perceive fairness, equity, and transparency in their relationship with the seller.

As further suggested by Saxena (2006), there are three stages in the development of customer loyalty in any organization: Customer acquisition, customer retention, and strategic customer care. In the acquisition stage the focus of the company is on transactions and product mix sold to each customer account, in the retention phase loyalty is assessed through tools like customer satisfaction surveys and development of satisfaction indices, while the strategic stage calls for integration of customer needs, aspirations and expectations in the product development, up gradation, and distribution changes (Saxena, 2006)

Customer retention which is one of the underlying factors for quality service provision is seen as an act of implementing certain strategies which allows current customers to keep using the brand and potential customers to turn into regular consumers. In order to sustain in the tough market competitions, businesses have to follow customer retention strategies right from the time they get a new customer till throughout the period the person uses the product. Customer retention is not just a matter of offering quality products, but also how the company gives proper services and creates a dependable goodwill in the market (Kotler & Keller, 2009). Customer retention strategies have assumed a great deal of significance in the modern world. Good customer retention strategies most importantly include techniques that exceed the expectations of customers, leading to utmost customer satisfaction. First of all, the seller should make it a point to provide the best customer service, be it to any type of customer. In order to generate loyalty in consumers regarding the brand, marketers and salesmen should create good personal relations with consumers.

On the other hand customer commitment is the intention of a customer to maintain a long-term relationship with a supplier. There are two types of customer commitment conceptualizations: affective and calculative or continuance commitment, as seen by Ruyter (1998). Calculative commitment is the way that the

customer is forced to remain loyal against his/her desire. In calculative commitment customers can be committed to a selling organization because they feel that ending the relationship involves an economic or social sacrifice (Fullerton, 2005). Affective commitment reflects a consumer's sense of belonging and involvement with a service provider akin to emotional bonding (Rhoades et al., 2001; Fullerton, 2003). The definition of customer commitment in the present investigation is based on its affective aspect, in view of its larger effect on loyalty compared to satisfaction (Johnson et al., 2001).

**THE STUDY**

Given the importance of the provision of quality service and its influence of the satisfaction of customers, the purpose of this study was therefore to find the underpinning elements through the variables discussed above, that contribute to the provision of quality service and how those element impact on the satisfaction of the customers. The study put in focus the following questions so as to be able to unearth and carry out a deeper investigation into the study.

1. What is the demographic profile of the respondents based on the gender, age, academic qualification and occupation?
2. What is the perception of the respondents towards the independent variables: tangibility, reliability, responsiveness, assurance and empathy as they relate to the dependent variable?
3. What is the perception of the respondents towards the dependent variables: customer turnover, customer loyalty, and customer trust and customer commitment as they relate to the independent variables?
4. Is there a significant relationship between the independent and the dependent variables?

**RESEARCH METHODOLOGY**

The theoretical architecture was bridged with methodological design towards deepening the scientific or philosophical undertone of the research. The research employed and utilized descriptive and correctional research design. The choice of these designs was informed by the ability of descriptive method to profile respondents categorically (Greener, 2008) and the correlation was to examine the relationship between variables (Wallace and Wray, 2006). Collectively, these designs formed the background upon which the statistical analysis is based. Evidence from Adams, Khan, Raeside and White (2007), Remenyi (2002 & 2005), and Pallant (2005) have demonstrated that survey-based research which required grouping is best organized and analyzed with descriptive approach. Primary data was used for the research. This was collected through a self-constructed questionnaire. The questionnaire was constructed on a likert-scale. The face, content, and construct validity (Greener, 2008) were established through experts' intervention from the field of management. The researcher employed convenience sampling method in the distribution of the research instrument to the bank customers. The research approached customers who walked into the banking hall for three consecutive days. The researcher approached 353 customers out of which 250 were willing to fill the questionnaire.

The questionnaire was divided into three parts. The first part was used to capture the demographic information of respondents: age, sex, occupation, education background, and frequency of respondents transacting with the bank. The second part gathered the respondents perception on the SERVQUAL five dimensions; tangibles, reliability, responsiveness, assurance and empathy. The third parts collected information regarding the respondent's perception on their degree of satisfaction on the quality of services provided. The respondents' participation was solicited through a consent letter and the data gathered are for academic purposes only.

**DATA ANALYSIS, INTERPRETATIONS AND DISCUSSIONS**

The profile of the respondents was analyzed through descriptive statistics as presented in Table 1.1 and it indicates that out of 250 respondents, 180 respondents representing (64.3%), were male while 70 respondents representing (25%), were female. This proportional difference only reflects the number of respondents surveyed.

**TABLE 1.1: DISTRIBUTION OF THE RESPONDENTS BY DEMOGRAPHIC FACTORS**

Demographic Variables	Categories	Frequency	Percentage
<b>Gender</b>	<b>Male</b>	<b>180</b>	<b>64.3</b>
	<b>Female</b>	<b>70</b>	<b>25.0</b>
<b>Educational Level</b>	<b>Diploma/Certificate</b>	<b>87</b>	<b>31.1</b>
	<b>Bachelors</b>	<b>156</b>	<b>55.7</b>
	<b>Masters</b>	<b>3</b>	<b>1.1</b>
	<b>PhD</b>	<b>0</b>	<b>0</b>
	<b>Others</b>	<b>2</b>	<b>7</b>
<b>Frequency of Accessing the bank</b>	<b>Daily</b>	<b>76</b>	<b>27.1</b>
	<b>Once to twice a Week</b>	<b>38</b>	<b>13.6</b>
	<b>Once in two weeks</b>	<b>34</b>	<b>12.1</b>
	<b>Once in 3 weeks</b>	<b>35</b>	<b>12.5</b>
	<b>Once a Month</b>	<b>63</b>	<b>22.5</b>

Table 1.1 further indicates that out of the 250 respondents, 87 respondents, representing (31.1%) had a certificate or Diploma, 156 respondents (55.7%) had a Bachelors Degree, 3 respondents (1.1%) with Masters Degree, PhD has 0 (0%) respondents, and 2 respondents hold other academic qualifications represented by 0.7% of the total respondents. However, four of the respondents representing 1.5% did not indicate their academic qualifications. Table 1.1 also indicates the frequency of the respondents access to the bank. Of the total 250 respondents, 76 (27.1%) access the bank on the daily basis, 38 respondents (13.6%), access the bank once to twice a week, 34 respondents (12.1%), access the bank once in two weeks, 35 respondents (12.5%), access the bank once in 3 weeks and 63 respondents (22.5%), access the bank once in a month. From the statistical results, clients that access the bank daily had the highest percentage, followed by those that access the bank once in a month, followed by those who access the bank once to twice in a week, then those that access the bank once in three weeks and finally those that access the bank once in two weeks.

From the categorization of the respondents, it becomes explicit that , educational qualification and frequency of accessing the bank appeared robust to authenticate the quality of the information provided by the respondents. As such, the perception of the respondents with reference to the quality of service provision and customer satisfaction were investigated. This aspect was approached with descriptive statistics. Table 1.2 below indicates that ICT complexity, cognitive dissonance, familiarity, and ambiguity affected the respondents' decision to adopt/use. The perceived ease of use was investigated through three questions requiring the respondents to assert to the degree to which they subscribed to a question.

**TABLE 1.2: RESPONDENT'S PERCEPTION ON THE INDEPENDET VARIABLE (QUALITY SERVICE PROVISION)**

Independent Variables	Mean	Std. Deviation
Tangibles	3.3450	.71363
Reliability	3.4413	.74288
Responsiveness	3.6160	.62530
Assurance	3.6587	.48991
Empathy	3.5987	.64441

From the statistical report in table 1.2, all the variables tested under the independent variable using the SERVQUAL Model are instrumental to the quality provision of services.

TABLE 1.3: PREDICTORS OF CUSTOMER SATISFACTION

	Overall satisfaction	Tangibles	Reliability	Responsiveness	Assurance	Empathy
Overall Satisfaction	1					
Tangibles	0.932**	1				
Reliability	0.954**	0.923**	1			
Responsiveness	0.925**	0.883**	0.943**	1		
Assurance	0.927**	0.881**	0.940**	0.934**	1	
Empathy	0.922**	0.860**	0.948**	0.918**	0.887**	1

Table 1.3 shows the predictors of five dimensions and their level of significance in relation to customer satisfaction. The results indicate that all the five dimensions have a significant relationship with customer satisfaction.

TABLE 1.4 RELATIONSHIP BETWEEN QUALITY OF SERVICE PROVISION AND CUSTOMER SATISFACTION

		Quality of Service Provision	Customer Satisfaction
Quality of Service Provision	Pearson Correlation	1	.966**
Customer Satisfaction	Pearson Correlation	.966**	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The depth of relationship between the independent and the dependent variable was established to substantiate the documented perception of the surveyed respondents. In light of this, the correlation analysis was conducted to authenticate the presumed proposition of a relationship. As evident in Table 1.4, a strong positive statistical significant relationship between quality of service delivery and customer satisfaction was found with a Pearson Correlation Coefficient of 0.966 at 1% (0.000) level of significance. This implies that customer satisfaction is dependent on the perception of the respondents aggregate quality of service provided by the micro finance institutions. With the aforementioned outcome the null hypothesis (there is no significant relationship between quality of service provision and customer satisfaction) is rejected and therefore a conclusive outcome of this is that, customer satisfaction (dependent variable) is positively (largely) related to service quality (independent variable) variables in micro finance institutions of Rwanda.

The aforementioned results are supported by Lai (2004), who found positive relationship between tangibles, empathy and assurance and customers' satisfaction. The strong positive correlation of customer satisfaction and service quality means that the customers will not rightly recommend other customers to and uphold a positive image of the micro finance institutions. Cohen *et al.* (2007) in his research found out that a loyal customer takes less of the company's time during transactions and are less sensitive to price changes. Reichheld (2006) stated that companies with the highest customer loyalty typically grew revenues at more than twice the rate of their competitors. Chen (2008) says that perceived value of service and satisfaction with the service has significant positive effect on behavioral intentions of usage in future. Akbar & Parvez (2009) found that there is positive relation between customer satisfaction and loyalty of customer leading to a more favorable disposition of commitment to re-patronize.

Based on these findings, this research is an added value to existing knowledge on the debate about the depths to which quality service provision in the micro finance institutions can influence customer satisfaction. Therefore, the respondents from the financial institutions in Rwanda assert that the quality of service provided positively influence the satisfaction of the customers. Hence, the paper suggests that in order to maintain and increase the customer base in the financial institutions the management need to ensure that there is quality service provided at all times so as to have a competitive edge in the industry.

## CONCLUSION

This research contributes to the wealth of existing documentation through the identification of the factors that enhance customer satisfaction in the micro finance institutions in Rwanda. The research is perceptual and relationship based. Therefore, bank managers would be well advised to emphasize the employee training programmes so that they can offer personalized service. The main aim should be to develop a long-term relationship with the customers. The current study demonstrates that there is a large positive correlation between customer satisfaction and quality service, meaning that if the customers are satisfied then they will become loyal. This calls for improving the staff related aspects on offering quality services which ultimately will increase customer satisfaction. This implies that staff must be trained in the skills of handling the customers well.

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## FOREIGN AID AND DEVELOPMENT IN AFRICA: IMPLICATION FOR THE MILLENNIUM DEVELOPMENT GOALS (MDG'S)

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### ABSTRACT

*For the past five decades, Africa has been a beneficiary or recipient of foreign aid, bilateral; multilateral or even private. The essence of this aid is to provoke even development in the poor Nations of the World especially Africa. More than \$650 billion has massively been injected into the continent of Africa, yet there is no absolute or clear cut demarcation between Africa and poverty. Many African countries today, rather than progress from poverty to feasible wealth have become Highly Indebted Poor Countries (HIPC's). Debt, and debt crisis is however where most African countries have found themselves. The paper is an examination of the role of foreign aid in developing the African continent, and the implication of such aid for the MDG's. The submission in this paper is that foreign aid has not only fostered underdevelopment in Africa, but has plunged the continent into a debt burden. The paper frowns at the West for continuous aid, being fully aware that a vast majority of the aid money (ies) ends up in the corrupt politicians and government bureaucrats' offshore accounts. The work is anchored on the Dependent theoretical framework.*

### KEYWORDS

Africa, Debt crisis, Development, Foreign aid, Underdevelopment.

### BACKGROUND

For many decades and even centuries, the African continent has suffered oppression and backwardness. From slavery to colonialism, the story has been the same. Post-colonial Africa has struggled with chronic poverty and underdevelopment even after independence from the whims and caprices of the colonialists. The challenge of Africa is development, and essentially the fight against poverty. In the light of this, Africa's romance with the West for assistance and aid for development has not yielded any good. Africa's fight against poverty with reliance on aid from the West only but totally amounts to begging. Thus, the contention among many development experts is that Africa's persistent reliance on foreign aid and assistance only 'enables' Africa's poverty. This is so in that the more aid Africa receives the more debt she has to pay, owing to the fact that aid and debt are quite synonymous. In this way, Africa's effort at development is purely the development of debts. It is arguable that aid, to say the least has been quite beneficial and essential to some developing countries, yet that does not in any way suggests it has immensely engendered development and neither has it drastically reduce poverty.

The thrust of the paper is on foreign aid and development, with a view to understanding its implication on the Millennium Development Goals (MDG's). The paper contends that foreign aid has not only fostered underdevelopment in Africa but has also plunged the continent into a situation of debt crisis. The paper further submits that the bulk of aid money to Africa ends up in the accounts of corrupt members of the political class. The paper is subdivided into four sections. The first section deals with the issue of conceptual clarification. The second section concerns itself with the theoretical framework, and in the third section we take a look at foreign aid and Africa's debt crisis. The last section deals particularly with the issue of the implications for the millennium development goals (MDG's).

### CONCEPTUAL CLARIFICATION

#### WHAT IS FOREIGN AID?

Foreign aid here is seen as the transmission of capital, goods as well as services from one particular country or international organization for the benefit of the recipient country and its population. According to Aluko and Arowolo (2010), aid is used to cover all financial transactions made or guaranteed by one government to another. Ajayi (2000) defined foreign aid as a form of assistance by a government or financial institution to other needy countries, which could be in cash or kind.

Historically, the earliest form of aid was military assistance basically designed to assist warring parties that were in some way considered strategically important. In modern times, its use began in the 18<sup>th</sup> century when Prussia subsidized some of its allies (Encyclopedia Britannica, 2010). Thus the structure and scope of foreign aid today can be traced to two major developments following the 2<sup>nd</sup> World War. These are (1) the implementation of the Marshall Plan – a U.S sponsored package to rehabilitate the economies of 17 Western European countries, wherein a Marshall aid of \$17.5 billion was granted to these countries (Encyclopedia Britannica, 2010; Aluko and Arowolo, 2010). (2) The founding of significant international organizations including the United Nations (UN), International Monetary Fund (IMF), and World Bank. These international organizations have played a major role in the allocation of funds as it were.

Since then, according to Todaro (1977) the aid system has remained a durable phenomenon of the international economic system. The aid world has become a complex of innumerable bilateral and multilateral agreements between recipients and individual donor governments, between recipients and European development Fund (EDF), the World Bank, the United Nations agencies and regional Banks. Foreign aid has its forms and shapes. It can come in the form of economic assistance such as:

1. Investment in the economy of the needy country
2. Loan
3. Infrastructural development, etc.

Aid can also come in the form of military assistance such as:

- a) Supply of military hardware.
- b) Military agreements, bilateral and multilateral, loose or solid or in defense pact.
- c) Supply of military technical assistance, as in the case of military presence, etc (Aluko and Arowolo, 2010).

From the above, it stands quite clear that foreign aid is not the same thing as loan. Their basic distinction is in the fact that, aid is more complex and encompassing; loan is thus embedded in aid. Loan can be defined as money or other valuable item that an organization, individual or even a country lends out

usually with interest. But in both, a particular concept is synonymous, and this is what we call debt. For the purpose of clarification, Oyejide, et al (1983) defined debt as the resource or money in-use in an organization which is not contributed by its owners and does not in any way belong to them. Gordon Brown, a former UK Prime Minister, addressing a jubilee rally in 2000 called debt, "the greatest single cause of poverty and injustice across the earth potentially one of the greatest threats to peace" (Nwaogwugwu, 2007).

Apparently, the major source of Third World and particularly Africa's foreign aid is bilateral and multilateral development assistance. This includes grants, loans and technical assistance and multilateral flows (Arnold, 1979). Again, for the purpose of clarity, by bilateral foreign aid we mean a financial outflow from one country to another. That is, it involves capital outflow between two countries. This actually accounts for 60% of aid to developing Nations. On the other hand, multilateral aid according to Nwoke (1988) is a capital outflow from one international financial body rather than from government to government. Thus, this on its own amounts to 40% of global assistance to developing Nations.

### WHAT IS DEVELOPMENT?

Development has been seen as a term covering intentional and unintentional changes, deliberate actions and change in general, and good as well as bad change (Thin, 2002). Different scholars view development from disparate point of view. The idealist school sees development as the restoration of meaning to the individuals. This approach however is similar to the participatory model of development, which emphasizes the group's involvement in any form of activity that portends the improvement of their lives. (Coetzee, 1986; Ololajulo, 2006; Modo, 2006). Meanwhile, from the materialist perspective, power is central in development. One way of looking at this power is the attainment of increased productivity. Scholars here (Rostow, 1966; Dahl and Hjort, 1984) assume that economic growth is development. However, Crocker (1998) in Modo (2006) observes that what is often called development especially growth may be bad for people, communities and the environment. This is why Ake (1987) insisted that in the development process, what Africa needs is; *"the empowerment by whatever means of the common people. This is not a matter of legislation, although could help a little. It is rather a matter of redistributing economic and political power across board."*

It is also in the light of this that Anikpo (1984) observes that development is the extent to which a group of people has control of the productive forces. In less technical language, what we are calling development is the continuous effort to improve the living standards and conditions through the application of a group's cultural means. This is why Africa wants to take the bull by the horn to attain development, which translates to the creation and establishment of NEPAD - a new framework for Africa's development. But in many ways the idea and issue of official development assistance in diverse form does not strike us as attempting self-development, but assisted development. This to a large extent is really not working in this part of the world.

### THEORETICAL ORIENTATION

This paper adopts Dependency theory to explicate the nature of the relationship between foreign aid and development in Africa. Succinctly, the theory is employed to comprehend the elastic relationship between the donor of aid one hand and the recipient on the other hand. The dichotomy in this perspective is between what is called economically buoyant countries, otherwise known as developed countries and countries that are economically backward, also known as developing countries. The dependency theory seeks to establish the factors that propel or contribute to the development of underdevelopment in Third World Countries (TWC). Moreover, the theory is predicated on the assumption that resources flow from a 'periphery' of poor and underdeveloped States to a 'core' of wealthy States, enriching the latter at the expense of the former. Clearly, it is the contention and standpoint of dependency theory that poor States are impoverished and rich ones enriched by the way poor States are integrated into the world system. (Todaro, 2003; Amin, 1976; Onimode, 1983).

Furthermore, it is the view of dependency theory that poverty of the countries of the periphery is not because they are not integrated or fully integrated into the world system as is often argued by free market economists, but because of the "how" they are integrated into the system. In other words, their relationship with the West with regards to foreign aid is however a dependent relationship, in every case, a dependent relationship of master – slave. In the end, the outcome of every such relationship is underdevelopment.

### FOREIGN AID AND DEVELOPMENT OF DEBTS

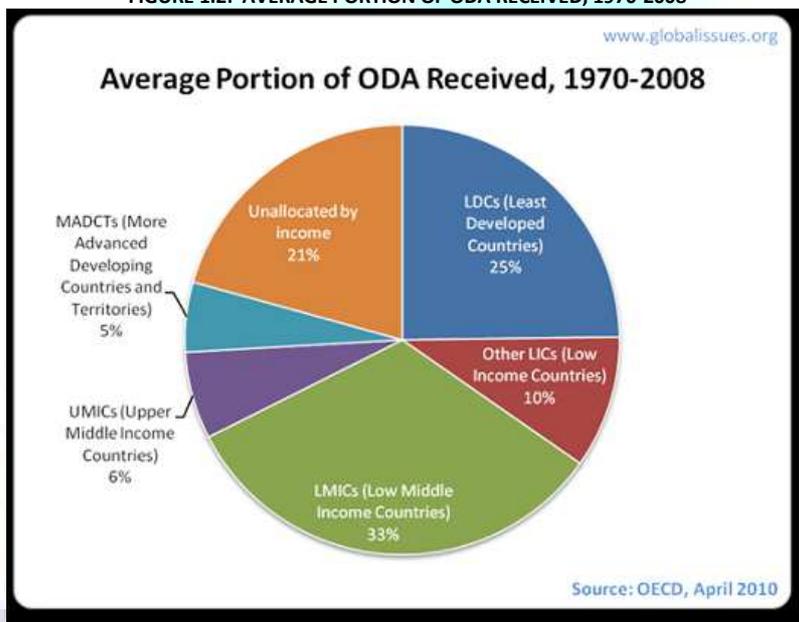
In 1970 the World's rich countries agreed to set aside 0.7% of their gross national product (GNP) as official international development assistance (ODA). Though many rich countries are inconsistent in meeting their promised targets, as shown in figure 1.1 below, yet billions have been rolling in each year (Shah, 2010). From figure 1.1 only five countries have however lived up to the expectation of the 0.7% (GNP) mark. Research statistics shows that total aid from rich countries represents the bulk of reported net financial flows to the continent, accounting for between 40% and 90% in any given year since 1970. Figure 1.2 shows that from 1970-2008, the least develop countries of which Africa is a "full member" have received more ODA. Since 1960 nearly \$650 billion in aid has been provided to sub-Sahara African countries by the (OECD) Development Assistance Committee (DAC) countries (Sundberg and Gelb, 2006). Between 1981 and 1991, the World Bank provided \$20 billion towards Africa's structural adjustment programmes. The practical purpose of the programme was necessarily to bring about transparency, efficiency and accountability in public institutions, and government agencies in Africa.

FIGURE 1.1: OFFICIAL DEVELOPMENT ASSISTANCE (ODA) FROM 2006 TO 2009 AT CURRENT PRICES (2008, USD MILLIONS)

	Country	ODA in U.S. Dollars (Millions)				ODA as % of GNI			
		2006	2007	2008	2009	2006	2007	2008	2009
1.	Australia	2,572	2,798	2,954	2,912	0.3	0.32	0.32	0.29
2.	Austria	1,797	1,947	1,714	1,179	0.47	0.5	0.43	0.3
3.	Belgium	2,366	2,094	2,386	2,661	0.5	0.43	0.48	0.55
4.	Canada	4,167	4,237	4,795	4,341	0.29	0.29	0.33	0.3
5.	<b>Denmark</b>	<b>2,726</b>	<b>2,805</b>	<b>2,803</b>	<b>2,922</b>	<b>0.8</b>	<b>0.81</b>	<b>0.82</b>	<b>0.88</b>
6.	Finland	1,008	1,055	1,166	1,319	0.4	0.39	0.44	0.54
7.	France	12,793	10,670	10,908	12,746	0.47	0.38	0.39	0.46
8.	Germany	12,406	13,146	13,981	12,297	0.36	0.37	0.38	0.35
9.	Greece	519	546	703	618	0.17	0.16	0.21	0.19
10.	Ireland	1,175	1,242	1,328	1,077	0.54	0.55	0.59	0.54
11.	Italy	4,406	4,302	4,861	3,350	0.2	0.19	0.22	0.16
12.	Japan	12,328	8,660	9,579	8,556	0.25	0.17	0.19	0.18
13.	Korea	409	599	802	910	0.05	0.07	0.09	0.1
14.	<b>Luxembourg</b>	<b>362</b>	<b>416</b>	<b>415</b>	<b>423</b>	<b>0.89</b>	<b>0.92</b>	<b>0.97</b>	<b>1.01</b>
15.	<b>Netherlands</b>	<b>6,539</b>	<b>6,738</b>	<b>6,993</b>	<b>6,675</b>	<b>0.81</b>	<b>0.81</b>	<b>0.8</b>	<b>0.82</b>
16.	New Zealand	298	312	348	337	0.27	0.27	0.3	0.29
17.	<b>Norway</b>	<b>3,720</b>	<b>4,193</b>	<b>3,963</b>	<b>4,650</b>	<b>0.89</b>	<b>0.95</b>	<b>0.88</b>	<b>1.06</b>
18.	Portugal	479	506	620	523	0.21	0.22	0.27	0.23
19.	Spain	4,640	5,552	6,867	6,786	0.32	0.37	0.45	0.46
20.	<b>Sweden</b>	<b>4,644</b>	<b>4,540</b>	<b>4,732</b>	<b>5,083</b>	<b>1.02</b>	<b>0.93</b>	<b>0.98</b>	<b>1.12</b>
21.	Switzerland	1,971	1,883	2,038	2,271	0.39	0.38	0.44	0.47
22.	United Kingdom	12,974	9,167	11,500	13,179	0.51	0.36	0.43	0.52
23.	United States	24,723	22,252	26,842	28,305	0.18	0.16	0.19	0.2

Source: OECD Development Statistics Online, 2010.

FIGURE 1.2: AVERAGE PORTION OF ODA RECEIVED, 1970-2008



Obviously, poverty is the justification for aid, yet it is hardly the central decisive factor used for allocating such. The essence of foreign aid was primarily to assist poor countries escape the iron grip of poverty, but in many ways this is not the case. Thus when it was conceived after the Second World War, foreign aid according to Jallow (2006) was designed for two conceptually independent, but potentially conflicting set of goals. One was the diplomatic and strategic goals that advanced U.S short term political and long term strategic interest.; and secondly, the development of, and humanitarian goals that sought a long term alleviation of suffering.

It is worthy of note to mention that, all the decades of aid to Africa has not suffice development. In spite of the massive injection of aid over the past five decades, Africa rather than achieve economic growth to warrant development has become more dependent, with standards of living experiencing a net decline. Financial aid transfer to Africa has not fostered development but underdevelopment. It has left seventy countries primarily in Sub-Saharan Africa poorer than they were in 1980, and 43 more countries are even worse off than they were in 1970 (Jallow, 2006).

Private flows of aid to Africa especially from Multinational Cooperation's (MNC's) as well as investment funds are reflections of the permanent interests of investors. These flows have an unswerving negative force on the African continent due to flooding of the market with excess products, while protecting their own markets from the products of the poor countries who are trying to develop. Perkins (2003) reports that the World Bank and IMF are dominated by rich

countries who wield immense influence over them, as such are protective of their trade protectionism to the South. While there is pressure on Africa to liberalize her economy, the US and Europe continue to subsidize her agriculture. It is reported that Europe subsidizes its agriculture to the tune of \$35 - \$40 billion per year, whereas that of the US amounts to \$190 billion (UN News Centre, 2003).

Developing countries especially Africa continues to face trade barriers in various forms and against sectors like agriculture and textiles, where they possibly have an advantage. Ever since the Uruguay Round Agreement, the developing countries have not benefited as they were supposed to. New trade agreements like TRIPS (Trade Related Aspects of Intellectual Property Rights) and GATS (General Agreements on Trade and Services) have however imposed considerable implication on economic development for developing nations (Fingers and Nogue, 2001). The estimated cost of trade barriers from the North to the South is over \$100 billion, much more than what developing countries receive from the west as aid (Aid Money, 2002.).

Thus, according to Christian Aid (2005), Sub-Sahara Africa is a massively \$272 billion worse off because of free trade policies forced on them as conditionality for receiving aid and debt relief. Furthermore, Christian Aid noted that these reforms which the rich countries coerce Africa to employ were supposed to boost economic growth, but in reality this is not so as Africa is eventually left barren and distant from development. The supposition here therefore is that the goal of aid is not distant from creating and maintaining dependent relations between the rich donor countries and the poor recipient countries, especially Africa.

To further buttress our position that foreign aid has fostered underdevelopment in Africa, we take a look at Somalia. In time past, especially in the 1980's Somalia was Africa's largest recipient of international aid (Maren, 1997). The huge flows from the West especially the United States of America gravely battered the productive sector of the Somalia economy particularly the agricultural sector. A World Bank finding on food import into Somalia in 1998 showed that aid had systematically undermined Somalia's civil society. Somalia had become more reliant on imported food than any other country in Africa south of the Sahara. Chosudovsky (2003) stated that Somalia remained a pastoral economy not until the early 1980's. Prior to this time, according to Chosudovsky, Somalia remained virtually self-reliant in food and food grain production. Livestock earnings accounted for 80% of export earnings in the country until 1983 when food aid began to arrive. He further argued that food aid program from the European Union as well as "economic medicine" from the IMF laid the foundation towards economic dislocation, and the demise of pastoral economy in Somalia. Thus, with loans and aids in the air, Somalia could not overcome her reliance and dependence on foreign assistance, hence a dependent nation in a dependent relationship.

There is need to state here that the greater part of the aid money received by African States ends up in the offshore accounts of corrupt government officials. Sharon Lafraniere (2005) laments that, "too much of the \$300 million in aid to Africa since 1980 has vanished into a sinkhole of malfeasance and waste". Jallow (2006) further contends that an Oxford international Group study has revealed that the external stock of capital held by Africans in overseas accounts, was between \$700 billion and \$800 billion in 2005, and nearly 40% of Africa's aggregate wealth was stacked in foreign bank accounts in Europe, United States and Japan. The point is that, in most cases, Western donors are usually fully aware of this situation. They are quite aware that in most times, 30% of the loans to African countries and governments went directly into the bank accounts of corrupt officials, yet the banks consider these officials and their governments as partners in development. The obvious fact here then is that these corrupt officials are nothing more than comprador bourgeoisies, who are in direct cahoot with 'donors' to continue derailing the continent from development.

Essentially, we must understand that aid is not charity, neither is it a donation borne out of pity. It is political and is driven by political interest. Little wonder it is administered most in conflict times. As posited by Sundberg and Gelb (2006), 'a great deal of aid was allocated to countries that became politically unstable or endured civil conflict'. In fact, the essence of this is to endeavor them to debt. This is so in that many foreign aids are 'tied funds' that come with conditions like preferential exports. This ensures that more money comes out of the recipient countries than is given. Especially as Smith (1994) puts it, 'most of Africa's debt resulted from loans to dictatorial governments, resulting in little benefit to the people'. Foreign aid has done little than was expected to Africa. Easterly (2006) laments that foreign aid has not done so much in spite of all the grand promises. It has plunged the African continent into a situation of debt crisis. By debt crisis we mean a situation whereby a country is heavily externally indebted and is unable to reimburse the principal of the debt (Mimiko, 1997). According to Ibrahim (1990), debt crisis is however a debt that can never be repaid. In this way we see it as a continuous situation of payment that never ends, but is transferred from one government to another.

George (1992) estimated that a net of about \$418 billion borrowed funds flowed right back from Africa to the North between 1982 and 1990. In the same vein, Mr. Kofi Annan, former UN secretary-general noted in 2003 that a whopping \$200 billion, the largest ever transfer of funds to 'other countries' was from the developing countries (Africa inclusive) in 2002 (UN News Centre, 2003). This however shows that more money even leaves the shores of Africa for the North. These are obviously funds that would have developed the continent and promoted the actualization of the millennium development goals as we journey to 2015. Such transfer of funds only tells us one thing – debt. Thus, Africa's debt crisis is without a doubt an 'evergreen debt' – that is, that generations cannot pay off. As at the year 2000, Africa owed an estimated \$350 billion external debt. The developing countries as a whole owed about \$1.3 trillion in 1990 (Aluko and Arowolo, 2010).

In 1976, Tanzania began the \$220 million Mufundi papermill factory project which turned out to be a fiasco. Yet, for 30 years Tanzania paid the bill for that ill-thought out experiment. No less than a couple of months after Tanzania's debt was forgiven under the Highly Indebted Poor Countries (HIPC) initiatives, which caused her debt to drop from \$3.8 billion in mid-1999 to \$2.6 billion in 2001. The World Bank quickly announced a new lending programme for Tanzania (Christian Aid, 2000). But of course this new programme of lending, which amounts to \$1 billion over a three year frame was just another opportunity to entangle Tanzania in the debt burden and generally breed underdevelopment. This is so, since savings will be spread out over 20 years and Tanzania must continue to borrow. Mutume (2001) posited that Tanzania's debt could increase to \$3.2 billion by 2005, and to \$6 billion by 2015. Fundamentally, Tanzania remains one of the world's poorest countries, despite her giant strides in recent time. On the other hand, Zambia got a possible \$3.8 billion debt write off, but still owes billions (Nwaogwugwu, 2007). The case of Nigeria's debt was a pathetic one before her 'debt sins' was eventually forgiven. Nigeria's debt profile had been put at \$31 billion, while her foreign reserve had grown to \$8 billion. Nigeria ought to service her debt by paying \$4.9 billion every year. Already Nigeria was in default on \$22 billion worth of Paris Club debts and was severely struggling to service her \$3.5 billion London Club debts obligations (CIA World Fact Book, 2008). The point in all this is that, rather than face development plans, African States were busy nursing their wounds of debt crisis, which further plunges the continent into backwardness. An obvious situation that will provoke reliance on foreign assistance and cause Africa to ever remain underdeveloped.

Figure 1.3 below shows estimates of indebted African countries debt servicing profile up the year 2015, when the millennium development goals is even expected to be achieved. One thing is clear here, and that is; the HIPC initiative is just another approach to continuous indebtedness.

FIGURE 1.3: ESTIMATES OF DEBT SERVICING

DEBT SERVICING OF 17 AFRICAN COUNTRIES ESTIMATES, \$Mn				
	2000	2005	2010	2015
Benin	62.5	36.9	43.9	72.8
Burkina Faso	33.8	41.5	54.7	83.2
Cameroon	312	347	375	n.a.
Gambia, The	19.6	9.8	18.7	23.4
Guinea	140	88	96	111
Guinea-Bissau	15	4	11	n.a.
Madagascar	104.5	81.6	119.5	156.2
Malawi	n.a.	47.1	55	85.9
Mali	88	66	76	125
Mauritania	87.4	43.3	n.a.	47.3
Mozambique	50	60	97	98
Niger	93.5	29	26.4	35.4
Rwanda	39.6	11.1	14.7	27.7
São Tomé & Príncipe	n.a.	1	3.3	2.8
Senegal	184.9	136.1	n.a.	n.a.
Tanzania	153.8	158.2	n.a.	258
Zambia	169	202	135	109

Source: World Bank, IMF.

### IMPLICATIONS FOR THE MILLENNIUM DEVELOPMENT GOALS (MDG's)

The Millennium Development Goals (MDG's) are a set of eight concrete, quantifiable objectives, adopted by the World leaders in 2000 and set to be achieved in 2015. In recent times, though a lot of changes have been met in the various facets of the goals, yet many if not all African countries are clearly on the wrong track towards 2015. Indeed, it has been noted that the debtor-countries have too much burden on their heads, the burden packaged with economic crisis and political difficulties. Expending 70 – 90% of export earnings on debt servicing connotes that virtually little is perhaps left for African countries to perform and meet the MDG's targets.

As it stands a vast majority of Africans are still wallowing in poverty. Globally, more than one in five PLWHA live in Botswana, South Africa, and Zimbabwe; 5.6 million PLWHA live in South Africa alone. Swaziland has the highest prevalence of any country in the world: Approximately one in every four citizens is HIV positive. Whereas sub-Saharan Africa continues to be an abode for 23 million people living with Hiv/Aids, and the scourge of malaria still ravages the populace; while maternal cum infant mortality as well as environmental degradation are having a field day in the continent. In view of this, the realization of the MDG's by 2015 becomes a nightmare or worse still, a day dream. After all, it is the year 2012 and 2015 is just ahead, yet primary school net enrolment/attendance in Nigeria for 2009 and 2010 remain 83.09% and 83.28% respectively (World Bank, 2011). Under five mortality rate in 2009 is 138, while infant mortality (under 1) rate as at 2009 is 86. (UNICEF, 2010). This shows that a lot more need to and must be done to meet 2015.

### CONCLUSION

We set out to understand the fundamental interface between foreign aid and development in Africa, and from the onset we tried to show that foreign aid in Africa is not development, but generates underdevelopment. The years of aid to Africa has not done Africa much good, but has rather made the continent worse off. The West and their aid are meted out to Africa with strict conditions, which equally rope-in the continent in debt. In most cases, these aid and loans fall into the wrong hands or rather are given to corrupt governments who end up stashing the funds in their offshore accounts. Such stashed funds in many cases come back to Africa as aid money. It is also understood in this work that such initiatives as the HIPC is not any salvation to African countries debt crisis. Rather it is another framework for enmeshing the continent in the mix of debt burden, as such further deep into underdevelopment.

With 2015 just ahead, the Millennium Development Goals stands challenged, as African countries are in a debt situation and attempting to service their debts rather than 'charge on' the MDG's. The implication of course is that Africa is further away from achieving these goals by 2015 and even beyond. Importantly therefore, we recommend a considerable reduction in aid acceptance in this 21<sup>st</sup> century. Acceptance of international assistance should be circumstantial, especially food aid to save humanity in times of famine and other disasters. Besides that, ODA has to be thoroughly weighed in the balance to know what sorts of conditions are attached to it and what purpose it would definitely serve. Aid acceptance for all practical purposes must necessarily be on the basis of needs assessment. They must be careful to understand that aid or assistance for development is nothing but 'hindrance to development'. Again, it is recommended here that Africa must review her socio-economic relationship with the IMF and World Bank as well as other donor institutions. For certain, their present relationship of course is basically an excruciatingly dependent relationship. More so, they must devise a way out of poverty by looking inward. This of course brings us to the point of saying that, African leaders must be accountable and responsible to their people. They must diversify their economy and employ the services of their best brains.

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## THE IMPACT OF HRM PRACTICES HAVING A MEDIATING EFFECT OF ORGANIZATIONAL COMMITMENT ON ORGANIZATIONAL PERFORMANCE

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### ABSTRACT

*The purpose of conducting this study is to observe the relationship of HRM practices having commitment as mediator with organizational performance in hotel industry of Pakistan. Having sample of eighty respondents of three five star hotels of Rawalpindi & Islamabad the hypothesized model is developed predicting the positive relationship between Human Resource Management and organizational performance through organizational commitment, which is proved true. At the same time the effect of organizational commitment is found less affective compared to HRM practices on organizational performance directly. The results indicate the need of improvement in HRM polices so that personal commitment can be enhanced for better organizational performance. The need of strategic HRM is felt in this industry in Pakistan because with out consulting each other the HR polices alone can not bring the desired results.*

### KEYWORDS

hrm practices, organizational commitment, organizational performance.

### INTRODUCTION

In this era of dynamic and diversified economies the emergence of Human Resource Management practices has been proved as an essential part of organizational Structure. It is not any new concept but an extension of personnel Management. HRM started emerging and replacing the personnel management in 1980's (Storey 2001, Smith 2006) In the light of HR practices Human Resource Management seems to be more closer to the Taylorism a concept of Frederick Taylor in 1911, where he showed more concern for training and better compensation for high performance of employees with a notion of selecting right people for right job. According to (Smith, 2006) The main difference among them is centralized and decentralized approach, where HRM is decentralized and soft approach.

Academician and HR practitioner are showing a great interest in it. The aggressive competition in the market and global industrial and technological changes are also causing them to explore more about it and to focus more on human resource than to physical resource as well as asset incentive to knowledge intensive approach (Rennie 2003) According to (Legge, 2001, Smith 2006) Human Resource Management was a hot issue among academician and HR practitioner in 1990's. Management functions as Planning, Organizing, Staffing, Leading and Controlling are usually applied equally in every organization, while the function of staffing among these is the main function of HRM practices. This relationship of Management function and HRM practices prove that HRM is not separate from strategic decisions It follows the line of action forwarded to it by the senior Management. It facilitates the other department in dealing with its human resource component. It does not only deals with polices and procedures related to organization but also attracts, develops, motivates and compensates the talented people to improve the effectiveness and efficiency of organizations. Japanese organizations are the role model of effective management of people (Ouchi, 1982, Smith, 2006). Furthermore the paradigm of HR practices and theories are discussed and acknowledged time to time. (Storey, 1980, (Rennie 2003) first described hard and soft concept of HRM. Hard approach deals human resource as physical product and values its performance through out come while soft approach pays equal importance to human resource and its output. HRM is people centered management and proactive approach works effectively in organic type organizational structure (Rennie, 2003).

Though the main function of HRM is to focus on people and make them grow for competitive advantage but (Barney 1991, 1995) suggested focusing more on organizational strategy. While (Lado & Wilson 1994, (Shahnawaz & Juyal 2006) proposed HRM practices for sustained competitive advantage. HRM at different platform among different people is equally acknowledged. Its importune can not be denied however (Keenog, 1990, Shahnawaz & Juyal (2006) take HRM as hologram. which changes its directions time to time. Similarly HRM practices are devised and applied for organizational development differently according to their need and situation. It is not same for all situations because it deals with people not material only. As human feeling and emotions are not similar the practices can also not be retained the same. They are modified as per requirement and situation.

Despite of having a lot of importance of HRM practices it is not applied equally in every organization and economies especially in small organizations ( Cappelli & New mark, 2001) and in developing countries like Pakistan. It has been observed through the evidences that during the last decade most of research on HRM is conducted in America, Europe and Asia and very little in Pakistan especially in Hotel Industry. By the change of time now the focus of HRM is more on financial position of organizations (Dr Ayesha Akbar, & Qureshi 2010) because economic activity beside capital and material resources Human is involved. Without people nothing can be generated and operated. Overall HRM is being held responsible for organizational financial growth (Hung 2006), however as a large number of people are involved in service sector the researcher and theories are trying to create link between HR strategies for competitive strategy in services (Boxall' 2003)

### RATIONALE OF STUDY

Hotel industry all over the world is considered the one of dynamic industry where a great customer care and deep consideration on novelty through human capital is must. As it is understood that even knowing the importance of this industry it is being ignored for research and no proper empirical research is conducted on it especially in Pakistan.. HRM is applied, but in few of the five star Hotels where it is not fully operational. As performance is an indicator of quality so it is critical for hotel industry to maintain it for sustainable development in the current globe competitive environment for customer's satisfaction (Min, et al 2002) There are different levels of hotel in the world from one bed to seven star but this study is done on five star Hotels in Pakistan Including Marriott, Serena and pearl Continental in Rawalpindi and Islamabad Region. As maintaining a competitive advantage is hard nut to crack in hotel industry so the maximum HRM practices are mandatory for its improvement. In the light of this study it is tried to observe how the HRM is working for the improvement of hotel industry in Pakistan.

**LITERATURE REVIEW**

Human Resource management practices are useless if they ignore the Human capital. Only the capital and material resource can not increase the productivity alone. Without human interaction progress is not possible. Not every individual but only the trained, skilled and qualified human resource is required. It is very easy to control the machines but not people because they have their emotions and feelings which make them decide to work. They can not be treated with same policy and be measured with same yardstick. So the need of HRM practices is being felt badly all over the world in every organization. Though the ultimate objective of both economic and HRM practices are profit maximization but HRM names it as organizational performance.

Despite the fact of HRM importance still it could not prove its position and clear role in the organizations. HRM is usually focused when there is surplus in organization otherwise the expenses are reduced on it quickly (Wright, Dunford & Snell 2001). However it got little importance when an economic Resource Based View theory paid attention to Human Capital as an asset. Similarly HRM is closer to RBV with a view of paying attention to internal resource of organization than to external (like industry position) for competitive advantage (Hoskisson, HGitt, Wan, Yiu, 1999, Wright & Snell 2001). The firms having emphasize on technology and research can retain competitive advantage for short time (like Sony) compared to those who retain Valuable, Rare, Inimitable and Organized skilled Human Resource. (Wright & Snell 2001)

In this changing time of global interaction and tough competition, the focus of HRM is moving toward organizational performance. The attention is laid down on both financial (profit, sales, and market share) and non financial (productivity, quality, efficiency) variables along with behavioral factors such as commitment, intention to quit, and satisfaction. (Dyer & Reeves, 1995, Asif Khan 2010). Different researchers have different point of view in term of research approaches. Similarly different cultures have different approaches for HRM practices., like Japanese are more focused as compared to Americans on HRM practices (Ichniowski and Shaw 1999, Asif Khan 2010)

Chang and Chen (2002 in Taiwanese high technology, Ngo et al., (1998), in a study in Hong Kong companies, Sing (2003) in India, BjorkmanIn and Xiucheng (2002) on Western firms' performance in China, in Korea, Bae and Lawler (2000) in New Zealand, Guthrie (2003), Tsai (2006), in a study in Taiwan, Rizov and Croucher (2008)in European firms, (Arthur, 1994; Huselid et al., 1997; Youndt et al., 1996). Wright et al. (2005) proved the causal relationship between performance and HRM practices in America and Canada in 45 business organizations. Similarly numerous studies have proved the positive correlation between HRM practices and organizational and employee Performance.

As for as this study is concerned HRM Practices are taken as Independent variable which include: Selection, Training, Performance Appraisal, Career Planning, Employee Participation, Job Definition and Compensation. It is an understood fact that mismatch selection & recruitment decline the effectiveness of employee if the uniform practices are not applied (Houet al 2002). The right association of Performance Appraisal with compensation causes positive effect on organization performance.(Gerhart and Milkovich 1990Borman 1991) A study by Ngo, Turban, Lau and Lui (1998) showed that training and compensation had high involvement in organizational performance. (Hang and Buyens 2008) recognized the importance of training and development which results with high financial performance through higher knowledge ,skills and abilities of employees. Compensation is another factor. The satisfaction, loyalty and productivity of employee is always associated with compensation. Compensation (Aswathappa, 2008. An American study by (Ting 1997) proved the same. Huselid (1996) explained the relationship of bundle of HRM practices with organizational performance.

Organization Performance is taken as dependent variable with its facets: Satisfaction, Effectiveness, Efficiency, Innovation and Quality are involved .The agreement of (Ting, 1997., Appelbaum, Bailey, Berg and Kalleberg, 2000) proves that Job satisfaction ultimately leads to better organizational performance. Similarly (Green, Wu, Whitten and Medlin 2006) stated that positive response of employees & organizational performance is possible thorough vertical and horizontal alignment of management system and HRM practices. The variables used in this study like effectiveness, efficiency, innovation, and quality. are also proved positive as in (Huselid1995 , Katou and Budhwar )2007.

Organizational Commitment is introduced as mediating Variable in this study. The main objective of mediating variable is to observe that to what extant the HRM practices help in organizational development. (Katou & Budhwar, 2006) As a result of various researches positive relationship of commitment and HR practices on organizational performance has been found. Commitment plays a key role in strengthening HR practices and enhancing organizational performance. Similarly there are some argument against by (Worsfold 1999, Shahnawaz2006) where they denied the participatory role of commitment in organizational performance and considered it as guide for performance development of organization through HRM practices, ( Meyer & Allen 1997) used the concept of affective(value added) normative(obligation based) continuance(cost and benefit based) commitment in their study, (Gaertner & Nollen1989) and (Kinicki 1992)proved the positive correlation of commitment and both actual & perceived HR practice

**RESEARCH QUESTIONS**

The study is carried out to find the answer of the question:

- To investigate the how HRM practices affect on organizational performance
- To investigate the Mediating effect of organizational commitment between HRM practices and organizational performance

**HYPOTHESIS**

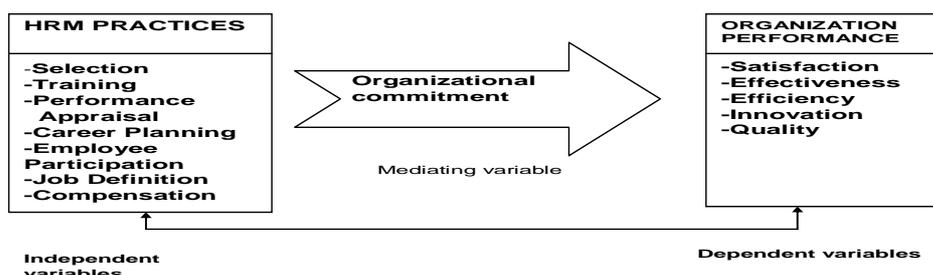
**H1:** HRM practices including selection, Training Performance Appraisal, Career planning, Compensation, Employee Participation, Job Definition has a positive effect on the organizational performance.

**H2:** HRM practices including selection, Training Performance Appraisal, Career planning, Compensation, Employee Participation, Job Definition has a positive effect on the Organizational Commitment.

**H3:** Commitment affects positive on Organizational Performance as mediator.

**H4:** Commitment as mediator between HRMP and Organizational Performance has positive effect on OP.

**Perceive Model**



**METHODOLOGY**

The rationale of using methodology is to prove the status of hypothesis and perceived reach model, which perceives the relationship of HRM practices and organizational commitment through commitment as mediator. The methodology includes the following:

**i. SAMPLE**

The stratified sampling technique is used to collect the data which is simple and convenient in data collection method where a specific target market is selected instead of large number of people. Three star hotels of Rawalpindi Islamabad were selected .The questionnaire is adapted from Qureshi, Katu,abd Azba. Total 150 questionnaires were floated. Pick and drop method was applied.80 responses were received; The target audience was the managers and supervisors. In order to identify the best results of HRM practices in service industry the four and five star hotels are The right choice (Hasynes&Fryer, 2000 and Hung, 2006) The employee were assured of confidentiality during the data collection.

**ii. INSTRUMENTATION**

On the light of various reaches commitment is significant impact on organizational performance. This study is conducted to understand the same in hotel industry if Pakistan where the major factor is Human resource which leads the organization to its good or bad condition. In this study the HRM practices including, Selection, Training, Performance Appraisal, Career planning, Employee performance, Job design& Compensation are taken as Independent variable along with commitment as mediator. While organizational performance. The responses are made on 1 to 5 likert scale from highly disagreed to highly agreed is taken as dependant variable.

**iii. RESPONDENTS PROFILE**

Gander	Male & Female
Age	Below 20 to 41 and above
Education	Matric to Masters
Salary	Below Rs. 10,000 to above Rs. 50, 000
Stay	<1 to >10 years

**iv. MODEL TESTS**

Among the several tests first of all the Reliably test is applied to check reliability of data against the each construct to check the relationship and reliability questionnaire and data collected .The results of cronbach Alfa are found almost above 70 are considered good as per opinion of (Sikaran 1992, Hendi2009).

Variable	Cronbach's Alfa
Selection	.855
Training	.850
Performance Appraisal	.870
Career Planning	.835
Employee participation	.858
Job Design	.747
Compensation	.86
Commitment	.873
Organizational performance	.909

Exploratory Factor Analysis (EFA) test is applied to confirm the feasibility of questions all in each variable construct. The results of each construct are found highly significant, which are above .70.

Linear Regression Analysis is applied on hypothesizes to check the effect of HRM practices and commitment as mediator on organizational performance.

**H1:** HRM practices including selection, Training Performance Appraisal, Career planning, Compensation, Employee Participation, Job Definition has a positive effect on the organizational performance.

	Mean	Std. Deviation	N
Organization Performance	3.2284	.67428	80
HRMP	3.1191	.68612	80

Mean and S.D is significant and correlation between two variable is also significant at .000 level ,R is .729 ,while beta is .729 which illustrates that unit 1 change in HRMP causes .729 change on organizational performance. The hypothesis stand true.

**H2:** HRM practices including selection, Training Performance Appraisal, Career planning, Compensation, Employee Participation, Job Definition has a positive effect on the Organizational Commitment

	Mean	Std. Deviation	N
Organizational Commitment	3.5125	.67624	80
HRMP	3.1191	.68612	80

Mean and S.D is significant and correlation between two variable is also significant at .000 level, R is 0.58 ,Beta is .58. The hypothesis is acceptable..

**H3:** Commitment affects positive on Organizational Performance as mediator.

significant Mean and S.D with significant correlation between two variable at .000 level ,R is 0.729 and beta is 0.729 The hypothesis is true.

	Mean	Std. Deviation	N
Organization Performance	3.2284	.67428	80
Organizational Commitment	3.5125	.67624	80

**H4:** . Commitment as mediator between HRMP and Organizational Performance has positive effect on OP.

	Mean	Std. Deviation	N
Organization Performance	3.2284	.67428	80
HRMP	3.1191	.68612	80
Organizational Commitment	3.5125	.67624	80

Mean and S.D is again and correlation is also significant at .000 level ,R is 0.72 Beta of HRM is 0.72 and commitment 0.007. The hypothesis stands true.

**DISCUSSION**

Overall all the results found significant well accepted and strong .It seems true that all the previous researches conducted support these result. HRM practices have its own importance but unfortunately the people in organization specially in this industry are nit given an opportunity to participate in such kind of training which ate really beneficial for their carrier development. HR departments are hooded by those who themselves need training. It is observed through data collection no electronic information was available .Usually employees were not allowed to be interviewed directly, they wanted to explain their problems but the HR departments themselves were the hurdle. This was the reason that hypothesis 4. proves that commitment with HRMP does not bring any significant change As it Plays an important role in any organization and is related to people but at the same time it can not be important for the achievement of competitive advantage unless the hotel department make strong HR strategy and standards for achieving the employee satisfaction (HUNG 2006) .The importance of HR practices can not be denied in hotel industry .It is a backbone of this industry. In Pakistan though it is not applied in small scale organizations with its full sprit but its application can be seen in a form of some other concepts. Having the same problem the only five star hotels were selected.

**SUGGESTION AND CONCLUSION**

This study suggests the HR department is required to pay attention to the strategic HRM. Only HRM polices can not solve the employees problems .There is need of positive alignment of higher authorities to involve the Human Resource Department as they set their future goals. They should not treat the employee like other material resources .Every time increase in capital and material can not expand the business. It is human relationship which binds the organization and customers. Which stands very much true for Hotel Industry especially in Pakistan where a lot of resources are getting wasted due to lack of behavioral training of Human Resource and Management.

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**ENTREPRENEURSHIP DEVELOPMENT THROUGH HUMAN RESOURCE MANAGEMENT PRACTICES**

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**ABSTRACT**

India's human capital is fast emerging as the key source of its economic growth. Much has been said recently about India's demographic dividend: that its working-age (15-59 years) population, as of now, largely consists of youth (15-34 years), and as a result its economy has the potential to grow more quickly than that of many other countries, including China. This paper attempts to focus on the dire need to garner this demographic gift through Human Resource Management (HRM) Practices, before it turns out to be a liability.. A detailed and in depth descriptive analysis of the secondary data have been done. The recommendations to foster entrepreneurship development towards the economic growth of our nation are: Strategic HRM practices are crucial for innovation and entrepreneurship, to shape the surplus workforce as job providers, rather than as job seekers; Corporate entrepreneurship or Intrapreneurship, is advocated as a means for organizational innovation and many other advantages at organizational as well as individual level; Kanter's Change management theory is crucial for increasing the employees' efficiency; The conducive Indian entrepreneurial climate - existence of iconic role models, functioning of entrepreneurship-oriented bodies with opening of numerous business opportunities should be the potent facilitating factor for entrepreneurship development.

**KEYWORDS**

Demographic dividend, Economic development, Entrepreneurship development, HRM Practices, Intrapreneurship.

**INTRODUCTION**

**T**here is a tide in the affairs of men. Which, taken at the flood, leads on to fortune; Omitted, all the voyage of their life is bound in shallows and in miseries. On such a full sea are we now afloat, and we must take the current when it serves, or lose our ventures.”

---Shakespeare

**DEMOGRAPHIC DIVIDEND OF INDIA**

India is being widely recognised as one of the most exciting emerging economies in the world. Besides becoming a global hub of outsourcing, Indian firms are spreading their wings globally through mergers and acquisitions. By the year 2020, India is expected to add about 250 million to its labour pool at the rate of about 18 million a year. This so called 'demographic dividend' has drawn a new interest in the Human Resource concepts and practices in India.

One of the noteworthy features of the Indian workplace is demographic uniqueness. It is estimated that both China and India will have a population of 1.45 billion people by 2030, however, India will have a larger workforce than China. Indeed, it is likely India will have 986 million people of working age in 2030, which will probably be about 300 million more than in 2007. And by 2050, it is expected that India will have 230 million more workers than China and about 500 million more than the United States of America (U.S.). It may be noted that half of India's current population of 1.1 billion people are under of 25 years of age. While this fact is a demographic dividend for the economy, it is also a danger sign for the country's ability to create new jobs at an unprecedented rate.

**2020 ESTIMATE OF INDIA'S POPULATION**

Year	Under 15	15-64	65+	Total
2000	361	604	45	1010
2005	368	673	51	1093
2010	370	747	58	1175
2015	372	819	65	1256
2020	373	882	76	1331

Source: Institute of Economic Growth, New Delhi, Discussion Paper No. 27/2001.

- **2020:** 1,326,093,000
- **2030:** 1,460,743,000
- **2040:** 1,571,715,000
- **2050:** 1,656,554,000

In order to reap the benefits of this demographic dividend, India will have to shape them as job providers, rather than as job seekers since entrepreneurship is the key to sustainable development of any nation.

**REVIEW OF LITERATURE**

Zhongming Wang and Zhi Zang,(2005), "Strategic human resources, innovation and entrepreneurship fit ; A cross-regional comparative model", demonstrated that the fit between strategic HRM practices, innovation strategy and entrepreneurship model, significantly contributed to entrepreneurial performance.

goliath.ecnext.com,(2007), "Human resource management in India: Where from and Where to?", has traced out notable evidence of economic organisations and managerial ideas from ancient Indian sources with enduring traditions and considers them in the context of contemporary challenges. The article has also highlighted the fact that the so called "demographic dividend" has drawn a new interest in the human resource concepts and practices in India.

Zhong-Ming Wang and Sheng Wang,(2008), "Modelling regional HRM strategies in China: An entrepreneurship perspective", examined the relationship between two general HRM practices, strategic entrepreneurship and organizational performance, in order to build up a cross-regional HRM strategy model, to prepare the Chinese firms to do business across regions and go global.

**Jeffrey.J. Busgang, (2010)**, "Fostering Intrapreneurship: Think like a VC, act like an entrepreneur", has mentioned the ways to instill entrepreneurial/analytical approach in the minds of corporate managers so as to enable them to analyze what idea is the best one like a VC and then to act with the raw and unbridled enthusiasm of an entrepreneur.

**Philip.G.Altbach and N.Jayaram,(2010)**, "Can India garner the Demographic dividend?", threw light on the existing deficit in the Indian education system and hence the need to increase and improve it qualitatively and quantitatively.

**Gert Van Brussel and Jan.M.Ulijn**, "Developing Intrapreneurship as a career perspective for senior professionals: Towards an innovative HRM and career management approach", has made it clear that an innovative career management approach is needed for the development of internal entrepreneurship.

**Rowena Barrett and Susan Mayson**, "International Handbook of Entrepreneurship and HRM", offered a new understanding of the role of HRM in developing sustainable entrepreneurship and describes the relevant HRM practices and procedures.

## NEED FOR THE STUDY

It is the right time to garner the demographic dividend of our nation before it could turn out to be a demographic liability. **This paper has attempted to focus on few Human Resource Management (HRM) practices to groom entrepreneurship as the ultimate solution to harness the bubbling youth force.**

This is on the assumption that "Entrepreneurship is a mindset. It's opportunity-driven, not resource constrained". The academic definition is that 'it is the pursuit of opportunities regardless of the resources controlled'. Any firm can benefit from this mindset among their employees. If a company has a group of employees who can recognize opportunities, evaluate them, and then go after them while assembling the pieces they need as they go, then there is something to be gained. HRM is one of many resources that can be utilized in the development of entrepreneurial ventures.

## STATEMENT OF THE PROBLEM

India is projected to overtake China as the world's most populous nation by 2030. India's population growth has raised concerns that it would lead to widespread unemployment and political instability. Unless, steps are taken to reap the benefit of this demographic dividend, it may soon turn out to be a disaster to our fast growing economy.

## OBJECTIVES OF THE PAPER

1. To emphasize HRM Practices to garner the demographic dividend of the nation
2. To focus on intrapreneurship as a potential HRM tool to develop entrepreneurship in the long run
3. To throw light on Management Theory of Rosabeth Moss Kanter for increasing the employees efficiency
4. To highlight the conducive entrepreneurial climate existing in India

## LIMITATIONS OF THE STUDY

Secondary data collected from websites and e journals have been used to support the views and opinion of the authors.

## RESEARCH METHODOLOGY

A detailed and in depth descriptive analysis of the secondary data have been done.

## RESULTS & DISCUSSIONS

### 1. HRM PRACTICES TO GROOM ENTREPRENEURSHIP

It is important to understand the role of HRM in developing sustainable entrepreneurship and entrepreneurial ventures as well as how HRM practices and procedures can be used to help navigate or indeed drive the changing landscape in small and entrepreneurial firms. It is indeed argued by management experts: "growing evidence suggests that an inability on the part of some founders of new ventures to successfully manage HRM issues is an important factor in their ultimate failure". Therefore, it is also important to understand the contribution and roles, individuals, other than the individual entrepreneur or entrepreneurial team, play in the success or otherwise of the entrepreneurial venture and whether this changes at different stages in the venture's growth.

### INDIAN HRM IN TRANSITION

HRM is one of many resources that can be utilized in the development of entrepreneurial ventures. And entrepreneurship is a complex phenomenon involving multiple stakeholders, an array of inputs that can be combined in innumerable ways.

### 2. INTRAPRENEURSHIP AS AN EFFECTIVE HRM PRACTICE TO FOSTER ENTREPRENEURSHIP

Retention of employees who perform and deliver results is becoming a challenge these days. So, in order to retain creative and effective employees, a new approach has emerged. In enterprises, administrative culture is giving way to entrepreneurial culture. Well-established companies should learn to make use of the entrepreneurial talents within, to avoid stagnation and decline. Such persons are driven not by monetary gain but by a deep desire of personal achievement. Therefore companies should provide such people with adequate financial resources and the autonomy necessary for the development and application of their ideas.

An American management expert Gifford Pinchot suggested the creation of a system which will provide selected executives a status within the corporation similar to that of an entrepreneur in society. Such people are intra-corporate entrepreneurs or intrapreneurs.

The notion of intrapreneurship requires that managers inside the company should be encouraged to be entrepreneurs within the firm rather than go outside. For an entrepreneur to survive in an organization, he/she needs to be sponsored and given adequate freedom to implement his ideas, otherwise the entrepreneurial spark will die. The entrepreneur who starts his own business generally does so because he aspires to run his own show and does not like taking orders from others.

All corporations have the challenge of trying to infuse an entrepreneurial spirit into their workforces. As the theory goes, when employees act like entrepreneurs, they put themselves in the mindset of business owners with a bias for action, which results in good decisions and good outcomes.

The practice, however, is more difficult than the theory. To get employees to act like entrepreneurs, companies have often taken a structural approach. For example, Google and Microsoft organize into small units of 50 to 100 employees to maintain a sense of entrepreneurial spirit and eliminate bureaucracy. The trade-off is that small groups can create silos across units, leading to duplication of efforts and a squelching of synergy. But if a company chooses to organize in large functional groups to achieve maximum efficiency and scale, it risks creating behemoth departments that crush the natural entrepreneurial spirit that exists within its employees.

Internal entrepreneurship can be a clear option for HR development or personal career development when it is termed as a role or specific set of competences. Active career development or career management is often considered and propagated as a rational and well planned process based on conscious decisions. But career choices and decisions are in fact grounded on affective reasons and unconscious layers of the mind. Planning a career, specially on the long term, seems to make not too much sense in our rapid changing world.

## FOUR ESSENTIALS TO FOSTER INTRAPRENEURSHIP

There are four elements essential to fostering intrapreneurship— or internal entrepreneurship—within an organization, also known as "The Four Pillars of Organizational Greatness," coined by Cyndi Laurin and her co-author in "The Rudolph Factor: Finding the Bright Lights That Drive Innovation in Your Business."

1. **Leadership that allows decisions to be made at the lowest levels.** In other words, it requires having a leadership that is secure enough with itself that it can allow employees a voice to share ideas and the ability to implement viable ones.

2. **Having a culture that is fairly transparent.** Deals are not being made behind the scenes. People understand and respect the mission and vision, the executive staff has created and is engaged in its success.
3. **A political structure that closely resembles a democracy.** Our country was built upon these tenets; however, most organizations tend to operate as bureaucracies, dictatorships, or oligarchies. Generally, becoming a democratic organization requires an intentional consciousness -- and often times the assistance of outside eyes (consultants specializing in organizational political structures) to turn the ship, so to speak, to a more democratic nature.
4. **A reward structure that encourages all employees to contribute to the success of the overall organization.** One size does not fit all when it comes to motivational tactics and reward structures.

Intrapreneurship, therefore, is not an inborn virtue; it can and must be developed through proper training. Birth of an organisation to a large extent, depends upon entrepreneurial capabilities and farsighted vision of its promoters. But to gain competitive advantage, it is important to ensure optimum organisational performance. To attain this, a business may concentrate on any of the several performance enhancing interventions, but one thing that it cannot overlook in attaining this goal, is its workforce. It is the human resource of an organisation that sets and pursues its core objectives diligently. It is only the human resources that can either break the process of organisational excellence or consolidate it manifold.

To ensure that the human resource perceives opportunities and is able to bring about innovation, using the current base of organisational resources, it is important to imbue entrepreneurial traits in them. The process of developing these traits in employees of an organisation is termed as 'intrapreneurship'. It involves accelerating the management of resources and locating new performance - enhancing factors and avenues by making better use of skills and talents of the employees of an organisation. The training, therefore, brings the employees closer to the requirements of the organisation so that they strategise and redefine practices that deliver promising results.

The demanding and unpredictable corporate world, signal the need for grafting the process of continuous improvement within various systems. Intrapreneurs can act as propellers to growth here.

**Therefore, the management must help employees understand:**

- the entrepreneurial behaviour desired by the organisation
- their own innate ability to act entrepreneurially
- the incentives for acting entrepreneurially as well as the penalties for failing to do so

**Entrepreneurial motivation need to be:**

- innovative
- proactive

### 3. MANAGEMENT THEORY THAT ENCOURAGES ENTREPRENEURSHIP THROUGH HRM PRACTICES

**Management Theory of Rosabeth Moss Kanter:**

Rosabeth Moss Kanter has written extensively on the subject of change management. Kanter's management theory provides a framework that organizations may use to improve their efficiency.

Kanter's theory suggests that the way an organization operates is an integral component in how employees derive their attitudes and behaviors. The Moss Kanter theory proposes that employees exhibit different behaviors based upon whether certain structural supports were in place.

**The following precepts sum up the Management Theory of Rosabeth Moss Kanter:**

1. Kanter's theory states power is derived from formal and informal sources.
2. Staff requires access to resources to meet organizational goals.
3. Increase staff knowledge and skills and Rosabeth Moss Kanter believes they will then be more productive.
4. Communicate organizational goals as part of Kanter's change theory. Kanter's change theory states that information must be shared from the top down so that everyone is aware of organizational goals. Spreading knowledge and sharing ideas will lead to innovative ideas and collaboration from the staff.
5. Provide support to increase productivity according to the Moss Kanter management theory. Rosabeth Kanter defines support as receiving feedback from peers and management. Staff who feels they are supported by management will have a greater stake in the organization and will be more productive and happy than those who are not supported by management.

The power of training is as close to a universal truth as HR can get. Organizations that maintain a strong training curriculum, irrespective of the downswings of the global market, have always found an edge over their competitors in tough times. And it is through intelligently-developed training programmes, that employees develop the requisite capabilities and new skills to perform their own jobs and those roles higher up the ladder.

Indians are recognized as one of the most hardworking people in the world and since independence through our capability alone, we have built substantial access to the resources of the world information and technological know-how. There has been undeniable improvement in education and the outreach of secondary education has increased through correspondence courses, but a lot more is required. India needs to bring about a change that will garner the demographic dividend.

### 4. OTHER FACILITATING FACTORS CONDUCIVE FOR ENTREPRENEURSHIP DEVELOPMENT

#### THE CHANGING ROLE OF THE ENTREPRENEUR

India's economic growth rate went from 3.5% in the 1950s to over 9% in 2006, and one of the key factors that drove this growth was the changing role of the entrepreneur. In the 1950s and the '60s, businesses were viewed with hostility; this attitude towards entrepreneurs started changing with the cautious steps towards reform in the 1980s, the big bang economic shift of 1991, and the changes that reform and globalization have brought about since 2000. Today, India has among the world's largest pool of entrepreneurial talent, and Indian businesses have evolved from working in a constrained economy to competing in global markets.

With the rest of the world beating a path to India to cash in on the rapid economic growth and tap low-cost services, countless business opportunities have opened up in India.

#### THE PRESENT DEMOGRAPHIC PATTERN IN INDIA HAS ATTRACTED TWO GROUPS OF ENTREPRENEURS

Local residents who are eager to launch companies of their own; and entrepreneurs from overseas, often from the US, who see new opportunities emerging back home. The latter comprises the returning diaspora – people who left their native country to study abroad and seek greater opportunities elsewhere, but who are now interested in returning home, bringing with them the education, experience and, often, personal wealth they have acquired overseas. The combination of these two groups represents a potentially powerful teaming up of ideas, experience and funding that is already resulting in success stories. They have just gone sailing forward on the crest of the wave formed by the opportunities from business process outsourcing and the IT boom."

The entrepreneurship environment in India appears to be perfectly normal and widely practiced way of pursuing a career with the advantage in terms of entrepreneurship-oriented bodies such as the TiE network (The Indus Entrepreneurs) or Wadhvani Foundation, which seek to promote entrepreneurship by, among other things, organising workshops and seminars nationally. Founded by entrepreneur Romesh Wadhvani, the foundation funds various entrepreneurship education-related projects like the National Entrepreneurship Network (NEN), which brings together prestigious Indian higher education institutions and entrepreneurs.

With icon entrepreneurs such as Narayana Murthy, co-founder of Infosys, **a rapidly expanding young population will save more and inject entrepreneurial vigour that will lift the country to a faster growth trajectory.**

### RECOMMENDATIONS

#### TO SUM UP

- Entrepreneurship development is the potential tool to shape the surplus workforce as job providers, rather than as job seekers since entrepreneurship is the key to the development of any nation.

- As hope in India's future growth is founded on its demographic dividend, immediate efforts should be taken to use HRM principles to foster entrepreneurship development.
- Strategic HRM is crucial for innovation and entrepreneurship.
- Corporate entrepreneurship or Intrapreneurship, generally defined as entrepreneurship within the boundaries of an existing organization, should be widely advocated as a mean for organizational innovation and many other advantages at organizational as well as individual level.
- Kanter's Change management theory suggests that the way an organization operates is an integral component in how employees derive their attitudes and behaviors. The Moss Kanter theory proposes that employees exhibit different behaviors based upon whether certain structural supports were in place.
- The conducive Indian entrepreneurial climate - existence of iconic role models, with opening of numerous business opportunities and with the advantage in terms of entrepreneurship-oriented bodies such as the TIE network (The Indus Entrepreneurs) or Wadhvani Foundation, which seek to promote entrepreneurship, should be the potent facilitating factor for entrepreneurship development.

## CONCLUSION

If nurturing of entrepreneurship does not happen now, then not only would the nation fail to benefit from the demographic dividend but it shall also become home to the largest number of frustrated youth. Instead of development, there shall be unprecedented human capital flight. This would be an anti-climax in the truest sense of the term. India's growth will remain stagnant, if not deteriorate, at a time when brain-drain from India shall spur other economies of the world. To fulfill India's aspirations for a leading position in the global economy, the country will have to emerge as a key player in innovation, and this requires state-directed efforts in research and development. The biggest of all challenges for India as it tries to realize its demographic dividend is to ensure that it transforms its growing workforce into an inclusive and sustainable economic advantage.

As noted by India's Minister of Human Resource Development Kapil Sibal, 'it will be a dividend if we empower our young. It will be a disaster if we fail to put in place a policy and framework where they can be empowered'.

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**SELF-MEDICATION IN YOUTH: A SURVEY IN JAIPUR**

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**ABSTRACT**

To obtain baseline data on self-medication with over the counter drugs in Jaipur and moreover to gain information on variables that influence self-medication. The data was collected via face to face structured interview of respondents in pharmacies of Jaipur using structured questionnaire from February 2012 to March 2012. A sample of 273 patients was collected from the selected pharmacies. The individuals who came to the pharmacy to buy drugs were selected but those who came to buy medicines on behalf of others were excluded from the study. The results were based on the data captured from 273 respondents. Weakness and tiresome was the most common ailment suffered by 84.98% for which they usually take multivitamins. Headache was the second ailment for which 77.65 % respondents self-medicate followed by fever, cough and cold and others. The ailment for which respondents don't prefer much medicine was constipation. The study revealed that time constraint is the most influencing variable for self-medication and common family practice is the variable which influenced least for self-medication.

**KEYWORDS**

Over-the-counter medicines, Self-medication, Youth.

**INTRODUCTION**

The World Health Organization defines self-care as "what people do by them-self to keep their health, prevent and treat illness". The frame of self-care includes self-medication and responsible self-medication. Idvis Eltayeb *et al*, 2005 stated that self-medication is defined as the selection and use of medicines chosen by the patient for the treatment of symptoms that the patient has perceived by him. Self-medication is the use of over the counter medicines and a range of different alternatives medicines such as food supplements, herbal remedies and traditional products home remedies. Self-medication with drugs is an economical choice of treatment for common self-limiting illness. Barar, 2005 mentioned that over the counter drugs are forms of self-medication. Most of the people when they fall sick despite of consulting a physician they consult a pharmacist or friends, family and neighbors for medication. Kasilo OJ, 1991 stated that every patient has atleast two prescribers his own doctor and himself. While many have additional prescribers in the form of family, well-wishers doctors etc. Jones R.V.H, 1976 cited the common reasons for self-medication are inaccessibility of health care facilities, economic constraints and previous experience of illness. Mohamed Saleem T.K *et al*, 2011 found that self-medication tends to be higher with a higher education, those with intermediate income. He also stated that self-medication was more likely to be used than prescribed medication to treat headaches, fever, sore throats and tonics were more frequently without taking prescription. Al-Motassemet *al*, 2008 stated the most common reasons for self-medication were the ailments were to minor to see a doctor, long waiting time to be seen by doctors and avoiding cost of doctor's visit. Dedy Almasdy and Azmi Shariff (2011) stated that self-medication patterns differ among diverse population and are influenced by many factors such as gender, age, education knowledge etc. Hussain and Sawalha (2008) stated that lack of time was the main reason for self-medication. Kilwein, JH (1989), Dean K (1989), Lee A, *et al* (2001), Lau JT *et al* (2000), Sleath B *et al* (2001), Nancy V *et al* (1997), Somsen GA (1998) and Cocks M. Dold A (2000) stated that a considerable population practiced self-medication and it is affected by socio-demographic (age, gender, education etc.) and socio-economic factors.

**OBJECTIVES**

1. To obtain baseline data on self-medication with over the counter drugs.
2. To gain information on factors that influence self-medication.
3. To give ranking to the variables that influence practices of self-medication.

**METHODOLOGY**

The study was conducted in 60 pharmacies located in Jaipur between February 2012 and March 2012. Pharmacist in-charge were explained the need of the study and it was assured that the confidentiality of information will be maintained. Respondents were encouraged to participate in the study and the target number was 5 respondents per pharmacy.

Jaipur is the capital of Rajasthan with an estimated population of approximately 36 lakhs. The pharmacies of Jaipur were stratified in five major geographical areas: East, West, North, South and Center. Jaipur has approximately 150 pharmacies and 40% of the pharmacies were selected on random basis. The sample frame was defined as any respondent who suffered from any disease and visited any of the 60 pharmacies within vicinity of Jaipur. The respondents who were interviewed aged between 18 to 30 years. Where people asked for medicine on behalf of someone else were not included in the study.

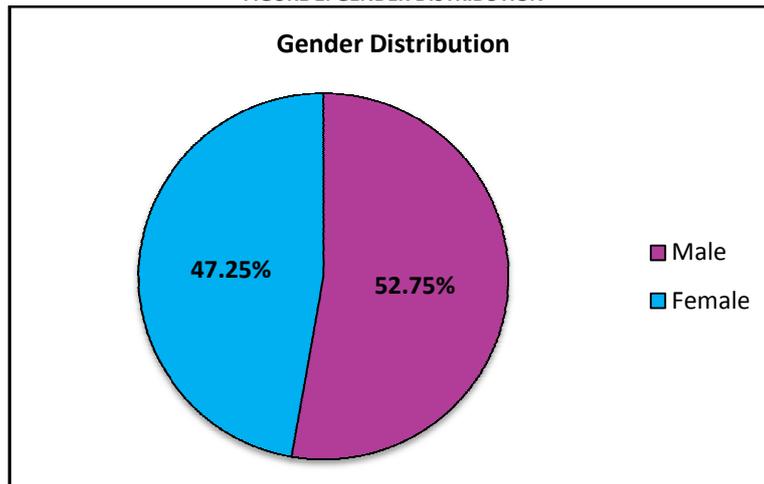
A questionnaire was developed using structured questionnaire. The questionnaire has three parts; Part A consisted of demographic data (gender, age, education level, whether studying working or non-working); Part B had information on the ailments that patient suffered mostly within last 30 days before day of interview and Part C emphasized on the reasons for self-medication. The questionnaire was distributed among 300 respondents out of which 273 were analyzed rest 15 were incomplete questionnaire as the respondents noticed certain difficulty in answering and 12 respondents didn't practice self-medication at all.

**DATA ANALYSIS AND INTREPRETATION**

The demographic factors like differentiation of gender, classification of age, education level of respondents, occupation of the respondents, different ailments were analyzed using bar charts and pie charts. The impact of the variables was analyzed using scaling technique. Likert-type Scales was used to analyze the impact of variables and on self-medication. It consisted of a number of statements which expressed either a favorable or unfavorable attitude towards the given statement to which the respondent were asked to reply. The respondent indicated his degree of agreement or disagreement with each statement in the instrument. Each response was given a numerical score, indicating its favorableness or un-favorableness, and the scores were then summed to measure the

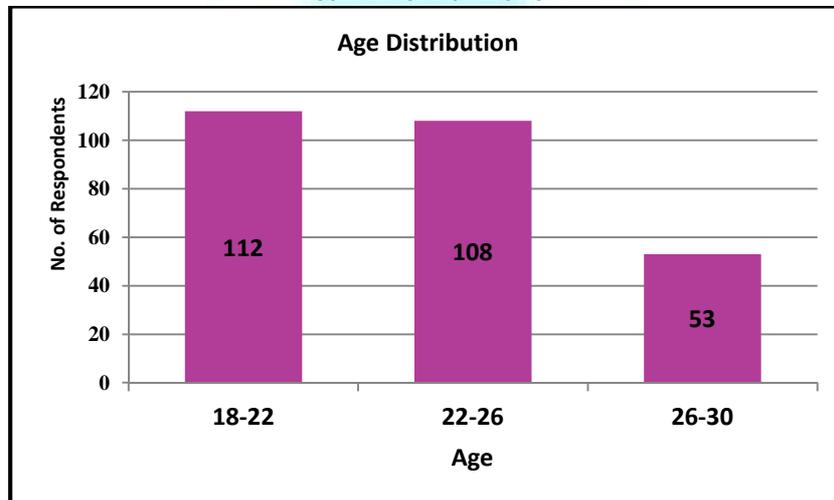
respondent's attitude. In other words, the overall score represents the respondent's position on the continuum of favorableness and un-favorableness towards an issue.

FIGURE 1: GENDER DISTRIBUTION



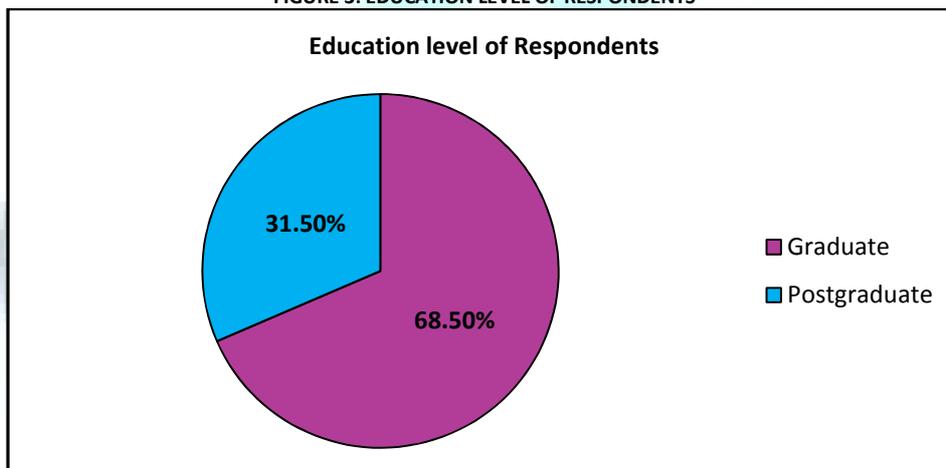
The total pharmacies that were included for study were 60 out of 150 (40%), and out of 300 questionnaires 273 respondents' questionnaires were analyzed. Of the total sample 144 i.e. 52.75% were men and remaining 129 i.e. 47.25% were females.

FIGURE 2: AGE DISTRIBUTION



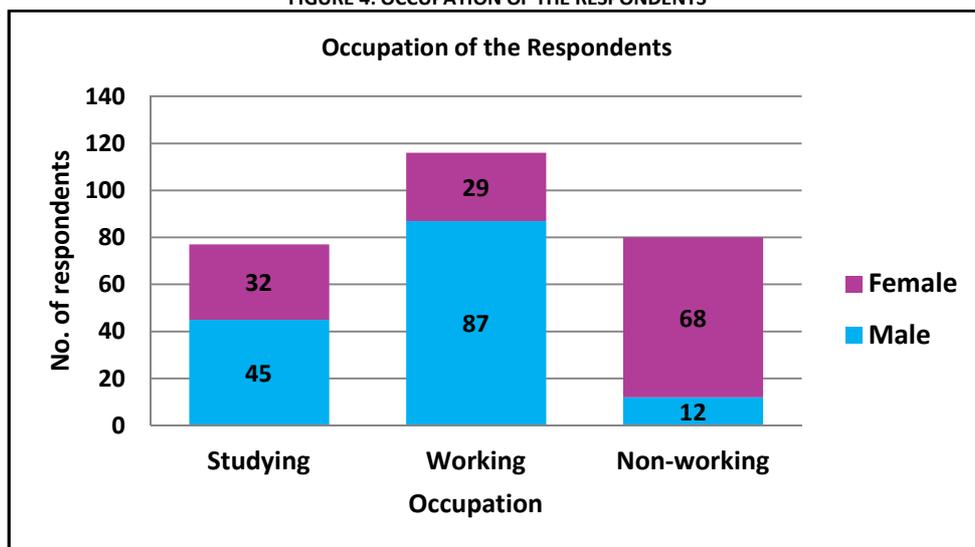
The age distribution of 273 respondents is shown in Figure 2. 112 (41.03%) respondents belonged to the age group of 18-22 years, 108 (39.56%) were between 22-26 years and remaining 53 (19.41%) were in the age group of 26-30 years.

FIGURE 3: EDUCATION LEVEL OF RESPONDENTS



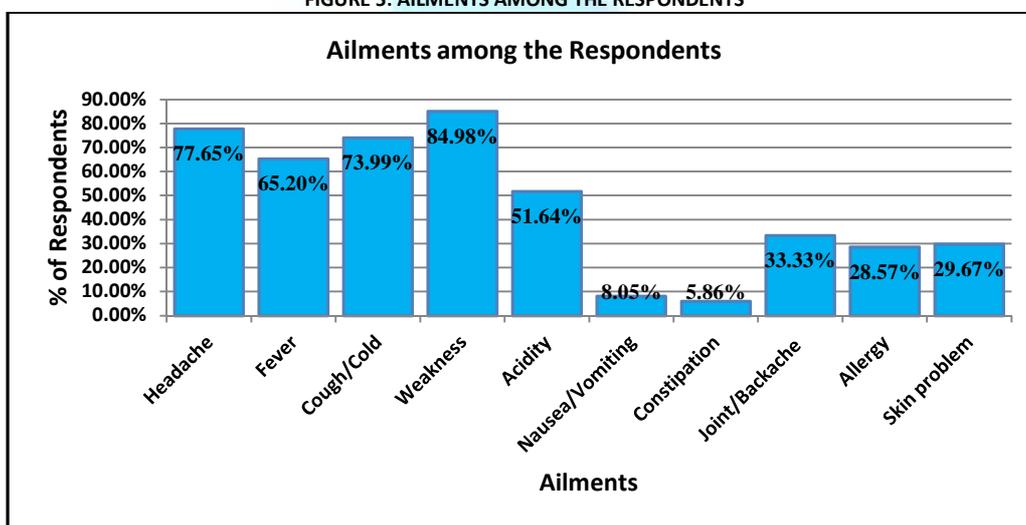
The data was collected from literate people and among them two levels of education was taken, Graduates which represented 68.50% (187 respondents) of the sample and Post-graduates were 31.50% (86 respondents) of the sample.

FIGURE 4: OCCUPATION OF THE RESPONDENTS



The occupation of the respondents was studied. There were 77 students out of which 32 were females and 45 were males, 116 respondents were working which had 87 males and 29 females, 80 were non-working which had maximum females i.e. 68 and 27 males. The respondents who were non-working were students who were waiting for their results.

FIGURE 5: AILMENTS AMONG THE RESPONDENTS



These days due to hectic work schedules people are not able to give time to their health and moreover cause of impurities in food proper nutrition is not reached to the body and weakness/ tiresome is always there. When asked from the respondents that for which ailment they maximum visited pharmacy store their reply was weakness/tiresome suffered by 232 respondents followed by headache suffered by 212 respondents. Common cough and cold was suffered by 202 respondents followed by fever suffered by 178 respondents. Acidity was the 5<sup>th</sup> common ailment suffered by 141 respondents the reasons being sifting towards junk foods. Joint pain and backache was suffered by 91 respondents. Common skin ailments like sunburn, pimples etc. was suffered by 81 respondents for which they visited their nearby pharmacy store. Allergy was also among the ailments suffered by 78 respondents. Nausea/vomiting and constipation were the ailments for which respondents rarely visited pharmacy stores; the count of the respondents was 22 and 16 respectively.

TABLE 1: SELF-MEDICATION VARIABLE

	LIKERT SCALE					Weighted Score	Total Score	Percentile	Rank
	1	2	3	4	5				
Common Family Practice	20	63	43	72	75	938	1365	68.72%	5
Safe to use	26	40	53	81	73	954	1365	69.89%	4
Lack of time	23	41	45	73	91	987	1365	72.30%	1
Media influence	24	39	56	73	81	967	1365	70.84%	3
Confidence in medication	19	42	59	65	88	980	1365	71.79%	2

Self-medication practice was very common among the youth of Jaipur. As per the response 72.30 % percentile respondent feel that lack of time was the major variable which influenced people for self-medication. When asked with patients informally they said that the time spent in travelling to see a doctor, the time spent in the waiting area to visit a doctor is very much. Nowadays people are very busy in their life and they have no time to visit doctor for these common illness. They prefer to ask pharmacist about the medicines for these common illness.

In the response of second parameter 71.79 % percentile respondent admitted their confidence in self-medication was reason for their self-medication. People these days are getting conscious about their health and self-care. They prefer to have good knowledge about medicines that help them to improve their health and even help them to take care of their health at the time of common illness. They keep medicines at home so that they can take them at the time of illness. They were very confident about their self-medication practices which they had been practicing.

As per the third parameter, 70.84 % percentile respondent said the media influence is also a major influencing variable for self-medication. Media these days is penetrating everywhere, in all sectors. The frequency of OTC medicines advertisements has been increasing since a decade. These advertisements aware people about different products launched in the market might be in any sector. These advertisements also aware people about different medicines launched in market which help people for self-medication and self-care. These advertisements influence people to practice self-medication.

With the 69.89 percentile respondents feel that OTC medicines are safe to use than prescription drugs. The prescription medicines have more adverse effects on body rather than over-the-counter drugs. Respondents have a feeling of safety to use over-the-counter medicines.

The last parameter where 68.72 percentile respondents said that practicing self-medication is their common family trend. Their family members influence them to practice self-medication and they even get the knowledge of medication from their relatives, parents and siblings.

## CONCLUSION

The prevalence of self-medication with over-the-counter drugs in Jaipur, Rajasthan is high but, this cannot reflect the trends in whole Rajasthan state. Self-medication tends to be higher among the youth with higher educational qualification and intermediate income. Disprin, Paracetamol and other NSAIDs were drugs commonly used for self-medication. Self-medication was more likely to be used than prescribed medicine to treat weakness, headache, fever, acidity, cough and cold etc. Bearing in mind the high practice of self-medication campaigns must be carried out to educate the population about the use of many medicines available in the market. The health care professionals, specially physician and pharmacist must take an active participation to educate people about self-medication.

Future studies can be done with more variables with socio-demographic and socio-economic factors. The same study if conducted in rural areas will render different results.

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**CUSTOMERS' PERCEPTION TOWARDS SERVICE QUALITY OF INTERNET BANKING SERVICES IN  
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COIMBATORE****ABSTRACT**

Internet banking is a result of explored possibility to use internet application in one of the various domains of commerce. It is difficult to infer whether the internet tool has been applied for convenience of bankers or for the customers' convenience. But ultimately it contributes in increasing the efficiency of the banking operation as well providing more convenience to customers. For analyzing customer's perception towards Internet Banking (IB) service quality in Coimbatore district one hundred and twenty consumers using internet banking were selected randomly and they were personally interviewed. The gaps analysis results shows there are no gaps existed with respect to the attributes such as information content and text easy to understand, queries taken seriously, quick complaint resolving, appearance of the website, clarity of website, customer can rely on bank for not misusing their information and language of the website. However, Customer's were not satisfied with respect to the attributes such as Links are problem free, accurate and pages download quickly, accurate information about product and prompt services, bank provides updated technology regularly for I- banking, web page do not freeze after putting all the information, easy to approach and contact bank, easy to find policy and notice statement on the bank site, easy to use, bank provides financial security and confidentiality. So there is need to formulate strategy to solve these problems.

**KEYWORDS**

Factors influencing, Internet Banking, Service quality.

**INTRODUCTION**

The emergence of new private-sector banks, expansion by the foreign banks, the changing business model of the nationalized banks compounded by the financial sector reforms and the burgeoning middle class, have, over the last 10 years, completely transformed the way banks in India operate. Some of the world-renowned foreign banks who have historically had a presence in India also started to expand their business in India, particularly in the area of retail banking, where a burgeoning middle class of almost 200 million people offer an enormous business opportunity. Therefore, both businesses and the masses of India have been exposed to a variety of banking services at different levels. Internet banking is the term used for new age banking system. Internet banking is also called as online banking and it is an outgrowth of Personal Computer banking. Internet banking uses the internet as the delivery channel by which to conduct banking activity, for example, transferring funds, paying bills, viewing checking and savings account balances, paying mortgages and purchasing financial instruments and certificates of deposits (Haque *et al.*, 2009). There are many advantages of online Banking. It is convenient, it isn't bound by operational timings, there are no geographical barriers and the services can be offered at a minuscule cost. Internet banking has experienced explosive growth and has transformed traditional practices in banking (Gonzalez *et al.*, 2008).

**REVIEW OF LITERATURE**

Broadie *et al.* (2007) predicted the Internet banking is leading to a paradigm shift in marketing practices resulting in high performance in the banking industry. Banking customers get satisfied with the system when it provides them maximum convenience and comfort while transacting with the bank. Internet enabled electronic system facilitate the operation to fetch these result. Christopher *et al.* (2006), opined that Internet banking has become an important channel to sell the products and services and is perceived to be necessity in order to stay profitable in successful. An in-depth analysis would help to understand that internet enabled electronic banking system differentiates from traditional banking operation through faster delivery of information from the customer and service provider. Additionally, it has to be noted that the banking operations does not transfer physical currencies instead it transfer the information about the value for currencies.

Yang *et al.* (2004) identified five online service quality dimensions (responsiveness, reliability, competence, access and security) and their relationships with the customer satisfaction. Agarwal and Gupta (2005) have attempted to develop a multilevel-multidimensional model, SERVQUAL (Service Quality) model of service

quality. The results showed that service quality of foreign banks and new private banks was comparatively much better than those of government banks. The reason was that these banks operated in a selected market and offered selected services along with the fact that the customers were valued. Jayawardhena (2007) showed that service quality in e-banking could be measured using 21 parsimonious measures spread across five dimensions viz., access, website interface, trust, attention and credibility. Joseph et al., (2006) investigated the influence of internet on the delivery of banking services. They found six underlying dimensions of e-banking service quality such as convenience and accuracy, feedback and complaint management, efficiency, queue management, accessibility and customization.

Parasuraman et al. (1985) studied the measurement of service quality, and then explored its impact on customer satisfaction and firm performance. The principal measure of service quality attempted to measure the gap between customer expectations and perceived actual service performance in terms of five dimensions relating to product and process (namely reliability, responsiveness, assurance, empathy and tangibility). Of these dimensions, the first four related to the element of human interaction/intervention in the service delivery. Their inclusion had been validated by numerous studies which highlighted the importance of the customer interface in determining service quality.

**IMPORTANCE OF THE STUDY**

Customers have started perceiving the services of bank through internet as a prime attractive feature than any other prime product features of the bank. Customers have started evaluating the banks based on the convenience and comforts it provides to them. Bankers have started developing various product features and services using internet applications. Sangaran (2001) found that change is required in the attitude of bankers to adopt Internet banking. The banks have to develop a sound strategy before implementing Internet banking in order to compete in the global market place.

I-banking has also affected the customers' expectations as they prefer to deal with the banks that offer, efficient and innovative services. To face and survive in this cutting edge competition, the banks have to deliver better services to the customers because it is only a customer who can evaluate the quality of services. Hence the services quality has to meet the customer's specifications and expectations. The banks must know what type of services the customers expect to have and then accordingly serve them the products and services that fulfill their expectations. The banks should be ready to accept changes otherwise their survival will become difficult in the competitive world. Therefore, there is a need to evaluate the customers perception regarding the internet banking services to improve the services if they are not up to their expectations.

Many Banks are providing internet banking services to their customers to increase customer turnover through delivering a wide range of value added products and services. In this regard, knowing the expectation and perception level of the customers on internet banking services provided by them would in turn help the banks to have thorough knowledge on their customers' needs.

**OBJECTIVES OF THE STUDY**

The broad objective of the study is to evaluate the service quality of internet banking services provided by bank from the customer's perspective.

The specific objectives are;

1. To examine the perception of bank customers on the service quality of internet banking services; and
2. To identify the measures for improving service quality of net banking services.

**RESEARCH METHODOLOGY**

To collect the required information, an interview schedule was prepared based on the literature reviewed on the important attributes of service quality and in depth discussion with the users. A total of 26 items were generated representing all important aspects of service quality as well as attributes of internet users and need of customers. A total of 120 consumers using internet banking were selected randomly in Coimbatore district. The primary data were collected from the users who using internet banking by personal interview during 2010-11. Secondary data for the studies were collected from several published and unpublished sources. The data collected were analyzed by using statistical tools like percentage analysis, Garrett ranking and gaps analysis.

**SERVQUAL METHOD (GAP ANALYSIS)**

To analyze the service quality of internet banking a set of questions about the services of Internet Banking was developed based on the SERVQUAL instrument. The statement developed is given in Table. 1. The attributes of reliability, responsiveness, efficiency, user friendly, tangibles, accessibility and privacy represents quality of Internet Banking services.

**TABLE 1: SERVICES PROVIDED**

Attributes	Statements
<b>Reliability</b>	Accuracy of information Functionality of webpage Links are problem free, accurate and pages download quickly Information content and text easy to understand
<b>Responsiveness</b>	Queries taken seriously Quick complaint resolving Accurate information about product and prompt services Knowledge and skill of the contact person
<b>Efficiency</b>	Bank site easy to navigate Speed of login account is fast Speed of logout account is fast Easy to find policy and notice statement on the bank site
<b>Privacy/security</b>	Customer can rely on bank for not misusing their information Bank provides financial security and confidentiality. Bank site secured for credit card information Bank site easy to navigate and simple to use
<b>Tangibles</b>	Appearance of the website Easy to use Clarity of website
<b>User-friendly</b>	Language of the website Information about transaction and product Personalization of the bank site for customer personal requirement Bank authority care to listen and meet personal needs of customers.
<b>Accessibility</b>	Bank site unrestricted to access to all financial information Bank provides updated technology regularly for Internet banking Web page do not freeze after putting all the information Easy to approach and contact bank

One of the aims of this study involves the use of SERVQUAL instrument in order to ascertain any actual or perceived gaps between customer expectation and satisfaction of the service offered. Service quality is analyzed considering the extent to which a service meets customers' needs or expectations.

**GARRETT RANKING TECHNIQUE**

This technique was used regarding suggestion to make customers aware of internet banking. The sample respondents were asked to rank each factors and the data were analyzed. The Garrett's Ranking Technique was adopted by using the following formulae

$$\text{Percent Position} = 100 (R_{ij} - 0.05) / N_i$$

Where,

$R_{ij}$  = Rank given to  $i^{\text{th}}$  attribute by  $j^{\text{th}}$  individual.

$N_i$  = number of factors ranked by  $j^{\text{th}}$  individual

By referring to the table given, the percent position estimated was converted into score for each factor and the score of various respondents was added and mean score value was calculated. The means scores values were arranged in a descending order. The factor to highest mean score was considered to be the most important.

**RESULTS AND DISCUSSION**

The consumer's wants and abilities changes with the age. Age is an important demographic variable to understand the needs of different types of the consumers.

**TABLE 2: AGE WISE DISTRIBUTION OF THE RESPONDENTS**

S.No	Age Group (years)	No of respondents	Percentage to total
1.	<20	6	5.00
2.	21-30	51	42.50
3.	31-40	30	25.00
4.	41-50	26	21.66
5.	>50	7	5.84
	<b>Total</b>	<b>120</b>	<b>100.00</b>

Source – Primary Data

From the Table 2 it could be inferred that majority of the respondents (43 per cent) belonged to age group of 21- 30 years followed by age group of 31-40 years (25 per cent). Hence it could be concluded that majority of the respondents were young and middle aged persons.

**FACTORS IMPORTANT IN ADOPTING INTERNET BANKING**

Six different factors, which are likely to influence the adoption of Internet banking was analyzed and the results are presented in Table 3.

**TABLE 3: FACTORS IMPORTANT IN ADOPTING INTERNET BANKING**

Factors	Least important	Less important	Neutral	Important	Very important	Mean	Rank
Better access	0(0.00)	1(0.83)	10(8.33)	50(41.67)	59(49.17)	<b>4.39</b>	<b>I</b>
Better price	0(0.00)	11(9.17)	26(21.60)	53(44.17)	30(25.00)	<b>3.85</b>	<b>II</b>
Higher privacy	7(5.83)	28(23.33)	41(34.17)	32(26.66)	12(10.00)	<b>3.11</b>	<b>III</b>
Better service	1(0.87)	44(36.67)	40(33.33)	27(22.50)	8(6.67)	<b>2.98</b>	<b>IV</b>
Marketing efforts	7(5.83)	46(38.33)	34(28.33)	34(28.33)	1(0.83)	<b>2.78</b>	<b>V</b>
Recommendations	8(6.67)	47(39.17)	34(28.33)	27(22.50)	4(3.33)	<b>2.77</b>	<b>VI</b>

(Figures in parentheses represent percentage to the total)

Source – Primary Data

According to the respondents the most important factor in starting to use Internet banking was better access to the services (convenience), followed by better price and higher privacy. Better service (i.e. preferring self service over office service) was also above the average importance.

**SERVICE QUALITY GAP OF INTERNET BANKING**

Customer satisfaction for the services is largely a function of perception and expectations of the services provided. If customer expects a certain level of service and service provided by the bankers fails to match the customer expectations, the service would be perceived as poor. Dissatisfaction with services provided largely stems from the difference between expectations and perception about what is actually provided. This is the basic premise for understanding the gaps that arises in customer service. In this study, the quality of service was measured with respect to eight dimensions namely reliability, responsiveness, accessibility, privacy/security, tangibles, efficiency, user-friendly, The 26 statements about service quality has been used to analyze the expectation and satisfaction of the customers and gaps are analyzed.

The gaps analysis of the every item of the internet banking service quality was studied by comparing the expectation mean score and the perception mean score of each of those items. If the gap is positive and high, then services provided did not meet the expectation of the customer, leading to dissatisfaction. If the gap is negative, the service provided was greater than the expectation of the customers; hence the customers were more satisfied. T-test was done to verify whether the gap is statistically significant or not. The results of gaps analysis of the respondents are shown in the Table 4.

TABLE 4: SERVICE QUALITY GAP OF INTERNET BANKING (n=120)

S.No	Statements	Expectation Mean score (E)	Perception mean score (S)	Gap (E-S)	T value
<b>Reliability</b>					
1.	Information provided is accurate	3.74	4.00	-0.26	-2.61*
2.	Functionality of webpage	3.13	4.21	-1.08	-11.05**
3.	Links are problem free ,accurate and pages download quickly	4.16	2.53	1.63	14.01**
4.	Information content and text easy to understand	3.85	4.36	-0.51	-1.13ns
<b>Responsiveness</b>					
5.	Queries taken seriously	3.99	4.10	-0.11	-1.02ns
6.	Quick complaint resolving	3.93	4.06	-0.13	-1.12ns
7.	Accurate information about product and prompt services	4.27	3.81	0.46	3.75**
8.	Knowledge and skill of the contact person	2.74	4.04	-1.30	-10.49**
<b>Accessibility</b>					
9.	Bank site unrestricted to access to all financial information	3.97	4.27	-0.30	-2.62**
10.	Bank provides updated technology regularly for I- banking	3.98	2.82	1.16	10.67**
11.	Web page do not freeze after putting all the information	4.28	2.95	1.33	11.30**
12.	Easy to approach and contact bank	4.33	3.21	1.12	9.62**
<b>Efficiency</b>					
13.	Bank site easy to navigate and simple to use	4.03	4.28	-0.25	-2.57*
14.	Speed of login account is fast	3.64	4.11	-0.47	-3.80**
15.	Speed of logout account is fast	3.40	4.01	-1.08	-5.01**
16.	Easy to find policy and notice statement on the bank site	4.21	3.08	1.13	10.58**
<b>Tangibles</b>					
17.	Appearance of the website	3.73	3.91	-0.18	-1.52ns
18.	Easy to use	4.13	2.58	1.55	14.93**
19.	Clarity of website	4.54	4.65	-0.11	-1.62ns
<b>Privacy/security</b>					
20.	Customer can rely on bank for not misusing their information	4.22	4.34	-0.12	-1.52ns
21.	Bank provides financial security and confidentiality.	4.45	3.27	1.18	10.48**
22.	Bank site secured for credit card information	4.23	2.70	1.53	14.59**
<b>User-friendly</b>					
23.	Language of the website	4.38	4.39	-0.01	-0.09ns
24.	Information about transaction and product	3.74	4.10	-0.36	-3.59**
25.	Personalization of the bank site for customer personal requirement	4.08	3.06	1.02	10.25**
26.	Bank authority care to listen and meet personal needs of customers.	4.39	2.87	1.52	13.66**

(NS- Non significant, \*\*- significant at 1per cent level, \* - significant at 5 per cent level)

Source – Primary Data

From the Table 4, it could be noted that among the 26 items, 7 items namely Information content and text easy to understand, Queries taken seriously, Quick complaint resolving, Appearance of the website, Clarity of website, Language of the website, Customer can rely on bank for not misusing their information were not statistically significant and there was no service quality gaps existing in above items. Remaining 19 items were significant and implied that a gaps existed in these attributes.

The gap analysis results showed that the perception and the expectation of the respondents were perfectly matching and there exist no gaps with respect to the attributes such as information content and text easy to understand, queries taken seriously, quick complaint resolving, appearance of the website, clarity of website, customer can rely on bank for not misusing their information and language of the website.

The customers were over satisfied than their expectation with respect to the attributes such as information provided is accurate, functionality of webpage, knowledge and skill of the contact person, bank site unrestricted to access to all financial information, bank site easy to navigate and simple to use, speed of login account is fast, speed of logout account is fast and information about transaction and product.

The customers were not satisfied with respect to the attributes such as links are problem free ,accurate and pages download quickly, accurate information about product and prompt services, bank provides updated technology regularly for Internet banking, web page do not freeze after putting all the information, easy to approach and contact bank, easy to find policy and notice statement on the bank site, easy to use, bank provides financial security and confidentiality, bank site secured for credit card information, personalization of the bank site for customer personal requirement, bank authority care to listen and meet personal needs of customers and there exist large gap to be bridged by the firm here.

Hence the strengths of the banks in Internet Banking services are information content and text easy to understand, queries taken seriously, quick complaint resolving, appearance of the website, clarity of website, customer can rely on bank for not misusing their information and language of the website. On the other hand the weaknesses lies in the attributes such as problem free links, easy to use, bank site secured for credit card information, bank authority care to listen and meet personal needs of customers.

**RESPONSE REGARDING SUGGESTION TO MAKE THE CUSTOMERS AWARE OF INTERNET BANKING**

The respondents were asked about suggestion regarding how to make the customers aware of internet banking services and the details are presented in the Table 5.

TABLE 5: RESPONSE REGARDING SUGGESTIONS TO MAKE THE CUSTOMERS AWARE OF INTERNET BANKING

S. No	Suggestions	Least important	Less important	Neutral	Important	Very important	Mean Score	Rank
1.	Information/demo at the counter	28	27	31	19	15	394	I
2.	Demo –fair regarding I- banking	39	20	11	23	27	381	II
3.	Personal contact programs	19	31	28	11	31	356	III
4.	Conduct more training programs for bank customers	23	19	23	28	27	343	IV
5.	More advertisement	11	23	27	39	20	326	V

Source – Primary Data

From Table 5. it was found that Information/demo at the counter is the most preferred solution to make them aware of internet banking, followed by the demo - fairs on Internet banking personal contact programs. Therefore, one can conclude that the bank make personal contacts with demo at the counter and any other information should make more and more customers aware of the internet banking services.

**SUGGESTIONS**

To sum up, the banks need to redesign their Internet banking business strategies to incorporate specific plans to promote their bank and its services. Bank has to simplify the text of the information as much as possible so that it can be easily understood by less educated people too. Customers have to provide separate customer mail id so there is no need to visit the banks personally in case of any problem/complaints and through their mail itself they can file up their complaints and needs. Bank has to provide accurate and problem free links so that customers can easily download the files. This is possible by removing the unwanted file from the web page. Then distinguish the activities in main and sub main activities. Banks have to use improved and updated technologies to reduce fraudulent and hacking. They can use online fingerprint identification or digital signature technologies to reduce fraudulence regarding cash transaction through customers' accounts. Banks have to provide information /demo at the counter to the customer for creating awareness of internet banking. They can also conduct demo fares, personal contact programs and conducting training programs for bank customers on I- banking. Through demo fairs bankers have to give assurance that customer money is safe with them. Banks have to update notice (regarding any information/scheme/policy/ changed rate etc.) in advance and they also have to highlight those notices on web page so that customer can easily go through it. Bank has to make people aware to avoid using online banking in public places so that they can avoid MITM like frauds.

**CONCLUSION**

The younger the age group, the use of I-Banking services are more because the younger are more technology savvy and prefer to use technological products that saves more of their time .While the older generation prefer traditional banking because they don't trust Internet Banking. Better access, price of Internet Banking and higher privacy of customer account information influencing more in adaptation of Internet Banking Services. There exist no gaps with respect to the attributes such as information content and text easy to understand, queries taken seriously, quick complaint resolving, appearance of the website, clarity of website, customer can rely on bank for not misusing their information and language of the website.

The customers were over satisfied than their expectation with respect to the attributes such as information provided is accurate, functionality of webpage, knowledge and skill of the contact person, bank site unrestricted to access to all financial information, bank site easy to navigate and simple to use, speed of login account is fast, speed of logout account is fast and information about transaction and product.

Customer were not satisfied with respect to the attributes such as Links are problem free, accurate and pages download quickly, accurate information about product and prompt services, bank provides updated technology regularly for I- banking, web page do not freeze after putting all the information, easy to approach and contact bank, easy to find policy and notice statement on the bank site, easy to use, bank provides financial security and confidentiality, bank site secured for credit card information, personalization of the bank site for customer personal requirement, bank authority care to listen and meet personal needs of customers so there is need to formulate strategy to solve these problems.

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## ECONOMIC PERSPECTIVE OF CHILD LABOR - IT'S IMPLICATIONS AND PREVENTIVE MEASURES: A STUDY ON UNORGANIZED SECTOR IN VISAKHAPATNAM, A.P., INDIA

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### ABSTRACT

*There are about six core child laborers in India. Irrespective of the presence of various Govt. policies, laws for the protection of children from labor, abuse, still children are working everywhere in the unorganized sector. Hence, there is a need to focus on child labor issue. Visakhapatnam is a port and steel city attributed as very fast growing in south Asia. The population of the city has been increasing immensely in the recent times due to migration of poor families from other parts of the region. They are mainly daily labor or rather employees in unorganized sector and forcing their children to work due to economic compulsions of their families. Therefore a study has been initiated on child labor with main focus on unorganized sector with a sample of 60 child laborers. A pre structured questionnaire (divided into three parts and meant for child laborers, their parents and owners as well) has been used with specific objectives of understanding the problem of child labor in India and abroad as well; to study the Govt. policies, laws and measures to eradicate the problem of child labor and to give suggestion at the end of the paper. The data collected for the study has been tabulated and analyzed with the help of SPSS 13 version and used to test the hypothesis that there is no significant difference in the dimensions "To earn money and study", Problem with Present Work, "Physical Problem and Abuse at present Work among different demographic factors of child labor and significant impact of Family Income on the dimensions of child labor. The study infers that there is significant impact of income on the above dimensions and there is significant difference in the dimension "To earn money and study" among different demographic factors of child labor.*

### KEYWORDS

Child Abuse, Hazardous Work, Child Labor in non-agricultural informal sector, economic compulsions of child labor.

### INTRODUCTION

The future of working children is ruined as they will not be able to attend schools and get educated for a better future. But when one considers the economic compulsions of the families which force the children to work, one will be compelled to admit that elimination of child labour will be a distant dream as long as the socio-economic status of these families is not improved. The prevalence of child labour reflects very badly on society that is not able to stop this evil. But in a society where many households may have to suffer the pangs of hunger if the children are withdrawn from work, these families have to send their children to work, even if the future of these innocents is ruined, as that is the only choice open for them to survive in this world. Therefore, unless the socio-economic status of the poor families is improved, India has to live with child labour. Some 180 million children aged 5-17 (73 per cent of all child laborers) are now believed to be engaged in the worst forms of child labor, comprising hazardous work and the unconditional worst forms of child labor. This amounts to one child in every eight in the world. Of the some 171 million children engaged in hazardous work, nearly two-thirds are under 15 years of age and therefore require immediate withdrawal from this work and rehabilitation from its effects. While 67 million children in the 5-14 age group are engaged in nonhazardous child labor that they should not be undertaking by virtue of their age, many more children (111 million) are involved in work that actually jeopardizes their well-being. Among older children aged 15-17 years (who are above the minimum age for employment), the estimates indicate that 59 million are involved in hazardous work. The present study is conducted with the objectives of understanding the problem of child labor in India and abroad as well; to study the Govt. policies, laws and measures to eradicate the problem of child labor and to give suggestion in this regard.

### CHILD LABOUR: WORLD SCENARIO

In the early days of the Industrial Revolution, factory owners in the United States employed child workers. In Britain, child labor became a major issue in the 19th century and eventually legislation was passed that brought it to an end. In Bangladesh, the volume of child labor is so high, near about 4.7 million children, of 5-14 years of age were economically active and percentage of labor force participation rate was 13.4 in the year 2002-03. On the other hand, the figure of informal activities of children is higher than above figure. If we compare with South-Asia, our labor forces participation rate is higher than rest of the nations. So policy maker should concentrate to ameliorate education of children and reduce child participation (reduce in number) in economic activity as well as unpaid work. Millions of children in today's world undergo the worst forms of child labor which includes Child Slavery, Child prostitution, Child Trafficking, Child Soldiers. In modern era of material and technological advancement, children in almost every country are being callously exploited. The official figure of child laborers worldwide is 13 million. But the actual number is much higher. Of the estimated 250 million children between the ages of 5 and 14 who are economically active, some 50 million to 60 million between the ages of 5 and 11 are engaged in intolerable forms of labor. Among the 10 to 14-year-old children the working rate is 41.3 per cent in Kenya, 31.4 per cent in Senegal, 30.1 per cent in Bangladesh, 25.8 per cent in Nigeria, 24 per cent in Turkey, 17.7 per cent in Pakistan, 16.1 per cent in Brazil, 14.4 per cent in India, 11.6 per cent in China. United Nations estimate that there were 20 million bonded child laborers worldwide. Based on reliable estimates, at least 700,000 persons to 2 million, especially girls and children, are trafficked each year across international borders. Some one million children enter the sex trade, exploited by people or circumstances. At any one time, more than 300,000 children under 18 - girls and boys - are fighting as soldiers with government armed forces and armed opposition groups in more than 30 countries worldwide. ILO estimates that domestic work is the largest employment category of girls under age 16 in the world.

### CHILD LABOR IN INDIA

Poor Children in India begin working at a very young and tender age. Many children have to work to help their families and some families expect their children to continue the family business at a young age. India has the dubious distinction of being the nation with the largest number of child laborers in the world. The child laborers endure miserable and difficult lives. They earn little and struggle to make enough to feed themselves and their families. They do not go to school; more than half of them are unable to learn the barest skills of literacy. Poverty is one of the main reasons behind this phenomenon. The unrelenting poverty forces the parents to push their young children in all forms of hazardous occupations. Child labor is a source of income for poor families. They provide help in household enterprises or of household chores in order to free adult household members for economic activity elsewhere. In some cases, the study found that a

child's income accounted for between 34 and 37 percent of the total household income. In India the emergence of child labor is also because of unsustainable systems of landholding in agricultural areas and caste system in the rural areas. Bonded labor refers to the phenomenon of children working in conditions of servitude in order to pay their debts. The debt that binds them to their employer is incurred not by the children themselves but by their parent. The creditors cum employers offer these loans to destitute parents in an effort to secure the labor of these children. The arrangements between the parents and contracting agents are usually informal and unwritten. The number of years required to pay off such a loan is indeterminate. The lower castes such as dalits and tribal make them vulnerable groups for exploitation.

### UNORGANIZED SECTOR IN INDIA

Unorganized sector has a crucial role in our economy in terms of employment and its contribution to the National Domestic Product, savings and capital formation. Unorganized sector refers to those enterprises whose activities or collection of data is not regulated under any legal provision or do not maintain any regular accounts. The informal sector on the other hand can be considered as a sub-set of the unorganized sector. As per the National Sample Survey Organization (NSSO) 1999-2000, out of total workforce of 397 million, only 28 million workers are employed in the organized sector and remaining in the unorganized sector. As per survey, there were 44.35 million enterprises and 79.71 million workers employed thereof in the non-agricultural informal sector of the economy. Among these 25.01 million enterprises employing 39.74 million workers were in rural areas whereas 19.34 million enterprises with 39.97 million workers in the urban area. Among the workers engaged in the informal sector, 70.21 million are full time and 9.5 million part times. Percentage of female workers to the total workers is 20.2 percent. About 370 million workers constituting 92% of the total workforce in a country were employed in the unorganized sector out of which a significant proportion is Child labor. There is over 60 million child labor population in India constituting nearly twenty five per cent of the working children of the world

### GOVERNMENT ASSISTANCE TO EMPLOYEES WORKING IN UNORGANIZED SECTOR

The Govt. of India has announced a co-contributory pension scheme "Swavalamban" in the Budget 2010-11. This scheme has been welcomed by the workers in unorganized sector. Over 4 lakh applications have already been received. Under this Scheme, workers will be allowed exit at the age of 50 years instead of 60 years, or a minimum tenure of 20 years, whichever is later. Under the on-going Indira Gandhi National Old Age Pension Scheme for BPL beneficiaries, the eligibility for pension is proposed to be reduced from 65 years at present to 60 years. Further, for those who are 80 years and above, the pension amount is being raised from 200 at present to 500 per month (Budget Speech 2011-12).

### REVIEW OF LITERATURE

Millions of children worldwide are engaged in labor that is hindering their education, development and future livelihoods; many of them are involved in the worst forms of child labor that cause irreversible physical or psychological damage, or that even threaten their lives. This situation represents an intolerable violation of the rights of individual children, it perpetuates poverty and it compromises economic growth and equitable development. Over eight million children worldwide are trapped in the unconditional worst forms of child labor, (International labor conference, and 90th session, <http://www.ilo.org/declaration>, 2002). UNICEF, Save the Children, and United Nations High Commissioner for Refugees (UNHCR) are turning to a *systems approach* in order to establish and otherwise strengthen comprehensive child protection efforts. However, common understanding of child protection systems does not yet exist within the field at large and that such common understanding would be an important prerequisite for moving child protection efforts forward (Fred Wolczyn et. al. 2010). The problem of child labor in Tanzania has been studied with an aim to explore the extent and form of child labor in fishing industry. It seeks to investigate the lived realities and laws of the working children in the fishing industry and focused to find out the effects of child labor socially, economically and culturally. It is believed to be human rights issue needs special attention for all stakeholders. Child labor is not job for kids. It is worst form of abuse of power. It is adult's exploitation the young, naïve, innocent, weak, vulnerable and insecure for personal profit. Although so many valuable efforts are going on, we have not yet mustered enough courage and imagination to really go beyond chipping at the margin and actually stop it (Mwanaisha A. kwariko 2004). Child labor is a global phenomenon. Its magnitude and dimensions, however, vary widely from country to country. India possesses the largest child labor force in the world despite various measures undertaken by the government and non-governmental agencies to tackle this issue. According to estimate there is over 60 million child labor population in India constituting nearly twenty five per cent of the working children of the world. In the pre-industrial agricultural society of India, children worked as helpers and learners in hereditarily determined family occupations under the benign supervision of adult family members. The work place was an extension of the home and work was characterized by personal informal relationships. The tasks and technology that work involved were simple and non-hazardous which the child could learn smoothly and unconsciously, over the years through association. The protection and welfare of working children, therefore, become an issue of paramount social significance (Nityananda Pradhan et.al.2012). In Bangladesh, children are accustomed to working in industrial and manufacturing plants, small scale factories, metal works, construction, as well as in many informal sector activities. Based on a survey conducted in Sylhet city, this study found that child workers are suffering from different physical and psychological problems and that more than half of them receive their medical assistance from local health care providers who have no recognized qualifications. The study maintains that working from an early age impedes the children's physical growth and intellectual and psychological development, which then also has negative effects on their long-term health and earning potential (Mohammad Nashir Uddinet.et.al. 2009). Child Domestic Work has been recognized as one of the most intolerable forms of child work and is a sector that has been identified by the International Labor Organization as a priority sector for removing children from work. The situation of children in domestic work has been compared to a new form of slavery in the ILO Convention on the prohibition and elimination of the worst forms of child labor (ILO Convention 182). Various studies, surveys and local observation projects estimate that the worldwide magnitude of this practice is enormous, repress ([www.savethechildren.net/india](http://www.savethechildren.net/india)). In recent years, it has become obvious to everyone that the numbers of children working on the streets of Kosovo's towns and cities are raising dramatically. This study has attempted to find out the reasons behind this increase, its impact on education, health and overall well-being of children, and to identify which aspects of child labor should be a priority target for all those – Government and non-government agencies alike – who are striving to create a better world for children. The overall number of working children remains unknown. Children work for different reasons, the most important being poverty. While most of the children do not bring in the main family income, they serve as major contributors to it (Sigrid Maurer 2009). The concepts of child labor and child education both are inversely linked with each other in terms of execution. Child labor does not allow child education and vice versa. Between the two types of economic ideologies normative approach promote child education but other ideology i.e. positive approach have preferred child labor. It is factual that, child labor, however, become a burden for every economy. It is a serious problem in any nation. Economy never accepts child labor and the high volume of child labor creates liability on economy. Any job of children always treated as the problem of underemployment through the labor market framework and all child work are strongly prohibited by ILO (Md. Aoulad Hosen 2010). Traditionally, most children, except for the privileged few, had always worked — either for their parents or for an outside employer. Through the years, child labor practices have changed — and so have the benefits and risks associated with employment of children. In some respects, altered workplace technology has served to make work easier and less hazardous. At the same time, some processes and equipment have rendered the workplace more dangerous — especially for the very young (William G. Whittaker 2005).

### INDIAN GOVERNMENT POLICY ON CHILD LABOR

From the time of its independence, India has committed itself to be against child labor. Article 24 of the Indian constitution clearly states that "No child below the age of fourteen years shall be employed to work in any factory or mine or employed in any hazardous employment" (Constitution of India cited in Jain 1985, 218). Article 39 (e) directs State policy such "that the health and strength of workers and the tender age of children are not abused and that citizens are not forced by economic necessity to enter avocations unsuited to their age or strength" (Constitution of India cited in Human Rights Watch 1996,29). These two articles show that India has always had the goal of taking care of its children and ensuring the safety of workers. The Bonded Labor System Act of 1976 fulfills the

Indian Constitution's directive of ending forced labor. The Act "frees all bonded laborers, cancels any outstanding debts against them, prohibits the creation of new bondage agreements, and orders the economic rehabilitation of freed bonded laborers by the state" (Human Rights Watch 1996, 30). In regard to child labor, the Indian government implemented the Child Labor Act in 1986. The purpose of this act is to "prohibit the employment of children who have not completed their 14th year in specified hazardous occupations and processes. ILO convention No. 138 suggests that the minimum age for employment should not be less than fifteen years, and thus the Child Labor Act of 1986 does not meet this target. In 1994, when then- Prime Minister Narasimha Rao announced his proposal of an Elimination of Child Labor Programme. This program pledges to end child labor for two million children in hazardous industries as defined in the Child Labor Act of 1986, by the year 2000. The program revolves around an incentive for children to quit their work and enter non-formal schooling: a one hundred rupee payment as well as one meal a day for attending school (Human Rights Watch 1996, 119-120). Where the funds for this program will come from is unknown. The government needs eight and a half billion dollars for the program over five years, and yet "about 4 percent of the five-year estimated cost was allocated for child labor elimination programs in 1995-1996" (Human Rights Watch 1996, 120). All of the policies that the Indian government has in place are in accordance with the Constitution of India, and all support the eradication of Child Labor. The problem of child labor still remains even though all of these policies are existent. Enforcement is the key aspect that is lacking in the government's efforts.

## LAWS TO PROTECT CHILDREN FROM LABOUR

Realizing the harm caused by child labour, the Indian Government made laws to protect children from exploitation at work and to improve their working condition. Besides, a comprehensive law called Child Labour (Prohibition and Regulation) Act, 1986, was promulgated to prohibit employment of children in certain hazardous occupations and processes. In 1987, the Indian government formulated National Police on Child Labour to protect the interests of children and focus on general development programmes for the benefit of children. As a part of this policy National Child Labour Projects have been set up in different parts of the country to rehabilitate child labour. Under these projects, special schools are established to provide non-formal education, vocational training, supplementary nutrition etc. to children who are withdrawn from employment. Though elimination of child labour is an impossible task in the current socio-economic scenario, the Indian government is committed to the task of ensuring that no child remains illiterate, hungry and without medical care. When this ideal will be achieved is a million dollar question. The development countries are exerting pressure on developing countries like India to eliminate child labour. According to the current thinking the developed countries may stop imports of those goods that involve child labour in their production. In some of our cottage industries like making of carpets, children are employed in larger numbers. These carpets, which are being exported, may soon lose their market abroad if the producers of these carpets persist with child labour.

## NEED FOR THE STUDY

There are about six core child laborers in India. Irrespective of the presence of various Govt. policies, laws for the protection of children from labor, abuse, still children are working everywhere in the unorganized sector. Hence, there is a need to focus on child labor issue. Visakhapatnam is a port and steel city attributed as very fast growing in south Asia. In the recent years, there has been lot of migration from nearby villages, other districts in the state and from other states as well for the purpose of livelihood and business. Most of them are working in unorganized sector as laborers. Their incomes are not sufficient to run their families and to educate their children. In this context, the children in these families are forcibly entered into labor activities of unorganized sector. The innocence and illiteracy of their parents can multiply this problem. The main problem of their children to work due to economic compulsions of their families besides the other causes such as Low family incomes, parent's illiteracy, village background, Migration, innocence, lack of interest in studies, lack of facilities for studies, bad habit and the likes.

## METHODOLOGY

A study has been initiated on child labor in unorganized sector with a sample of 60 child laborers, their parents and owners. A pre structured questionnaire (divided into three parts and meant for child laborers, their parents and owners as well) has been used with the main objectives of understanding the economic compulsions of child labor problem in India; to study the socio economic conditions of child labor; to analyze the Govt. policies, laws and measures to eradicate this problem of child labor and to offer suggestions at the end. The study has tested the hypothesis, that there is no impact of child demographic factors and economic status on the intensity of child labor problem and their implications. The data collected for the study has been tabulated and analyzed with the help of percentages, chi square tests, correlatives and ANOVA by using SPSS 13 version.

## HYPOTHESIS

Ho1- There is no significant difference in the dimension "To earn money and study" among different demographic factors of child labor.

Ho2- There is no significant difference between demographic factor and the dimension "Problem with Present Work" among majority of different demographic factors of child labor.

Ho3- There is no significant difference between demographic factor and the dimension "Physical Problem and Abuse at present Work" among majority of different demographic factors of child labor.

Ho4- There is no significant impact of Family Income on the dimensions of child labor

## STUDY ANALYSIS

About 63 per cent of child labor, selected for study belongs to 14 years of age, followed by 13 years age (about 20 per cent) and 15 years (about 10 per cent). Forward caste (about 48.3 per cent) and backward caste (about 43.3 per cent) are the two major communities producing child labor in this region. All child laborers are either Hindu (about 80 per cent) or Christian (about 20 per cent). The proportion of gender includes Male (about 73.3 per cent) and female (about 26.7 per cent). Only About 3.3 per cent of them are only orphanages, followed by father less children (about 10 per cent) and mother less children (about 6.7 per cent). The data regarding occupation of child labor has been elicited. About 36.7 per cent are working as, labor in construction industry, followed by domestic laborers (about 23.3 per cent) and others include electricians, drummers, cleaners, agriculture labor, lorry cleaner, hotel server, saloon worker, painter and the likes and each constitute less than about 6.7 per cent. Most the parents (fathers- about 56.7 per cent and mothers about 36.7 per cent) of child laborers selected for the present study are laborers and uneducated (fathers- about 80 per cent and mothers about 93.3 per cent). All of them have less than one lakh rupees family income. About 76.7 per cent have formal education up to 9<sup>th</sup> std only, followed by school drop outs (about 73.3 per cent) and child labor still with some interest in studies (about 40 per cent). About 16.7 per cent are only family workers and most of them are working under their father (about 80 per cent) and in rest of the cases the income of them is below 5000 rupees (about 73.3 per cent).

**TABLE - 1: CHI- SQUARE VALUES BETWEEN DEMOGRAPHIC VARIABLES AND THE DIMENSION "TO EARN MONEY AND STUDY"**

Variable	Group	Yes	No	Total	$\chi^2$
Age	12		2(3.3)	2(3.3)	0.59 (0.964)
	13		12(20.0)	12(20.0)	
	14	1(1.7)	37(61.7)	38(63.3)	
	15		6(10.0)	6(10.0)	
	16		2(3.3)	2(3.3)	
Gender	Male	1(1.7)	43(71.7)	44(73.3)	0.37 (0.543)
	Female		16(26.7)	16(26.7)	
Community	OC		29(48.3)	29(48.3)	11.19** (0.004)
	BC		26(43.3)	26(43.3)	
	SC	1(1.7)	4(6.7)	5(8.3)	
Religion	Hindu		48(80.0)	48(80.0)	4.07* (0.044)
	Muslim				
	Christian	1(1.7)	11(18.3)	12(20.0)	
Income per month	Below 5,000	1(1.7)	43(71.7)	44(73.3)	0.370 (0.831)
	Above 5,000		14(23.3)	14(23.3)	
	No income		2(3.3)	2(3.3)	
	<b>Total</b>	<b>1(1.7)</b>	<b>59(98.3)</b>	<b>60(100.0)</b>	

Source: Field Study, Note: \*Significant at 5% level

Note: \*\*Significant at 1% level

Although there is no significant difference in family incomes of child labor and the dimension "To earn money to study", there have been significant differences found in the above dimension in respect of community and religion. The generated Chi- square values between demographics and the dimension "To earn money and study" are 11.19 \*\* (community), 4.07\* (Religion), there is significant difference in the dimension "To earn money and study" among different demographic factors of child labor. Hence, Null Hypothesis (Ho1) is rejected (Table-1).

**TABLE - 2: CHI- SQUARE VALUES BETWEEN DEMOGRAPHIC VARIABLES AND THE DIMENSION "PROBLEM WITH PRESENT WORK"**

Variable	Group	Yes	No	Total	$\chi^2$
Age	12		2(3.3)	2(3.3)	0.59 (0.964)
	13		12(20.0)	12(20.0)	
	14	1(1.7)	37(61.7)	38(63.3)	
	15		6(10.0)	6(10.0)	
	16		2(3.3)	2(3.3)	
Gender	Male	1(1.7)	43(71.7)	44(73.3)	0.37 (0.543)
	Female		16(26.7)	16(26.7)	
Community	OC	1(1.7)	28(46.7)	29(48.3)	1.09 (0.581)
	BC		26(43.3)	26(43.3)	
	SC		5(8.3)	5(8.3)	
Religion	Hindu		48(80.0)	48(80.0)	4.07* (0.044)
	Muslim				
	Christian	1(1.7)	11(18.3)	12(20.0)	
Income per month	Below 5,000	1(1.7)	43(71.7)	44(73.3)	0.37 (0.831)
	Above 5,000		14(23.3)	14(23.3)	
	No income		2(3.3)	2(3.3)	
	<b>Total</b>	<b>1(1.7)</b>	<b>59(98.3)</b>	<b>60(100.0)</b>	

Source: Field Study

There is no significant difference in the dimension "Problem with Present Work" in respect of different demographic variables via, Age, Gender, Community and Income per month. However there is a significant difference with the same dimension in respect of Religion (the generated Chi- square value is 4.07\*). It can be inferred that there is no significant difference in the dimension "Problem with Present Work" among majority of demographic factors of child labor. Hence, Null Hypothesis (Ho2) is accepted (Table-2).

**TABLE-3: CHI- SQUARE VALUE BETWEEN VARIABLES AND THE SUB-DIMENSION "PHYSICAL TORTURE"**

Variable	Group	Yes	No	Total	$\chi^2$
Age	12		2(3.3)	2(3.3)	2.76 (0.598)
	13		10(16.7)	12(20.0)	
	14		36(60.0)	38(63.3)	
	15		6(10.0)	6(10.0)	
	16		2(3.3)	2(3.3)	
Gender	Male	4(6.7)	40(66.7)	44(73.3)	1.56 (0.212)
	Female		16(26.7)	16(26.7)	
Community	OC		29(48.3)	29(48.3)	5.60* (0.061)
	BC	4(6.7)	22(36.7)	26(43.3)	
	SC		5(8.3)	5(8.3)	
Religion	Hindu	4(6.7)	44(73.3)	48(80.0)	1.07 (0.30)
	Muslim				
	Christian		12(20.0)	12(20.0)	
Income per month	Below 5,000	4(6.7)	40(66.7)	44(73.3)	1.56 (0.459)
	Above 5,000		14(23.3)	14(23.3)	
	No income		2(3.3)	2(3.3)	
	<b>Total</b>	<b>4(6.7)</b>	<b>56(93.3)</b>	<b>60(100.0)</b>	

Source: Field Study

Note: \*Significant at 5% level

The generated Chi- square values between demographics and the sub-dimension "Physical Torture" are 2.76 (Age), 1.56 (Gender& Income), 1.07 (Religion) and exceptionally the Chi-square value of Community is 5.60\*. This infers that there is no significant difference between majority of above variables and the dimension "Physical Torture" which is common in all cases expect community and physical torture. Hence, Null Hypothesis (Ho2) is accepted (Table-3).

TABLE - 4: T- VALUE BETWEEN DIFFERENT DIMENSIONS AND INCOME

Dimensions	Income	N	Mean	Std. Deviation	Std. Error Mean	t-value	Sig.
Willing to come out from work	Below 5000	44	1.84	.370	.056	0.145	0.772
	Above 5000	14	1.86	.363	.097		
Willing to join in school	Below 5000	44	1.91	.291	.044	2.074*	0.012
	Above 5000	14	2.00	.000	.000		
Work experience	Below 5000	44	3.23	1.538	.232	1.220	0.488
	Above 5000	14	3.79	1.477	.395		
Reasons to force child labor	Below 5000	44	1.91	.291	.044	2.074*	0.012
	Above 5000	14	2.00	.000	.000		
Do you have any problem with present work	Below 5000	44	1.98	.151	.023	1.00	0.256
	Above 5000	14	2.00	.000	.000		
Willing to study in free school	Below 5000	44	1.84	.370	.056	0.145	0.772
	Above 5000	14	1.86	.363	.097		

Source: Field Study

The generated t-values between different dimensions and Family Income of child labor are 0.145 (willing to come out from work& willing to study in free school), 1.220 (Work experience), 1.00 (problem with present work) which are not significant at any level and infer that there is no significant impact of income on the above dimensions and exceptionally the t-values of Income and the dimensions like willing to join in school and reasons forcing child labor are 2.074\*each. This infers that there is significant impact of income on the above dimensions. Hence, Null Hypothesis (Ho4) is rejected (Table-4).

### IMPLICATIONS AND SCOPE FOR FURTHER RESEARCH

The problem of child labor is an evil to the society that cannot be easily eliminated. Hence, several studies on this issue have to be undertaken on a regular basis. The inferences of the present study reveal that mainly certain communities and religion play crucial role in sourcing child labor with an attitude to earn money and study. Similarly physical torture and Abuse are also more in these cases. The Income factor is also significant to create impact on willing to join in school and as reason to force child labor. Some studies have been undertaken by the researchers on child labor at different places and countries from different perspectives. Still, there is a scope for further research. Comprehensive studies at macro level are required to address the problem and provide useful information to the policy makers. In depth analysis also required to identify the root causes of problems creating child labor in India. The present study has been conducted on a particular segment of Visakhapatnam, A.P, India which may require the broad sample covering wide area. Several other segments other than unorganised sector may be separately taken for study. Micro level studies using correlatives, ANOVA, Factor Analysis may further help in identifying specific issues behind the data.

### CONCLUSION

The economic compulsions of the families force the children to work. This is very commonly seen in migrants of urban unorganized sector. It is difficult to eliminate this problem from our society as long as the socio-economic status of these families is not improved. The prevalence of child labour reflects very badly on society that is not able to stop this evil. The Govt. policies, laws and measures to eradicate the problem of child labor must be properly propagated and new laws to protect child from abuse, trafficking, kidnaps and killing have to be formulated. Measures are to be implemented for identifying, making child labor ready for study and educating parents of child labor all over India by taking Govt. initiative and with support of genuine NGO's. It is a common responsibility of all the citizens of India. Nobody or Body alone can do this. The Govt. support to stabilize Artisans, Village Textile and Cotton, Tiny and Small scale Industrial activities besides strengthening agriculture activities will considerably reduce migration of families from villages to nearby towns and there by the problem of child labor in urban unorganized sector.

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**HAZARDOUS WASTES: INDUSTRIAL CONCENTRATION AND POLLUTION INTENSITY IN ANDHRA PRADESH**

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**ABSTRACT**

*Disposal of hazardous wastes emitting from industries is causing severe environmental pollution across the world. In this paper, we examine the profile of hazardous wastes generation in Andhra Pradesh, India, in terms of total generation of hazardous wastes, the number of hazardous wastes generating industrial units, composition of hazardous wastes, and pollution intensity of such wastes. We also estimate the Pollution Concentration Intensity, to ascertain the districts in which there is high concentration of polluting industries, and the District Pollution Intensity, and Vulnerability Index, to depict the pollution exposure rate of population of different districts of Andhra Pradesh. Our findings show that the maximum Pollution Concentration Index is for Vishakhapatnam district, followed by Srikakulam. Shares of Recycled and Disposable wastes are similarly highest in Vishakhapatnam district, followed by Ranga Reddy district. When estimating the Vulnerability Index, we find that Hyderabad district, which has the highest population density in Andhra Pradesh, was the most vulnerable to pollution from hazardous wastes, while Nizamabad district was the least vulnerable. Finally we look at economic and ecologically efficient ways of disposal of hazardous wastes, which will earn both profits, and reduce environmental pollution.*

**KEYWORDS**

hazardous waste, pollution.

**INTRODUCTION**

**I**ndustrial Hazardous Waste is defined by the Ministry of Environment and Forest as “any substance, excluding domestic and radioactive waste, which because of its quantity and/or corrosive, reactive, ignitable, toxic and infectious characteristics causes significant hazards to human health or environment when improperly treated, stored, transported and disposed off” [MOEF rules 1989].

Industrial Hazardous Waste (HW) is generated by 18 categories of industries such as petrochemicals, pharmaceuticals, pesticides, paint and dyes, petroleum, fertiliser, asbestos, caustic soda, inorganic chemicals, general engineering, etc. These wastes are harmful in nature as they have high concentration of toxic elements which contaminate surface and ground water, posing major ecological and health risks. Their treatment and disposal also pose environmental and health hazards; therefore HW has to be handled and disposed off with proper care. With industrial development, the quantum of HW also increases, creating problems of safe disposal. Further, when similar types of industries converge to reap economies of agglomeration, it leads to further increase in the local concentration of HW pollution.

**OBJECTIVES OF THE PAPER**

The main objective of this paper is to identify locations where there is concentration of HW generating industries in different regions and districts of Andhra Pradesh (AP), and the need to ensure that further burden of pollution is not imposed therein, by not allowing the establishment of more polluting factories in such regions. We analyse the concentration of HW producing industries through the Pollution Concentration Index to depict the conglomeration of hazardous waste generating industries in different districts of AP. We also estimate Pollution Intensity, and Population Intensity to identify those districts in AP that are most vulnerable to HW pollution.

**METHODOLOGY**

Secondary data on the number of HW generating industrial units, and HW generated is taken from the Andhra Pradesh Pollution Control Board website ([www.appcb.ap.nic.in](http://www.appcb.ap.nic.in)) from Dec 2011 – Jan 2012, given for the year 2010. Data on population density is taken from [www.aponline.com](http://www.aponline.com), the official AP government portal, in April 2012. Discussions on HW disposal were held with the staff of the official TSDF of AP.

We use ratios, percentages and graphical methods to estimate the above parameters in our study.

**REVIEW OF LITERATURE**

Survey of literature showed that no studies have been conducted so far regarding industrial HW generation, distribution, and concentration in Andhra Pradesh. In this article we aim to fill this gap. Earlier studies have enquired into either the technical aspects of HW generation, or on their legal aspects in India.

A CPCB sponsored National Inventory of HW in India (2009) gives a detailed account of amount of HW generated, the number of HW industrial units in different states of India, and the HW generation, composition, and distribution within the country. An Indo-Japan project (2010) discusses the amount of HW produced in Gujarat, and suggests technical methods and funding for recycling, reuse, and reduction. The negative impacts of HW pollution have been described in a paper by TERI (2005), in general, as well as for specific areas of Gujarat, Maharashtra and Rajasthan. It specifies remedial measures to be implemented for HW disposal. Dua, A (2011), analyses the legal aspects of HW regulation in India, growth of HW generation, and offers suggestions to improve effective regulation. Ashok Pappu et.al (undated) examine potential recycling techniques of HW in India.

**INDUSTRIAL HW REGULATIONS IN INDIA**

Since money costs of disposal and pollution impacts, are external costs, industries tend to ignore them, and throw their wastes away indiscriminately. Therefore it is up to the government to ensure that HW is disposed of properly, without causing any environmental damage. The Ministry of Environment and Forests (MOEF) has passed a number of regulations giving guidelines for the safe disposal of HW. In 1989, the MOEF passed the Hazardous Waste (Management & Handling) Rules, which was later amended in the years 2000 and 2003. In 2008 the Hazardous Wastes (Management, Handling and Trans-boundary Movement) Rules was notified, for effective HW management. The stakeholders of hazardous waste disposal include:

1. *Central Government:* MOEF passes the Environmental Rules, and frames the regulations. The Central Pollution Control Board (CPCB) classifies hazardous wastes and proposes standards regarding treatment and disposal.
2. *State Pollution Control Boards (SPCB):* create inventories of the composition of hazardous wastes generated by industrial units in their states, and provide licenses for handling, and recycling waste materials. They have to identify disposal sites and plan facilities, called TSDF (transport, storage and disposal facilities), for proper and environmentally safe means of treatment and disposal of HW.
3. *HW producing industries:* The Hazardous Wastes Rules of 2008 of MOEF stipulates that all HW producing industries are responsible for “the safe and environmentally sound handling of their own generated HW”. As per the Rules, all industries generating, treating, reprocessing, and disposing of HW, have to register with their SPCBs and with the available TSDFs. They also have to provide all information about the amount of HW generated, and disposal methods. The industries should first consider reusing, reprocessing, or recycling their HW. The remaining wastes that cannot be recycled should be

disposed off in PCB authorised disposal facilities. The generator of HW should get permission from the SPCB for handling hazardous waste before starting operation. A letter of authorisation is given to such industries, to enable them to start/continue production. [MOEF HW Rules, 2008]

4. *The Facility or Occupier:* The responsibility of treating and disposing of hazardous waste lies with the occupier of the facility (TSDF) handling HW. There are numerous directions given to the occupier regarding how it should be transported, stored, incinerated and disposed off [MOEF HW Rules, 2008]. TSDFs should also inform the PCB annually about the amount, composition and manner of treatment of HW.

**HW GENERATED IN INDIA**

A 2009 inventory undertaken by the CPCB showed that there were 36,165 hazardous waste generating industries in India, generating 6,232,507 MT of HW per annum. Of these, Recyclable HW comprised nearly 50%, followed by Disposable<sup>2</sup> HW 43.78%, and Incinerable wastes 6.67 % [CPCB, *National inventory of HW: 2009*]. In 2009, Gujarat had the largest share (28.76%) of HW generated in India, followed by Maharashtra (25.16%), while AP was the third largest generator of HW in India (8.93%).

From the information given by CPCB ( Feb 2010), there were currently only 27 TSDFs in 12 states of India, while 35 notified sites and 64 identified sites were at various stages of development [CPCB website]. The annual capacities of the TSDFs range from 10,000 to 1.2 lakhs T/annum, with an operating life span of 15-30 years. This is just around 1/6<sup>th</sup> of the HW generated in India and totally inadequate to handle all the wastes. Also most disposal facilities seem to be undertaking only landfill and incineration of HW, but not recycling. In some cases, TSDF operators have not installed hazardous waste incinerators, as the quantity of incinerable hazardous waste generation is not adequate to be economical, or else generation it is not uniform.

**HAZARDOUS WASTE GENERATION IN AP**

Data from APPCB website showed that the total number of HW generating industrial units in AP was 3,222 in 2010, as compared to 1,739 in 2008, i.e. an average annual increase of about 43% over these two years. The share of HW generating industrial units in total industries in AP, which was around 48% in 2008, had increased to 71% in 2010. These include only the large and medium scale industries, as the small scale industries’ inventories have not been taken. Thus the actual number of HW generating units and wastes may be much larger.

These 3,222 industrial units generated a total of 1,089,962 MT of hazardous wastes (HW) in 2010, a growth of 48% pa over 2008 [APPCB website]. The growth of Hazardous Wastes generated was thus about 5% greater than the growth of its generating industrial units in these two years.

The HW generated in AP during 2010 consisted of 58% recyclable, 38% disposable (landfill), and 4% incinerable wastes [APPCB website]. Although recyclable is the largest portion, both the TSDFs in AP do not recycle HW, but dispose them off in landfills. This is both an uneconomical and environmentally unsafe way of treating recyclable wastes.

**REGIONAL HW GENERATION IN AP**

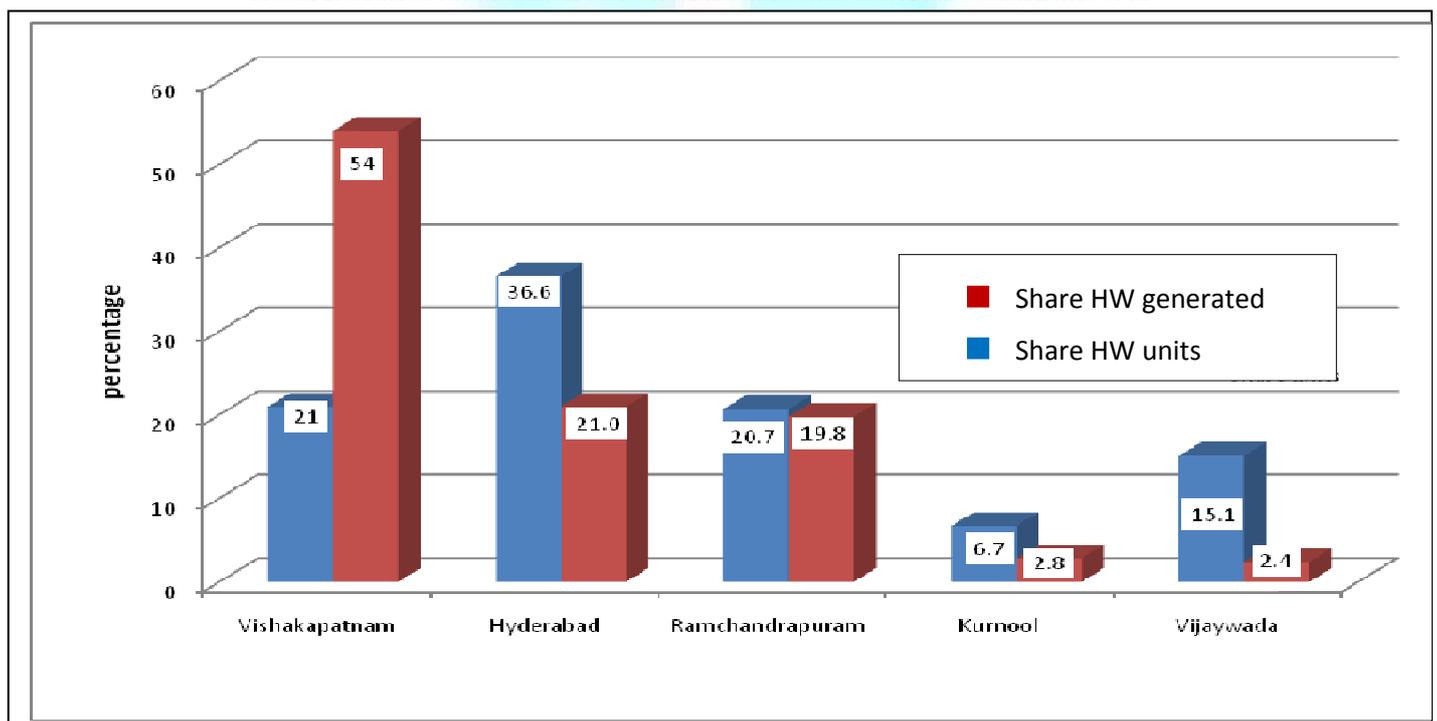
AP consists of three regions: Telengana, Andhra and Rayalaseema, divided into five industrial zones. These are Hyderabad, Ramchandrapuram, Kurnool, Vijayawada, and Visakhapatnam Zones, covering the 23 districts of Andhra Pradesh. The first two zones cover 10 districts of Telengana; the last two cover 9 districts of Andhra region, while Kurnool covers 4 districts of Rayalaseema.

1. *Telengana Region* comprising of Hyderabad and Ramchandrapuram industrial zones, had the highest share of HW generating factories (57%), but contributed only 41% of HW generated in the state.
2. *Andhra Region* consisting of Vishakhapatnam and Vijayawada industrial zones, with 36% of HW generating industrial factories, generated 54% of the State’s HW.
3. *Rayalaseema* (Kurnool zone) had a very small share of both HW generating units and wastes.

**HW GENERATION IN THE FIVE INDUSTRIAL ZONES OF AP**

APPCB data sources showed that while the maximum share of HW generating *industrial units or factories* was in the Hyderabad Zone (36.6%), followed by Vishakhapatnam Zone (21%), the latter had the maximum share of HW *generated* (54%). This could be due to the opening of the Pharma City near Vizag, and the relocation of chemical and pharmaceuticals to the coastal city [Figure 1]. The other four zones had proportionally lower generation to industrial units’ ratio.

**FIGURE 1: SHARE OF HW GENERATED AND HW GENERATING UNITS IN FIVE INDUSTRIAL ZONES OF AP**



Source: APPCB website, Dec 2011

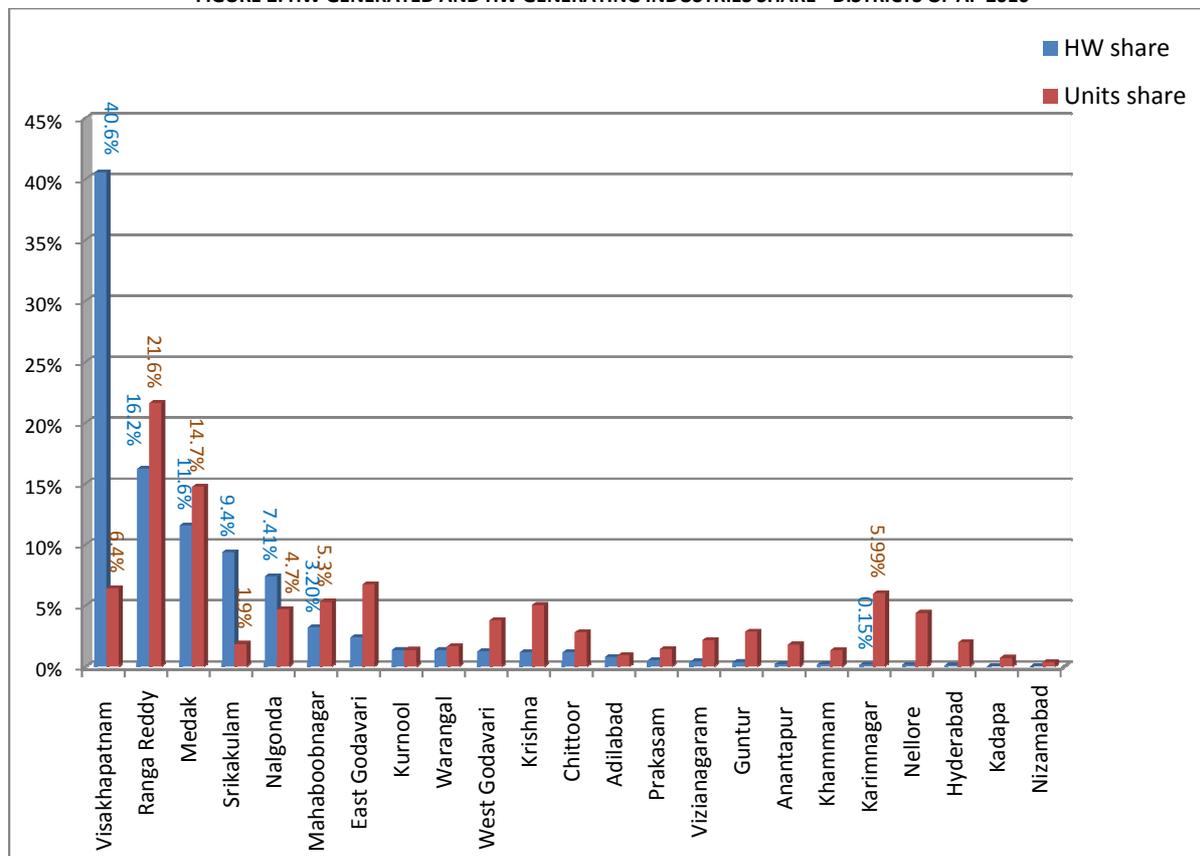
<sup>2</sup> Wastes that can be dumped in landfills

**• ODISTRICT WIDE HW GENERATION**

We now look into the distribution of factories and amount of HW generated in the 23 districts of AP. We find that 69% of HW generating factories was concentrated in just 6 districts of the state in 2010. 85% of HW generated was from just 5 districts (Table 1). This shows that the amount of HW generated is highly concentrated in a few districts.

Ranga Reddy district with the highest share of HW generating units of about 22% contributed just 16% of HW. Vishakhapatnam district however, with just 6.42% of HW generating units had a massive share of total HW generated (41%), other districts had even lower shares of generation and HW producing units (Figure 2). This shows that at the district level also, the share of HW generated does not match the share of HW generating factories.

**FIGURE 2: HW GENERATED AND HW GENERATING INDUSTRIES SHARE - DISTRICTS OF AP 2010**



Source: APPCB website Dec. 2011

Looking at the figure 2 above, we observe that the ranking of districts according to the amount of HW generated does not match their ranking in terms of number of HW factories. In other words, districts with a small share of total hazardous industrial units could have a higher share in total HW generated, showing greater concentration of pollution.

The pollution concentration within a district thus depends on not only its share of total waste generated, but also on the number of industrial units generating these wastes. As can be seen from the above table, Vishakhapatnam with a smaller share of industrial units than Ranga Reddy had the maximum share of HW generated. This indicates that pollution intensity is not just the conglomeration of a large number of polluting units, but depends on the amount of HW generated per factory. So merely looking at the number of HW units in a district does not depict its Pollution Concentration.

We now estimate the Pollution Concentration Index or PCI [Panth P.2004, Panth P. and R.A.Shastrri 2011], to identify districts with the highest concentration of HW pollution.

**POLLUTION-CONCENTRATION INDEX (PCI)**

As discussed above, while certain zones have high share of HW generating units, their share of HW generated may be low, and vice versa. Hence it is necessary to take note of both these factors in the estimation of the Pollution Concentration Index. This index measures the share of a district in HW generation to its share of HW units.

$$PCI = \frac{\text{Share of total HW generated in a district}}{\text{Share of total HW industrial units in the district}}$$

Thus if a district has a 20% share in HW generated, but only 5% of the HW industrial units then its  $PCI = 20/5 = 4$ . This denotes that this district's generation of HW is 4 times higher than its share of HW industrial units in AP. As a thumb rule we may posit that there is high pollution concentration if  $PCI > 1$ ,

Using this index, some surprising results emerge in terms of the pollution intensity of various districts in AP. PCI of different districts are shown in Table 1. Three districts have high HW Pollution Concentration, shown by their  $PCI > 1$ . These include Vishakhapatnam with a PCI of 6.3 (denoting a 6 times higher share in total HW, to its share of HW industrial units), followed by Srikakulam ranking second, with  $PCI = 5$ , and Nalgonda ( $PCI = 1.58$ ). Six districts have  $PCI > 0.5$ , while the others have much lower PCI, Nizamabad having the least value.

TABLE 1: POLLUTION CONCENTRATION INDEX OF DISTRICTS OF ANDHRA PRADESH (2010)

Rank	Districts	PCI	Rank	Districts	PCI
1	Visakhapatnam	6.315	13	West Godavari	0.327
2	Srikakulam	5.043	14	Krishna	0.233
3	Nalgonda	1.581	15	Vizianagaram	0.191
4	Kurnool	0.993	16	Guntur	0.134
5	Adilabad	0.882	17	Khammam	0.133
6	Warangal	0.822	18	Anantapur	0.109
7	Medak	0.786	19	Hyderabad	0.062
8	Ranga Reddy	0.750	20	Kadapa	0.052
9	Mahaboobnagar	0.603	21	Nellore	0.033
10	Chittoor	0.414	22	Karimnagar	0.026
11	Prakasam	0.357	23	Nizamabad	0.006
12	East Godavari	0.355			

Source: Estimated from above data.

Thus although there is massive HW generated in AP, it is not uniformly distributed, with some districts having high concentration of pollution generation. Knowledge of HW concentration in various districts would help in policy decisions regarding future location of HW generating industries in AP. For, even though there may be economies of scale in terms of concentration of similar industries in an area, there will also be negative externalities due to the high concentration of HW, as for instance in Vishakhapatnam, Srikakulam, and Nalgonda districts.

### HW COMPOSITION IN DISTRICTS OF AP

To dispose of HW, it is necessary to know its physical characteristics. HW consists of Recyclable, Landfill (Disposable), and Incinerable wastes. Recycling of HW seems to have great potential, as the wastes can be reused for further production<sup>3</sup> [Ashok Pappu et.al. not dated]. Land filling of wastes raises the danger of chemicals leaching into ground water and soil. Similarly incineration burns wastes creates air pollution.

### SHARES OF HW COMPOSITION IN AP

Data taken from APPCB website shows that recyclable HW forms the major share of total HW (58%) in AP, followed by disposable (38%) and finally incinerable wastes (4%). The following table gives the type and shares of different types of HW over the five industrial zones in AP, 2010.

TABLE 2 - INDUSTRIAL ZONES SHARE OF DIFFERENT TYPES OF HW

Shares in total HW types	Share disposable	Share recyclable	Share incinerable
Hyderabad Zone	20.8%	22.2%	7.4%
Ramchandrapuram Zone	22.5%	16.0%	<b>49.1%</b>
Kurnool Zone	3.7%	2.3%	0.3%
Vijayawada Zone	2.9%	1.7%	8.4%
Vishakhapatnam Zone	<b>50.2%</b>	<b>57.8%</b>	34.9%
Total	100%	100%	100%

Source: APPCB website Dec 2011. Bold letters show maximum shares

Vishakhapatnam had the highest share of both Disposable (50%) and Recyclable wastes (58%), followed by Ramchandrapuram and Hyderabad. While Ramchandrapuram had the highest share of Incinerable wastes 49%, Vishakhapatnam stood second at 35%, with Kurnool the least.

#### • SHARE OF DIFFERENT TYPES OF HW WITHIN INDUSTRIAL ZONES

We now look at the share of different types of HW within each Zone. The data is shown row-wise. At the district level, 62% of Vishakhapatnam's was recyclable, followed by Hyderabad with 61%. In case of disposable waste, Kurnool's HW was 51% disposable, followed by Vijayawada with 46%. Kurnool's had 14% incinerable HW, the highest in all the regions.

TABLE 3 - ZONE-WISE SHARES OF DIFFERENT TYPES OF HW 2010

Industrial Zone	Share disposable	Share recyclable	Share incinerable	Total
Hyderabad Zone	37.6%	<b>61.0%</b>	1.4%	100%
Ramchandrapuram Zone	43.4%	<b>46.8%</b>	9.8%	100%
Kurnool Zone	<b>50.8%</b>	48.7%	0.5%	100%
Vijayawada Zone	<b>46.2%</b>	40.0%	13.8%	100%
Vishakhapatnam Zone	35.5%	<b>62.0%</b>	2.5%	100%
Total AP	38.2%	57.9%	3.9%	100%

Source: APPCB website, Dec 2011

#### • COMPOSITION OF HW – DISTRICT LEVEL

The composition of HW at district levels also differs. For instance from Table 5, it can be seen that while Visakhapatnam had the largest amount of Disposable and Recyclable wastes, Medak had the most Incinerable waste. Five districts had no incinerable wastes, while Nizamabad has zero Disposable wastes.

<sup>3</sup> However it is not known if the end result will be more hazardous types of wastes, or whether they would be converted into less harmful compounds.

TABLE 4: COMPOSITION OF HW – DISTRICT LEVELS AP

District	No of units	Disposable HW	Recyclable HW	Incinerable HW	TOTAL HW
Visakhapatnam	207	172,849.62	257,042.08	11,022.62	440,914.31
Ranga Reddy	697	78,651.10	95,305.94	2,431.11	176,388.14
Medak	475	51,660.64	60,118.89	14,169.36	125,948.89
Srikakulam	60	11,438.65	88,150.94	2,458.65	102,048.24
Nalgonda	151	35,905.89	37,757.65	6,840.12	80,503.66
Mahaboobnagar	171	5,040.92	29,038.15	720.09	34,799.16
East Godavari	217	17,982.24	7,662.46	354.99	25,999.69
Kurnool	44	6,658.23	8,074.76	0	14,732.99
Warangal	53	1,865.30	12,823.98	1.80	14,691.08
West Godavari	122	3,962.17	9,471.31	15.41	13,448.89
Krishna	163	4,589.14	5,570.33	2,653.10	12,812.57
Chittoor	90	7,777.69	4,791.60	1.20	12,570.49
Adilabad	29	5,800.00	2,829.00	0	8,629.00
Prakasam	46	4,794.00	15.51	725.98	5,535.49
Vizianagaram	70	1,862.50	1,556.19	1,084.73	4,503.42
Guntur	92	1,339.84	2,643.02	170.00	4,152.86
Anantapur	58	629.00	1,366.00	134.00	2,129.00
Khammam	43	1.10	1,930.04	0	1,931.14
Karimnagar	193	21.27	1,648.30	1.88	1,671.45
Nellore	142	1,301.56	232.70	39.90	1,574.16
Hyderabad	64	511.34	816.11	1.35	1,328.79
Kadapa	23	105.00	296.57	0	401.57
Nizamabad	12	0	25.80	0	25.80
TOTAL:	3,222	414,747	629,167	42,826	1,086,740

Source: APPCB website, Dec 2011

## EXPOSURE RATE TO POLLUTION

The HW Regulations of 2008 specify that all HW generating industries should register with TSDF, as well as send their wastes to them for disposal. AP was the first state in India to set up a TSDF. Now it has two such sites owned and operated by RAMKY Enterprises – M/s. Hyderabad Waste Management Project (HWMP) at Dundigal in Ranga Reddy District, and M/s Coastal Waste Management Project (CWMP) near Visakhapatnam.

From information given by RAMKY only 2800 (88%) of the 3300 HW generating units in AP had registered with them in 2010-11, and of these only 600 units (19%) were compliant using their services regularly. This raises serious doubts regarding the fate of the rest of HW generated by the non-compliant factories in the state; for, HW being dumped indiscriminately increases risk to human health and environment, making the surrounding environment and population vulnerable to HW pollution.

We now estimate the vulnerability of various districts to HW exposure. This is the product of regional pollution intensity and regional population intensity. [P. Panth and R.A. Shastri, Feb 2011]

### 1. REGIONAL POLLUTION INTENSITY

It measures the pollution intensity per thousand sq. km. This measure stems from the idea that the spread of HW per region/district decides the ability of the region/district to 'bear' or 'endure' pollution. The larger the area, the greater is the volume of air/water/land over which pollutants can be dispersed. An area of one thousand square kilometres will have half the ability to carry pollutants than an area of two thousand square kilometres.

Regional Pollution intensity =  $\frac{\text{HW generated in a region or district}}{\text{Area of the region or district}}$

Area of the region or district

This shows the area over which HW can be disposed off in each district of AP. Results are given below in Table 5.

### 2. VULNERABILITY INDEX

Between two regions with the same pollution intensity per sq. km., the one with a larger population density will be more vulnerable to the effects of pollution. We call this the "Exposure Rate to Pollution" or the "Vulnerability Index" that assesses the vulnerability of a district's population to industrial pollution. District wise population density is estimated from the 2010 provisional figures of Census 2011, and results are shown in Table 5.

Vulnerability Index = (Regional Pollution intensity/ sq km) × Regional population density

- District Pollution intensity:** In Table 5, Column 2 is estimated by dividing HW of each district by its area. This gives the amount of HW disposed of by industrial units in a square Km in their respective districts. The larger the area, the more dispersed the pollution. The lowest pollution density is in Nizamabad, and the highest is Visakhapatnam, followed by Ranga Reddy, Srikakulam and Medak. Hyderabad stood 6<sup>th</sup> in pollution intensity in terms of area<sup>4</sup>.
- Population density:** Column 2 shows that population density or population per sq km is highest for Hyderabad district. This is almost 4 times more than the next populated district of Ranga Reddy. The other districts have much lower population densities.
- Vulnerability Index or Population Exposure Levels:** is given in the third column, i.e. district level pollution into the number of persons per sq km, in Metric tonnes. The higher the population density, the more the number of persons who are exposed to pollution and greater is their vulnerability to HW pollution. Hence we can also call this the *Vulnerability Index*. From table 5 it can be seen that the largest number of vulnerable population is in Hyderabad district. Due to its high population density it has the highest population exposure levels. It is followed by Visakhapatnam, Ranga Reddy, Srikakulam, and Medak.

<sup>4</sup> However these are only average levels; it is possible that there will be higher concentration of pollution in a few areas within a district, where toxic wastes are dumped.

TABLE 5 - THE VULNERABILITY INDEX

Districts	Regional Pollution intensity (MT/sq km)	Population density (persons/ sq km)	Vulnerability Index (MT/person/ sq km)	Relative exposure*
1	2	3	4 = 2 × 3	5
Nizamabad	0.003	296	0.95	1
Kadapa	0.03	171	4.45	5
Khammam	0.12	163	19.62	21
Ananthapur	0.11	193	21.50	23
Nellore	0.12	206	24.75	26
Karimnagar	0.14	299	42.30	44
Prakasham	0.31	176	55.27	58
Adilabad	0.54	156	83.66	88
Guntur	0.36	395	144.04	151
Kurnool	0.83	202	168.41	177
Chittoor	0.83	249	206.12	216
Vizianagaram	0.69	347	240.75	252
Warangal	1.14	254	289.01	303
Mahaboobnagar	1.89	194	366.61	384
Krishna	1.47	485	714.68	749
W.Godavari	1.75	496	865.74	908
E.Godavari	2.41	456	1,098.13	1,151
Nalgonda	5.67	230	1,306.15	1,369
Medak	12.98	279	3,622.62	3,798
Sirkakulam	17.59	440	7,746.99	8,121
Rangareddy	23.52	500	11,750.42	12,318
Visakhapatnam	39.37	346	13,630.64	14,289
Hyderabad	6.64	19239	1,27,823.10	1,33,997

Source: Pollution data from APPCB website Dec 2011, Area and Population from www.aponline.com, April 2012

\* Taking Nizamabad as the norm, the relative vulnerability positions of other districts are estimated.

1. *Relative Exposure Positions:* Taking Nizamabad with the lowest Population Exposure levels as the norm, we estimate the relative levels by which other districts exceed the norm. The relative positions of the various districts are shown in Column 4, showing the enormous gap between Nizamabad (1) and Hyderabad<sup>5</sup> (134,000) exposure levels! It also shows that the population of Hyderabad is 134 thousand times more vulnerable than Nizamabad to industrial pollution. Hyderabad is followed by Visakhapatnam, Ranga Reddy, Srikakulam and Medak. Other districts' levels of vulnerability are also shown.

#### HW DISPOSAL IN ANDHRA PRADESH

Our analysis shows that due to the high rate of non-compliance (81%), the environment and population of AP are at great risk from HW pollution. This is more in certain districts than in others. Therefore it is necessary to chalk out different methods to reduce, reuse, and recycle HW.

##### • PROFITS FROM RECYCLING

The present method of dumping recyclable wastes into landfills is not optimum economically or ecologically. Data shows that more than half the HW in AP can be recycled, which will considerably reduce vulnerability of the environment and population. Since recyclable wastes form the bulk of HW generated in AP, dumping them in landfills means loss of a huge amount of physical resources that could have been used for further production.

The costs to industries of disposing of their recyclable wastes can be reduced if industrial units undertook to recycle and reuse them. This will not only save them the costs of disposal, but also generate income through recycling. The opportunity cost of Recyclable HW presently disposed in landfills is:

Profits from recycling = Revenue earned from recycling – costs of recycling + savings of disposal costs

Similarly, if the TSDF takes up the task of recycling HW, it can earn huge profits, and perhaps reduce its disposal charges to the member factories. Thus districts like Vishakhapatnam which has nearly 62% recyclable wastes can significantly reduce their HW burden through recycling.

It has been shown in many studies that recycling generates enough revenue to cover the initial costs of plant and material required for recycling [TERI, 2005]. A study by Panth, P [2008] showed that the rate of payback of recycling wastes from waste streams ranged from 6 months to 5 years.

##### • PROFITS FROM INCINERABLE WASTES

Similarly incinerable wastes can be used to generate power, and the ash used in various industries. Both these methods turn HW into economic resources, and not pollutants. Incineration merely burns up high calorific wastes which produces energy. Incineration converts the solid wastes to air pollution and ash. Some very toxic gases may be released in the process, and the problem of disposing off the ash also arises. The CPCB is encouraging co-processing of incinerable wastes, i.e. as raw material and as a source of energy to replace fossil fuels in energy intensive industries such as cement, lime, steel, glass, and power generation. In the case of cement kilns the high temperatures ensure complete destruction of harmful pollutants. Further, metal and non-metallic wastes are captured in the clinker substances of cement and rendered harmless. A number of successful projects have been undertaken wherein incinerable wastes have been used to generate energy for cement plants; these should be extended to all Incinerable HW in the country. [CPCB Feb.2010]

#### SUMMARY

AP generated the third largest amount of Hazardous Wastes in India in 2010. While the number of HW producing factories is highest in Telengana, the amount of HW generated is highest in Andhra region.

Data showed that there is no match between number of HW generating units and total HW generated in different districts of AP. Thus Visakhapatnam district with a smaller share in HW generating units, had the highest share in amount of HW generated, while Ranga Reddy had the largest number of HW generating factories, but only 2/3 of HW generated compared to Vishakhapatnam.

Since HW generated per district does not follow the same ranking as the HW units, an index showing the relative concentration of pollution in each district – called the Pollution Concentration Index (PCI), was estimated. To estimate the Pollution Concentration Index (PCI), the share of a district in total HW production is divided by its share in total HW units. If PCI is greater than unity, it shows a high level of concentration of polluting units in that area. Again Visakhapatnam emerged first with the highest PCI, with its rate of HW generation more than 6 times its share in HW producing units, followed by Srikakulam and Nalgonda districts.

The PCI shows that future location of polluting industries should not be permitted in these districts, as it will lead to more environmental problems. Similarly location of these industries in highly vulnerable areas such as Hyderabad should be avoided in future, to reduce the risk factor of pollution to the local population and environment.

<sup>5</sup> This is the maximum level of exposure; the actual depends on how many industrial units are compliant.

Although APPCB conducts regular inspections, and imposes penalties, obviously this is not enough to deter the non compliant industries. Data from TSDF showed just 19% compliance of HW units in AP, which means that the other 81% industrial units are indiscriminately dumping their wastes. The larger the area of a district, the more dispersed will be the HW currently being dumped. This is the basis for calculating the Pollution Intensity Index. But the larger the population density, the greater will be the vulnerability of the population to HW pollution. The Vulnerability Index estimated for all 23 districts shows that Hyderabad district, with the highest population density is the most vulnerable to HW pollution.

HW consists of recyclable, disposable and incinerable wastes. Recyclable wastes forms the major share of HW generated in AP. There is great potential to recycle HW, and to generate energy through incineration. However, in AP neither of these methods is being used to reduce HW pollution, and to earn profits from wastes, showing economic and ecological inefficiency by both the industries and TSDF.

The problem of HW disposal and treatment needs to be better organised in AP, with stricter regulations, inspections, and penalties imposed on non-compliant industries. Recycling of HW has to be taken up on a large scale, so that nearly 50% of the HW in AP can be recycled – reducing pollution and generating profits. Incineration of wastes for power generation should also be taken up, to reduce pollution.

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**CHANGING WORK SCENARIO- A CAUSE FOR STRESS AMONGST BANK EMPLOYEES**

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**ABSTRACT**

*The banking sector in Indian economy has undergone tremendous change with increasing levels of deregulation, increased competition which have facilitated globalization of the Indian banking system and has placed pressure on the employees of banks. Performing in this demanding environment has exposed banks to various challenges. The competition paved the way for the banks to introduce new instruments and find out new opportunities to have an edge over its competitors. In this context the researcher has undertaken a study to find out the impact of stress on the performance of bank employees in Dakshina Kannada district. Statistical tool such as annova is used.*

**KEYWORDS**

Job stress, challenges, employees, banks.

**INTRODUCTION**

Stress is dependent on organizational factors such as expectations of an organization in terms of performance, deadlines to be met, targets to be achieved, conflict for power, desire to take decisions, unhealthy competition, instability in organization structure, strained personal relationship with co-workers, frequent quarrels and back biting, increased automation, distortion in communication, tendency to revolt against the management, prestige, recognition, desire for status, performance based evaluation, rewards linked to performance, have pressurized the employees to work beyond their capacity and has disturbed the well being of the employees.

The entry of the foreign banks and advance in technology has set higher standards for the banking industry. To cope up with these increased challenges, the existing banks have to continuously involve in work to render better services and meet the demands and expectations of the customers. This has brought many changes in the work structure and causes stress among the employees of the bank. In this regard, a study on banking employees stress in Dakshina Kannada district of Karnataka state is conducted.

**CONCEPT OF JOB STRESS**

A generic definition of job stress given by US National Institute of Occupational Safety and Health (1999) is 'harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker. Job stress can lead to poor health and even injury'. The terms work stress, job stress, or occupational stress is used interchangeably (Dollard, 2003).

**REVIEW OF LITERATURE**

**Yahaya L.A et.al (1996)** in their survey in 5 cities of Nigeria on commercial banks indicated that there was no significant difference in the stress experienced by male and female bank employees. This shows that sex had no significant influence on sex experienced by the 2 groups. This finding might be related to the fact that bank employees irrespective of sex are exposed to similar working conditions and work activities. The responses of single and married respondents were compared. The 2 groups were significantly different in the stress experienced by them. This finding could be as a result of the responsibilities attached to marriage.

**Jasmine (1997)** conducted a study to compare the level of job related stress among public and private sector blue collar employees. The analysis of the data revealed that incumbents of public sector organization experienced significantly more stress than those of private sector organization. Job stress was reported to be significantly and negatively associated with income. No significant relationship was found between stress and age.

**Aminabhavi and Triveni (2000)** revealed that nationalized bank employees have significantly higher occupational stress than non nationalized bank employees, in the dimensions such as role conflict, unreasonable group/political pressure, intrinsic impoverishment and strenuous working conditions.

**Fernandes et al (2008)** studied the impact of social support on role stress experienced by the executives of public and private sector banks in Goa. Ten types of role stress were measured using the ORS scale and their study found that enhancing social support lowered the role stress.

**Garg Pratibha (2010)** in her study on few selected private sector banks of Chandigarh stated that Private sector banking employees experience stress in the workplace because of role and demands, control, interpersonal relationships, organizational processes and work-home balance: Deadlines they have to meet, high management expectation, job insecurity causes stress. They earn excellent salaries but they are expected to perform in accordance and even give more that their money's worth to justify their positions and their salaries. Apart from the stress at the workplace, there are other areas of their lives where they experience stress. With ongoing stress in work and non work areas employees feel out of balance with themselves and their environment. If employees do not take steps to manage their stress level it could be detrimental to their health and work performance and they can lead to burnout.

**Sankalp et.al (2010)** in their article 'Organizational Role Stress of Employees: Public Vs Private Banks' found that the private bank employees experienced higher organizational role stress than their public bank counterparts. Looking at the various aspects of components of organizational role stress, it was found that there

was no difference between the Public and Private Sector bank employees in certain aspects like role expectation conflict, role isolation, personal inadequacy and role ambiguity.

**Malik Nadeem (2011)** in his study on the occupational stress of employees in public and private sector banks in Quetta city, Pakistan stated that occupational stress is higher among private bank employees as compared to public bank employees. In both sectors the role over load, role authority, role conflict and lack of senior level support are the major stressors. The study indicates that the private Bank employees have high workload compared to public bank employees. The employees feel that the work allotted is taxing to the employees and it is beyond their expertise and limit. In this turbulent competition status in banking sector existence is the factor than maintenance. Members have to work under pressure, to compete with other private banks. The study also indicates that the private bank employees have high feeling towards lack of supervisory support compared to public bank employees. This indicates that the private bank employees are not getting adequate support from the superiors in their work accomplishments and dissemination of functional duties. Lower the level of support employees obtained from the organization higher the level of stress experienced by the employees at work.

**OBJECTIVES OF THE STUDY**

The objectives of the proposed research are;

- To understand the stress level of bank employees in public and private sector banks in Dakshina kannada district.
- To understand the influence of demographic variables on job stress.

**HYPOTHESIS**

- H<sub>1</sub>: Women are more stressed than men.
- H<sub>2</sub>: Higher the education more the stress
- H<sub>3</sub>: Age has a significant influence on stress of employees
- H<sub>4</sub>: Married employees experience more stress than the unmarried
- H<sub>5</sub>: Income level of the employees have a significant influence on stress
- H<sub>6</sub>: The type of family has a significant influence on stress.
- H<sub>7</sub>: Larger the dependents in the family higher the stress
- H<sub>8</sub>: Higher the designation more the stress.
- H<sub>9</sub>: The type of employment has a significant influence on stress.

**METHODOLOGY**

**DATA COLLECTION**

The secondary sources of data such as books, periodicals, and through internet is collected. The relevant primary data and information is collected through a comprehensive, structured and pre-tested questionnaires, interview, discussion and observational methods.

**ANAYSIS AND INTERPRETATION**

The researchers studied the relation between demographic variables and job stress in private and public sector banks. The analysis of the study is as follows

**TABLE 1: SHOWING THE GENDER AND THE LEVEL OF STRESS**

	Type of Bank	Gender	N	Mean	Std. Deviation	Median	Percentage mean	t value	p
Level of stress due to job	Public	Male	216	2.99	.532	3.00	59.8	.71	.478
		Female	195	3.03	.596	3.00	60.6		NS
	Private	Male	83	3.06	.631	3.00	61.2	.60	.551
		Female	43	3.14	.833	3.00	62.8		NS
	Total	Male	299	3.01	.562	3.00	60.2	.759	.448
		Female	238	3.05	.645	3.00	61		NS

There is no significant difference in stress and gender in public sector banks as t value =.71, p=0.478 as well as private banks as t=.60, p=.551. In banks as a whole also there is no significant difference in stress and gender as t=.759, p=.448 and hypothesis H<sub>1</sub> is rejected.

**TABLE 2: SHOWING THE EDUCATION AND THE LEVEL OF STRESS**

	Type of Bank	Education	N	Mean	Std. Deviation	Median	Percentage mean	ANOVA F	p
Level of stress due to job	Public	sslc	35	2.83	.382	3.00	56.6	10.603	.000
		puc	46	3.00	.816	3.00	60		HS
		graduate	240	3.12	.523	3.00	62.4		
		PG	90	2.77	.475	3.00	55.4		
	Private	sslc	4	3.25	.500	3.00	65	2.731	.047
		puc	6	3.50	.548	3.50	70		sig
		graduate	81	3.16	.679	3.00	63.2		
		PG	35	2.83	.747	3.00	56.6		
	Total	sslc	39	2.87	.409	3.00	57.4	11.618	.000
		puc	52	3.06	.802	3.00	61.2		HS
		graduate	321	3.13	.566	3.00	62.6		
		PG	125	2.78	.562	3.00	55.6		

There is high significant difference in stress among the different levels of education in public sector banks as F=10.603, p=0.000 whereas in private banks there is significant difference among the age groups as F=2.731, p=.047. Therefore stress is more among the post graduate qualification holders in public sector banks when compared to in private banks.

In banks as a whole there is high significant difference among the different levels of education as F=11.618, p=.000 and it is observed that stress is more among the post graduate qualification holders. Hence hypothesis H<sub>2</sub> is accepted.

**TABLE 3: SHOWING THE AGE GROUPS AND THE LEVEL OF STRESS**

Type of Bank	Age(yrs)	N	Mean	Std. Deviation	Median	Percentage mean	ANOVA F	p
Public	21-25	30	3.00	.000	3.00	60	1.719	.129
	26-30	23	2.83	.388	3.00	56.6		NS
	31-35	16	3.00	.000	3.00	60		
	36-40	48	2.83	.630	3.00	56.6		
	41-45	36	3.03	.506	3.00	60.6		
	above45	258	3.05	.612	3.00	61		
Private	21-25	38	3.00	.658	3.00	60	6.008	.000
	26-30	20	2.80	.616	3.00	56		HS
	31-35	10	2.40	1.265	3.00	48		
	36-40	20	3.15	.366	3.00	63		
	41-45	11	3.45	.522	3.00	69		
	above45	27	3.48	.509	3.00	69.6		
Total	21-25	68	3.00	.489	3.00	60	3.451	.004
	26-30	43	2.81	.500	3.00	56.2		HS
	31-35	26	2.77	.815	3.00	55.4		
	36-40	68	2.93	.581	3.00	58.6		
	41-45	47	3.13	.536	3.00	62.6		
	above45	285	3.09	.616	3.00	61.8		

There is no significant difference in stress among the age groups in public sector banks as  $F=1.719, p=0.129$  whereas in private banks there is high significant difference among the age groups as  $F=6.008, p=.000$ . Therefore stress is not related with age in public sector banks whereas in private banks the age group 31 to 35 has more stress compared to other age groups.

In banks as a whole there is high significant difference among the age groups as  $F=3.451, p=.004$  and the age group 31- 35 shows more stress compared to other age groups. Hence hypothesis  $H_3$  is accepted.

**TABLE 4: SHOWING THE MARITAL STATUS AND THE LEVEL OF STRESS**

	Type of Bank	Marital status	N	Mean	Std. Deviation	Median	Mean(%)	F	p
Level of stress due to job	Public	married	356	3.00	.603	3.00	60.06	.188	.851
		unmarried	55	3.02	.135	3.00	60.36		NS
	Private	married	81	3.15	.726	3.00	62.96	1.304	.195
		unmarried	45	2.98	.657	3.00	59.56		NS
	Total	married	437	3.03	.629	3.00	60.59	.447	.655
		unmarried	100	3.00	.449	3.00	60.00		NS

There is no significant difference in stress and marital status as in public sector banks as  $f=.188, p=0.851$  as well as in private banks as  $f=1.304, p=.195$ . In banks as a whole also there is no significant difference in stress and type of banks as  $f=.447, p=.655$  and the hypothesis  $H_4$  is rejected.

**TABLE 5: SHOWING THE INCOME PER MONTH AND THE LEVEL OF STRESS**

	Type of Bank	Income per month	N	Mean	Std. Deviation	Median	Percentage mean	ANOVA F	p
Level of stress due to job	Public	<10,000	8	3.00	.000	3.00	60	1.160	.328
		10,000-20000	35	3.00	.000	3.00	60		NS
		20000-30000	94	2.90	.442	3.00	58		
		30000-40000	136	3.01	.678	3.00	60.2		
		above40,000	138	3.07	.594	3.00	61.4		
	Private	<10,000	8	3.13	.641	3.00	62.6	2.539	.043
		10,000-20000	44	3.16	.680	3.00	63.2		sig
		20000-30000	28	2.79	.630	3.00	55.8		
		30000-40000	25	3.36	.490	3.00	67.2		
		above40,000	21	3.00	.949	3.00	60		
	Total	<10,000	16	3.06	.443	3.00	61.2	2.441	.046
		10,000-20000	79	3.09	.511	3.00	61.8		sig
		20000-30000	122	2.88	.491	3.00	57.6		
		30000-40000	161	3.07	.663	3.00	61.4		
above40,000		159	3.06	.649	3.00	61.2			

There is no significant difference in stress and the income per month in public sector banks as  $F=1.160, p=0.328$  whereas in private banks there is significant difference with the income per month as  $F=2.539, p=.043$ . Therefore stress is not related with the income per month in public sector banks whereas in private banks the income group of 20,000 to 30,000 has more stress compared to other income groups.

In banks as a whole there is significant difference in stress and the income per month as  $F=2.441, p=.046$  and the income group of 20,000 to 30,000 shows more stress compared to other income groups. Hence hypothesis ( $H_5$ ) is accepted.

**TABLE 6: SHOWING TYPE OF FAMILY AND THE LEVEL OF STRESS**

	Type of Bank	Family type	N	Mean	Std. Deviation	Median	Percentage mean	ANOVA F	p
Level of stress due to job	Public	nuclear	257	3.02	.499	3.00	60.47	.952	.387
		joint	67	3.03	.577	3.00	60.60		NS
		extended	87	2.93	.712	3.00	58.62		
	Private	nuclear	67	3.07	.724	3.00	61.49	.036	.964
		joint	24	3.08	.881	3.00	61.67		NS
		extended	35	3.11	.530	3.00	62.29		
	Total	nuclear	324	3.03	.553	3.00	60.68	.371	.690
		joint	91	3.04	.665	3.00	60.88		NS
		extended	122	2.98	.668	3.00	59.67		

There is no significant difference in stress and type of family in public sector banks as  $f=.952, p=0.387$  as well as in private banks as  $f=.036, p=.964$ .

In banks as a whole also there is no significant difference in stress and type of family as  $f=.371, p=.690$  and the hypothesis  $H_6$  is rejected.

**TABLE 7: SHOWING NUMBER OF DEPENDENTS AND THE LEVEL OF STRESS**

	Type of Bank	No. of dependents	N	Mean	Std. Deviation	Median	Percentage mean	ANOVA F	p
Level of stress due to job	Public	<2	159	3.09	.488	3.00	61.89	5.672	.004
		3-5	243	2.96	.598	3.00	59.26		HS
		above5	9	2.56	.527	3.00	51.11		
	Private	<2	56	2.93	.735	3.00	58.57	2.781	.066
		3-5	67	3.22	.670	3.00	64.48		NS
		above5	3	3.00	.000	3.00	60.00		
	Total	<2	215	3.05	.566	3.00	61.02	2.373	.094
		3-5	310	3.02	.623	3.00	60.39		NS
		above5	12	2.67	.492	3.00	53.33		

There is high significant difference in stress and the number of dependents in the families of the respondents in public sector banks as  $f=5.672$ ,  $p=0.004$  whereas in private banks there is no significant difference in difference in stress and the number of dependents in the families of the respondents as  $f=2.781$ ,  $p=.066$ . Therefore stress is more among the respondents who have more than 5 dependents in their family in public sector banks when compared to in private banks. In banks as a whole there is no significant difference in stress and the number of dependents in the families of the respondents as  $f=2.373$ ,  $p=.094$  and hence hypothesis  $H_7$  is rejected.

**TABLE 8: SHOWING DESIGNATION AND THE LEVEL OF STRESS**

	Type of Bank	designation	N	Mean	Std. Deviation	Median	Percentage mean	ANOVA F	p
Level of stress due to job	Public	clerk	205	3.08	.563	3.00	61.56	3.924	.021
		officer	139	2.96	.523	3.00	59.14		sig
		Branch head	67	2.88	.616	3.00	57.61		
	Private	clerk	60	3.17	.740	3.00	63.33	1.097	.337
		officer	42	3.07	.745	3.00	61.43		NS
		Branch head	24	2.92	.504	3.00	58.33		
	Total	clerk	265	3.10	.608	3.00	61.96	4.774	.009
		officer	181	2.98	.582	3.00	59.67		HS
		Branch head	91	2.89	.586	3.00	57.80		

There is significant difference in stress and designation of the respondents in public sector banks as  $F=3.924$ ,  $p=0.021$  whereas in private banks there is no significant difference in stress and designation of the respondents as  $F=1.097$ ,  $p=.337$ . Therefore stress is more among the branch heads in public sector banks. In banks as a whole there is high significant difference in stress and the designation of the respondents as  $F=4.774$ ,  $p=.009$  and stress is more among the branch heads. Hence hypothesis  $H_8$  is accepted.

**TABLE 9: SHOWING TYPE OF EMPLOYMENT AND THE LEVEL OF STRESS**

	Type of Bank	Type of employment	N	Mean	Std. Deviation	Median	Percentage mean	ANOVA F	p
Level of stress due to job	Public	probationary	44	2.91	.291	3.00	58.18	1.427	.233
		permanent	367	3.02	.587	3.00	60.33		NS
	Private	probationary	19	3.00	.000	3.00	60.00	.312	.732
		temporary	12	3.00	.853	3.00	60.00		NS
		permanent	95	3.12	.756	3.00	62.32		
	Total	probationary	63	2.94	.246	3.00	58.73	.785	.457
		temporary	12	3.00	.853	3.00	60.00		NS
		permanent	462	3.04	.626	3.00	60.74		

There is no significant difference in stress and type of employment in public sector banks as  $f=.1427$ ,  $p=0.233$  as well as in private banks as  $f=.312$ ,  $p=.732$ . In banks as a whole also there is no significant difference in stress and type of employment as  $f=.785$ ,  $p=.457$  and the hypothesis  $H_9$  is rejected.

**FINDINGS**

It is observed that gender does not have a significant influence on stress. Men and women experience the same level of stress. The literature on stress says that women experience more stress than men but in the present days the scenario has changed. Men are very supportive more women to be career oriented and they support them in taking up a career. Men give a helping hand to their wives at home and hence they do not experience the overburden of handling roles at different places.

Age has a significant influence on stress and the age group 31- 35 shows more stress compared to other age groups. This age is seen to be the age where they settle down by getting married and build a family life. Hence coping with pressure of the work place as well as their personal life may have an influence on them. This would lead to stress.

Higher responsibilities would be given to those who are well qualified. Hence it is observed from the study that job stress is more among the post graduate qualification holders in banks as responsible jobs of managerial level would be given to those who have higher level of education.

The income group of 20,000 to 30,000 has more stress compared to other income groups. It is observed that the living expenses have risen and a salary in this range has to take care of the family. Employees in this range of salary would be clerks and officers who would have to handle a lot of documentation and perform monotonous type of jobs.

There is no significant difference in stress and marital status. Both married and unmarried experience the same level of stress. The type of family also has no significant influence in the stress of employees banks. Whether the employee lives in a nuclear or a joint family or an extended family he experiences the same level of stress.

The respondents who have more than 5 dependents in their family in public sector banks are having more stress when compared to in private banks. In banks as a whole there is no significant difference in stress and the number of dependents in the families of the respondents.

Job stress is more among the branch heads in public sector banks. In banks as a whole there is high significant difference in stress and the designation of the respondents

There is no significant difference in stress and the type of employment in private or public sector banks. It doesn't matter whether the employees are probationary, temporary or permanent for the stress which they experience at the work place.

**CONCLUSION**

The banking sector has undergone tremendous changes due to the improvement in technology and entry of foreign banks. This has an ultimate impact on the bank employees. There is pressure for the employees to perform effectively in order to sustain and grow along with peers. The results of the analysis suggest that there is an increasing tendency of the banking employees to give better performance irrespective of their age groups and type of the bank. There is no significant impact of gender, marital status, and type of employment on stress.

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**A STUDY ON CONSUMER BEHAVIOUR OF MINI PUMPS IN DOMESTIC SECTOR****G. DEVAKUMAR****PROFESSOR****DEPARTMENT OF MANAGEMENT STUDIES****M. S. RAMAIAH SCHOOL OF ADVANCED STUDIES****BANGALORE****DR. G. BARANI****PERSONAL ASST. TO VICE CHANCELLOR****ANNA UNIVERSITY OF TECHNOLOGY****COIMBATORE****ABSTRACT**

*In marketing, understanding the behavior of the consumers is a starting point, knowing the consumer personality and their needs which lead to prompt sales. This study is primarily focused to understand the consumer behavior on mini pumps in Coimbatore City. There are numbers of organized and unorganized sector, who manufactures variety of pumps in Coimbatore. And there is huge demand for mini pumps, especially for domestic usage. This article attempts to understand the consumer behavior on the usage of mini pumps. The Study conducted with 250 customers to know their buying behavior, and it has found that the consumers are influenced by the plumbers, mechanics and electricians.*

**KEYWORDS**

Behavior, Consumer, Marketing, Mini pumps.

**THE BACKGROUND OF THE STUDY**

Consumer buying behavior is a decision process and an acts of people involved in buying and using the product. The various stages involved in consumer buying process are problem recognition, information search, evaluation of the alternatives, purchase decision, purchase and post purchase evaluation. The consumer making a purchase decision would be affected by the three major factors namely, personal factor, psychological factor and social factors.

**STATEMENT OF THE PROBLEM**

The attitude of the consumer, which prompts sale, depends on the situational behavior, availability of product, near by dealer shop, attractive price and after sales service support. Coimbatore is the place where too many payers in the pump market both organized and unorganized sectors. Hence this study is beneficial to the dealers and retailers with a view to understand the consumer behavior to attract the customer.

**OBJECTIVE OF THE STUDY**

1. To identify the various factors behind consumer behavior
2. To understand the influencing factor on promotional strategy
3. To suggest suitable recommendation to the dealers and retailers in the domestic pump market

**HYPOTHESIS**

- There is no significant association between the age group of respondents and the decision making.
- There is no association between the age group of respondents and the type of advertisement.
- There is a significant preference and association between the gender and the type of advertisement

**LITERATURE REVIEW**

Charterina (2012) the results show the conditions of the urban infrastructure, not only influence the decision as to where to shop in an in-town versus out-of-town dichotomy. The other factors like, means of transport, size of shopping basket and variety of types of retail outlets selected by consumers for their purchases.

Hasan Afzal and Muhammad Aslam Khan (2010). Says, with the use of effective advertising techniques, brands must build their image which in turn would build customer trust and credibility. Brands must try to build their competencies so that customer needs can be satisfied

Jacques Viaene and Xavier Gellynck (1995). There are five basic behaviour influencers namely, cognitive, affective, social, moral or ethical. These five basic influencers are used to determine the extent of willingness to change the habits.

Joy M. Kozar,(2012), It has noted that advertising executives are often apprehensive about using older models for fear that younger audiences might be offended, a misperception as older models is not found to actually alienate younger consumer groups. According to the study, among a sample of younger age consumers, older models were perceived as more trustworthy and credible than younger models.

M.Sathish, K. Santhosh Kumar, K.J.Naveen, and V.Jeevanantham (2011). Study says that the majority of the consumers are influenced by their friends and family members.

**METHODOLOGY**

The methodology involves collection of primary data from the respondents of the study. Well defined questionnaire was used to collect information from the respondents in Coimbatore city. The collected data was analyzed through frequency, percentages and Chi-square test. Literature survey was done using publication, journals and articles. Using convenience sampling, 250 samples were collected from the respondents.

**LIMITATION OF THE STUDY**

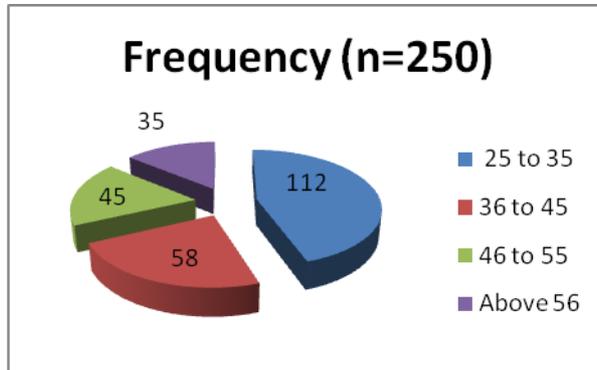
1. The present study is confined to usage of house hold mini pumps in Coimbatore city.
2. The sample size of 250 taken in domestic sector, which cannot be taken for generalizing other sectors.

**DATA ANALYSIS AND INTERPRETATION**

**TABLE 1: DISTRIBUTION OF AGE OF RESPONDENTS**

Age group	Frequency (n=250)	Percentage %
25 to 35	112	44.8
36 to 45	58	23.2
46 to 55	45	18
Above 56	35	14

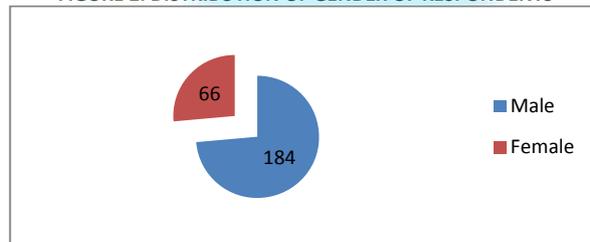
**FIGURE 1: DISTRIBUTION OF AGE OF RESPONDENTS**



**TABLE 2: DISTRIBUTION OF GENDER OF RESPONDENTS**

Gender	Frequency (n=250)	Percentage %
Male	184	73.6
Female	66	26.4

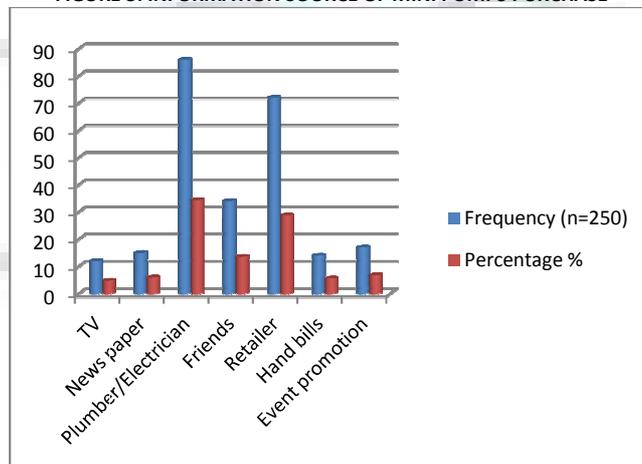
**FIGURE 2: DISTRIBUTION OF GENDER OF RESPONDENTS**



**TABLE 3: INFORMATION SOURCE OF MINI PUMPS PURCHASE**

Source	Frequency (n=250)	Percentage %
TV	12	4.8
News paper	15	6
Plumber/Electrician	86	34.4
Friends	34	13.6
Retailer	72	28.8
Hand bills	14	5.6
Event promotion	17	6.8

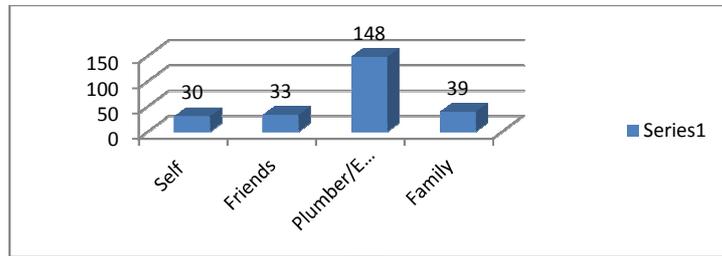
**FIGURE 3: INFORMATION SOURCE OF MINI PUMPS PURCHASE**



**TABLE 4: DECISION TAKEN TO PUCHSE THE MINI PUMP SET**

Decision	Frequency (n=250)	Percentage %
Self	30	12
Friends	33	13.2
Plumber/Electrician	148	59.2
Family	39	15.6

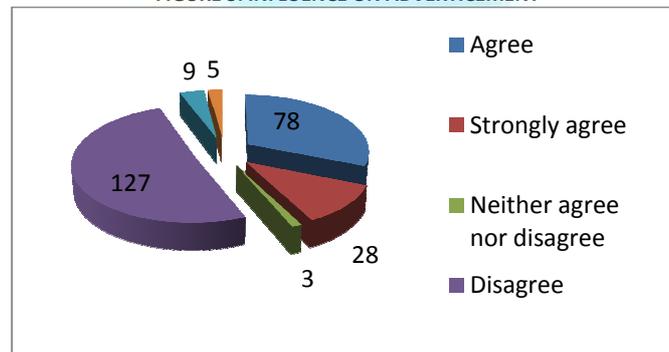
**FIGURE 4: DECISION TAKEN TO PUCHSE THE MINI PUMP SET**



**TABLE 5: INFLUENCE ON ADVERTICEMENT**

Description	Frequency (n=250)	Percentage %
Agree	78	31.2
Strongly agree	28	11.2
Neither agree nor disagree	3	1.2
Disagree	127	50.8
Strongly disagree	9	3.6
Neither disagree nor agree	5	2

**FIGURE 5: INFLUENCE ON ADVERTICEMENT**



**TABLE 6: AGE GROUP OF RESPONDENT AND DECISIONMAKING**

Age	Self	Friends	Plumber	Family	Total
25-35	11	15	68	18	112
36-45	8	6	34	10	58
46-55	6	7	24	8	45
Above 50	5	5	22	3	35
Total	30	33	148	39	250

**FIGURE 6: AGE GROUP OF RESPONDENT AND DECISIONMAKING**

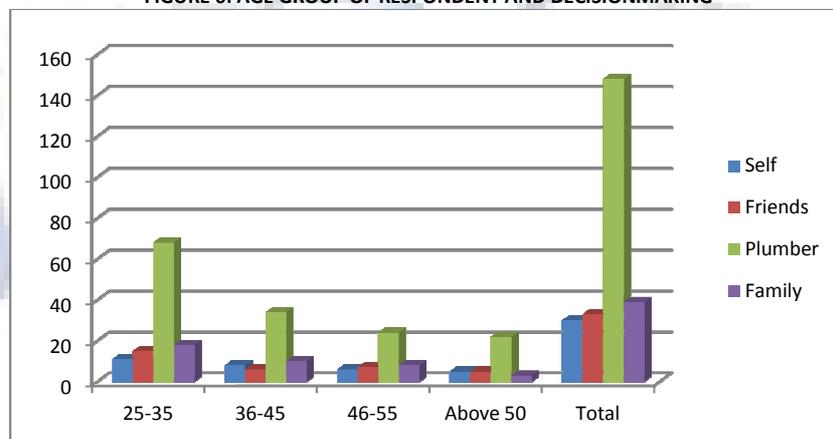


TABLE 7: ASSOCIATION BETWEEN THE AGE GROUP OF RESPONDENT AND DECISIONMAKING

O	E	O-E	(O-E) <sup>2</sup> /E
11	13.44	-2.44	0.442976
15	14.784	0.216	0.003156
68	66.304	1.696	0.043382
18	17.472	0.528	0.015956
8	6.96	1.04	0.155402
6	7.656	-1.656	0.358194
34	34.336	-0.336	0.003288
10	9.048	0.952	0.100166
6	5.4	0.6	0.066667
7	5.94	1.06	0.189158
24	26.64	-2.64	0.261622
8	7.02	0.98	0.136809
5	4.2	0.8	0.152381
5	4.62	0.38	0.031255
22	20.72	1.28	0.079073
3	5.46	-2.46	1.108352
			3.147838

Chi-square (actual) value = 3.14, Degree of freedom = 9, p = 0.05

Chi-square (critical) value = 16.19,

Since, Chi-square (actual) value < Chi-square (critical) value, do not reject the hypothesis H0, There is no significant association between the age group of respondents and the decision making.

TABLE 8: AGE GROUP OF RESPONDENT AND TYPE OF ADVERTISEMENT

Age	TV	News paper	Plumber	Friends	Retailer	Hand bills	Event promotion	Total
25-35	2	1	36	8	21	4	5	77
36-45	2	3	13	6	23	4	4	55
46-55	4	5	10	12	12	2	3	48
Above 50	4	6	27	8	16	4	5	70
Total	12	15	86	34	72	14	17	250

FIGURE 7: AGE GROUP OF RESPONDENT AND TYPE OF ADVERTISEMENT

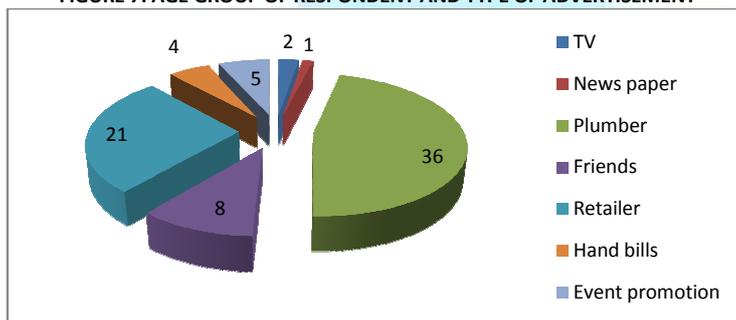


TABLE 9: ASSOCIATION BETWEEN THE AGE GROUP OF RESPONDENT AND TYPE OF ADVERTISEMENT

O	E	O-E	(O-E) <sup>2</sup> /E
2	3.696	-1.696	0.778251
1	4.62	-3.62	2.83645
36	26.488	9.512	3.415816
8	10.472	-2.472	0.583536
21	22.176	-1.176	0.062364
4	4.312	-0.312	0.022575
5	5.236	-0.236	0.010637
2	2.64	-0.64	0.155152
3	3.3	-0.3	0.027273
13	18.92	-5.92	1.852347
6	7.48	-1.48	0.292834
23	15.84	7.16	3.236465
4	3.08	0.92	0.274805
4	3.74	0.26	0.018075
4	2.304	1.696	1.248444
5	2.88	2.12	1.560556
10	16.512	-6.512	2.568202
12	6.528	5.472	4.586824
12	13.824	-1.824	0.240667
2	2.688	-0.688	0.176095
3	3.264	-0.264	0.021353
4	3.36	0.64	0.121905
6	4.2	1.8	0.771429
27	24.08	2.92	0.354086
8	9.52	-1.52	0.242689
16	20.16	-4.16	0.858413
4	3.92	0.08	0.001633
5	4.76	0.24	0.012101
			26.33097

Chi-square (actual) value = 26.33, Degree of freedom = 18, p= 0.05,

Chi-square (critical) value = 28.86

Chi-square (actual) value < Chi-square (critical) value

Since, Chi-square (actual) value < Chi-square (critical) value, do not reject the hypothesis H0, There is no significant preference among the categories and no association between the age group of respondents and the type of advertisement .

TABLE 10: GENDER AND THE TYPE OF ADVERTISEMENT

Type of Add	Male	Female	Total
TV	8	4	12
News paper	7	8	15
Plumber/Electrician	68	18	86
Friends	24	10	34
Retailer	60	12	72
Hand bills	8	6	14
Event promotion	9	8	17
Total	184	66	250

FIGURE 8: GENDER AND THE TYPE OF ADVERTISEMENT

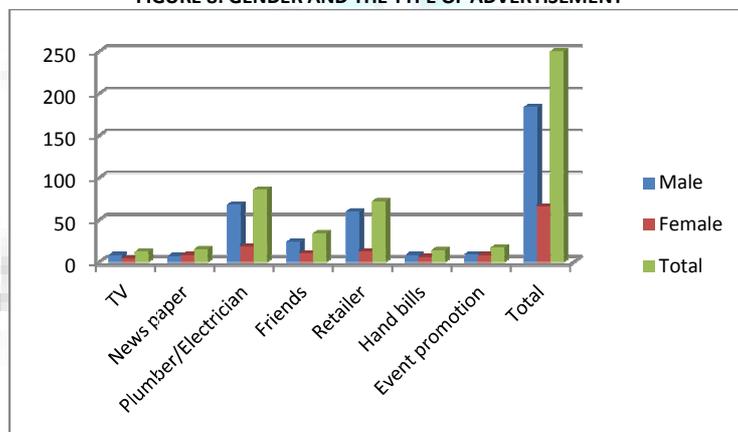


TABLE 11: ASSOCIATION BETWEEN THE GENDER AND THE TYPE OF ADVERTISEMENT

O	E	O-E	(O-E) <sup>2</sup> / E
8	8.832	-0.832	0.078377
4	3.168	0.832	0.218505
7	11.04	-4.04	1.478406
8	3.96	4.04	4.121616
68	63.296	4.704	0.349589
18	22.704	-4.704	0.974613
24	25.024	-1.024	0.041903
10	8.976	1.024	0.11682
60	52.992	7.008	0.926783
12	19.008	-7.008	2.583758
8	10.304	-2.304	0.51518
6	3.696	2.304	1.43626
9	12.512	-3.512	0.985785
8	4.488	3.512	2.74825
			16.57584

Chi-square (actual) value = 16.57, Degree of freedom =6,  $p = 0.05$ ,

Chi-square (critical) value = 12.59

Chi-square (actual) value > Chi-square (critical) value

Since, Chi-square (actual) value > Chi-square (critical) value, reject the hypothesis  $H_0$ , There is a significant preference among the categories and there is an association between the gender and the type of advertisement

### FINDINGS AND SUGGESTIONS

The majority of the buying behaviors of the respondents were influenced by the information source provided by the plumbers, mechanics and electricians. The maximum numbers of respondents were told that they were attracted by plumbers and mechanics, and the decision taken based on these information sources, which contribute to 59% of the total. It is also observed that the retailer plays an important role for pushing the product. It was found that the Chi-square (actual) value is less than the Chi-square (critical) value, hence there is no significant preference among the categories of association between the age group and decision making on purchase. Also there is no association between the age group of respondents and the type of advertisement. The maximum respondents were having age group from 25 to 35, in which 74% of them were men and there is a significant association between the gender and the type of advertisement.

### CONCLUSION

Coimbatore city being the heart of pump manufacturing industries and the utilization of mini pump has become a part of every house hold irrespective of all the seasons. Many companies under organized and unorganized sector are entering in to the market .For better survive, the manufactures should motivate the dealer, sub-dealer, retailer and the influencers' of the product i.e., plumbers, mechanics and electricians for better margin on their effort made on sales. Marketers to design attractive promotional campaigns like dealers meet, mechanics training program, plumbers meet, which will result in customer attraction against salability of the brand.

### SCOPE FOR FUTURE RESEARCH

Similar type of study can be conducted on sectors like agricultural sector and industry sector for other range of product namely, open well submersible pump sets, bore well submersible pumps and mono block pump sets.

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**SHOPPING MOTIVES OF CONSUMERS TOWARDS ORGANIZED RETAIL SECTOR IN ODISHA****CHINMAYEE NAYAK****STUDENT****ODISHA UNIVERSITY OF AGRICULTURE & TECHNOLOGY****BHUBANESWAR****DR.DURGA CHARAN PRADHAN****PROFESSOR****ODISHA UNIVERSITY OF AGRICULTURE & TECHNOLOGY****BHUBANESWAR****ABSTRACT**

The study was undertaken with the main objectives to find out factors affecting category loyalty in organized retail chain. Data were collected through a well prepared questionnaire from the respondent and from the staff of retail outlet. Component factor analysis method was used to identify shopping motives of consumers towards organized retail outlets. Major finding revealed that most of the consumer preferred organized retail due to hedonic, economic and recreational motives. In order to carry out sizable business by retailer they have to cater to the needs of consumers. The kiran shops owners have to provide better amenity to the customers and develop more consumer friendly retailing to stay in the business.

**KEYWORDS**

Consumers, Odisha, organized retail sector, shopping motives.

**INTRODUCTION**

Satisfying customers is one of the main objectives of every business. Business recognizes that keeping current customers is more profitable than having to win new ones to replace those lost. To keep current consumers the retailers should understand the shopping motives of the consumers. The traditional retail formats with limited assortments catered to the convenience and utilitarian shopping values. The liberalized policies of the Indian government towards retailing and the focus on organized retailing have fuelled a major change in Indian consumer's shopping behaviour. Babin *et al* (1994) state that consumers can have multiple shopping motives and the primary motive is termed as utilitarian. The transition of shopping motives from only utilitarian to more of hedonic or pleasure seeking has been triggered by an exponential growth in the number of malls in India. The traditional shopping behaviors of product acquisition and consumption may no longer explain the shopping 'experience' the consumers seek when they go to a store or a mall. They look beyond mere assortment of products and functional attributes. Babin *et al* (1994) state that most consumption activities must combine both utilitarian and hedonic attributes and their absence may not reflect the totality of shopping experience ( Bloch and Richins, 1983 ). Research in the past few years has recognized the pivotal role hedonic values play in shopping and how they add to the emotional value ( Langrehr, 1991 ; Babin *et al* , 1994 ; Roy, 1994 ).

**REVIEW OF LITERATURE**

Skinner (1969) identified the basic consumer motives in selecting supermarket for the retail food industry. His study revealed that six variables friendliness, selection/ assortment, cleanliness, packing, fast check out service and ease of shopping to increase the probability of the shopping trip.

Tauber (1972) advanced the idea that shoppers were often motivated by a number of personal and social factors unrelated to the actual need to buy products. He proposed that people shop not just to purchase goods, but to learn about new trends, to make themselves feel better, to gain acceptance with their peers, and simply to divert themselves from life's daily routine. He identified 11 hidden motives that drive people to the stores and often lead to 'impulse buys' among consumers who initially were not planning on buying anything at all.

Babin *et al* (1994) developed a scale to assess shopping experience of the consumer based on utilitarian and hedonic value. Utilitarian value is considered when there is a product purchase in efficient way and when shoppers take shopping as a mission. Hedonic value relates to proposal experience, pleasure taken from shopping trip.

Kaur and Singh (2007) found shopping motives of Indian youth. The result predicted that Indian youth consumers were having less utilitarian motives rather having more hedonic motives.

Chakraborty (2010) found out shopping motives of the Indian discount store shoppers. The motives were both hedonic and utilitarian in nature. The identified shopping motives of discount shoppers were diversion motive, socialization motive and utilitarian motive. Discount store shoppers had response for the particular discount store's attributes, shopping outcomes and shopping perceived cost incurred for making a trip to the particular store.

**NEED OF THE STUDY**

In the current retail scenario of India, new retail format like supermarket, discount store etc. make an interesting field of research work. The research questions that arise are, "What makes Indian consumer buy from corporate retail outlet?" Keeping on view of this question research was conducted to know the factors motivating consumers towards organized retail outlet.

**OBJECTIVES**

1. To analyze the socio economic profile of consumers visiting organized retail outlet.
2. To identify the factors motivating consumers to purchase from organized retail outlet.

**METHODOLOGY**

For the present study three major food retail chains operating in Bhubaneswar, Odisha were selected. Data were collected during 2008. In order to study the shopping motives 100 retail chain customers were selected. The bulk of the departmental store consumers were commonly in the age group of 20-50 years from middle class urban. Factor analysis was employed to identify the shopping motives. The consumers were asked to rank 27 statements compiled from the study of Skinner (1969), Tauber (1972) in five point scale, 1 for strongly disagree and 5 for strongly agree. Kaiser-Meyer-Olkin (KMO) Measure of Adequacy and Bartlett's Test of Sphericity was done to know the appropriateness of the data collected for factor analysis. If KMO value is 0.5 then the data is acceptable for factor analysis. Furthermore values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great and values above 0.9 are superb. For the data to be appropriate Bartlett's test should have a significant value. Eigen value was used to know number of factors to be extracted. In component analysis each variable contributes a value of 1 to the total Eigen value. Thus only the factors having Eigen value greater than 1 are

considered significant and all factor loadings greater than 0.4 (ignoring sign) were retained. Each factor was named according to the structure of the statements loaded into that factor.

## RESULT AND DISCUSSION

Table 1 reveals the socio economic profile of respondent selected for the study. It may be observed from table that, in the organized retail market 36 percent of the consumers were in the age group of 30-39 years followed by 33 percent of the consumers in the age group of 20-29 years, 16 percent were in the age group of 40-49 years, 13 percent were in the age group of 50-59 years and only 2 percent were in the age group of above 60 years. Most of the consumers who visited organized retail market had higher educational qualification with nearly 49 percent of them being professional qualified, 37 percent of them completed graduation and 13 percent of them completed diploma. The distribution of households across different monthly income levels reveals that in organized retail market 43 percent of the respondent had a monthly income between Rs20,001 to Rs50,000 per month, 30 percent of the respondents had a monthly income between Rs 50,001 to Rs 1,00,000, 20 percent had a monthly income between Rs 10,001 to Rs 20,000, 3 percent had monthly income between Rs 1,00,001 to Rs 2,00,000.

In order to gauge the extent of agreement and disagreement why the respondent shopped weighed average scores (WAS) were calculated. Table 2 depicts information about weighted average scores of shopping motives. For these data Bartlett's test (Table 3) was found out to be statistically significant. As the chi square value was 668.588 which were much higher than critical value, it was suggested that factor analysis could be applied without any technical / statistical problem.

Table 4 lists the Eigen values associated with each linear component after extraction and total variance explained. Before extraction SPSS had identified 27 linear components within the data set. After extraction 9 statements had Eigen values greater than 1 which indicates number of factors extracted were 9. Factor 1 explained 18.652 percent of total variance and the total variance explained by these 9 factors were 75.973 percent. From the table it was concluded that first nine factors explained 76 percent of total variance and subsequent factors explained small amount of variance. Thus 9 factors were retained for analysis.

Table 5 shows the statement loading on each factor. All the factors were named according to the nature of statements loaded in that factor.

### FACTOR-1: HEDONIC SHOPPING MOTIVES

In the first factor seven statements were loaded on to this factor. The factor includes S5, S6, S8, S9, S23 and S25. The factor structure suggests that consumer tends to shop for personal as well as social reasons unrelated to the actual consumption criteria including rationally convenience motives. Their prime motives include getting product ideas, shopping with family etc.

### FACTOR-2: ECONOMIC SHOPPERS

This factor includes S1, S15, S18 and S22. This factor suggests that the shoppers tend to act as wise shoppers who make a purchase only after comparing prices and not getting affected by the environmental cues or sensory stimulants. They only purchase the planned product.

### FACTOR-3: RECREATIONAL SHOPPERS

This factor includes S2, S3, S4 and S24. The statements loading on this factor reveal that consumers like to shop simply because they have been to the market for fun, seek escape from daily routine, just browse through the outlets and dislike the physical activity involved in shopping. To sum up, they tended to act as recreational shoppers.

### FACTOR-4: MARKET MAVEN

The fourth factor in order of importance loaded statement like S7, S12, S16 and S17. The factor suggest that this group of shopper kept themselves aware of the latest products, trends and fashion as people look upon them for information and advice.

### FACTOR-5: STATUS CONSCIOUS SHOPPER

Fifth factor includes S13, S26. Status conscious consumers preferred to select stores that conform to their status.

### FACTOR-6: DEMONSTRATION GROUP

S18, S19 and S20 were loaded to the factor 6<sup>th</sup>. The consumers were used to be motivated by the display of commodity on the shelf. Hence along with quality products proper display of commodities is sine qua non for attracting consumers.

### FACTOR-7: IMPULSE SHOPPING MOTIVE

S10, S11 were included in this factor. The statements emphasis shopping based on sensory stimulation such as back ground music, handling of product. An appealing shopping complex attracts more customers. Shopping should not take as a stenotypic duty.

### FACTOR-8: HASSEL FREE MOTIVE

This factor includes only S19. These groups of consumers hesitate to bargain for a long time. Busy people avoid bargaining for being cheated by the trader.

### FACTOR-9: PEER GROUP ASSOCIATION

The last factor includes S27, S25. This factor reflects instinct of the consumers to stay associate.

The last three factors loading are not very important from the prospective of retailer.

## FINDINGS

People aged between 20 to 39 years old were emerging as the fastest growing consumer group and the mean age was 29. They constituted 69 per cent of the total consumers. The highest per cent of consumers belonged to income group of Rs.20, 000/- to Rs 50,000/ per month. They constituted 43 per cent of total consumers. The study revealed that consumers with in high income bracket visited organized retail as they were quality conscious and preferred hassle free shopping. Hedonic and recreational factors were found to be the main shopping motive.

## CONCLUSION AND RECOMMENDATION

The study concluded that young consumers interestingly tend to shop not from a utilitarian perspective but from a hedonic perspective. The consumers were particularly found to be considerably involved in the role of information seeker from the market and disseminator of the same to the peer group. Most of the consumers preferred retail outlet due to hedonic, economic and recreational shopping motives. Thus the organized retailers should take appropriate steps on priority basis to cater to the needs of the consumers for rapid development of retail chain.

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**TABLES**

**TABLE 1: SOCIO ECONOMIC PROFILE OF THE CONSUMERS SELECTED FOR THE STUDY**

Sl. no	Particulars	Percentage (N=100)
1	Age group in years	
	a. 20-29	33
	b. 30-39	36
	c.40-49	16
	d.50-59	13
	e. above 60	2
2	Educational status	
	a. professional courses	49
	b.graduate	37
	c. diploma	13
	d. intermediate	0
	e. secondary	0
	f. primary	0
3	Occupation of chief wage earner	
	a. executive officers	64
	b. supervisory level	20
	c. clerical level	6
	d. business man	10
	h. others	0
4	Average monthly household income	
	a. up to 10,000	0
	b. 10,001-20,000	24
	c. 20,001-50,000	43
	d. 50,001-1,00000	30
	e. 1,00001-2,00000	3
	f. 2,00001- 5,00000	0

Source: generated from questionnaire data

**TABLE 2: WEIGHTED AVERAGE SCORES**

Sl No.	Statements	Weighted average score	Standard Deviation
S1	I go to shop as I always do shopping for the family	4.575	0.95
S2	I enjoy shopping as it gives me an opportunity to escape from daily routine	3.625	1.33
S3	I prefer to spend my leisure time browsing through the outlet	2.30	1.24
S4	I enjoy shopping as it is a meeting place for my friends	2.82	1.53
S5	When I am depressed I go out shopping as it helps me in reducing the tension	2.02	1.32
S6	Visiting stores to shop helps me in learning new trend, style and fashion	3.92	1.30
S7	My friends seek my advice and so I keep updated with shopping knowledge	2.75	1.67
S8	Walking while shopping is a great physical exercise that I enjoy	2.65	1.36
S9	I enjoy shopping as it exposes me to new products and ideas	4.15	0.94
S10	While visiting the store I enjoy handling the product	2.15	1.45
S11	I like the soft background music in the store I shop	3.97	1.45
S12	I select a particular store to shop if my friends are doing the same	2.10	1.31
S13	I select a store where I don't need to bargain	4.025	1.42
S14	I compare prices at several fixed price stores to select best deal.	4.10	1.25
S15	I buy product as soon as like to display	2.50	1.05
S16	It is inconvenient for me to shop if place is too noisy	1.50	1.06
S17	I shop for products simply because I have been to the market	2.10	1.10
S18	My shopping plan is based on ads I see and discount offers available	1.65	1.00
S19	I like to make purchase as quickly as possible	3.20	1.30
S20	I like to shop in a store that has pleasant odors	3.40	1.66
S21	I purchase only planned product.	4.40	0.92
S22	I go out shopping for fun	3.52	1.44
S23	I go out on a shopping trip with my family	2.77	1.42
S24	I go out on a shopping trip with my family	3.37	1.21
S25	I combine visits to friends with shopping trip	2.80	1.01
S26	I combine hobbies with shopping trip	2.60	1.00
S27	I go out shopping with friends	2.07	0.91

Source: generated from questionnaire data

**TABLE 3: BARTLETT TEST OF SPHERICITY**

Chi square value	668.558
Degrees of freedom	378.58

Source: SPSS data run

TABLE 4: EIGEN VALUES AND TOTAL VARIANCE EXPLAINED AFTER EXTRACTION

Statements	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
S <sub>1</sub>	5.223	18.652	18.652
S <sub>2</sub>	3.538	12.634	31.286
S <sub>3</sub>	2.776	9.916	41.202
S <sub>4</sub>	2.144	7.656	48.857
S <sub>5</sub>	1.951	6.969	55.286
S <sub>6</sub>	1.722	6.148	61.974
S <sub>7</sub>	1.515	5.411	67.385
S <sub>8</sub>	1.321	4.719	72.104
S <sub>9</sub>	1.083	3.868	75.973

Source: SPSS data run

Extraction Method: Principal Component Analysis.

TABLE 5: STATEMENTS LOADING INTO EACH FACTOR

Statements	Factor <sub>1</sub>	Factor <sub>2</sub>	Factor <sub>3</sub>	Factor <sub>4</sub>	Factor <sub>5</sub>	Factor <sub>6</sub>	Factor <sub>7</sub>	Factor <sub>8</sub>	Factor <sub>9</sub>
S5	0.497								
S6	0.803								
S8	0.684								
S9	0.722								
S21	0.578								
S23	0.825								
S25	0.647								
S1		0.679							
S15		0.659							
S18		0.644							
S22		0.835							
S2			0.586						
S3			0.777						
S4			0.804						
S24			0.675						
S7				0.66					
S12				0.573					
S16				0.817					
S17				0.528					
S13					0.762				
S26					0.766				
S18						0.4			
S19						0.756			
S20						0.684			
S10							0.562		
S11							0.789		
S14								0.836	
S27									0.479
S25									0.898

## CURRENT STATUS AND CHALLENGES IN IMPLEMENTING INFORMATION AND COMMUNICATION TECHNOLOGY INITIATIVES IN EDUCATION IN INDIA

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### ABSTRACT

*India is well known for its large pool of technical manpower, a fair proportion of which finds employment in developed countries, especially in the West. As a happy sequel to the story, India has in the last decade witnessed a big boom in the knowledge led service sector. In order to sustain this trend, and to ensure that India does not throw away this key advantage, it is imperative that we continue to produce a critical mass of highly skilled manpower at an accelerated pace. At any given time, education has been a key factor for its ability to change and to induce change and progress in the society. One of the striking features of the development of higher education in India over the last few decades has been the extent to which private institutions have entered the scene and attempted to respond to the massive demand for education at the post-secondary level. This is particularly true in the fields of engineering, medicine, and management, and much less at the broader level of university education. The strong emergence of the private sector is reflected in the funding pattern: the government's share in overall education expenditure has declined and private expenditure on education has increased. A large number of Initiatives using ICT at all levels of education are ongoing in India, some at a pilot stage while others are operating full scale in a large geography. This paper reviews the progress of Education, its administration, and the progress of different ICT initiatives and the challenges of implementation.*

### KEYWORDS

Education, Information and communication technology.

### INTRODUCTION

India is well known for its large pool of technical manpower, a fair proportion of which finds employment in developed countries, especially in the West. As a happy sequel to the story, India has in the last decade witnessed a big boom in the knowledge led service sector. In order to sustain this trend, and to ensure that India does not throw away this key advantage, it is imperative that we continue to produce a critical mass of highly skilled manpower at an accelerated pace.

### OBJECTIVE OF THE STUDY

The main purpose or objective of study of this paper is as follows:

1. To highlight the initiatives in Information and Communication technology in the field of Education.
2. To summarize the challenges faced in implementing information and communication technology and recommendation to overcome the challenges.

### RESEARCH METHODOLOGY

This paper is based on a review of key literature and a descriptive analysis of secondary data, from government sources like The Ministry of Communications & Information Technology, Department of Telecommunications, Office of the Administrator, USOF, Department of School Education & Literacy, SARVA SHIKSHA ABHIYAN, EDUSAT Distance Learning Programme, Implementation Document, National Institute of Open Schooling, Ignou, The people's University and from reports from private organization.

### INDIA AND KNOWLEDGE ECONOMY

An enabling academic and economic setting is a key factor determining the fate of our nation in the wake of the knowledge service sector boom. At any given time, higher education has been a key factor for its ability to change and to induce change and progress in the society. Not surprising that in today's globalized economy; it is the globalization of knowledge that will enable us to deal with the present and future challenges that is confronting us in every sphere of life, whether it is in environment, health or food security. Since independence, higher education has always been identified as a critical component of India's growth story. When Pandit Jawaharlal Nehru established the Indian Institutes of Technology, he understood the need for educated and skilled human resources only too well.

### ADMINISTRATION OF EDUCATION

The education system in India is administered by the Ministry of Human Resource Development at the center and the different Departments of Education at the state level. Education is a concurrent subject, which implies that Indian states and the federal government both have jurisdiction over the sector; although the Government of India provides the overall policy framework, financial support and guidelines to ensure a national standard of education, implementation is primarily done at the state level.

### CONTRIBUTION OF PRIVATE SECTOR IN EDUCATION

One of the striking features of the development of higher education in India over the last few decades has been the extent to which private institutions have entered the scene and attempted to respond to the massive demand for education at the post-secondary level. This is particularly true in the fields of engineering, medicine, and management, and much less at the broader level of university education. The strong emergence of the private sector is reflected in the funding pattern: the government's share in overall education expenditure has declined and private expenditure on education has increased. Till the late 1990s, the expansion of higher education largely took place through affiliated colleges. By then, many promoters of private unaided colleges began to realize that the regulatory mechanisms of the affiliating university and state governments were inhibiting their growth and did not allow them to fully exploit their

market potential. The promoters were not able to make money from their educational enterprises. Such institutions explored the possibilities of emerging out of the control of the state governments and the affiliating universities. Some of the institutions took the deemed to be university route to get the degree granting powers. Commercial private higher education emerges from market forces and tied to economic and global forces. They thrive on the principles of commercialism, primarily focus on vocational courses and highly pragmatic. Their commercial thrust is training jobs; indeed, part of the curriculum is industrial training. Not only training for jobs but also place their students in well-paid jobs.

In a report prepared by Ernst & Young titled "Making the Indian higher education system future ready" presented in the FICCI Higher education summit 2009 makes the case that we must replicate the private sector higher education success story, given now that the private sector accounts for a large and growing proportion of the higher education segment (63.21% in 2006, with a predominance in professional education such as engineering and Pharmacy).

## CONTRIBUTION OF INFORMATION & COMMUNICATION TECHNOLOGY IN EDUCATION

Usage of ICT can help improve India's higher education system in three ways:

### a) Greater equity:

1. Easy access to students from various socio-economic groups, leading to greater inclusion.
2. Good quality institutions are not restricted to a few pockets but are made accessible to students located all over the country.
3. Content from all over the world can be made available to students with access to internet.

### b) Better Access:

1. Cheaper costs of education.
2. Increased flexibility, providing anytime anywhere access to students
3. Reduction in capacity constraints making large enrolments possible in courses run by reputed institutes.
4. Technology can be leveraged to provide access to courses in new and emerging fields to greater number of students.

### c) Improved Quality:

1. Usage of supplementary teaching aids
2. Better and more efficient processes and management systems
3. Access to up-to-date content
4. Increased knowledge sharing among course creators and scientists
5. Creation of comprehensive centralized digital repositories for reference material

## NATIONAL KNOWLEDGE COMMISSION

The importance of using ICT for improving education has been emphasized for over a decade in India; right from 1992 the National Policy on Education emphasized using educational technology to improve the quality of education. Consequently major government schemes have a component of funding allocated for using ICTs and focused initiatives. A glance at the Eleventh Five-Year Plan also reflects the importance of ICT in the education scenario of India. To harness the capacity of ICT in delivering educational services, a national ICT initiative, the National Knowledge Network has been launched with the mandate of providing a blue print for reform of the educational sector in the context of the emerging knowledge society. The NKC recommendations outline a roadmap for strengthening the education system from school education to general higher and professional education, as well as skill development in India, with a focus on how to leverage available technologies to improve access and quality of education.

Based on the recommendation of the NKC, with the collaborative effort of the Ministry of Human Resource Development (MHRD), Department of IT and Department of Telecom that will make its presence felt in 378 Universities and 18,064 colleges. The network will focus on digitization and networking of the educational institutions, making available bandwidth to facilitate collaborative research and knowledge sharing. Further, the National Mission on Education through ICTs launched by the MHRD aims to leverage ICTs to provide high-quality, personalized, and interactive knowledge modules over the Internet/intranet to all learners in higher education institutions, any time anywhere.

A coherent policy level framework for the use of ICTs in school education in India was recently initiated through a stakeholder dialogue on formulating a draft national policy for ICT in education, led by the Ministry of Human Resource Development, Global e-Schools Initiative (GeSCI), and Centre for Science, Development and Media Studies (CSDMS). Based on feedback received a draft "National Policy on ICT in School Education" has now been published for comments and revision. In terms of ICT literacy for students, this draft policy document proposes implementing a programme for ICT literacy for all secondary schools, suggesting that all states develop an ICT literacy curriculum to instill basic as well as advanced ICT skills among secondary school students. At the higher secondary stage, the draft policy states that ICT-related elective courses will be offered in schools which will be taught by a postgraduate teacher with appropriate qualifications. To foster an environment of ICT-enabled teaching-learning, the draft policy states that competent teachers will be encouraged and given the resources to adopt ICT-enabled practices in teaching-learning. For this purpose, the transformation of classrooms into SMART classrooms (classrooms equipped with a wide range of ICT facilities including computers, projectors et cetera, used to teach the curriculum) will be catalyzed. As for ICT infrastructure, the draft policy states that each school will be equipped with at least one computer lab and a minimum of a 10:1 student computer ratio will be maintained. Policies regarding other ICT facilities and enabling infrastructure and their delivery mechanism have also been articulated in the draft policy document. There is also a focus on capacity building of teachers as well as state/district education department personnel and on using ICT for open and distance learning (ODL).

## 1. CURRENT STATUS OF ICT INITIATIVES IN INDIA – GOVERNMENT INITIATIVES

A large number of initiatives using ICT at all levels of education are ongoing in India, some at a pilot stage while others are operating full scale in a large geography. While individual states in India have significant ICT-related interventions in their education systems, major initiatives operating at a national level in educational institutions are profiled here. Some of the major initiatives taken by the government are:

### 1.1. NATIONAL KNOWLEDGE NETWORK

A high-speed digital broadband network, the National Knowledge Network, is envisaged for interconnecting the country's major research and educational institutions, colleges, and universities. A structured empowered committee will be in charge of coordinating the activities of creation and implementation of the content, application, and establishment of the network. The Mission has two major components: content generation and providing connectivity, including last mile connectivity for students and institutions. On the content generation front, a wiki style collaborative platform under the supervision of content advisory committees is envisaged.

### 1.2. INDIRA GANDHI NATIONAL OPEN UNIVERSITY

The IGNOU is a higher education institution; as an open education provider, it has been at the vanguard of developing and maintaining standards in open learning in India and is a significant milestone in any discussion on the use of technology for education. The University was established in 1985 by an Act of Parliament with the dual responsibilities of (i) enhancing access and equity to higher education through distance mode and (ii) promoting, coordinating, and determining standards in open learning and distance education systems.

### 1.3. GYAN DARSHAN

Launched in 2000, Gyan Darshan is a bouquet of channels that broadcasts educational programs for school kids, university students, and adults. Courses are contributed by IGNOU, UGC CEC, IITs.

### 1.4. GYAN VANI

It is a bouquet of FM radio channels which broadcast programs contributed by institutions such as IGNOU and IITs.

**1.5. UGC COUNTRYWIDE CLASSROOM**

Under the country wide classroom initiative, education programs are telecast on Gyan Darshan and Doordarshan's National Channel (DD1) every day. Till date, more than 10,000 programs have been telecast on subjects such as Arts and Social Sciences.

**1.6. E-GYANKOSH**

It is a knowledge repository launched by IGNOU in 2005 which aims at storing and preserving digital learning resources. Almost 95% of IGNOU's printed material has been digitised and uploaded on the repository.

**1.7. NATIONAL PROGRAMME FOR TECHNOLOGY ENHANCED LEARNING**

Approved in 2001, National Programme for Technology Enhanced Learning (NPTEL) is a joint initiative of IITs and IISc. As a part of its first phase, digital course content for 129 engineering/science courses has been developed and uploaded on you tube.

**1.8. E-JOURNAL CONSORTIA**

AICTE – Indian National Digital Library in Engineering & Technology (AICTE – INDEST) is a consortium set up by the Ministry of Human Resource to enhance greater access and generate annual savings in access of bibliographic databases.

UGC has also launched its Digital Library Consortium to provide access to peer reviewed journals and bibliographic databases covering subjects such as arts, humanities, and sciences.

**1.9. NETWORKING OF HIGHER EDUCATION INSTITUTIONS:**

Education and Research Network (ERNET) promoted by the Department of Information Technology, Government of India, provides communication infrastructure and services to academic research institutions in India. It is undertaking networking projects such as AICTE-Net, ICAR-Net and UGC-Infonet to provide internet and intranet facilities.

**1.10. ICT@SCHOOLS SCHEME**

The ICT @ Schools scheme was launched in 2004 with a view to provide opportunities to students to develop their ICT skills as well as use ICTs to aid the teaching learning process. Under this scheme, support is provided for procurement of computers, peripherals, software, connectivity, and so on. The scheme is currently being implemented in all states and union territories of India in government and government-aided secondary and higher secondary schools.

**1.11. EDUSAT—EDUCATION SATELLITE**

Indian Space Research Organization (ISRO) launched EDUSAT (Education Satellite), the first Indian satellite built exclusively for serving the educational sector. It was launched primarily to serve the need for an interactive satellite to enhance the distance education system in the country. Many projects have been initiated to impart education through the satellite. The Virtual Classroom Technology on EDUSAT for Rural Schools (VICTERS) program is one such initiative. The program is an "IT @ School" project of the Kerala State Government envisioned to harness the EDUSAT satellite for training teachers, providing high-speed net connectivity to schools, and for implementing learning management solutions. The Rajiv Gandhi Project for EDUSAT Supported Elementary Education (RGPEEE) is another initiative aimed at harnessing the benefits of EDUSAT; it is a collaborative project of Indira Gandhi National Open University (IGNOU), Ministry of Human Resource Development (MHRD), and ISRO. The project promotes the use of EDUSAT in enabling teachers to incorporate ICT in elementary education. It is operational in Madhya Pradesh, Chhattisgarh, Uttar Pradesh, and Bihar.

**1.12. SARVA SHIKSHA ABHIYAN**

SSA is a flagship programme of the Government of India in partnership with the state governments to support the states in creating, developing, and strengthening the formal primary and upper primary school systems. SSA is a time bound mission, with the objectives of ensuring Universalization of Education and bridging gender and social gaps. The SSA encourages states to use ICT and the satellite EDUSAT (Education Satellite) to provide distance education within states to supplement school education. Distance education has been naturally chosen as a catalyst for expediting SSA.

**1.13. NAVODAYA VIDYALAYA SAMITI**

Navodaya Vidyalaya Samiti (NVS) is an autonomous organization under the Ministry of Human Resource Development, Department of Secondary & Higher Education Government of India. Its significance lies in providing quality education to the rural population who has been deprived of quality modern education typically available in urban areas. It is an attempt to realize the goal of setting up residential schools to bring out the best of rural talent envisaged in the National Policy on Education 1986. Each of these residential schools is known as Jawahar Navodaya Vidyalayas (JNV). NVS has integrated a number of ICT facilities in each of the 576 schools spread across the rural areas of the country.

**1.14. KENDRIYA VIDYALAYA SANGATHAN**

Like NVS, Kendriya Vidyalaya Sangathan (KVS) is also an autonomous organization of the Ministry of Human Resource Development; however, its aim is to cater to the educational needs of the children of transferable Central Government Employees including Defense Personnel and Para-Military forces by providing common programme of education. KVS is tasked with the responsibility of establishing and maintaining Kendriya Vidyalayas (Central Schools). At present, there are 978 KVs in India with one school each in Kathmandu, Moscow, and Tehran. Over the last 4 years KVS has made extensive efforts to promote ICTs in its schools.

**1.15. NATIONAL INSTITUTE OF OPEN SCHOOLING:**

The NIOS is partly funded by the government and is responsible for providing education to all those who are not able to attend the formal school system. In addition to providing the regular range of school subjects, the NIOS also provides vocational and community-oriented courses. The NIOS has the authority to conduct and certify examinations for secondary levels, and its certification is recognized by all universities in India. NIOS is planning to utilize EDUSAT for live interactive sessions in a phased manner. In the first phase, the NIOS studio will be connected to 11 regional centers, which would be expanded to 100 study centers in the second phase. This is an effort to facilitate direct face-to-face interaction between the learners and the teaching community. NIOS has also introduced an Online Admission facility through the NIOS On-Line (Ni-On) Project to facilitate the learners in registering themselves for the courses. NIOS has collaborated with Cisco to offer Cisco Networking Academy Programs in 10 accredited vocational institutes. The program focuses on teaching students how to design, build, and maintain computer networks. Cisco will provide PC hardware and other IT essentials, Web-based course materials, 24-hour technical support, and nominate a representative to aid in the implementation of the program. NIOS plans to scale this program in 100 accredited vocational institutes.

**1.16. SAKSHAT PORTAL**

The Sakshat Portal launched by the MHRD in 2006 is a single window portal for all education-related needs of students, teachers, and lifelong learners. It provides a range of services from informational services like details of scholarships, tests, educational resources, as well as interactive services like a discussion forum, one-on-one sessions with teachers, career counseling, and video conferencing facility.

**1.17. MEDIA LAB ASIA**

Media Lab Asia (MLAsia) has been set up by the Department of Information Technology, Government of India, as a not-for-profit Research & Development organization. Its administrative headquarters is in Mumbai; however, the project will be scaled to other parts of Asia as well. MLAsia works with academic and R&D institutions, industries, NGOs, and the Government to develop relevant technology and culturally appropriate solutions for the common man. Many projects undertaken in the areas of ICT for village livelihood generation, healthcare education, empowerment of the disabled and rural connectivity are now undergoing test deployment and are being made ready for national/large-scale deployment.

**1.18. NATIONAL MISSION ON EDUCATION**

Recently, National Mission on Education through ICT was launched by the government to harness ICT's potential to make a difference. The National Mission on Education through ICT is an Rs. 500 crore, centrally sponsored scheme submitted by the Ministry of HRD and approved by the Cabinet Committee on Economic Affairs (CCEA). The Mission envisions to cater to the learning needs of 500 million Indians. Some of the key objectives of the Mission include:

- Availability of e-knowledge content free of cost to Indians.
- Development of knowledge modules to take care of personalized needs of learners.
- Providing support for the creation of virtual technological universities.

- Building connectivity and knowledge network among and within institutions of higher learning in the country.
  - Standardization and quality assurance of contents to make them world class.
  - Spreading digital literacy for teacher empowerment.
  - Certification of competencies of the human resources acquired either through formal or non-formal means
- The Mission has planned a variety of initiatives aimed at developing and standardizing digital content for Indian higher education segment.

Scaling up Sakshat portal

- The Mission intends to scale up the existing Sakshat portal to take care of the needs of entire learning community.
- It will also act as a human resource database aiding education related decision making.

Generation of new digital content

- It also plans to generate new online course content for UG, PG and Doctoral education.
- Efforts are already underway to prepare course content for 130 courses (Includes UG and PG courses).

Virtual Technical University (VTU)

- The Mission envisages creation of a VTU to enable training of UG/PG students along with new teachers.
- It will focus on science, technology, management and other related areas.

Quality assurance

- It is also planning to set up national resource centers for standardization and quality assurance of e-content for College and University segment and Engineering and Technology segment.

### 1.19. UNIVERSAL SERVICE OBLIGATION FUND

Universal Service Obligation Fund (USOF) was established in India in 2002 under the Ministry of Communications and Information Technology, Department of Telecommunications. The fund is exclusively utilized for providing access to telegraph services, mobile services, and broadband connectivity to people in the remote and rural areas at affordable and reasonable prices. Funds are raised through a Universal Service Levy (USL), which is a percentage of the revenue earned by certain telecom service providers and through grants and loans provided by the central government. Since its inception USOF has initiated many projects to provide telecom infrastructure in rural areas. USOF provides and maintains public access facilities such as Village Public Telephones (VPT) and Rural Community Phones (RCP) in village and rural areas. In terms of empowering individuals in rural areas, USOF has provided Rural Household Direct Exchange Lines (RDELs) to the rural population. Around 7,800 mobile infrastructure sites spread across 500 districts and 28 states are being rolled out. An agreement has been signed with BSNL where USOF will provide subsidy towards broadband connectivity from about 28,000 rural exchanges spread across the country.

## 2. CURRENT STATUS OF ICT INITIATIVES IN INDIA – PRIVATE SECTOR AND NGO INITIATIVES

ICTs are also being used extensively for education in India through the pioneering efforts of some private players and NGOs, some of these are outlined in the following:

### 2.1. PROJECT "SHIKSHA," MICROSOFT

Teacher training under Project Shiksha aims at enabling teachers to use technology in the classroom; they are trained on using visual presentation of theories and concepts in the curriculum. The teachers are trained after school hours to ensure that the project does not interfere with the daily school routine. The training lasts for a period of 10 days by working 3–4 hours per day.

### 2.2. EDUCOMP SOLUTIONS LIMITED

One of the largest education services companies in India. Educomp offers a range of education services and products from multimedia content and SMART classes, to programs in vocational education and training, for both private as well as government schools. It has partnered with State and Central Government agencies, Ministries of IT and HRD, and Governments of other countries in order to bridge the digital divide. Educomp has partnered with fourteen State Governments, namely Government of Assam, Karnataka, Orissa, Tripura, Gujarat, Uttar Pradesh, West Bengal, Tamil Nadu, Haryana, Jharkhand, Rajasthan, Punjab, Chhattisgarh, and Andhra Pradesh, covering over 14,000 government schools and benefiting 7.7 million students studying in government schools in India.

### 2.3. INTEL EDUCATION INITIATIVES:

Intel's initiatives are aimed at using "ICT as part of the curriculum." As a first step, Intel organized Principal Leadership Forums for 750 KV Principals. Through these forums Intel gave them an insight into understanding how technology integration in the classroom can positively impact student learning. For the KVs that have been classified as "SMART" schools by the MHRD, Intel provided guidance to the principals and teachers on how to use the ICT facilities for various institutional processes (both school systems and the teaching/learning process).

### 2.4. ORACLE EDUCATION INITIATIVES:

Oracle introduced think.com. At Think.com, students can create their own Web pages, work on projects, and interact with children in other parts of the world. Oracle also provides a series of refresher and training courses available through face-to-face as well as online programmes. Following a successful Think.com pilot project in 25 KVs in October 2004, KVS decided to rollout Oracle's Think.com initiative to more than 900 of its schools. Oracle initially trained master trainers selected by KVS who then trained schools administrators and other teachers and students in the schools.

### 2.5. HUGHESNET

Has a network of 50 classrooms in 34 cities equipped with the technology to receive satellite signals from studios located in educational institutes. Examples of institutes using HughesNet infrastructure include IIMs, IITs and XLRI.

### 2.6. RELIANCE WORLD

Part of Reliance ADAG, Reliance World is a chain of cyber cafes that has tied up with testing companies to offer testing centers (e.g. TOEFL).

### 2.7. NATIONAL INSTITUTE OF INFORMATION TECHNOLOGY

National Institute of Information Technology (NIIT) is a global IT solutions company, which offers training programs to students and professionals. It aims to use ICT to transform the teaching-learning process into a more interactive and efficient process. NIIT's training programs are based on the concept that "You don't have to be an engineer to excel in the IT industry."

### 2.8. DIGITAL EMPOWERMENT FOUNDATION

Digital Empowerment Foundation (DEF) is a not-for-profit organization dedicated to bridging the digital divide by providing consultancy services to the government and corporate in providing ICT facilities to rural areas. It therefore serves as platform for stakeholders including the government, private companies, and NGOs to bring forth their knowledge and expertise to the rural population who live on the edge of information and economic benefit through innovative interventions of ICT tools and digital media. Human resource at DEF includes 72 ICT experts and professionals dedicated to fulfill the objectives of the foundation.

### 2.9. CENTRE FOR SCIENCE, DEVELOPMENT AND MEDIA STUDIES

CSDMS) is a Non-Governmental Organization that has been involved in the field of development research. It is committed to developing solutions for underprivileged societies through the use of ICT (both advanced technology as well as more traditional ones such as print) and Geographic Information systems (GIS). The various activities under CSDMS involve research in the field of ICT and GIS, undertaking developing projects in Geo-ICT, creating a platform for knowledge sharing, organizing globally renowned conferences, and capacity building through training programs.

## 3. CONSTRAINTS & CHALLENGES IN IMPLEMENTING ICT'S IN EDUCATION

India faces a number of unresolved issues and challenges in the field of education and for the adoption of ICT particularly in the education sector. Some of these issues are discussed in the following:

**3.1. ADMINISTRATION IN EDUCATION**

A National Knowledge Commission (NKC) was accordingly set up to prepare a blue print to tap in to the enormous reservoir of knowledge base to confidently face the challenges of 21st century. Some other important recommendations of NKC on expansion include change in the system of regulation for higher education, increase in public spending and diversifying sources of financing and establishment of 50 national universities. The Commission perceiving confusion and overlap in mandates of multiplicity of regulatory agencies has recommended establishment of an Independent Regulatory Authority for Higher Education (IRAHE) which should be at an arm's length from all stake holders including Government of India. IRAHE conceptualized by NKC is to be set up by an Act of Parliament and would be the only agency authorized to accord degree granting powers. "The purpose of creating an IRAHE is to separate these functions. The proposed IRAHE shall be responsible for setting the criteria and deciding on entry. It would, in addition, licence agencies to take care of accreditation. The role of the UGC will be limited to disbursing public funds. Issues of access will be governed by state legislation on reservations and other forms of affirmative action. And, professional associations may, in some institutions set requirements to determine eligibility for conducting a profession."

The Ministry of Human Resource Development, Government of India set up another Committee, post- NKC, under the chairmanship of eminent physicist and a former Chairman of UGC, Prof. Yashpal, to guide the efforts at reforms process. This Committee known as the Committee to Advise on Renovation and Rejuvenation of Higher Education submitted its report very recently (June 2009) and advised a different structure and role for the regulatory authority than the one suggested by NKC. Prof Yashpal Committee maintained that a holistic view of knowledge requires a regulatory system which treats the entire range of educational institutions in a holistic manner. The Committee recommended a single, all-encompassing higher education authority since it considered all higher education including engineering, medicine, agriculture, law and distant education as an integrated whole. This Committee noted that there were 13 professional Councils created under various Acts of Parliament to promote and regulate specialized areas of education and underlined the need to bring them under a national apex body for bringing greater coordination and integration in the planning and development of higher education system including research as already envisaged in the National Policy of Education (1986) and the Plan of Action (1992). The Committee accordingly proposed to create an apex body to subsume academic functions of all professional bodies to be called The National Commission for Higher Education and Research.

**3.2. EDUCATION**

Literacy levels in India are low, even those deemed to be literate are perhaps not competent enough to receive IT education. Educational standards would need to be raised before the citizens can become digitally literate.

**3.3. FEAR OF TECHNOLOGY**

To increase digital literacy levels among students and teachers, steps will need to be taken to overcome their technophobia. Teachers are typically wary of technology; this is the case for not only teachers in the rural areas but for those in urban areas as well. Unless teachers realize that training will help them rather than pose a threat to their jobs they will continue to remain hesitant. The first step therefore is to get the teachers on board. Raising awareness, about use of ICT in education and improving their teaching efficiency could help in developing positive attitude toward the use of ICT in education among teachers.

**3.4. MONITORING AND EVALUATION**

The penetration of hardware (computers) is fairly high in most schools as it is easy to install, however the level of usage is debatable; this is because there is no auditing or monitoring system to see whether students are actually using these computers.

**3.5. PROCUREMENT OF CONTENT**

There are also no clear guidelines available for procuring quality content. Identifying quality content is a common constraint for schools looking to use ICT-enabled teaching learning practices.

**3.6. OVERLAP OF ADMINISTRATION**

Curriculum decisions, infrastructure decisions, content decisions, policy making, and policy implementation are all taken up by different bodies at different levels. Some harmonization/coordination is required.

Other constraints faced by India include linguistic diversity and income disparity. The digital divide in the country is so acute that it becomes difficult for the policy-makers to frame universal policies to be implemented.

**4. RECOMEDATIONS**

ICT has changed the way learning is imparted in educational institutions. The key stake holders of ICT include students, teachers, administrators, regulatory authority, and content developers. This paper recommends following initiatives to overcome the challenges given above:

**4.1. EXPAND VIRTUAL INFRASTRUCTURE**

Establishment and expansion of virtual universities will effectively help spread the access to education to the rural population. Virtual class rooms can consist of interactive modules on the internet. These can help standardizing the content and distribution irrespective of the teacher availability.

**4.2. EXPAND TELECENTRES TO SPREAD EDUCATION**

There are several telecenters offering different services. The Indian government has also approved the establishment of 100,000 common service centers in rural India focusing on various sectors like e-governance, healthcare and other services. Establishment of telecenters exclusively to spread education will help in increasing the literacy in rural areas.

**4.3. USE MOBILE CENTRES TO SPREAD DIGITAL LITERACY**

Vans and cars can be used in providing a mobile platform to provide education in areas where it is difficult to establish physical infrastructure. Mobile van or cars can carry computers with preloaded training modules to spread the digital literacy.

**4.4. TRAIN WORKERS TO SUPPORT ICT IMPLEMENTATION PROGRAMMES.**

Use of ICT across various platforms requires the availability of skilled manpower to install, maintain and repair computer systems and networks. It is important to train people involved in maintaining various classrooms under open and distance learning systems. Therefore it is important to provide adequate training to the manpower managing these centres.

**4.5. EXPAND THE BROADBAND NETWORK**

In areas which do not have physical infrastructure to support ICT, use of broadband can be considered as a viable alternative. The government may look at expanding the reach of broadband network.

**4.6. DEVELOP STANDARDIZED OFFLINE CONTENT**

Since the internet and broadband connectivity is very low in India developing standardized offline content for education will significantly help in spread of education and help in reducing the digital divide.

**4.7. ARRANGE TRAINING BY INDUSTRY EXPERTS FOR SKILL ENHANCEMENT**

Vocational institutes like ITI can identify certain skill sets to be imparted and then collaborate with industry experts to roll out a programme with relevance to the industry so that apart from spread of education the employability can be increased.

**4.8. EXPAND SKILL BASED CENTRES**

The government is establishing 50,000 skill development centers (SDC) across areas. These centers can be expanded by participation of the Industry with the industry providing the content and logistics support.

**4.9. DEVELOP OF LOW COST HARDWARE AND SOFTWARE**

In order to spread the use of ICT and increase literacy it is necessary to develop low cost hardware and software solutions. Government can take up initiative like the "aakash" tablet to produce low coast computers and network. Use of open source software can also be encouraged so that software licensing issues are taken care off.

## 5. CONCLUSION

India is a vast geography with varying levels of development in different parts of the country; therefore, experiences of using ICTs for education across the country also reflect this diversity. At all levels, from infrastructure availability to availability of trained faculty, there is tremendous variation between urban and rural areas, developed and less developed states, and access for economically and socially weaker sections vis-à-vis the more wealthy in the country. While some interventions have been immensely successful in one area, the same interventions in another part of the country have not succeeded. The most significant insight through this study has been that a whole spectrum of solutions using ICTs in the education space is required in India. This can range from initiatives using community radio for non-formal education through general community mobilization and awareness creation in rural areas to the state-of-the-art technology-enabled learning spaces and other advanced e learning practices in select schools.

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WORLDWIDE

**USING WEB SERVICES IN ENTERPRISE COMPUTING AND INTERNET APPLICATION DEVELOPMENT**

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**ABSTRACT**

*Web services extend the World Wide Web infrastructure to provide the means for software application to connect to other software applications. Applications access web services via a set of web protocols and data formats such as HTTP, XML, and SOAP, with no need to worry about how each Web service is implemented. Web services combine the best aspects of component-based development and the Web. This paper discusses the use of web services in enterprise computing and internet application development. Web Services promise to make it simpler and cheaper than ever before for different software applications to work together. Simple and ever-present standards are in place, and with the backing of major hardware and software players, Web Services may become the new foundation for enterprise computing and the most dynamic technology since the original web. Web Services promise to change the way companies do their business, and people use the Internet and are poised to be an important block for business integration.*

**KEYWORDS**

Web Services, XML, UML, SOAP, UDDI, WSDL, HTTP, TCP/IP.

**INTRODUCTION**

A web service is any piece of software that makes it available over the internet and uses a standardized XML messaging system. XML is used to encode all communications to a web service. For example, a client invokes a web service by sending an XML message, and then waits for a corresponding XML response. Because all communication is in XML, web services are not tied to any one operating system or programming language like Java can talk with Perl, Windows applications can talk with UNIX applications.

Web Services are self-contained, modular, distributed, dynamic applications that can be described, published, located, or invoked over the network to create products, processes, and supply chains. These applications can be local, distributed, or Web-based. Web services are built on top of open standards such as TCP/IP, HTTP, Java, HTML, and XML. Web services are XML-based information exchange systems that use the Internet for direct application-to-application interaction. These systems can include programs, objects, messages, or documents.

A web service is a collection of open protocols and standards used for exchanging data between applications or systems. Software applications written in various programming languages and running on various platforms can use web services to exchange data over computer networks like the Internet in a manner similar to inter-process communication on a single computer. This interoperability (e.g., between Java and Python, or Windows and Linux applications) is due to the use of open standards.

To summarize, a complete web service is, therefore, any service that:-

- ✓ Is available over the Internet or private (intranet) networks
- ✓ Uses a standardized XML messaging system
- ✓ Is not tied to any one operating system or programming language
- ✓ Is self-describing via a common XML grammar
- ✓ Is discoverable via a simple find mechanism

**WEB SERVICE COMPONENTS**

The basic Web services platform is XML + HTTP. All the standard Web Services works using following components-

- **SOAP** (Simple Object Access Protocol)
- **UDDI** (Universal Description, Discovery and Integration)
- **WSDL** (Web Services Description Language)

**USING THE WEB SERVICE**

Consider a simple account-management and order -processing system. The accounting personnel use a client application built with Visual Basic or JSP to create new accounts and enter new customer orders. The processing logic for this system is written in Java and resides on a Solaris machine, which also interacts with a database to store the information. Than following steps illustrates above as web service communication:-

- 1) The client program bundles the account registration information into a SOAP message.
- 2) This SOAP message is sent to the Web Service as the body of an HTTP POST request.
- 3) The Web Service unpacks the SOAP request and converts it into a command that the application can understand. The application processes the information as required and responds with a new unique account number for that customer.
- 4) Next, the Web Service packages up the response into another SOAP message, which it sends back to the client program in response to its HTTP request.
- 5) The client program unpacks the SOAP message to obtain the results of the account registration process. For further details regarding the implementation of Web Services technology, read about the Cape Clear product set and review the product components.

A customer visits an airline Web site and makes requests to buy an airline ticket, rent a car and reserve a hotel room. The airline Web site server, linked via XML-based Web Services to the servers of the car rentals and hotel sites sends requests. After the customer has been authenticated, a confirmation is sent via XML to the airline Web site server. The customer trip is planned after one visit to only one web site. If the return flight is delayed, the customer's calendar is automatically adjusted, e-mails are sent to reschedule meetings, and a car rental office or relatives are notified of a change in pickup time. This is an example of what we expect to experience as we enter the third wave of Internet development. The first wave was characterized by widespread use of emails to connect people to people, the second wave connected people to information in web sites, and the era of Web Services connects applications and processes to one another for business to business interoperability.

In the last 10 years the concept of Web Services has created a stir among companies in the Internet and electronic commerce fields. A standard definition does not exist quite yet; however of the several that has been advanced the following stands out as being the easiest to understand from a non-technical perspective: "A new technology that makes it easier for different business software applications to talk with each other. Where the traditional web allows any person with a browser to visualize data published by an Internet site, Web Services allow any computer program equipped with the right interface to connect to any other program on the Internet that has been set up as a web service. The client programs can then get data from the program providing the Web Services or ask it to perform some useful task or transaction"

Other more technical definitions describe Web Services are self-contained, modular, loosely coupled web applications, which perform many functions from simple requests to complicated business processes via a set of standards based on XML data description language. Web Services can be invoked from any platform and devices and once it is deployed, other applications including other Web Services can invoke the deployed application. They can run on a server, a PC, an embedded system or a mobile device.

Exactly what makes Web Services such a great technology that major vendors of the caliber of IBM, Microsoft, Oracle, Sun, HP invest billions of dollars on it? Let us now concentrate on the characteristics of this technology that distinguishes it from previous one such as EDI or CORBA, which also promised seamless business integration.

## ADVANTAGE OF USING WEB SERVICES

### 1). FLEXIBILITY

Web Services represent an evolution of the Web to allow applications to interact in a dynamic, open and reconfigurable execution environment. It connects private or public networks, can work with existing programs written in different languages, developed by different vendors or in-house IT departments.

XML (Extensible Markup Language) is at the core of the technology and is used to encode all communications to a Web Service. For example, a client invokes a Web Service by sending an XML message, and then waits for a corresponding XML response. Because all communication is in XML, Web Services are not tied to any one operating system or programming language--Java can talk with Perl; Windows applications can talk with UNIX applications. Programs can talk to one another regardless of how the companies build their own internal systems.

Many Web Services are wrappers for existing applications so that these applications can be accessible on the Internet or an intranet. As such, many are very simple and can be generated automatically by tools. As a result they work with heterogeneous operating environments rather than homogeneous, totally controlled environments. Web Services could be shared or rented rather than installed and owned. All these features make them independent of the interactions from the platform, programming language or application. This new ease of communications will make enterprise software as we know it obsolete, inciting companies to dump expensive in-house packages in favor of the new breed of mix-and-match software functions piped in from outside providers in the form of web applications or components.

### 2). SCALABILITY

A company can invest modestly at first and scale up as Web Services mature, starting perhaps by web service enabling existing applications. With most Web Services of moderate complexity little restructuring and fewer skills are needed, and an installation can be completed in days or weeks rather than months or years. This gradual approach is not only less invasive but minimizes migration costs.

Exposing existing applications as XML Web Services, will allow users to build new, more powerful applications that use XML Web Services as building blocks. For example, a user might develop a purchasing application to automatically obtain price information from a variety of vendors, allow the user to select a vendor, submit the order and then track the shipment until it is received. The vendor application, in addition to exposing its services on the Web, might in turn use XML Web Services to check the customer's credit, charge the customer's account and set up the shipment with a shipping company.

### 3). INTEGRATION

Rather than replace or restructure existing systems to achieve uniformity across facilities, companies can now create a common front end using Web Services standards. At GM parties inside and outside the company require access to the VIN number that GM assigns to each car it makes. Until now GM had to build hundreds of custom interfaces to link user applications to the VIN database. With Web Services, all those applications are interfaced effortlessly in a more simplified manner.

Dell Computer was able to connect its assembly plants (each with its own manufacturing and database management systems) to share the data vastly improving utilization and cutting logistics costs throughout the production network. It also served as the basis for automated communication with the company's supply chain partners. Dollar Rent A Car Systems built a Web Service to connect its reservation system with Southwest Airlines, allowing passengers to reserve a car through the airline's Web site. The operation, which can be duplicated for other airline partners, took only two months--well short of the estimated eight months it would have taken before today's Web Service technologies were available. It costs the company just \$1 per online transaction routing customer reservations through airline sites compared to the travel-agent networks that charge as much as \$5 per online transaction.

This interoperability also works well in outsourcing situations. Thus, Web Services ensure seamless transfer of data from the outsourcer to the outsourced company and vice versa. Integrating disparate systems after a merger or acquisition for instance, can be done fairly cheaply and quickly with Web Services. Rather than forcing companies to throw out old technology, Web Services tie together old software systems, including mainframes, that hadn't been able to talk before, and that way it solves the industry's biggest problem, which is that systems built over 30 years using different technologies now have to be integrated and delivered in ways that nobody intended.

### 4). STANDARD BASED

Just 20 years ago the Internet consisted of many disparate network technologies. Since then, the widespread standardization of TCP/IP as the core Internet transport has greatly simplified global communications for both businesses and consumers. A similar widespread agreement on the use of standard web protocols, namely XML, SOAP, UDDI and WSDL has sparked the same revolutionary simplification for business-to-business collaboration. Because Web Services are based on standards, it keeps companies from having to cope with pricey, proprietary software that can cost 10 times as much as Web Service software.

A significant number of companies already have a Web infrastructure, and people with knowledge and experience in maintaining it, so the cost of entry for XML Web Services is significantly less than for previous technologies. Software and hardware manufacturers have learned a lesson from past rivalry among competing technologies and they now know that anything proprietary, no matter how big it is, can't dominate. That is why in an unprecedented display of cooperation has characterized the early stages of Web Services standard development. Hewlett-Packard, IBM, Microsoft, Oracle, and Sun Microsystems among others, in a historic show of unity, have collectively blessed the core set of Web Services protocols by creating the Web Services Interoperability (WS-I) consortium. The nonprofit group's aim is to ensure that software by rival technology makers is compatible, and to promote harmony in the Web Services sector so that customer information can freely move across platforms, applications and programming languages.

The potential rewards of universal connectivity are untold savings in time and money, increase of software sales, and a major boost in productivity. A catalog company for instance, that needs to communicate with FedEx and UPS could rely on a single Web Service to dispatch orders to both shippers, instead of having to separately integrate its applications with each company.

### 5). COOPERATION AND EFFICIENCY

Web Services provide better connection among trading partners not only streamlining their activities but also collaborating to deliver more value to customer. Companies like Dell Computers, General Motors, and Merrill Lynch are using Web Services protocols to connect selected activities to suppliers, dealers, or customers. What it means is that a company with a broad range of partners for example, will be able to connect its own technology to that of its suppliers more efficiency reducing the need for manual data reentering. Data exchanges could be expanded transforming the development and distribution of products and forging business alliances. Coordination efforts obviate the need for expensive enterprise application integration software or high-priced integration talent. Furthermore, Web Services boosts customer relationship by building more effective websites.

## WEB SERVICES STANDARDS

It is widely accepted and recognized the fact that Web Services are based on four platform-neutral standards: XML, SOAP, UDDI and WSDL. The whole process is likened to an ordinary phone call. XML represents the conversation, SOAP describes the rule for how to call someone, and UDDI is the phone book. WSDL describes what the phone call is about and how you can participate. From a standards point of view, Web Services is defined an XML Web Service as a software service exposed on the Web through SOAP, described with a WSDL file and registered in UDDI.

The lingua-franca of Web Services is XML (Extensible Markup Language), classified as a page description language. XML allows companies to more easily exchange data online by defining the element of the document that describe its various pieces, the names you call the data, and the relationship of all data to one another. SOAP (Simple Object Access Protocol) describes how Web Services communicate over the Internet. It is a specification that defines the XML format for messages and acts as a wrapper around it.

WSDL (Web Services Description Language) describes Web Services and how to access them while UDDI (Universal Description, Discovery, and Integration) lets businesses register, advertise and find Web Services in a directory. UDDI is the yellow pages of Web Services. As with traditional yellow pages, you can search for a company that offers the services you need, read about the service offered and contact someone for more information. You can, of course, offer a Web Service without registering it in UDDI, just as you can open a business in your basement and rely on word-of-mouth advertising but if you want to reach a significant market, you need UDDI so your customers can find you. There are three parts to an entry in the UDDI directory. The "white pages" describe the company offering the service: name, address, contacts, etc. The "yellow pages" include industrial categories based on standard taxonomies such as the North American Industry Classification System and the Standard Industrial Classification.

The "green pages" describe the interface to the service in enough detail for someone to write an application to use the Web Service. The UDDI directory also includes several ways to search for the services you need to build your applications. For example, you can search for providers of a service in a specified geographic location or for business of a specified type. The UDDI directory will then supply information, contacts, links, and technical data to allow you to evaluate which services meet your requirements.

### CHALLENGES IN USING WEB SERVICES

As much as there is a tremendous interest and support behind Web Services, and companies are deploying them, there are a few challenges that need to be overcome before the technology moves into the next phase of development. Forrester Research Inc. predicts that traditional application integration technologies will prevail until 2004, because Web Services standard for security, auditing, and transactions won't stabilize until then. It will not be until 2006 that business will apply more complex technologies as their confidence increases. In survey on utilization of Web Services, respondents said that their biggest stumbling blocks to Web Services were lack of security and authentication. Part of the concern is the current lack of universal online identification system. Without it is difficult for machines to know whom they are dealing with and to protect people's privacy. Furthermore, external transactions must be authenticated and remain confidential and intact, and the transactions have to be verifiable, so they can't be disavowed if there is a dispute.

A key benefit of the emerging Web Services architecture is the ability to deliver integrated, interoperable solutions. Ensuring the integrity, confidentiality and security of Web Services through the application of a comprehensive security model is critical, both for organizations and their customers. Security standards in particular are of primary importance, since connecting to expose Web Services interfaces over the Internet will require new levels of trust between business partners. Before we see a rush of companies web service enabling their mission critical applications, the technology needs to operate as reliable as the telephone system, always on – no breakdowns of servers computers and networks and it has to be difficult for hackers to break in.

This concern is not lost in the ears of the industry's movers and shakers. The World Wide Web Consortium which has given full support to the technology from its inception recently approved two XML encryption specifications that enable web pages using XML to encrypt parts of a document for instance, a credit card number entered in an XML form being exchanged between web sites. In addition, six new Web Service specifications aimed at advancing security capabilities and streamlining business policy for organizations implementing Web Services have been outlined by IBM and Microsoft. They are part of second wave of proposed Web Services security capabilities, which is crucial to making Web Services fly on a global scale.

### CONCLUSION

Web Services await a bright future as electronic marketplaces, inter-company collaboration and E-commerce grow. The potential is there to save money and even find new ways to generate revenue. For companies that have not yet implemented Web Services applications, it is recommended to start with a pilot program and get educated on the intricacies of the technology. Until this is done it may be difficult to do a proper risk assessment. Gradually wrapping one application after another will soon form a base of components that it could connect together to build new services.

In summary, Web Services have a profound implication for business. The promise of business interoperability, with the ease with which Web pages flow over the Internet, is what will fuel the demand for Web Services. The speed with which Web Services are deployed will be determined by a combination of how quickly additional standards are finalized, how strong customer demand is, how fast the market rolls out support tools, and how encompassing is the synergy that is produced as more Web Services are created and interfaced.

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**TEXT CATEGORIZATION USING FPI METHODOLOGY**

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**ABSTRACT**

*Text clustering methods can be used to group large set of data. In this paper we present a naïve based approach for clustering frequent item sets. Such frequent term set can be discovered using First principles of instruction technique. We categorize the text using FIP methodology and the algorithm involves the text tokenization, text categorization and text analysis.*

**KEYWORDS**

FPI, Text mining, Text characterization, Clustering, Association rule mining and Instructional Phase.

**INTRODUCTION**

A large portion of all available information today exists in the form of unstructured textual data. Books, magazines, articles, research papers, products, manuals, memorandums, emails and web content: all contain textual information in natural language form. The amount of text is simply too large to read and analyze efficiently.

Furthermore, data is dynamic and requires ongoing review and analysis to stay in the current global market. Manual analyzing of huge amount of textual data requires a tremendous amount of processing time and effort in reading the text and organizing them in required format.

This has led to the development of automated tools and techniques for analyzing text to discover knowledge for various applications. These techniques are gathered under the name of text mining.

This paper will discuss the approach to categorise the text based on bag of key words associated with First instruction principle.

**TEXT MINING**

Text mining is used to manage textual information. It can also be defined as knowledge discovery in textual database, allows us to create a technology that combines a human linguistic capability with the speed and accuracy of a computer.

Text mining aims to analyse more detailed information in the content of each document and to extract interesting information that can be provided only by multiple documents viewed as whole, such as trends and significant features that may be a trigger to useful actions and decision making. Text mining is about analysing text for particular purposes and involves looking for regularities, patterns or trends in natural language text. Text mining, also known as intelligent text analysis or text data mining or knowledge-discovery in text, refers generally to the process of extracting interesting and non-trivial information and knowledge from unstructured text. The objective of text mining is to exploit information contained in textual documents in various ways which includes discovery of patterns and trends in data, associations among entities predictive rules, etc. Text mining is a challenging task as it involves dealing with text data that are inherently unstructured and fuzzy.

Documents rarely have strong internal structure. In one approach to text mining the metadata about the documents is extracted from the documents and stored in a database where it may be mined using data base and data mining techniques. The other approach that extracts textual data generate by text mining tools, serves as a method to enrich the content of the documents. In this case text mining can be described as a way to extend mining methodologies by an automated process that creates structured data describing the documents. Providing help for building ontologies of documents, performing intelligent text search, text segmentation, topic tracking are some of the other related areas in the context of text mining. Text mining can also extract concept from a large collection of documents without having to scan through a great number of files i.e. to uncover and discover valuable relationships between ideas and words contained in vast amounts of text information.

**CLUSTERING**

The goal of clustering is to find data points that naturally group together, splitting the full data set into a set of clusters. Clustering is particularly useful in cases where the most common categories within the data set are not known in advance. If a set of cluster is optimal, within a category, each data point will in a general be more similar to the other data points in that cluster than data points in other clusters.

Clustering algorithms can either start with no prior hypotheses about clusters in the data or start from a specific hypothesis, possibly generated in prior research with a different data set.

**FIRST PRINCIPLES OF INSTRUCTION**

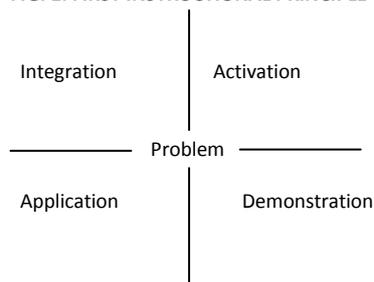
A first principle is an attempt to identify Reigeluth's basic methods. Principles method is a relationship that is always true under appropriate conditions regardless of program or practice. Properties of first principles of instruction learning from a given program will be facilitated in direct proportion to its implementation.

- a) Analyze instructional theories, models, programs, and products to extract general first principles of instruction.
- b) Identify the cognitive processes associated with each principle.
- c) Identify empirical support for each principle.
- d) Describe the implementation of these principles in variety of different instructional theories and models; &
- e) Identify prescriptions for instructional design associated with these principles.

**INSTRUCTIONAL PHASE**

Many current instructional models suggest that the most effective learning environments are those that are problem-based and involve the student in four distinct phases of learning: 1) activation of prior experience, 2) demonstration of skills 3) application of skills and 4) integration or these skills into real world activities.

**FIG. 1: FIRST INSTRUCTIONAL PRINCIPLE**



- Activation** → Recalls the prior knowledge or experience and create learning situation for the new problem.
- Demonstration** → Demonstrate or show a model of the skill required for the new problem.
- Application** → Apply the skills obtained to the new problem.
- Integration** → Provides the capabilities and to show the acquired skill to another new situation.

**TEXT CATEGORIZATION**

**Text categorization** can be defined as assigning category labels to new documents based on the knowledge gained in a certain categorization system. The categorization system is usually based on supervised learning or unsupervised learning or methodology using based on supervised or unsupervised learning or a methodology using hierarchy.

**ROLE OF TEXT CATEGORIZATION IN TEXT MINING**

Text categorization becomes one of the important techniques for handling and organizing text data. Text categorization is the task of classifying text documents into categories or classes based on their content. This task of automatically classifying text document is of great importance given the massive volume of online text available today. The concept-centric nature of documents is also one of the reasons why the issues of document categorization are particularly challenging. Text categorization is now being applied in many context, ranging from document indexing based on a controlled vocabulary, to document filtering, automated metadata generation, word sense, disambiguation, population of hierarchical catalogue of web resources, and in general any application requiring document organization or selective and adaptive document dispatching. Text categorization based on machine learning methods need a training set and a test set. The training set is a set of documents, which is tagged manually by the experts. The performance of the system depends on good training set. Moreover the machine language approach to the text categorization is based on keyword matching. The motivation for the work described in this thesis is the categorization of documents based on semi automated concept in addition to the keywords. The use of concepts for text categorization increases its overall performance specifically when considering categorization of domain specific corpus.

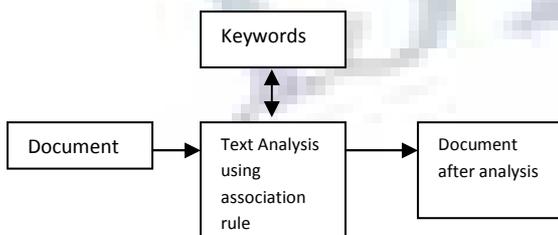
**PROPOSED SYSTEM**

The analysis of huge text collection usually aims at finding relevant text or text groups. It would be a tedious task of any information seeking user to scan all retrieved item. In order facilitate this task, most text mining system characterize their resulting text with various kinds of annotations. Keywords are helpful in the categorization process. Keywords are valuable means for characterizing texts. In order to extract keywords an efficient and robust, language and domain independent approach has been applied. The keywords can be generated by the human judgment based on the repeated analysis on the text. The algorithm is used to examine the first instructional principle with the help of the keywords. This papers aims to categorize the text using principle of FPI with a given set of pre-categorized keywords generated by the human judgment. It also finds how much percentage of the four distinct phases of learning that is activation, demonstration, application and integration is presented in the document.

**METHODOLOGY USED**

In traditional document clustering methods, a document is considered a bag of words. There are many algorithms for automatic clustering like the k-mean algorithm and hierarchical clustering which can be applied to a set of vector from the cluster. Traditionally the document is represented by the frequency of the word that makes up the document. The prosed methodology uses FIP methodology to categorize text. **Text categorization** is a task of assigning natural language texts to predefined categories based on their content. It is applicable to assign subject categories document to support information retrieval or to aid human indexers in assigning such categories. Our system uses David Merrill's first Instructional Principle properties for categorizing text. The system is implemented with a set of process as parsing and tokenizing.

**FIG. 1: TEXT MINING SYSTEM ARCHITECTURE**



Text Extraction is the task of selecting documents relevant to the set of keywords. The system uses the clustering approach to identify the quality of the document. The system process with the following observation:

- The clustering keywords
- Algorithm called FIP to find accurate cluster
- A cluster obtained is estimated for the quality of the document.

**THE STEPS INVOLVED IN THIS SYSTEM ARE**

1. Select clustering keywords
2. Clustering document using the FIP algorithm
3. Obtain the relevancy information using clustering keyword
4. If the match does not encounter with any of the cluster keyword allow the user to make the decision based on the Input

**AN IMPLEMENTATION OF EXTRACTION SYSTEM BASED ON THIS ALGORITHM NEED TO ADDRESS THE FOLLOWING POINTS**

- Which set of keywords need to be used as threshold parameter for clustering
- How should we resolve undefined cases?

**APPLICATION OF THE SYSTEM**

Some of the applications of the current system are

- It measures interestingness and rules for learning management system.
- A very important aspect which is dealt with in this system is learner characteristics like knowledge, motivation, meta cognition and attitudes.

**CONCLUSION**

This paper has presented a text mining approach for automatically extracting association rule from a collection of documents based on the keyword features. The system can be applied to all or a specific portion of a document.

This technique requires not only that adequate thresholds be chosen for the two standard parameters of support and confidence, but also that appropriate measures of interestingness be considered to retain meaningful rules and filter uninteresting ones out.

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**APPLYING AND EVALUATING DATA MINING TECHNIQUES TO PREDICT CUSTOMER ATTRITION: A SURVEY**

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**ABSTRACT**

Churn prediction is the concept of identifying those customers who are intending to move their custom to a competing service provider. This phenomenon has been magnified by electronic commerce. The internet channel returns control and power to customers who are no longer confined to the decision of single company. The outcomes are increase in customer power (Minguel, 2005) and competition exacerbation. Customer empowerment is likely to persist and amplify customer attrition issue. This paper focuses on introducing the phenomenon of customer attrition, reason for customer attrition and various data mining techniques which the author has encountered in literature. These techniques have been successfully applied to predict customer churn in different domains. Most common tools and measures used for evaluating the accuracy of different data mining techniques is another important issue which has been addressed in this paper.

**KEYWORDS**

Customer churn, classification, data mining, ISP, Prediction.

**1. CUSTOMER ATTRITION**

With the emergence of electronic commerce, customers can more easily inquire about the market opportunities. They become more demanding and tend to switch from current/previous service provider to another service provider. This gives birth to the notion of churn, the movement of customers from provider to provider in search of better and cheaper products and services. Churn or customer attrition is defined as “the annual turnover of market base” (Minguel, 2005).

Geppert (2002) defines churn as the gross rate of customer loss during a given period. Churn can be shown as follows:

$$\text{Monthly Churn} = (C0 + A1 - C1) / C0 \quad (1.1)$$

Where:

C0 = Number of customers at the start of the month

C1 = Number of customers at the end of the month

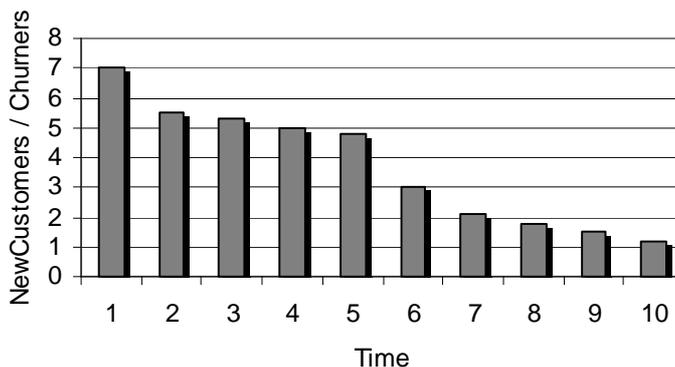
A1 = Gross new customers during the month

Churn prediction is the concept of identifying those customers who are intending to move their custom to a competing service provider. Once identified, these customers can be targeted with proactive marketing campaigns for retention efforts. Churning customers can be divided into two main groups, voluntary and non-voluntary churners (Daskalaki, 2003). Non-voluntary churners are the easiest to identify, as these are the customers who have had their service withdrawn by the company. There are several reasons why company could revoke a customer’s service, including abuse of service and non-payment of service. Voluntary churn is more difficult to determine, because this type of churn occurs when a customer makes a conscious decision to terminate his/her service with the provider. Voluntary churn can be sub divided into two main categories, incidental churn and deliberate churn. Incidental churn happens when changes in circumstances prevent the customer from further requiring the provided service. Example of incidental churn includes changes in the customer’s financial circumstances, so that the customer can no longer afford the service, or a move to different geographical location where the company’s service is unavailable. Incidental churn usually only explains a small percentage of company’s voluntary churn. Deliberate churn, also the major concern of this study, is the problem that most churn management solutions tries to battle (Gappert, 2002). Reasons that could lead to customer’s deliberate churn are discussed in section 2.

This phenomenon has been magnified by electronic commerce. The internet channel returns control and power to customers who are no longer confined to the decision of single company. The outcomes are increase in customer power (Minguel, 2005) and competition exacerbation. Customer empowerment is likely to persist and amplify customer attrition issue.

The impact of churn is correlated with the industry lifecycle. When the industry is in the growth phase of its life cycle, sales increase exponentially;

FIGURE 1.1: CHURN RATE EVOLUTION (Minguel, 2005)

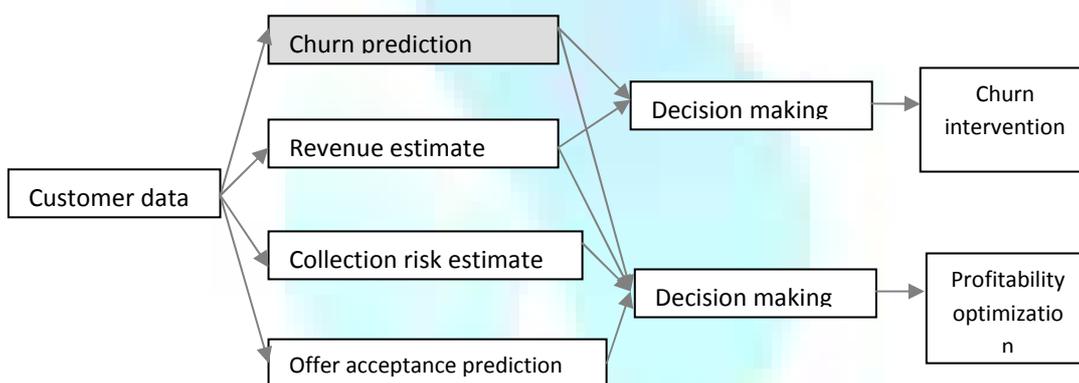


The number of new customers largely exceeds the number of churners. Companies aim at getting more and more new customers. Nevertheless, the ratio (new customers/churners) tends one over time (Figure 1.1). The impact of churn becomes then markedly more sensitive. For product/services in the maturity phase of their lifecycle, companies put the focus on the churn rate reduction.

As shown in Figure 1.2, Yan et.al (2004) state that predicting customer churn is a component in the decision framework for retaining customers and maximizing profitability. Yan et.al (2004) further state that customer data can help predict the reasons customers switch companies, the revenues generated in a specified period, revenue collection risk, and the response to a marketing offer.

Companies can use these probability and revenue estimates in a decision theoretic framework to determine a churn intervention strategy and a profitability optimization strategy.

FIGURE 1.2: THE FRAMEWORK FOR CUSTOMER RETENTION AND PROFITABILITY MAXIMIZATION (Yan et.al, 2004)



There are two basic approaches of managing customer churn. Untargeted approaches rely on superior product and mass advertising to increase brand loyalty and retain customers. Targeted approaches rely on identifying customers who are likely to churn, and then either providing them with a direct incentive or customizing a service plan to stay. There are two types of targeted approaches: reactive and proactive. With the reactive approach, the firm waits until the customer contacts the firm to cancel his or her account. The firm then offers the customer an incentive to stay. With the proactive approach, the firm tries to identify in advance customers who are likely to churn at some later date. The firm then targets these customers with special programs or incentives to forestall the customer from churning (Burez, 2006). Churn management efforts should not focus across the entire customer base because firstly not all customers are worth retaining, and secondly customer retention costs money; attempting to retain customers that have no intention of churning will waste resource. Targeted proactive programs have potential advantages of lower incentive costs.

**2. REASONS OF CHURN**

In an intensely competitive environment like that of mobile services or internet services, customers receive numerous incentives to switch and encounter numerous disincentives to stay.

- Price. Particularly in the wireless and long-distance markets, carriers often offer pricing promotions, such as relatively low monthly fees, high-volume offerings (fixed number of minutes at a reasonable fee per month), and low rates per-minute. These price incentives can provide residential customers, in particular, with powerful incentives to change carriers.
- Service quality. Lack of connection capabilities or quality in places where the customer requires service can cause customers to abandon their current carrier in favor of one with broader reach or a more robust network. Frequent disconnections from their service providers may also increase the user's frustration.
- Fraud. Customers may attempt to "game the system" by generating high usage volumes and avoiding payment by constantly churning to the next competitor.
- Lack of carrier responsiveness. Slow or no response to customer complaints is a sure path to a customer relations disaster. Broken promises, long hold times when the customer reports problems, and multiple complaints related to the same issue are sure to lead to customer churn.
- Brand disloyalty (or loyalty to another). Brand issues may arise due to service or other issues experienced over time, mergers or acquisitions involving the incumbent carrier, or entry into the market of another carrier with strong brand recognition and reputation. Marginal brand loyalty can often be overcome by competitors' incentives.
- Privacy concerns. Consumers have an increasing awareness that companies they deal with have a lot of information about them, including their spending habits, personal financial information, health information, and the like. Breaking of privacy promises, publicized privacy problems, telemarketing, and other

issues are causing many customers to consider their personal privacy as an asset and they are holding their service providers responsible for keeping privacy promises.

- Lack of features. Customers may switch carriers for features not provided by their current carrier. This might include the inability of a particular carrier to be the "one-stop shop" for all the customer's communications needs.
- New technology or product introduced by competitors. New technologies —such as high-speed data or bundled high-value service offerings—create significant opportunities for carriers to entice competitors' customers to switch.
- New competitors enter the market. The mere existence of viable competitors to the incumbent carrier may cause certain disloyal customers to churn. Further, as competitors enter new markets, they often offer short- or long-term incentives to new subscribers to build market share.
- Billing or service disputes. Billing errors, incorrectly applied payments, and disputes about service disruptions can cause customers to switch carriers. Depending on the situations, such churn may be avoidable.
- Filtering, depending upon the government rules and regulations ISPs may be asked to block some content, which may cause inconvenience to some users. Especially when filtering is not accurate and some sites are blocked by mistake.

### 3. APPLYING DATA MINING TO DEAL WITH CUSTOMER CHURN:

To solve a business problem like customer churn using data mining, that problem is needed to be translated in to one of the KDD functions. These functions include Classification, Prediction, Estimation, Association, Clustering, etc. Classification, Prediction and Estimation are examples of directed data mining. Association and Clustering are examples of undirected data mining. In directed data mining there is always a target variable- something to be classified, estimated or predicted. In undirected data mining, there is no target variable. The data mining task is to find overall patterns that are not tied to any one variable. The most common form of undirected data mining is clustering, which finds groups of similar records without any instructions about which variable should be considered as most important. In the machine learning literature, directed data mining is called supervised learning and undirected data mining is called unsupervised learning (Berry, 2004). Churn prediction being a classification task (Wei et.al, 2002) it will be discussed next section including its difference with prediction.

#### 3-1) CLASSIFICATION AND PREDICTION

Classification and prediction are two forms of data analysis that can be used to extract models describing important data classes or to predict future data trends. Such analysis can help provide us with a better understanding of the data at large. Whereas classification predicts categorical (discrete, unordered) labels, prediction models continuous-valued functions (Han, 2003).

**CLASSIFICATION** is a two-step process. In the first step, a classifier is built describing a predetermined set of data classes or concepts. This is the learning step (or training phase), where a classification algorithm builds the classifier by learning from a training set made up of database tuples and their associated class labels. A tuple,  $X$ , is represented by an  $n$ -dimensional attribute vector,  $X = (x_1, x_2, \dots, x_n)$ , depicting  $n$  measurements made on the tuple from  $n$  database attributes, respectively,  $A_1, A_2, \dots, A_n$ . Each tuple,  $X$ , is assumed to belong to a predefined class as determined by another database attribute called the class label attribute. The class label attribute is discrete-valued and unordered. It is categorical in that each value serves as a category or class. The individual tuples making up the training set are referred to as training tuples and are selected from the database under analysis.

This first step of the classification process can also be viewed as the learning of a mapping or function,  $y = f(X)$ , that can predict the associated class label  $y$  of a given tuple  $X$ . In this view, we wish to learn a mapping or function that separates the data classes. Typically, this mapping is represented in the form of classification rules, decision trees, or mathematical formulae.

In the second step, the model is used for classification. First, the predictive accuracy of the classifier is estimated. If we were to use the training set to measure the accuracy of the classifier, this estimate would likely be optimistic since the classifier tends to overfit the data (that is, during learning it may incorporate some particular anomalies of the training data that are not present in the general data set overall). Therefore, a test set is used, made up of test tuples and their associated class labels. These tuples are randomly selected from the general data set. They are independent of the training tuples, meaning that they are not used to construct the classifier. The accuracy of a classifier on a given test set is the percentage of test set tuples that are correctly classified by the classifier. The associated class label of each test tuple is compared with the learned classifier's class prediction for that tuple. If the accuracy of the classifier is considered acceptable, the classifier can be used to classify future data tuples for which the class label is not known. (Such data are also referred to in the machine learning literature as "unknown" or "previously unseen" data.) (Han, 2003).

**PREDICTION** is a two-step process, similar to that of data classification. However, for prediction, we lose the terminology of "class label attribute" since the attribute for which values are being predicted is continuous-valued (ordered), rather than categorical (discrete-valued and unordered). The attribute can be referred to, simply, as the predicted attribute. Prediction can also be viewed as a mapping or function,  $y = f(X)$ , where  $X$  is the input (e.g., a tuple describing a loan applicant) and the output  $y$  is a continuous or ordered value (such as the predicted amount that the bank can safely loan the applicant). That is, we wish to learn a mapping or function that models the relationship between  $X$  and  $y$ .

Prediction and classification also differ in the methods that are used to build their respective models. As with classification, the training set used to build a predictor should not be used to assess its accuracy. An independent test set should be used instead. The accuracy of a predictor is estimated by computing an error based on the difference between the predicted value and the actual known value of  $y$  for each of the test tuples,  $X$  (Han, 2003).

### 4. CUSTOMER CHURN IN LITERATURE

Customer attrition is an important issue for any company and is easiest to define in subscription based businesses, and partly for that reason, churn modeling is most popular in these businesses (Berry, 2004). Long-distance companies, Mobile phone service providers, Insurance companies, Cable companies (Pay-TV) (Burez et.al, 2006), financial service companies, Internet service providers, newspapers, magazines, and some retailers all share subscription model where customers have a formal, contractual relationship which must be explicitly ended.

#### 4-1. CUSTOMER CHURN IN MOBILE SERVICE PROVIDERS

As deregulation, new technologies, and new competition have opened up telecommunication industry, the telecommunication service market has become more competitive than ever. And in this strongly competitive and broadly liberalized mobile telecommunication industry, customer churn has turned into very serious issue. Many subscribers frequently churn from one provider to another in search of better rates/service or for the benefits of signing up with new carrier (e.g., such as receiving the latest cellular phone). Low signup fees particularly for prepaid mobile services also encourage customers to churn. Wireless local number portability (WLNLP) or the ability to change mobile carriers and keep mobile phone number also poses a big challenge to the already reeling telecommunication company.

It is estimated that the average churn rate for the mobile telecommunications is 2.2% per month. i.e., about 27% of given carrier's subscriber are lost each year (Yan et.al, 2004), making it essential to develop an effective churn reduction method. The cost of acquisition of new mobile service subscriber is estimated to be from \$300 to \$ 600. However, the cost of retaining an existing subscriber is generally much lower than that (Wei et.al, 2002).

Wei et.al (2002) used the call pattern changes and contractual data and developed a data mining based churn prediction technique that identify potential churners at the contract level. In their study they used the decision tree approach as the basis for the development of their technique for mobile telecommunication company in Taiwan. In another attempt to identify the determinants of subscriber churn and customer loyalty in Korean mobile telephony market; Kim et.al (2004) used binomial logit model based on the survey of 973 mobile users.

#### 4-2. CUSTOMER CHURN IN BANKING AND INSURANCE

Over the past two decades, the financial markets have become more competitive due to the mature nature of the sector on the one hand and deregulation on the other, resulting in diminishing profit margins and blurring distinctions between banks, insurers and brokerage firms. Hence, now a day a small number of large institutions offering a wide set of services dominate the financial-service industry. These developments stimulated bank and Insurance companies to

implement customer relationship management (CRM). Under this intensive competitive pressure, companies realize the importance of retaining, their current customers. The substantive relevance of attrition modeling comes from the fact that a bank is able to increase its profits by 85% due to a 5% improvement in the retention rate (Prinzle et.al, 2005).

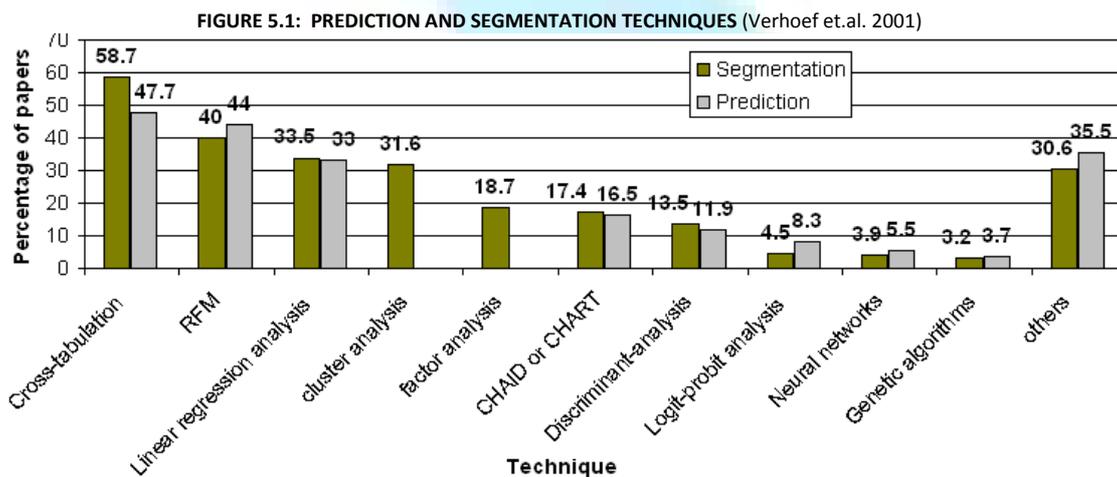
Bart Lariviere et.al (2004) studied the defectors of saving and investment (SI) customers of a large Belgian financial service provider. Their study involves the use of Kplan-Meier estimator to gain insight into the timing of the SI churn event. A multi dimensional probit model and a proportional hazard model are performed to find the most convenient products to cross sell in terms of customer preferences and the likelihood to lower the customer defection prones respectively. In order to establish a system that can provide warning signs to network banking services soon before they are losing valuable customers, Chaing et.al. (2003) took association rules in use and proposed an efficient algorithm called goal- oriented sequential pattern, which can find out behavior patterns of loosing customers or clues before they stop using some products.

**4-3. CUSTOMER CHURN IN ISP**

Internet popularity is growing at impressive rate. Sooner or later, every customer comes face to face with a decision of choosing an ISP. ISPs endure a five times higher churn rate cumulating to 10% monthly (Minguel, 2005). It is also said that nearly half of all Internet subscribers leave their provider every year (Au et.al, 2003). IP network metering, which has lately pick up steam, is the key enabler of getting the fundamental information of churn prediction. Shen-Tun Li et.al. (2005) applied the well known data mining methodology CRISP-DM to investigate network usage behaviors of the ISP subscribers in Taiwan. They used Attribute-oriented Induction (AOI) method for discovering characteristics and discrimination knowledge of ISP customers from the ISP traffic data. An empirically tested model developed by Jyh-Shen Chiou (2004) examines the antecedents of consumer loyalty toward ISPs. In choosing an ISP, pricing was and is a main differentiating factor in mind of customers; however, service quality has emerged as a major concern among users lately. Management of ISP has discovered that service quality is important not only for attracting new customers, but more importantly for retaining existing customers who may otherwise be lured away by lower fees. Gray Madden et.al (1999) developed a probability model for ISP subscriber churn. Their model relates the probability of subscribers churn to various service attributes and subscriber characteristics. Khan et.al (2010) used the subscribers’ demographic, billing and usage date to find the best predictors in one hand and compared the performance of different data mining techniques on the other. They found that best predictors lies among usage data and neural network showed better performance than decision trees.

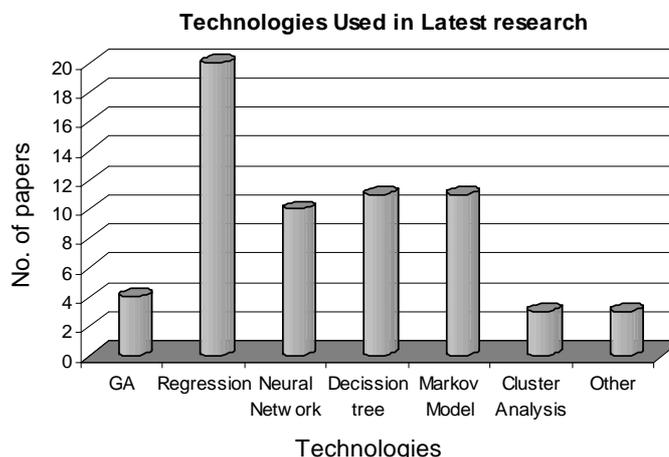
**5. TECHNIQUES USED TO DEAL WITH CHURN**

This section provides a discussion on the various predictive modeling techniques and provides an overview of the research gap area. Much work has been done in the area of CRM and predicting customer behavior, although it appears that to date customer churn management has not received the attention that it requires. Figure 5.1 shows a chart of the known predictive and segmentation methods, compiled by Verhoef and Donkers (2001). It can be observed from Figure 5.1 that cross-tabulation has been the most popular segmentation and predictive modeling technique in the past. The next column shows RFM as segmentation and predictive modeling technique. Hadden et.al (2005) state that RFM defines the variables for use with segmentation and prediction modeling techniques rather than a technology of its. Methods such as waiting RFM variables have been reported in the literature, and weighting the variables provides better results.



Linear regression is another popular technique, for performing both segmentation and prediction, while cluster analysis and factor analysis have been shown specifically for segmentation. According to Verhoef et.at (2001), the three main technologies for prediction, CART, Logit analysis and neural networks have been least used methods. However, the figure shows that CART has been preferred over neural networks and logit regression.

**FIGURE 5.2: KDD TECHNIQUES USED IN LATEST RESEARCH (Hadden, et. al., 2005)**



Based on a review of literature related to churn management, Hadden et.al, (2005) compiled Figure 5.2. The research conducted by Hadden et.al, (2005) is focused mainly on publications during the last five years. Therefore it updates the finding of Verhoef et.al, (2001). Cross-tabulation is an older modeling technique, which has been overtaken by more advanced and accurate methods. Furthermore, the difference between Figure 5.1 and 5.2 are also because the focus of Figure 5.1 is on segmentation and prediction techniques in general, and focus of figure 5.2 is on technologies for predicting customer behavior. One of the major differences is that regression analysis has taken the lead for the preferred method, following by decision trees and Markov models, and then neural networks. This means that four of the least used methods reported by Figure 5.1 have become four of the most popular as reported by Figure 5.2. Following the charts, Table 5.1 is presented, which offers a reference to which research papers are connected with which technology.

TABLE 5.1: REFERENCE OF PAPERS AND THE TECHNOLOGIES

Reference	Regression	Neural Network	Decision Tree	Markov model	Discriminant analysis	GA	Other
Au, W.-H., (2003)		*	*				
Hwang, (2004)	*	*	*				
Baesens, (2004)	*			*			
Ng and Liu, (2001)			*				
Verhoef & Donkers, (2001)	*						
Ven Den Poel, (2003)	*						
Madden & Savage, (1999)	*						
Wei & Chiu, (2002)			*				
Van Den Poel & Lariviere, (2003)			*				
Chae, (2001)	*		*				
Au, T., (2003)	*	*	*				
Daskalki, (2003)		*	*		*		
Malhotra, (2003)		*	*		*		
Chiang, (2003)		*				*	
Lariviere, (2004)	*						
Hsieh, (2004)		*					
Hung, (2003)		*	*				
Kim, (2004)	*						
Yan, (2004)	*						
Burez, (2006)				*			

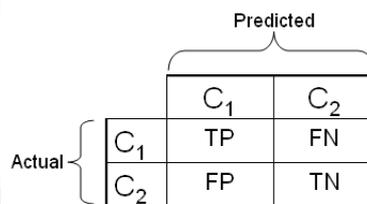
Support Vector Machine is another technique which has lately picked up and is being extensively used for churn prediction.

A Support Vector Machine (SVM) is an algorithm for the classification of both linear and nonlinear data. It transforms the original data in a higher dimension, from where it can find a hyperplane for separation of the data using essential training tuples called support vectors. Detailed description of all the classification techniques is out of the scope of this paper. However, next section presents how we can calculate the accuracy of different models applied for churn prediction.

1. EVALUATING DIFFERENT TECHNIQUES

The confusion matrix is a useful tool for analyzing how well our classifier can recognize tuples of different classes. A confusion matrix for two classes is shown in fig.

FIG 6.1: CONFUSION MATRIX FOR TWO CLASSES



As an example, if we consider C1 as a class of churners and C2 as a class of non churners, then TP (true positive) represents those who were churners and are correctly classified as churners, FP (false positive) represent those who were non churners but our classification technique has classified them as churners. Similarly, FN (False negative) represent those who were churners but are classified as non churners and TN (True negative) represent those who are non churners and are correctly classified as non churners.

The following meaningful measures can be extracted (Bradley (1997)):

Accuracy = (TP + TN) / (TP + TN + FP + FN)

Sensitivity = TP / (TP + FN)

Specificity = TN / (TN + FP)

There are several methods documented for validating a customer churn model. Some popular methods are discussed below:

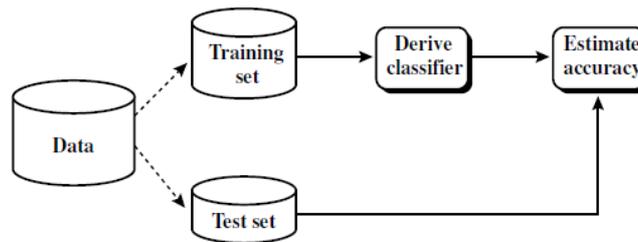
- Cross-fold validation: Hwang et.al, performed validation by creating a 70/30 divide of the data. The 70% divide created the training set, and the 30% divide created the validation set. Cross-fold validation is based on the principle of using the available for both training and validation. Several cross-validation methods have been proposed in the literature, two examples follow:

- V-fold cross validation—the learning set is randomly partitioned into limited datasets of equal size. Each set is then used as a validation set.

- Monte Carlo cross validation—the learning set is repeatedly divided into two random sets for training and validation.

- Cross-fold validation is most suitable in those cases in which there is a scarcity of data.

FIG 6.2: ESTIMATING ACCURACY WITH HOLDOUT METHOD

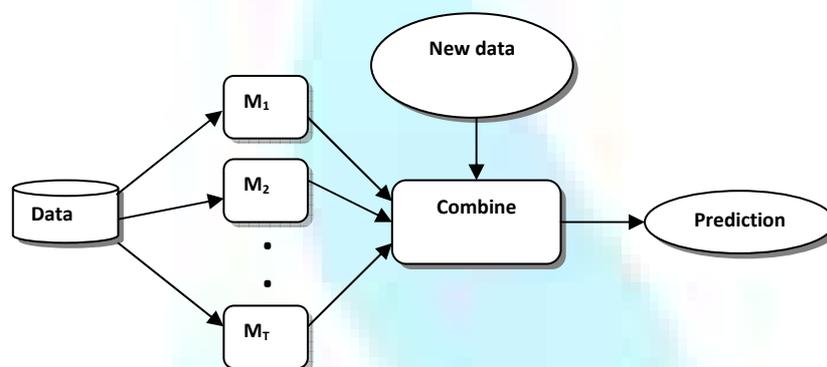


•The holdout method shown in fig 6.2, the given data are randomly partitioned into two independent sets, a training set and a test set. Typically, two thirds of the data are allocated to the training set, and the remaining one third is allocated to the test set. The training set is used to derive the model, whose accuracy is estimated with the test set.

## 7. INCREASING THE ACCURACY

There have been numerous comparisons of the different classification and prediction methods, and the matter remains a research topic. No single method has been found to be superior over all others for all data sets. Issues such as accuracy, training time, robustness, interpretability, and scalability must be considered and can involve trade-offs, further complicating the quest for an overall superior method.

FIG 7.1: INCREASING MODEL ACCURACY (Han, 2003)



Empirical studies show that the accuracies of many algorithms are sufficiently similar that their differences are statistically insignificant, while training times may differ substantially. However, there are strategies to increase the accuracy of prediction or classification. Two such techniques are Bagging and Boosting; each generate a set of classification or prediction models,  $M_1, M_2, \dots, M_k$ . Voting strategies are used to combine the predictions for a given unknown tuple.

## CONCLUSION

Customer churn has been identified as one of the serious business issues and the mitigation of the same has been the center of attention for academicians and researchers from quite some time. Without going in to the details of different data mining techniques, which has been taken use of, for the minimization of customer churn, this paper first of all introduced the notion of customer churn in detail and highlighted different possible reasons which give birth to the churn. Different domains, which are severely affected with customer churn have been identified as appeared in the literature. However, different indexes and parameters for measuring the most affected industry are yet to be investigated. This paper further introduced the most common tools and measures used for evaluating the accuracy of different data mining techniques.

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## IMAGE EDGE DETECTION USING MORPHOLOGICAL OPERATION

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### ABSTRACT

Edges define the boundaries between regions in an image, which helps with segmentation and object recognition. The usual existing edge detection methods like LoG, Canny, Sobel, Prewitt etc. They make use of maximal gradient value or zero-crossing point of second-order derivatives operator or appropriate threshold value obtain image edge. They all belong to high pass filter and unsuitable to detect the noise corruption of the medical image, because noise and edge are located in high frequency domain. Morphological edge detectors involve simple addition/subtraction operations and max/min operations. Since different edge detectors work better under different conditions, it would be ideal to have an algorithm that makes use of multiple edge detectors, applying each one when the scene conditions are most ideal for its method of detection. In order to create this system, it is first required to know which edge detectors perform better under which conditions. Clear edges can show where shadows fall in an image or any other distinct change in the intensity of an image. The process of extraction of these feature points is called edge detection.

### KEYWORDS

edgedetection; multi-scalestructure element; Magnetic Resonance Images; Mathematical Morphology.

## I. INTRODUCTION

Image edge detection is an important work for modern medical image process. The purpose of edge detection confirms the edge of objective contour in noise image. The result of edge detection affects the next diagnoses and therapy [1]. The usual methods are: Log operator, Canny operator, Sobel operator, Prewitt operator etc. They make use of maximal gradient value or zero-crossing point of second-order derivatives operator or appropriate threshold value obtain image edge. They all belong to highpass filter and unsuitable to detect the noise corruption of the medical image, because noise and edge are located in high frequency domain. In practical application medical image usually includes objective edge, objective shadow and noise, so it is difficult to separate edge from noise and the other jamming. Morphological edge detectors involve simple addition/subtraction operations and max/min operations. Since different edge detectors work better under different conditions, it would be ideal to have an algorithm that makes use of multiple edge detectors, applying each one when the scene conditions are most ideal for its method of detection. In order to create this system, it is first required to know which edge detectors perform better under which conditions. In this paper, a new morphological method based multiscale edge detection is proposed to detect edge. It gains the better image edge via changeable structure elements. The experimental results show that the new algorithm is more efficient.

## II. THE TRADITIONAL MORPHOLOGICAL EDGE

### DETECTION OPERATION

The corrected resistances to noise operations are:

$$OME1 = (f \bullet B) \circ B - (f \bullet B) \odot B \quad (1)$$

$$OMD1 = (f \circ B) \oplus B - (f \circ B) \bullet B \quad (2)$$

When the corrected resistance to noise operations OME1 and OMD1 detect edge, responses are all zero for positive and negative pulse to filter noise effectively. But blurred edge is gained [9]. To decrease edge fuzzy performance, to gain better image edge details and restrain capacity of noise, the modified morphological edge detection operations are shown as follow:

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$$E_{min} = \min \{ OME1, OMD1 \}$$

$$E_{max} = \max \{ OME1, OMD1 \}$$

$$E_d = E_{max} - E_{min} \quad (3)$$

Improved morphological edge detection operation is defined by the expression:

$$ED = OMD1 + E_d \quad (4)$$

Fuzzy edge is decreased by iterating some edge details of the improved operation. The increased ability of noise rejection and the better edge image lie on the changeable structure elements.

## III. THE NEW ALGORITHM OF MORPHOLOGICAL

### EDGE DETECTION

#### A. Algorithm Description

The result is directly influenced by the selected structure element [10-12]. In this paper original image is divided into two parts: objection  $f'$  and background  $f_2$ . The part which is larger than the threshold uses large-scale structure element to detect the edge, and uses small-scale structure element for the part less than the threshold. The large-scale structure element is obtained via dilating small-scale structure element and MSE (Mean-Squared Error) and PSNR (Peak Signal-to-Noise Ratio). It can be defined as in (11) and (12):

$$MSE = \frac{\sum_{0 \leq i < M} \sum_{0 \leq j < N} (f - f')^2}{M \times N} \quad (5) \quad (10)$$

$$PSNR = \frac{10 \log_{10} 256 \times 256}{MSE} \tag{6}$$

Where the adjusting factor is  $a$ ,  $f'$  is original image and processed image respectively,  $M$  and  $N$  is image size. Edge image is obtained via large and small-scale morphological operations additive combination:

$$f'(x, y) = w_1 * ED_1(x, y) + w_2 * ED_2(x, y) \tag{7}$$

Where  $f(x, y)$  is the combined edge image,  $w_1$  and  $w_2$  are weights.

**B. Methodology Overview**

Based on foregoing analyses, the better image edge is obtained in terms of algorithm which is shown as below:

- 1) *Select threshold:* Firstly, we estimate an approximate threshold to be regarded as initial value; secondly, segment the image to gain sub-image, then select a new threshold via character of sub-image. The image is segmented by the new threshold after several iterations; finally, the result including the less false partition is gained. The method is better than direct partition for initial threshold. The key is that update threshold. .
- 2) *Select limited structure element B:*  $B_i$  is the large-scale structure element which is obtained from dilating small-scale structure element  $B$ :  $B_i = B \circ \dots \circ B$ , ( $i = 2, 3, 4, \dots, n$ )
- 3) *Compute MSE and PSNR on the basis of (6) and (7):* If  $MSE < M$  ( $M$  is expected value), continue to step 4, or  $i=i+1$  to step 2
- 4) *Detect the edge  $ED_1$  and  $ED_2$  of  $f'$  and  $f_2$  in terms of step 2*
- 5) *Additive combination  $ED_1, ED_2$  to gain edge image based on formula (7):*

In this paper non-mean weight is adopted to detect the better edge image and filter noise. Different scale possesses different ability of noise rejection to confirm the weight  $w_1$  and are  $w_2$  in (7) [13]:

- 1) *The synthetic operations of open-close filter noise using the structure element in step 2:*

The respective mean image is obtained:

$$e_1 = \frac{f \circ B \circ B + f \circ B \circ B}{2}$$

$$e_2 = \frac{f \circ B_i \circ B_i + f \circ B_i \circ B_i}{2}$$

- 2) *Compute image standard deviations:*

$$\Delta_1 = |f - e_1| \quad \Delta_2 = |f - e_2|$$

and variances

$$\Delta_1^2 = |f - e_1|^2 \quad \Delta_2^2 = |f - e_2|^2$$

- 3) *Confirm weight in terms of standard deviations and variances of different scale image:*

$$W_1 = \frac{\Delta_2}{\Delta_1 + \Delta_2} \quad \text{or} \quad W_1 = \frac{\Delta_2^2}{\Delta_1^2 + \Delta_2^2}$$

$$W_2 = \frac{\Delta_1}{\Delta_1 + \Delta_2} \quad \text{or} \quad W_2 = \frac{\Delta_1^2}{\Delta_1^2 + \Delta_2^2}$$

That is, in inverse proportion to the difference between selected weight and corresponding image. The weight of large-scale is larger than small-scale.

**IV. EXPERIMENT**

The source image used for simulating experiment is shown in Fig.2 (a). It is MRI (Magnetic resonance image) of brain tumor; the size is 467 X 529. The proposed algorithm as above detects Gaussian and salt & pepper noise corrupted image edge. The selected structure element is 3 X 3 cross.

FIGURE 1: a) ORIGINAL IMAGE

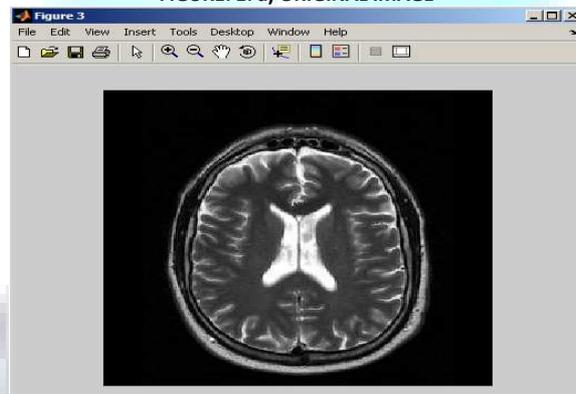
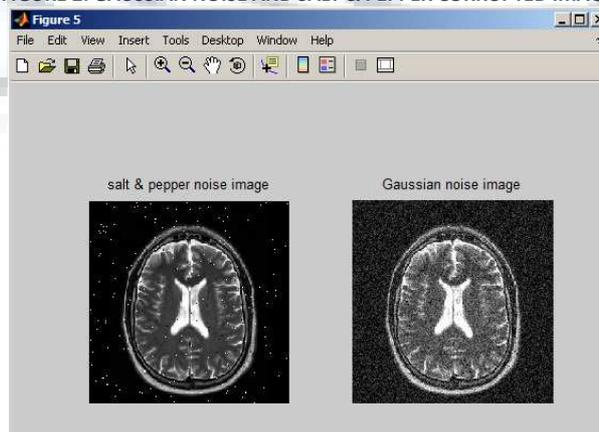


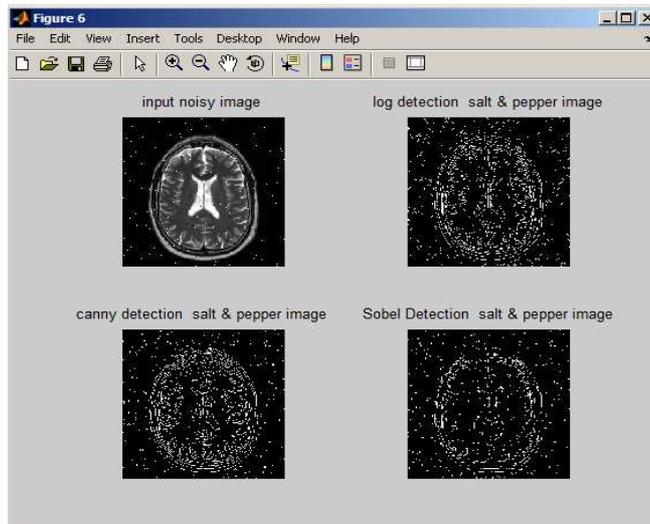
FIGURE 2: GAUSSIAN NOISE AND SALT & PEPPER CORRUPTED IMAGE



A. Comparison with widely known methods

To testify the effectiveness of the proposed algorithm, we detect edge for Gaussian and Salt & pepper noise corrupted image using the traditional gradient-based operations: Canny, Laplacian of Gaussian and Sobel methods and the proposed method in the study. The result is shown as follow:

FIGURE 3: RESULTS OF SALT & PEPPER CORRUPTED IMAGE DETECTION



B. Noise corrupted image detection

From the experimental results Fig.2 and Fig.3, we think that the better edge is gained, the more dilation numbers, the focus of infection is clear. It helps doctor to make sure the state of illness ponderance and confirm how to cure. Circular iteration is needed in dilation. This increases the computational time of processing. It is very important to select suitable dilation times. Different image selects different dilation times to gain better detection edge. Image. The dilation results are as follows:

FIGURE 4: FIRST DILATION OF IMAGE

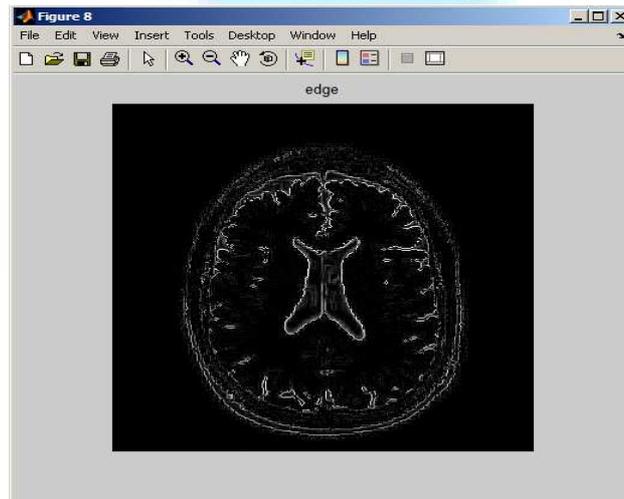


FIGURE 5: SECOND DILATION OF IMAGE

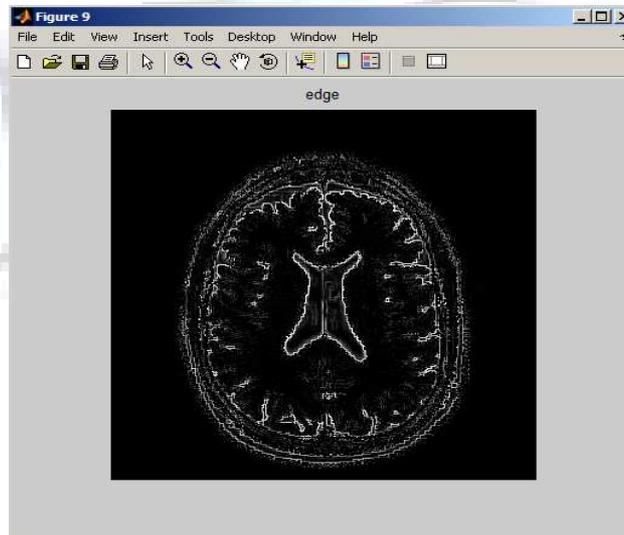
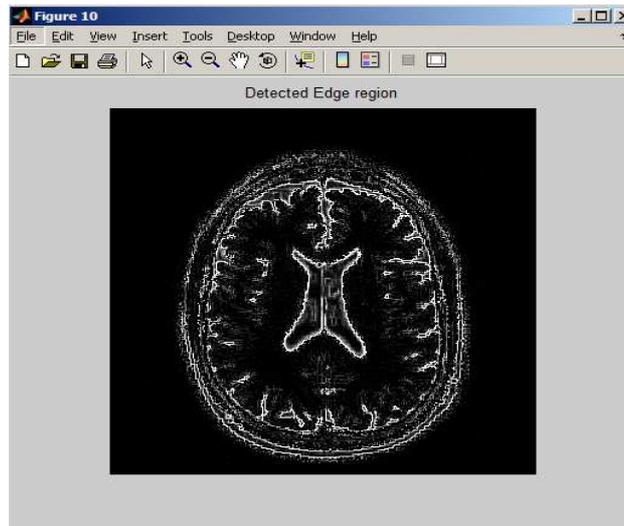


FIGURE 6: CLEAR DETECTION IMAGE EDGE USING MORPHOLOGICAL OPERATION



C. Computational comparisons

The comparisons of widely known methods is compared using our algorithmic method is an shown in the graph for both salt & pepper and Gaussian noised images:

FIGURE 7: THE RESULTS OF GAUSSIAN CORRUPTED IMAGE DETECTION

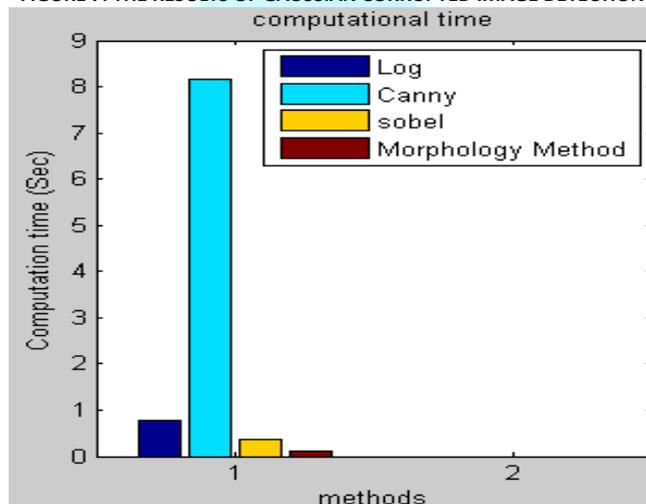


FIGURE 8: THE RESULTS OF SALT & PEPPER NOISE CORRUPTED IMAGE DETECTION

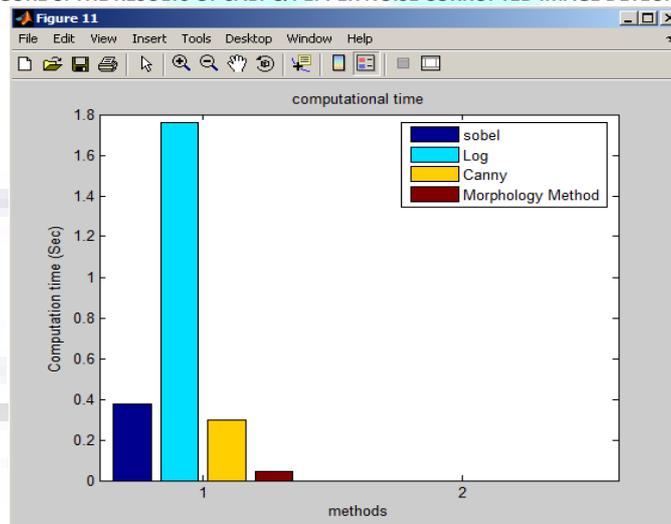


Fig.1a is noise corrupted image. Fig.3 show the results obtained with Log edge detection, Canny edge detection, Sobel edge detection and our proposed method is as shown in fig.4,5 & 6 as first dilation second dilation and finally the detected edge. It is can be seen from these figures that the edge image obtained with our method detected clearer edge which is not detected by Canny method, Log method and sobel method. It is sensitive to noise for widely known methods. The edge obtained with Sobel that is not integrated; Log has weak edge location; Canny detects the thinner edge and discontinuous focus of infection. All of them are not benefit for the research of infection focus. Our proposed method can obtain clearer edge for infection focus where the two noises corrupted (Gaussian and Salt & pepper noise) image. It is not sensitive to noise and in favor of analyzing state of an illness and later cure. It is can be seen from these figures and under noisy condition, our method can still get better image, and less the calculation time, than the well-known Canny, Laplacian of Gaussian and Sobel methods.

## V. CONCLUSION

Image edge is not clear for some pathology or any other field in special reason. The clear edge is important to cure illness. In this paper original image is divided into two parts: objection and background. The part which is larger than the threshold uses large-scale structure element to detect the edge, and uses small-scale structure element for the part less than the threshold. Large-scale structure element is obtained by dilating small-scale structure element.

The experimental results show in fig.3, is that the algorithm is more efficient for even medical image denoising and edge detecting than the usually used gradient-based edge detection algorithms such as Log operation and Sobel edge detector, and Canny operation and is very efficient method as shown in the fig 7& 8 for Gaussian and Salt & pepper corrupted image.

Edge detection is an important task in any image analysis system. The response of the conventional edge detectors are largely dependent on the size of spatial filters (area of support) and the threshold (cut off level) used. The choices of those parameters remain heuristic due to the absence of proper image model. This problem is greatly reduced when a multi-scale approach for integrations of edge information, obtained from various size of filters, is used. The present work proposed morphological operation based on multi-scale edge detector.

It is shown that the proposed detector has better noise immunity and orientation and positional response compared to most of the conventional morphologic edge detectors. This present work is computationally less expensive and is more efficient and effective than sophisticated edge detectors like Log, Canny and Sobel edge detector, with comparable result. They all belong to high-pass filter and unsuitable to detect the noise corruption of the medical image, because noise and edge are located in high frequency domain.

The proposed work detects fine edge with cleared Gaussian and salt & pepper noise corrupted image which is very helpful for any practical applications

## VI. FUTURE SCOPE

The present work can be extended to work with different types of noises. It can be enhanced to work more with natural image segmentation. It can be implemented in many practical applications like to help doctors to make sure the state of illness and confirm how to cure detect any bone fracture. This work in future can also be used to work in most Image Processing applications to obtain information from frames as precursor step to feature extraction and object segmentation. It can be extended to work on many different practical applications of image edge detection.

- Multi-Scale edge detection in Machine Vision Gauging applications such as inspection for missing parts, measurement of critical part dimensions using gauging, and identification and verification of electronic user interface displays.
- This technique is also used in a Mobile Robot Vision System, it is of vital importance to separate objects from the background. This needs firstly to extract edges from the images collected by the mobile robot

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**PERFORMANCE AND EVALUATION OF CONSUMER FORUMS – A CASE STUDY OF WARANGAL DISTRICT****T. VIJAYA KUMAR****ASST. PROFESSOR****SREE CHAITANYA INSTITUTE OF TECHNOLOGICAL SCIENCES  
KARIMNAGAR****M. RADHA KRISHNA****ASST. PROFESSOR****NATIONAL INSTITUTE OF TECHNOLOGY  
WARANGAL****ABSTRACT**

*The consumer is the forgotten man of the modern Indian economy. He is the least organized and the most centrifugal element in the circle of investment, production, sale and consumption, and is generally taken for granted as one who has anyhow to buy in order to live. The consumer forums which are established by the government in order to protect the interest and providing justice to the consumers are functioning in each of district, state and central level. To analyse the legal provisions of the consumer forum and give suggestions against deceptive and unfair trade practices. The present paper investigates the performance of the consumer forums with a special focus on consumer forums at Warangal District. The present paper is the output of an empirical study. The paper will also provide through analysis on the consumers' awareness and opinions on consumer councils.*

**KEYWORDS**

Consumer, government, Investments, Legal Provisions.

**INTRODUCTION**

Consumer is defined as someone who acquires goods or services for direct use or ownership rather than for resale or use in production and manufacturing. Consumer interests can also be protected by promoting competition in the markets which directly and indirectly serve consumers, consistent with economic efficiency, but this topic is treated in Competition law. Consumer protection has gained momentum especially after independence and the enactments of many acts benefited to the consumers from exploitation from unfair trade practices. Consumer protection can also be asserted via non-government organizations and individuals as consumer activism. The need for consumers' protection and satisfaction has been widely accepted all over the world.

**NEED & IMPORTANCE OF THE STUDY**

The business world is witnessing tremendous changes in the tastes and needs of the consumers. Simple kinds of goods and services are replaced by complex products and services. Due to advancement in science and technology, the speed with which these products and services are turned out are far a head of the speed of the consumers in understanding and evaluating them. To evaluate the products and services he needs expert knowledge, which is usually beyond his capability. This makes him difficult for a comparative analysis to ascertain whether the product or service is worth for its price. In the absence of a reliable agency to provide true and fair information, the consumers have to rely on the information provided by the traders. The Government of India realizing the need of consumer protection and eliminating the consumer exploitations enacted many acts. Among those, the very important beneficiary for the consumers is the Consumer Protection Act, 1986. This act provided with important objectives i.e., to provide better protection of the interests of the consumers and also the establishment of consumer councils which are primarily aimed at providing justice to the consumers from marketing of goods which are hazardous dangerous to life and property and to seek redressal against unfair trade practices or unscrupulous exploitation. The year 1987 showed great ray of hope to the consumers in India as the consumer councils started to function. Ever since, the consumer councils at central & state level and district forums resolved many cases right from a small retail store to a big MNC company. The consumer councils provided better justice to the consumers who are violated by the unfair trade practices of the business men. Hence, the evaluation of performance of Consumer forums are needed to brought out more fair and ethical practices of consumer forums in providing good and fair justice to the consumers. The present study is needed to evaluate the performance of consumer councils with special reference to Warangal District of Andhra Pradesh in order to create consumer awareness and to know the practices and performances of the consumer councils in the two selected districts.

**REVIEW OF LITERATURE**

There are very few studies that are purely aimed to provide the basis for the present research study. Several papers and articles focused on consumer protection and interest but very few studies concentrated on consumer councils and forums. Hence, an attempt is made to thoroughly examine the earlier researches.

Neha, in her research project titled "Role of consumer councils in furthering the consumer interest in India" discussed about the importance of performance of consumer councils in providing the justice to the consumers. And the project also focused on the consumer interests and the role of consumer councils in making the consumer interests protected with reference to India.

Monroe Friedman, in his research article titled "Research on Consumer Protection issues: The perspective of the Human Sciences" analyzed on the overview of consumer protection issues and the body of scholarly research in the human sciences that addresses the issues related to consumer protection. The research paper also analyzed on the typology of consumer protection research areas based on the human effects of consumer policy initiatives.

Spillman in his book entitled "consumers personal planning Readers" opined that the important principle for consumers is found in the expression "Let the buyer beware", a warning which means that the consumers are literally on their own. He emphasized that consumerism will not change the basic need of consumers to make their intelligence to use caution in any transaction. It is resourceful in solving problems. Most of the consumers in India are illiterate and may not understand their rights.

Analyzing the Consumer complaints, Manubhai Shah in his article titled "Changing profiles of consumer complaints" stated that the complaints are more conscious about the end result of their lodged complaints. He also noticed a qualitative change that complaints are coming not only from individual consumers, but also from industrial, commercial organizations as well. The research studies reviewed so far has not attempted to study the impact and evaluation of consumerism, particularly in the state of Andhra Pradesh. The present study is totally different from the research studies conducted elsewhere.

Himachalam and Jayachandra in their article entitled "Consumer Protection in India – An overview of legal framework" asserted that legislation alone cannot safeguard the interest of the consumers. There should be much awareness, education, understanding and realization of the rights and the privileges on the part of the consumers. They also suggested that a strong organization will really help in building up more effective consumerism in our country.

Lizzy in his article entitled "Consumer Redressal Agencies: How effective? Kerala Experience" published in Economic and political weekly identified that the literary levels are correlated to the filling of complaints in the consumer forums. It is evident from the study that the complaints received by redressal agencies are high where the literary rate is high almost equal to state average literacy rate of 89.9% is high. It is pertinent to mention that consumer education cannot be neglected for effective consumer protection.

### OBJECTIVES OF THE STUDY

The present paper is aimed at achieving the following objectives.

1. To study the overview and functioning of consumer councils in India.
2. To analyze the performance of consumer forums with special reference to Warangal and District.
3. To Create Awareness on Consumer legislations and to protect their Rights.
4. To examine the opinion of consumers on the awareness and evaluation of the performance of consumer forums.

Finally, the study will provide the conclusions and suggestions on the basis of analysis.

### METHODOLOGY OF THE STUDY

The study for the present research study is made from using both primary and secondary data sources. The primary data has been collected from the select consumers, employees of consumer forums in Warangal District. The secondary data has been collected from Andhra Pradesh State Consumer Dispute Redressal Commissions and District forums of Warangal and District. And also, various articles published in different journals, magazines, news paper sources are also used for the study.

### FINDINGS

The detailed findings of the study are as follows.

#### A). OVERVIEW AND FUNCTIONING OF CONSUMER COUNCILS

After analyzing the importance of the consumers and their rights, the government of India enacted a special act which is purely aimed to protect consumer interest in the year 1986. The Consumer Protection Act, 1986 is one of the benevolent social legislation intended to protect the large body of consumers from exploitation. The Act has come as a panacea for consumers all over the country and has assumed the shape of practically the most important legislation enacted in the country during the last few years. It has become the vehicle for enabling people to secure speedy and in-expensive redressal of their grievances. The Act postulates establishment of Central Consumer Protection Council and the State Consumer Protection Councils for the purpose of spreading consumer awareness. Central Council is headed by Minister-in-charge of the Consumer Affairs in the Central Government and in the State it is the Minister-in-charge of the Consumer Affairs in the State Government who heads State Council. To provide cheap, speedy and simple redressal to consumer disputes, quasi-judicial machinery is set up at each District, State and National levels called District Forums, State Consumer Disputes Redressal Commission and National Consumer Disputes Redressal Commission respectively.

Under the Consumer Protection Act, there is a provision for a three-tier consumer disputes redressal system at the district, state and national levels. Thus the Act provides for the establishment of the following consumer disputes redressal agencies.

- A District level forum, in each district of every state
- A State level commission in each state, and
- A National level commission

The National Commission was established by the Central Government in August 1988, whereas the responsibility for the establishment of the State Commission and District Forum lies with the respective State Governments, after a prior approval is obtained from the Central Government.

#### I). DISTRICT FORUM OR DISTRICT CONSUMER COUNCIL

The District Forum will include:

- a). A person who is, had been or is a qualified to be a district judge nominated by the state government. This person will also be its president.
- b). An eminent personality from the field of education, trade or commerce, and
- c). A lady social worker.

#### II). STATE COMMISSION

In case of the state commission, will include:

- A person who is or has been a judge of a high court and appointed by the state. This person will also be the president of the commission.
- Two other members who shall be persons of ability, integrity and standing, with adequate knowledge or experience or have shown capacity in dealing with problems relating to Economics, Commerce, Law, Accountancy, Industry, Administration or Public Affair.

A complaint may be filed with a district Forum or State Commission, related to any goods sold or delivered or any service provided, as the case may be. The complaint may be filled by:

- By a consumer to whom such goods are sold or delivered or such service is received:
- By any recognized consumer association irrespective of whether the aggrieved consumer is a member of such association or not; or
- By the state or Central Government

#### III). NATIONAL COMMISSION

The National Commission will comprise of:

- A person who has been a judge of the Supreme Court and is appointed by the central government. This person will also be the president of the commission.
- Two other members who are persons with ability, integrity and standing and with the adequate knowledge and experience or has shown capacity to deal with problems related to Economics, Commerce, law Accountancy, Industry, Public affairs or Administration.

The District forum is empowered to deal with complaints where the value of the goods or services and compensation if any, is less than one lakh of rupees. In case value exceeds one lakh but does not exceed ten lakh of rupees, the state level commission is empowered to deal with the complaint, whereas complaints where the value is more than ten lakh of rupees are to be dealt by the national commission. Appeals against the orders of the state commission can be made to the National Commission. The National Commission is also empowered with similar jurisdiction over the state commissions. It may also be noted that appeals against the orders passed by the national can be made to the Supreme courts.

### REGULATIONS

In case of any of the consumer disputes redressal agencies feel that any of the allegations filled by the aggrieved person or persons is true, it will issue an order to the effect that, the opposite party may have to do one or more of the following:

- (a). To remove the defect from the goods in question, as pointed out by the laboratory.
- (b). to replace the defected goods with new goods (which are free from all defects), of similar description.
- (c). To return to the complainant the charges or price paid by them.
- (d). To pay an amount as the case may be, as a compensation for any loss or injury suffered by the consumer due to the negligence of the opposite party.

#### B). PERFORMANCE EVALUATION OF CONSUMER COUNCILS WITH SPECIAL REFERENCE TO WARANGAL DISTRICT

This particular analysis is divided into 3 sections. Section-I concentrates on comparison of National, State and District consumer councils. Section-II is dedicated to evaluate the performance of State Consumer councils and Section-III will provide the performance evaluation of Warangal and Karimnagar Districts.

**SECTION-I: PERFORMANCE OF NATIONAL COMMISSION**

The following table shows the Work performance of the consumer councils. The table shows the performance of councils in individuals' right from the introduction of Consumer Protection Act, 1986 in India.

**TABLE NO. 1**

Since inception Under Consumer Protection Law (As on 6 <sup>th</sup> November,2010)						
Sl. No.	Name of Agency	Cases filed since inception	Cases disposed of since inception	Cases Pending	% of total Disposal	Remarks
1	National Commission	65849	57626	8223	87.51%	----
2	State Commissions	515527	407143	108384	78.98%	----
3	District Forums	2875132	2622983	252149	91.23%	----
	<b>TOTAL</b>	<b>3456508</b>	<b>3087752</b>	<b>368756</b>	<b>89.33</b>	----

Source: National Consumer Dispute Redressal Commission, New Delhi.

From the above statistics, it is clear that all the three major consumer councils are showing good performance since from its inception. National Commission's statistics shows that it has less number of cases filed with a figure of 65849 till October, 2010. This indicates that majority of the cases are getting dissolved at the District and State Consumer councils. And the percentage of cases disposed in the National Commission is 87.51%. Hence, the above statistics clearly showing that the no. of cases filed were less in the National Commission, and it is showing the accuracy of dissolving of cases with 87%. The State Commissions are showing slight lower success rate than compared to the National Commission with the success rate of 78%. And the number of cases filed under State Commissions are 515527. The District consumer Councils or Forums are very impressive with the success rate of 91.23%. From the above statistics, it is clear that the role and performance of District consumer Councils are far better than the National Commission and State Commissions. The total no. of cases filed in District consumer forums are 2875132. Hence, from the above statistics it is to be concluded that majority of the cases were filed in the District Forums with a figure of 2875132. And the less number of cases were filed in National Commission. And when it comes to the disposal of Cases, the District Consumer Forums are ahead with the success rate of 91.23%. When it comes to the National and State Commissions, the National Commission is impressive with second best success rate of 87% and the State Commissions are achieved with the success rate of 78.98%. And the total aggregate figures are showing that the total number of consumer cases filed in India after the introduction of Consumer Protection Act are 34,56,508 and the number of cases solved since from the inception of the CP Act were 30,87,752 and the number of cases still in pending are 3,68,756 and the percentage of cases disposed overall in India are 89.33%.

**SECTION – II: PERFORMANCE ANALYSIS OF STATE CONSUMER COMMISSIONS IN INDIA**

The following table shows the list of cases filed since from the inception of the State commissions in different states. The following table shows the figures about number of cases filed and disposed since from the inception of state commissions and these figures are based on the availability of statistics.

**TABLE NO. 2**

Sl. No.	Name of State	Cases filed since inception	Cases disposed of since inception	Cases Pending	% of Disposal	As On
1	Andhra Pradesh	180745	176178	4567	97.47	31.07.2010
2	A & N Islands	330	301	29	91.21	31.03.2006
3	Arunachal Pradesh	300	266	34	88.67	31.07.2010
4	Assam	13601	11771	1830	86.55	31.03.2010
5	Bihar	77745	66925	10820	86.08	31.05.2010
6	Chandigarh	41194	40043	1151	97.21	31.07.2010
7	Chattisgarh	31203	28759	2444	92.17	31.07.2010
8	Daman & Diu and DNH	153	129	24	84.31	30.06.2010
9	Delhi	212087	197007	15080	92.89	30.06.2010
10	Goa	5968	5382	586	90.18	31.07.2010
11	Gujarat	155442	135582	19860	87.22	31.07.2010
12	Haryana	195546	176981	18565	90.51	31.07.2010
13	Himachal Pradesh	51661	48739	2922	94.34	31.07.2010
14	Jammu & Kashmir	20792	18855	1937	90.68	31.12.2007
15	Jharkhand	31461	29185	2276	92.77	31.03.2010
16	Karnataka	133248	128463	4785	96.41	31.07.2010
17	Kerala	166559	158772	7787	95.32	31.07.2010
18	Lakshadweep	62	58	4	93.55	31.08.2010
19	Madhya Pradesh	154047	141505	12542	91.86	30.06.2010
20	Maharashtra	228984	210961	18023	92.13	31.03.2010
21	Manipur	1037	1012	25	97.59	30.09.2008
22	Meghalaya	322	308	14	95.65	31.03.2007
23	Mizoram	2065	2011	54	97.38	31.12.2006
24	Nagaland	246	205	41	83.33	30.6.2006
25	Orissa	82615	77506	5109	93.82	30.06.2010
26	Puducherry	2742	2519	223	91.87	31.07.2010
27	Punjab	131045	126266	4779	96.35	30.06.2010
28	Rajasthan	248672	227166	21506	91.35	31.07.2010
29	Sikkim	252	240	12	95.24	31.01.2010
30	Tamil Nadu	94672	88035	6637	92.99	31.07.2010
31	Tripura	2015	1807	208	89.68	30.09.2008
32	Uttar Pradesh	500961	419556	81405	83.75	30.06.2010
33	Uttarakhand	31760	29913	1847	94.18	30.06.2010
34	West Bengal	75600	70577	5023	93.36	31.03.2010
	<b>TOTAL</b>	<b>2875132</b>	<b>2622983</b>	<b>252149</b>	<b>91.23</b>	

Source: Statistics about state commissions from NCRDC

From the above statistics, it is clear that Andhra Pradesh State Commission is the 2<sup>nd</sup> top performer in terms of percentage of success in case disposals. The State of Andhra Pradesh achieved 97.47% as on 31<sup>st</sup> July, 2010 and among all the states and Union Territories in India, Manipur State achieved the best percentage in terms of case disposals with a success rate of 97.59%. Overall, the total number of cases filed in all the states is 2875132. And the number of cases disposed is 2622983 and the number of cases still to be disposed (or) pending is 252149. All the states together achieved 91.23% of success in terms of case disposals in India. Overall, 23 states crossed the average percentage of success in terms of case disposals. Andhra Pradesh State Commission is far away from the average of success in terms of case disposals with a healthier percentage (97.47%).

**SECTION-III: PERFORMANCE OF DISTRICT FORUMS IN ANDHRA PRADESH**

The following table gives detailed list of districts consumer forums performance.

**TABLE NO. 3**

S.No.	Name of the District	Cases filed since inception	Cases disposed since Inception	Cases Pending	Percentage of cases disposed
1.	Adilabad	4767	4692	75	98.51
2.	Ananthapur	4732	4708	24	99.49
3.	Chittoor-I	4420	4352	68	98.46
4.	Chittoor-II at Tirupathi	699	662	37	94.70
5.	East Godavari – I at Kakinada	8814	8707	107	98.78
6.	East Godavari – II at Rajahmundry	1052	976	76	92.77
7.	Guntur	9997	9639	358	96.41
8.	Hyderabad – I	16790	16444	346	97.93
9.	Hyderabad – II	8332	7927	405	95.13
10.	Hyderabad – III	2484	2189	295	88.12
11.	Kadapa	6715	6670	45	99.32
12.	<b>Karimnagar</b>	<b>9461</b>	<b>9154</b>	<b>307</b>	<b>96.75</b>
13.	Khammam	8826	8677	149	98.31
14.	Krishna – I at Machilipatnam	5338	5302	36	99.32
15.	Krishna – II at Vijayawada	3852	3700	152	96.05
16.	Kurnool	6681	6542	139	97.91
17.	Mahboobnagar	4664	4604	57	98.71
18.	Medak at Sanga Reddy	2755	2723	32	98.83
19.	Nalgonda	2785	2750	35	98.74
20.	Nellore	13583	13442	141	98.81
21.	Nizamabad	6097	6000	97	98.40
22.	Prakasam at Ongole	7655	7502	153	98.00
23.	Ranga Reddy	4544	4245	299	93.41
24.	Srikakulam	4861	4696	165	96.60
25.	Visakhapatnam-I	16128	15905	223	98.61
26.	Visakhapatnam-II	2317	2142	175	92.44
27.	Vizianagaram	3106	3046	59	98.06
28.	<b>Warangal</b>	<b>5723</b>	<b>5643</b>	<b>80</b>	<b>98.60</b>
29.	West Godavari at Eluru	4888	4266	622	87.27
	<b>GRAND TOTAL</b>	<b>182062</b>	<b>177305</b>	<b>4757</b>	<b>97.38</b>

Source: AP state consumer redressal commission, Hyderabad

From above table, the following conclusions are made.

1. Maximum number of cases filed in District Consumer forum is : Hyderabad-I
2. Maximum number of cases disposed in terms of percentage of Success : Anantapur District Consumer Council
3. Minimum number of cases disposed in terms of percentage of Success: West Godavari at Eluru
4. Number of District Consumer forums whose performance is more than the average percentage of success in terms of cases disposed : 20
5. District Consumer foras(forums) which are performing more than the average percentage of performance in terms of success in cases disposed : Adilabad, Anantapur, Chittoor-I, East Godavari –I at Kakinada, Hyderabad – I, Kadapa, Khammam, Krishna –I at Machilipatnam, Kadapa, Khammam, Karimnagar, Mahboobnagar, Medak at Sangareddy, Nalgonda, Nellore, Nizamabad, Prakasam at Ongole, Visakhapatnam – I, Vizianagaram and Warangal.

**I). COMPARISON OF PERFORMANCE OF WARANGAL DISTRICT CONSUMER COUNCIL WITH THE AVERAGE OF PERFORMANCE OF ALL DISTRICT COUNCILS**

1. Number of cases filled in Warangal District consumer council (5723) is less the average number of cases filled in all district consumer councils (6278). The Number of cases disposed since inception (5643) in Warangal District Consumer Council is less than number of cases disposed in all district consumer councils (6114). The number of cases pending in Warangal District Consumer council (80) is less than the number of cases pending in average number of cases pending in all district consumer councils (164).

**II). YEAR WISE EVALUATION OF PERFORMANCE OF CONSUMER COUNCILS AT WARANGAL DISTRICT**

**TABLE NO.4**

Year	Name of the Consumer council/consumer forum	Number of cases in which Judgement has given	Maximum cases filed against
2005-06	Warangal	01	Insurance Organization
2006-07	Warangal	0	-----
2007-08	Warangal	14	Insurance organizations (8)
2008-09	Warangal	136	Insurance organizations (31)
2009-10	Warangal	119	Individuals
2010-11	Warangal	77	Individuals

Source: AP state consumer redressal commission, Hyderabad

From the above table, it is evident that the year 208-09 clearly showed with majority of the cases were disposed. From the table, the period 2006-07 showed no case was disposed. Among all the cases which were given the justice to the consumers, it is clearly showing that majority of the cases were filed in the insurance organizations. And especially 2008-09 showed that majority of the cases in which consumer council at Warangal district given verdict clearly showing that the majority of the cases were filed in the insurance organizations, especially life insurance organizations.

**C). ANALYSIS ON CONSUMER AWARENESS AND EVALUATION ON DISTRICT CONSUMER FORUMS**

**i). Association between consumer age group and awareness about complaining to the consumer councils**

The following table suggests the different age groups and the awareness about complaining to consumer councils. Chi-Square test is been applied in order to analyze the association between consumer age group and awareness about complaining to the consumer councils.

TABLE NO.5

Type of Response	Age Groups				Total
	Under 20	20-39	40-59	60 & over	
Aware of complaining	8	52	56	8	124
Not aware of complaining	32	11	18	15	76
<b>Total</b>	40	63	74	23	200

**ANALYSIS**

H0 : There is no significant association between the consumer age group and awareness about complaining to the consumer councils.

H1 : There is a significant association between the consumer age group and awareness about complaining to the consumer councils.

Taking 5% level of significance, and Degrees of freedom (D.F) = (r-1) (c-1)

D.F = (2-1) (4-1) = 3

Therefore, the Tabular value of  $\chi^2$  at 5% level and 3 degrees of freedom = 7.81

Calculation of  $\chi^2$  Value is given by =>

TABLE NO. 6

Given Observation (Oij)	Expected Observation (Eij)	(Oij-Eij)	(Oij – Eij) <sup>2</sup>	$\frac{(Oij - Eij)^2}{Eij}$
8	24.8	-16.8	282.24	11.38
52	42.16	9.84	96.82	2.29
56	45.88	10.12	102.41	2.23
8	14.26	-6.26	39.18	2.74
32	15.2	16.8	282.24	18.56
11	23.94	-12.94	167.44	6.99
18	28.12	-10.12	102.41	3.64
15	8.74	6.26	39.18	4.48
Total = 200				<b>52.31</b>

Hence, the calculated value of  $\chi^2 = 52.31$

And the tabular value of  $\chi^2 = 7.81$

Hence, the calculated value of  $\chi^2 >$  tabular value of  $\chi^2$

Therefore, we accept H1

So, it is to be concluded that there is a significant association between the consumer age group and awareness about complaining to the consumer councils.

**II). ASSOCIATION BETWEEN CONSUMER LITERACY AND AWARENESS OF CONSUMER PROTECTION MECHANISM**

The following table shows the consumer literacy and awareness of consumer protection mechanism. Chi-Square test is been applied in order to analyze the association between consumer literacy and awareness about complaining to the consumer councils.

TABLE NO.7

S.No.	Type of Response	Consumer literacy				Total
		Below the grade of S.S.C	Under graduate	Graduate	Post-Graduate	
1	Aware of consumer protection mechanism	8	16	25	78	127
2	Not aware of consumer protection mechanism	14	27	19	13	73
	<b>Total</b>	22	43	44	91	<b>200</b>

**ANALYSIS**

H0 : There is no significant association between the consumer literacy and awareness of consumer protection mechanism.

H1 : There is a significant association between the consumer age group and awareness of consumer protection mechanism.

Taking 5% level of significance, and Degrees of freedom (D.F) = (r-1) (c-1)

D.F = (2-1) (4-1) = 3

Therefore, the Tabular value of  $\chi^2$  at 5% level and 3 degrees of freedom = 7.81

Calculation of  $\chi^2$  Value is given by =>

TABLE NO. 8

Given Observation (Oij)	Expected Observation (Eij)	(Oij-Eij)	(Oij – Eij) <sup>2</sup>	$\frac{(Oij - Eij)^2}{Eij}$
8	13.97	-5.97	35.64	2.55
16	27.30	-11.3	127.69	4.67
25	27.94	-2.94	8.64	0.30
78	57.78	20.22	408.84	5.24
14	8.03	5.97	35.64	2.54
27	15.69	11.31	127.91	8.15
19	16.06	2.94	8.64	0.53
13	33.21	-20.21	408.44	12.29
Total = 200				<b>33.72</b>

Hence, the calculated value of  $\chi^2 = 33.72$

And the tabular value of  $\chi^2 = 7.81$

Hence, the calculated value of  $\chi^2 >$  tabular value of  $\chi^2$

Therefore, we accept H1

So, it is to be concluded that there is a significant association between the consumer literacy and awareness of consumer protection mechanism.

**FINDINGS & SUGGESTIONS**

From the study it is found that the consumer councils at National, State and District level are significantly contributing to provide justice to the consumers who are in need. The mechanism of Consumer Protection act, 1986 provided consumers from different categories based on the value of the case to take the assistance of district, state and National commissions. The study on state commissions revealed that the Andhra Pradesh state commission is progressing at a good margin with 97.47% of case disposals. The present study reveals that the consumers are having lack of knowledge on consumer rights, but the last few years consumers are showing interest to know the fundamental rights provided by the Constitution. The Warangal district consumer council achieved better performance than the average number of cases filed in other district councils of the state. From the last 5 years, it is found that the majority of the cases which

were filed against insurance organizations in Warangal District. The consumer awareness on district consumer council showed that there is a significant between the consumer age group and awareness about complaining to the consumer councils. And the association between consumer literacy and awareness of consumer protection mechanism showed that there is a significant relation between the consumer literacy and awareness of consumer protection mechanism.

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## PROSPECTS OF TRADITIONAL THERAPY: CONSUMER'S PERCEPTION - AN EMPIRICAL STUDY OF RURAL MARKET WITH SPECIAL REFERENCE TO INDORE DISTRICT

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**INDORE**

### ABSTRACT

*Ayurveda is maintenance and promotion of positive health and cure of diseases through medicine, dietary restrictions and regulated life style. Ayurveda is the name for a comprehensive health care system that began in ancient India. Ayurveda proposes for an omnipresence of basic building blocks of life in the universe suggesting that beginning of synthesis is subject to the availability of optimal conditions. The study was undertaken in the rural market in and around Indore. Questionnaire was administered on 200 adult respondents (119 Males and 81 females), of which 193 valid responses were obtained (107 Males and 86 Females). Research finding about the consumers' perception regarding the ayurvedic products in rural areas in and around Indore indicated that 68% people use Ayurvedic products and 32% of the people use Homoeopathic and Allopathic products. Findings further showed that the percentage of people using ayurvedic medicine is very less and restricted to only 25% of the whole population. Analysis revealed that there is no significant difference between Male and Female consumers on their experience in using Ayurvedic product. The same data when analyzed with respect to the income showed that the experience in the use of ayurvedic product is independent of income effect. Preference for type of therapy showed no effect of Gender or Incomes.*

### KEYWORDS

Ayurveda, Rural Market, Preference, Perception, Awareness.

### INTRODUCTION

The health of a nation is a reflection of the health of the people. The health of a nation is a composite variety of health indicators, of which the chief are infant mortality rate, maternal mortality rate, and life expectancy. The Health of India lags behind that of many nations both developed and developing, something which the Government has been trying to improve for the last 64 years. In recent past, an upsurge has been observed in India towards healthy and stress-free life. Obviously our country needs to divert more resources to health than the amount countries ahead of us do. Yet, there is the problem that resources are limited and many other developmental works are all vying for them. The country is caught in a bind: The poor health of the people demands more resources, yet shortage of resources means that no more can be allocated to health. In this situation, the Ayurveda which is maintenance and promotion of positive health and cures the diseases through medicine, dietary restrictions, yoga and regulated life style certainly play an important role in providing inclusive, affordable, and accessible healthcare services to millions of people.

Ayurveda is the name for a comprehensive health care system that began in ancient India. Ayurveda proposes for an omnipresence of basic building blocks of life in the universe suggesting that beginning of synthesis is subject to the availability of optimal conditions. This justifies the life process to begin only a few billion years ago despite availability of the basic materials since eternity. Primitive earth was proposed to be characterized by Sattva, Rajas and Tamas (Triguna) symbolizing the physical properties prevalent to the primitive earth. Sattva, the foremost of Triguna, symbolizes the energy required for creation, Rajas, the second of Triguna symbolizes the particle movements and Tamas finally symbolizes inert material having a capacity to convert into new forms under the constant influence of Sattva and Rajas. (Rastogi 2010).

Ayurveda has been recognized by the World Health Organization (WHO) as a complete system of natural medicine. Medicinal herbs as potential source of therapeutics aids has attained a significant role in health system all over the world for both humans and animals not only in the diseased condition but also as potential material for maintaining proper health. Rural markets in India constitute a wide and untapped market for many products and services which are being marketed for the urban masses. India is one of the largest economies in the world in terms of purchasing power and has a strong middle class base of more than 300 million. The Indian rural market with its vast size and demand base offers a huge opportunity for investment. Rural India has a large consuming class with 41 per cent of India's middle-class and 58 per cent of the total disposable income. With population in the rural areas set to rise to 153 million households by 2009-10 and with higher saturation in the urban markets, future growth in the FMCG sector will come from increased rural and small town penetration. Technological advances such as the internet and e-commerce will aid in better logistics and distribution in these areas.

During last two decades, use of Ayurveda and other Traditional Medicines has expanded globally and gained popularity. It has not only continued to be used for primary health care of the poor people in developing countries, but has also been used in countries where conventional medicine is predominant in the national health care system. With the tremendous expansion in the use of Traditional medicines worldwide especially in developed countries, safety and efficacy as well as quality control of herbal medicines and Traditional procedure – based therapies have become important concerns for both health authorities and practitioners.

The 21st century began with a few landmark observations that helped decisively to rediscover the lost links between modern Science and Ayurveda. This period has also proposed certain new models to comprehend Ayurvedic fundamental tenets on grounds acceptable to the Western world. The evolved and explicit human physiology and behavioural science have been described to have their seeds in the philosophy of Ayurveda. The identification of a genomic link to the theory of Prakriti led to a search for possible classification of people on their Prakriti based on their genetic makeup. These studies could eventually lead to a personalization of medical practice on the basis of prakriti as is conceived in Ayurveda.

**Consumer Satisfaction:** Consumer satisfaction and acceptance are often considered in the literature to be closely linked yet these are distinct concepts. Satisfaction is the fulfillment and gratification of the need for a stated good or service, here, Traditional Therapy.

**Consumer Preferences:** This is used primarily to mean an option that has the greatest anticipated value among a number of options. Preference and acceptance can in certain circumstances mean the same thing but it is useful to keep the distinction in mind with preference tending to indicate choices among neutral or more valued options with acceptance indicating a willingness to tolerate the status quo or some less desirable option.

**Consumer Awareness:** Consumer awareness is the level of knowledge about, in this case, the traditional therapy and the various effects and outcomes of ayurvedic products. In most research the adequacy or otherwise of this awareness is anchored against the service provider or regulator's perspective on the supply. Where consumer awareness does not equate with this industry perspective this is often termed a consumer (mis)perception. (TECHNEAU CONSUMER PREFERENCES an Overview (2006); an Integrated Project Funded by the European Commission under the Sixth Framework Programme, Sustainable Development, Global Change and Ecosystems Thematic Priority Area).

**LITERATURE REVIEW**

Over the past several decades, support for traditional medicine has dramatically increased worldwide. In the Alma Ata Primary Health Care Delivery Declaration of 1978, which called for "health for all by the year 2000," the World Health Organisation (WHO) acknowledged the importance of traditional medicine in providing primary health care and encouraged countries to develop official policies on traditional medicine (Saleh 1993: 21–22). The WHO General Guidelines for Methodologies on Research and Evaluation of Traditional Medicine (2000) provide a strategy for assessing the safety and the efficacy of traditional medicine.

Wharton marketing professor Lisa Bolton (2007), New York University doctoral student Wenbo Wang and Peking University marketing professor Hean Tat Keh (2007) looked at how people's perceptions of a given remedy, their perceptions of their illness and other factors influence medical decision making. The researchers also examined how the choice of remedy, be it Western medicine (WM) or traditional Chinese medicine (TCM), impacts the decision to follow a healthy lifestyle. They found that on the whole, Chinese consumers tend to prefer TCM but will opt for Western medicine in particular situations, such as when they are hoping to quickly alleviate their symptoms or when they are certain about what is making them sick.

Their study has implications beyond the Chinese market, Bolton and her co-authors note. "Consumers today face a wide array of choice options. Proliferation in choice extends to remedies for illness or disease -- including drugs, supplements, radiation, surgery, chiropractics, acupuncture, massage therapy, homeopathy, Ayurveda and traditional Chinese medicine, to name a few. In many countries of the world, medical pluralism is the norm, with Western and traditional medicine existing side-by-side in the marketplace. Even in countries with a dominant medical tradition, complementary and alternative medicines are increasingly available. Treatment goals and patients' time frames influenced their preferences. "Consumers perceive TCM (versus WM) to have slower action and milder side effects and a greater focus on treating the underlying illness versus alleviating the symptoms," the authors note. Likewise, when consumers were uncertain about their condition and not in any particular hurry for a resolution, they preferred traditional remedies. Bolton and her colleagues also discovered that the decision to select Western medicine over traditional remedies has broader implications for health.

The researchers found that, in general, Western medicine (versus TCM) "reduces the perceived importance of, and motivation to engage in, complementary health-protective behaviour, thereby undermining a healthy lifestyle." In other words, patients taking pills for their high blood pressure may be less apt to see the need to exercise, watch their diet or lose weight.

"We know what remedies are supposed to do. They are supposed to improve your health, but Western drugs can actually backfire and boomerang healthy lifestyle intentions," Bolton says. For example, people taking cholesterol drugs may figure they don't need to cut fat from their diet because the pills are protecting them from heart disease.

Emily Hillenbrand (2006): A 2002 report from the Ministry of Public Health confirms that the economic crisis and the failure of the social security system have created an intensive return to traditional health services. Today, 7% of the average household health budget goes to traditional medicines. Nearly twice as many people from poor households rely on traditional medicine as do people from rich households (Strategie Sectorielle de Sante, 2002: 32–49).

Herbal medicinal products have become popular because of perceived safety and economy and inability of allopathy to cure everything. However, recent reports of contamination and potential for adverse reactions, have tempered the enthusiasm of consumers for these "natural" cures, resulting in decline of sales of herbal products in the United States. The consumers now want more authentic information on quality, safety and efficacy of HMPs. Arun Bhatt MD (Med) FICP (Ind) MFPM (UK), President, Clininvent Research Pvt Ltd, Mumbai. (2008):

The medical perceptions about complementary medicine (including HMPs) are diverse. Surveys show that, overall, physicians believe it is moderately effective, while many doctors regard complementary therapies as scientifically unproved. The doctors' are concerned about 1) use of such therapies as an adjunct or an alternative to conventional care, 2) comparative efficacy of complimentary and allopathic therapies and 3) the possibility of adverse effects. In general, globally, the trend amongst doctors is to support the patients' preferences for complementary therapies. However, they want published information from reliable sources on quality, safety and efficacy of HMPs.

The use of herbal supplements is prevalent among patients who are taking prescription medications, particularly senior citizens. (J Altern Complement Med 2001). Yet few clinical studies have systematically assessed potential interactions between herbs and medications Most patients do not readily disclose their use of complementary ayurvedic medicine to their health care providers (Eisenberg DM, Davis RB, Ettner SL, 1998) and physicians may not routinely ask about such use. As a result, dangerous herb–drug interactions may be missed. However, potentially serious consequences might be avoided by obtaining a more careful history about complementary ayurvedic medicinal use. In this review, we highlight some common herbal remedies used, their adverse cardiovascular effects, and their potential interactions with cardiovascular drugs. We also discuss issues about the use of herbal products and suggest ways to improve their safety. J Am Coll Cardiol (2005)

Pareek (1999), the finding of their research showed that the Indian rural market has immense untapped potential. The rural market's importance arises out of the fact that India lives in the villages, both literally and metaphorically. According to National Council for Applied Economic Research (NCAER) surveys, the income of the average villager is rising. Recession is hardly possible in rural India.

Raj and Selvaraj (2007), the finding of their research coins that there is an opportunity for makers of branded products, who can convert consumers to buy branded products. Many companies including MNCs and regional players started developing marketing strategies to lure the untapped market. Their study also covers the marketing strategies adopted by many companies in rural areas.

Hundal and Anand (2008), the finding of their research conducted a study to gain insight into perception of rural and urban consumers about various promotional measures adopted by durable goods manufacturing companies. Their results indicate that though both the groups seem to have considered all the factors as important in sales promotion, a minute observation states that urban respondents have assigned high priority for these schemes, installment purchase, off-season discount, zero interest system.

Pirakathesswari P. (2010), the finding of their research emphasized that success of a brand in the India rural market is as unpredictable as rain. It has always been difficult to gauge the rural market. Many brands, which should have been successful, have failed miserably. More often than not, people attribute rural market success to luck. Therefore, marketers need to understand the social dynamics and attitude variations within each village, though nationally, it follows a consistent pattern.

The Economic Times (2003), "The rural market likes it strong" the strength of rural markets for Indian companies. Financial express, June 19, 2000 has published the strategy about FMCG majors, HLL, Marico Industries, Colgate Palmolive have formula had for rural markets.

Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural sources. Many of these isolations were based on the uses of the agents in traditional medicine. The plant-based, traditional medicine systems continue to play an essential role in health care, with about 80% of the world's inhabitants relying mainly on traditional medicines for their primary health care. India has several traditional medical systems, such as Ayurveda and Unani, which has survived through more than 3000 years, mainly using plant-based drugs. The material medical of these systems contains a rich heritage of indigenous herbal practices that have helped to sustain the health of most rural people of India Owolabi et al (2007).

Determining quality of public health care services in rural India: The survey instrument had an overall Cronbach's alpha value of 0.96 and was able to discern differences across various socio-demographic characteristics of the respondents. The opinions of the respondents towards health care quality were not very favourable. Negative scores were obtained on items, "availability of adequate medical equipments" and "availability of doctors for women". Education, gender and income were found to be significantly associated with user perception. Clinical Governance An International Journal (2003).

**METHOD & DATA ANALYSIS**

The study was undertaken in the rural market in and around Indore. Questionnaire was administered on 200 adult respondents (119 Males and 81 females), of which 193 valid responses were obtained (107 Males and 86 Females). Thus the data analysis was considered on these limited set of responses. Some of the responses had missing values and on analysis it was found that these were Missing at Random (MAR) and thus the response sheets were eliminated from further analysis. The final data has 61% male respondents and 59% female respondents.

Also the respondents were categorized on the basis of Income. Out of the total 193 valid responses 43% were having the income below Rs 5000, 28% were having the income between 5-10 thousand and the remaining 29% had income above Rs10, 000.

Normal Probability Plot showed that the data is normally distributed and requires no transformation. The Box Whisker Plot demonstrated the presence of 2 Outliers which were not significant enough to affect result and thus there was no point in eliminating them for data analysis.

Research finding about the consumers' perception regarding the ayurvedic products in rural areas in and around Indore indicated that 68% people use Ayurvedic products and 32% of the people use Homoeopathic and Allopathic products. Findings further showed that the percentage of people using ayurvedic medicine is very less and restricted to only 25% of the whole population (Population which is considered for research study).

Analysis revealed that there is no significant difference between Male and Female consumers on their experience in using Ayurvedic product ( $p>.05$ ). The same data when analysed with respect to the income showed that the experience in the use of ayurvedic product is independent of income effect ( $p=.073$ ). Preference for type of therapy showed no effect of Gender or Income (all  $p>.05$ ). Yates correction had to be taken while carrying out the Income effect as some of the cell had values less than 5.

The research study shows that 52% of people see the most popular brand advertisement like Dabur, Navratna and Borolin and all these advertisements were rated with almost same points. Himani ayurvedic product advertisements were ranked second after the above mentioned products. Maximum people were in favour of Ayurvedic products as according to them they are aware that Ayurvedic products do not have any side effects.

Research finding regarding the impact of advertisements on consumer's mind, that is, do they buy the Ayurvedic products after seeing the advertisements, identified that 64% people purchase and are immediately influenced by the advertisements which shows them quality and various features of the product, whereas 36% people denied with the immediate effect or influence of ads on them.

On the availability of ayurvedic products on the shops in villages, research identified that 91% of the village shops keep the ayurvedic products and 9% do not keep. The availability factor widely depends on the content of ayurvedic medicines like they are made with tree leaves, flowers, jadi-butees etc which are basically found in the forest areas and as many big industries are set nearby villages and therefore it's convenient for the companies to approach villages and make the product available on all the shops.

Branding is about getting your prospects to see you as the only one that provides a solution to their problem. Brand play a vital role in sell of product the research finding on the percentage of people who prefer branded ayurvedic products and the percentage that do not go for brand suggested that 64% people preferred to buy branded ayurvedic product and remaining do not go for purchase of branded product.

Availability of ayurvedic medicine is a major concern and in the research 82% people agreed that the ayurvedic products are very much available in their nearby areas and at the same time remaining 18% people denied the availability of products in nearby areas and they have to purchase the product from far areas.

There are so many determinants which affect the selection of a product, but when we tried to identify the selection of product on the basis of different determinants like Price, Quality, Effectiveness, Availability, we found that 48% people select the ayurvedic product on the basis of product Quality, 42% people select the product on the basis of Effectiveness and the remaining percentage select on the basis of price and availability.

On the basis of research, Dabur, Navratna & Borolin, some of the very common brands which were easily available in or nearby area of village and the percentage of brand available are in ration of, Borolin: 26%, Navratna: 18%, Dabur: 56%.

The consumers' perception regarding the impact of ayurvedic products including medicines, is comparatively less then the Other Alopethic or English medicines. 49% people agreed that ayurvedic products helps in curing diseases much more faster than the other alopethic or such medicines. Whereas according to 51% people the case is just opposite, they believe that alopethic, homopethic etc medicine are faster in curing the diseases. When asked whether the ayurvedic products help in curing the diseases faster than the common western medicine, there was no significant difference between the male and females response ( $p=.064$ ). The common diseases, for which people purchase the ayurvedic products were namely, cough and throat infection, etc.

The research identifies that people are not consuming ayurvedic products just because of non availability of ayurvedic products in their town, village or the nearby areas. 75% people were found to agree that if the ayurvedic products are in vicinity they will definitely prefer for those products and at the same time they said, they also know that ayurvedic products are available at cheap prices compared to urban areas. Whereas at the other hand there are 25% people who deny that even after the vicinity of products they won't prefer buying those products, may be just because they feel other products better than ayurvedic products.

Packaging is a very important marketing strategy to glamorize the product in order to attract the consumer's attention. As most consumers judge a product by its packaging before buying, therefore it is logical to say attractive packaging is crucial in order to get the first time buyers to buy the products and at the same time it is very necessary that product is available in different sizes. The current trend of market is that, people prefer small sachets, use and throw packaging. The demand of handy products is increasing therefore in this research we tried to find out the link between sell of ayurvedic products with the size of package. As per the research 80% people were in favour that sale increases when product comes in small packets and 20% people were against this statement. When asked if the small packing of ayurvedic product will help in increasing the sale of the medicine the gender effect showed significant difference ( $p=.042$ ) implying that males and females think differently. But the question had no income effect thus implying that rural mass think (irrespective of their income) that sale of ayurvedic medicine will increase if the products come in small packing ( $p=.057$ ).

## CONCLUSION

Rural markets are for marketers with perseverance and creativity. The market is extremely attractive with its vast potential but also provides challenges. It is a classic case of risk return situation. It is a high risk area but with the promise of a large customer following as the prize for those who succeed. The key to reducing the risk is to understand the market, the consumer need and behaviours. A marketer needs to understand that rural consumers are not a homogeneous lot. The rural market is not synonymous with the farmer. The consumer groups here differs by occupation, income, social and cultural grouping. The rural marketer will find it useful to identify consumer groups who require products purchased in the urban market. "Therefore the time for preparing tomorrow is today".

The present study contributes to both theory and practice. At the conceptual level, our findings provide support for the increasing utility of Traditional Therapy. Empirical studies on people of rural India are relatively dimensional. Our study found that consumer's perception towards traditional therapy is very positive. Whereas at the same time the consumer's perception towards Ayurvedic Medicine is negative, no doubt with modernisation people are inclining towards ayurvedic products, but still the confidence and trust viz-a-viz ayurvedic medicine found is very less. The study found a inverse relationship between the people and ayurvedic medicine. There is a positive impact of advertisements on consumers' mind and apart from this, availability of ayurvedic products; the size of packaging and awareness also plays a very important role in changing the consumer's perception towards traditional therapy. Study found that consumers are satisfied with the results of the traditional therapy.

In the present context of cut throat competition, tapping rural market is a critical challenge for marketers. Marketers need to critically evaluate the need and wants and together with this the perception of consumers and would work accordingly. By highlighting the important aspects of traditional therapy, this study focuses the consumer perception on the most important aspect of health and safety, namely, AYURVEDA (The Traditional Therapy).

## LIMITATIONS

- The Effect size of the data was relatively low (.023). Considering such low effect size the sample should be relatively larger to make the power of test ( $\beta$ ) at least .08.
- The current study was limited to measuring the perceived quality of health care services. Moreover, as the study was confined to rural areas of and nearby Indore city, so caution has to be exercised in making generalisations for the entire nation.
- Respondents' lack of understanding of language stood in the way of providing correct response.
- Lack of awareness in people of rural areas about ayurvedic products.

➤ Sample size is restricted to 200 people which will not provide results that can be generalized.

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## STATE FINANCIAL CORPORATIONS AND INDUSTRIAL DEVELOPMENT: A STUDY WITH SPECIAL REFERENCE TO RAJASTHAN FINANCIAL CORPORATION

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### ABSTRACT

*Financing and industrial development are closely linked, as without adequate finance organizations are not in position to take a single decision. Finance is needed for every activity of the organizations and in every step. In India, national and in state level there are many financial institutions to provide financial assistance to the industries. State Financial Corporations (SFCs) are state level financial institutions established under State Financial Corporation Act, 1951 and their activities are confined within the territory of the state. SFCs mainly established to provide the financial and other assistance to those organizations, which are beyond the normal banking services. Main goals of SFCs are to provide assistance to micro, small and medium enterprises (MSMEs) and not to large scale. At present 18 State Financial Corporations (SFCs) are in India and they are playing very active role for the state industrial development. SFCs offer various types of financial schemes so that every organization can access their financial assistance as per their needs and requirement. SFC provides loan to sole trading concern, partnership firm, private limited companies and public limited companies.*

### KEYWORDS

SFCs, MSMEs, Industrial Development, Finance, and Financial Schemes.

### INTRODUCTION

To provide medium and long-term credit to industrial unit, central Industrial financial corporation (IFCI) was set up under the Industrial finance corporation Act 1948. The object was mainly to provide the credit to those undertaking which fall outside the normal banking activity. The state governments also expressed their desire to set up similar corporations in the state to supplement the activities of the industrial financial corporation. The main objectives of state governments are to provide financial assistance to small and medium scale industries within the state but outside the activities of central financial corporation. The State Financial Corporation Bill passed by the both houses of parliament received the assent of the president on 31<sup>st</sup> October 1951. It came on the statute book as "The State Financial Corporation Act, 1951." The state financial corporation act 1951 empowered the each state and union territory to established state financial corporation with a view to provide financial assistance to small and medium scale industries. The area of operation of each state financial corporation (SFC) is within the state in which it established, but in some exceptional cases the activities may be extended to neighbors state or union territory if there are no state financial corporation. (Maharashtra state financial corporation's activities extended to Goa, Daman & Diu) . SFC provides loan to sole trading concern, partnership firm, private limited companies and public limited companies. But loan period is maximum up to 20 years. Beside providing the loan to small and medium scale organization SFC also engaged in the various activities to assist the entrepreneurs to undertake the programme of diversification, expansion, modernization etc. currently it also offering various facilities like a) Consultancy, b) Merchant Banking, c) Equipment Leasing, d) Debenture trust ship etc. It acts as an agent of state government, central government, IFCI and any other financial institution if it became necessary. At present there are 18 State Financial Corporations in India. Out of these 17 were set up under State Financial Corporations Act (SFCs) 1951. The Tamil Nadu Industrial Investment Corporation Ltd established in 1949 under the companies act as Madras Industrial Investment Corporation, also functions as SFCs. Industrial development and SFCs are very close to each other and SFCs are playing an important role for overall industrial development of the country.

### LITERATURE REVIEW

**Few literatures in relation to industrial development and finance are discussed below:**

**Upadhyaya.K.K (1980)** in his study explains the sources of finance for small scale, medium scale and also Large-scale enterprises. Study also provides financial spectrum for industrial sector as a whole.

**PATEL.G. S (1996)** in his doctoral thesis emphasizes the progress made by the commercial banks in the various components of the priority sector lending i.e. agriculture, small scale industries and other priority sector advances comprised of rural artisans, transport operators, education etc.

**Desai, Vasanta (2000)** in his study explains financial inadequacy is one of most important causes leading to sickness of small –scale units. He also mentioned that bank should provide expertise in guiding small entrepreneurs in their financial management problems and offer preventive assistance to them in case where sickness is anticipated.

**Raje, Vasandhara (2000)** Reported that credit is an essential input for the working of small-scale sectors. Delay or inadequate supply of credit seriously affects growth of small- scale sectors. Therefore timely and adequate availability of credit is crucial for setting up and expansion of existing SSI units.

**Uma, S (2001)** in her doctoral thesis assess the extent and purpose of credit channeled to priority sector and specially to small scale industries and she also assess the prospects of priority sector lending in the light of the new economic policy.

**H.S. Parekh (2004)**, in his study examine the role of financial institutions and state agencies in extending credit to small scale units and pin points their attitude of indifference in catering to the needs of the tiny units. He was the view that financial assistance has to attain their lending policies in consonance with the need of the small sector in general and smaller among the small-scale units in particular.

**Srinivas. Y (2005)** in his study explains without adequate bank finance, SMEs cannot acquire or absorb new technologies or can they expand to compete in global markets or even strike business linkages with larger firms. At the same time banks cannot consider the financing of SMEs as a viable option unless their priorities are addressed by SMEs. SMEs should be assisted largely by public initiatives involving participation of the banking industry.

**Basu.S.K (2007)** tries to analyses the role and problems of small-scale industries. He emphasizes their importance in the economic development and their financial problems and also the role of state financial corporation in helping them.

**Inigo, R.M (2008)** in his research work reveals the various role played by the Bank to financing the small–scale industries in Sivnaganga district of Tamilnadu.

**Pooja (2009)** in her study explain inadequate and delayed supply of credit continues to be the main problem faced by the small and medium enterprises. The problem is more acute in case of micro enterprises.

**A study conducted by Chakrabarty. K. C. (2010)** States that with increasing competition, introduction of new products and stringent regulatory environment, the role of banks needs to change from mere lenders to partners in business. There is a need for greater participation of banks in the affairs of their constituents by convergence of credit services and non-credit services. The banks should not only provide differentiated products for MSMEs, but also provide counseling & guidance to new and established businesses, extending marketing support etc. Similarly, the Government and other institutions entrusted with development of the MSMEs sector need to focus providing an enabling environment, infrastructure and forward & backward linkages so that the credit function being discharged by the banks is adequately supplemented by their non credit functions.

## OBJECTIVES OF STUDY

The objective of study is to find out the role played by state financial corporation in the development of industry and more specifically the role played by Rajasthan financial corporation.

## DATABASE AND RESEARCH METHODOLOGY

Data are mostly collected through desk research of online resources, research papers, conference documents, and other publications. Data from various annual reports of Rajasthan Financial Corporation and from Micro, Small & Medium Enterprises Development (MSMED) Act, 2006 also has been used. Data from various State Financial Corporations have been also used. The data have been compiled from three types of sources: published documents and reports, the World Wide Web and statistical agencies. All data sources are listed at the end of this note and Web links are provided where possible. Simple statistical tools have been used for analyzing data

## STATE FINANCIAL CORPORATION AND INDUSTRY

At present 18 state financial corporations in India and they are actively playing various roles for industrial development of the country. More or less every state have own state financial corporation for the development of state industries. Beside the above, the following state's State Industrial Development Corporation (SIDCs) also act as a state financial corporation (SFCs) for providing assistance to small and medium scale enterprises and act as a promotional agencies for this sector. The name of state and union territory where these SIDCs are acts as a SFCs are: Andaman & Nicobar, Arunachal Pradesh, Daman & Diu and Dadra & Nagar Haveli, Goa, Manipur, Maghalaya, Mizoram, Nagaland, Tripura, Pondicherry, and Sikkim.

## THE FOLLOWING MAIN FUNCTIONS ARE PLAYED BY SFCs FOR INDUSTRIAL DEVELOPMENT

- *Loans and advance:* SECs Grants loans or advances to industrial concern repayable within a period not exceeding twenty years.
- *Guarantee Providing:* SECs provides guarantee for loans raised by industrial units from commercial banks and state cooperative banks and also for deferred payments in cases where industrial units have purchased capital goods on a deferred payment basis or for taking any other loans.
- *Underwriting of securities:* For properly financial assistance it underwrites the shares, bonds and debentures of industrial concerns.
- *Subscription of securities:* It also Subscribe the shares, bonds and debentures of industrial concerns for providing long-term finance.
- *Different types of loan with matching the industrial needs:* SFC's provides different types of loans and it includes loans to industrial units for the purchase of different fixed assets. In some exceptional cases, SFC's also provide loans for working capital requirements in combination with loans for fixed capital.
- *Providing assistance of foreign currencies:* SFC's provide loans in foreign currency for the import of machinery and technical know – how, under the IDA (International development association) and World Bank tie up if the industrial unit so needed.

But SFC's are prohibited from subscribing directly to the shares or stock of any company *having limited liability*. Beside these main function SFCs also plays various functions as per the needs of industrial units with a view to overall industrial development of the state.

## FINANCIAL ASSISTANCE TO INDUSTRIAL UNITS

The SFC has been involved in the industrial development of the country by providing various types of financial and non-financial assistances to industries. The financial assistance sanctioned and disbursed by all SFCs during the period 1998-1999 to 2007-08 has been shown in table No.1. The various types of loan sanctions by all SFCs has increased from Rs.1863.90 crores in 1998-99 to Rs.2337.78 crores in 2007-08, thus a growth in 25.42% in these ten-year periods. Similarly disbursement of loan has increased from Rs.1270.80 crores in 1998-99 to Rs. 1825.09 crores in 2007-08, thus a growth in 43.62% in these ten year-periods. Average increase in sanctions and disbursement of loan in these ten-year periods is 2.54% and 4.36%. The sanctions and disbursement of loans in these periods clearly indicates that SFCs have playing an active role for the industrial development of the country as well as of the respective states.

TABLE 1: CREDIT FLOW TO INDUSTRY BY STATE FINANCIAL CORPORATION (SFC) (Amount in Rs. Crore)

Year	Loan Sanction By SFC	Growth rate in Loan sanction %	Loan Disbursement	Growth rate in Disbursement %	Disbursement to Sanction %
1998-99	1863.90	-----	1270.80	-----	68.18
1999-00	2190.30	17.50	1536.80	20.90	70.16
2000-01	2015.30	(08.00)	1557.40	01.30	77.28
2001-02	1908.80	(05.30)	1563.40	00.40	81.88
2002-03	2702.40	41.60	1880.90	20.30	69.92
2003-04	4188.50	55.00	2961.10	57.40	70.69
2004-05	3544.80	(15.40)	2782.70	(06.00)	78.50
2005-06	2626.10	(25.90)	2110.20	(24.20)	80.35
2006-07	1864.18	(29.00)	1624.65	(23.00)	87.16
2007-08	2237.78	(20.00)	1825.09	12.30	81.56
<b>Cumulative up to March, 2009</b>	<b>25,242.06</b>		<b>19,113.04</b>		<b>75.72</b>

Sources: IDBI report on development banking in India – 2008.

### Coefficient of Correlation between Loan Sanctions and Disbursement = 0.96925

The Coefficient of Correlation between the two variable i.e Loan Sanctions and Disbursement is 0.96925. This indicates that there is a significant and close relationship between loan sanctions and loans disbursements. In this ten-year periods total loan sanctions and disbursement were Rs. 25,242.06crores and Rs. 19,113.04crores. Average loan disbursement ratio is 75.72%. This is also remarkable.

After analyzing the annual reports of various SFCs it is found that during 2008-09 out of 18 SFCs, 11 SFCs recorded an increase in sanctions were Delhi (52.4 percent), Kerala (80.5 percent), Haryana (69.4 percent), and Uttar Pradesh (63.3 percent) Maharashtra (39.8 percent), Karnataka (36.7 percent), Madhya Pradesh (30 percent), and West Bengal (18.7 percent) Andhra Pradesh (16.9 percent), Tamil Naidu (14.6 percent) and Orissa (1.3 percent).

## RAJASTHAN FINANCIAL CORPORATION (RFC)

Rajasthan Financial Corporation (RFC) was established in the year of 1955. The corporation has 7 regional offices, 34 branch offices and 6 sub-offices to properly reach to tiny, small and medium enterprises. RFC has playing an important and key role in the development of the various industries in the state of Rajasthan during this 57 years of periods. RFC's various financial assistance includes term loans, working capital loans, Equity participation, lease assistance etc. It operates a number schemes for refinancing and equity participation on behalf of IDBI and SIDBI. RFC is continuing to work as a Catalyst of development for translating into practice the industrial policies and priorities of the Central and the State Governments as also for providing and improving upon immediate assistance in the planned and balanced development of industries in the State, particularly in the small and tiny sectors. Since, its very inception, the Rajasthan Financial Corporation has been striving incessantly towards its Goal - that of extending a helping hand to varied entrepreneurial section of society for their financial requirements. A Goal, ultimately aimed at spurring up the process of industrialization of its parent State. For the fulfillment of its prime objective it operates various loan schemes for the tiny, small and medium scale industries, many of them tailor-made for specific entrepreneurial classes. Ever prepared to adopt as

well as to adapt itself to the changing industrial needs, RFC has over the period, widened its network, multiplied its numerous schemes and added multifold to its policies and incentives, liberalizing them with the need of the hour.

Since its inception, the corporation has sanctioned a sum of Rs. 4649.25 crores to 77,100 units and disbursed Rs.3193.32 crores to 59737 units (unto 31<sup>st</sup> March, 2008).

### RFC AND INDUSTRY

The RFC have been involved in the industrial development of the country by providing various types of financial and non-financial assistances to industries. The financial assistance sanctioned and disbursed by RFCs during the period 1998-1999 to 2007-08 has been shown in table No.2. The various types of loan sanctions by RFC has increased from Rs.9332.73 lacks in 1998-99 to Rs.43,821 lacks in 2007-08, thus a growth in 369.54% in these ten-year periods. Similarly disbursement of loan has increased from Rs.9567.27 lacks in 1998-99 to Rs. 26,691.67 lacks in 2007-08, thus a growth in 178.99% in these ten year- periods. Average increase in sanctions and disbursement of loan in these ten-year periods is 36.95% and 17.89%. The sanctions and disbursement of loans in these periods clearly indicates that RFCs have playing an active role for the industrial development of the country as well as of the respective states.

**TABLE 2: ASSISTANCE BY RFC TO INDUSTRY** (Amount in Rs. Lac)

Year	Loan Sanction By SFC	Growth rate in Loan sanction %	Loan Disbursement	Growth rate in Disbursement %	Disbursement to Sanction %
1998-99	9332.73	----	9567.27	----	102.51
1999-00	20,456.30	119.19	12,793.12	33.72	62.54
2000-01	19,628.77	(04.05)	14,612.91	14.22	74.45
2001-02	17,437.71	(11.16)	12,897.32	(11.74)	73.96
2002-03	20,279.97	16.30	13,992.07	08.49	68.99
2003-04	24,117.23	18.92	16,864.27	20.53	69.93
2004-05	30,160.09	25.06	19,843.09	17.66	65.79
2005-06	34,427.35	14.15	26,594.43	34.02	77.25
2006-07	36,844.31	07.02	26,153.43	(01.66)	70.98
2007-08	43,821.07	18.94	26,691.67	02.06)	60.91
<b>Cumulative up to March, 2009</b>	<b>2,56,505.53</b>		<b>1,80,009.58</b>		<b>70.18</b>

*Sources: Annual Report of Rajasthan Financial Corporation.*

**Coefficient of Correlation between Loan Sanctions and Disbursement = 0.96487**

### DESCRIPTIVE STATISTICS OF RFC

Particulars	Minimum	Maximum	Average	S.D
Sanction	9,332.73	43,821.07	25,650.33	55.96
Disbursement	9,567.27	26,691.67	18,000.96	43.93

The Coefficient of Correlation between the two variable i.e Loan Sanctions and Disbursement is 0.96487. This indicates that there is a significant and close relationship between loan sanctions and loans disbursements. In this ten-year periods total loan sanctions and disbursement were Rs. 2,56,505.53 lacks and Rs. 1,80,009.58 lacks. Average loan disbursement ratio is 70.18%. This is also remarkable.

RFC offers various types of loan schemes for industrial units and it going changed time by time as per actual needs of the industries. Its schemes are multidimensional and flexible one. A brief of schemes are shown in TableNo: 3.

TABLE 3: VARIOUS LOAN SCHEMES FOR INDUSTRIAL UNITS BY RFC

SL.NO	Schemes	Brief of Schemes	
01	General term loan scheme	Term loan upto Rs. 20 crore for acquisition of land, building and plant & machinery for any eligible industrial activity defined under the SFCs Act for setting up a project in the manufacturing sector including mining, wind farm and individual wind turbine generator.	
02	Scheme for Service Sector	Hospitals and nursing home:	Loan to cover investment in land, building, electro-medical equipments, instruments, furniture, air-conditioners, small generators etc. for Hospital I/ Nursing Homes.
		Tourism sector:	Loan for Hotel, Restaurants, Resorts, Amusement Park, Guest Houses, Drive-in-Cinemas, Multiplexes and Tourism related activities in Rajasthan for acquisition of Land, Building, Kitchen equipments, Office equipments, AC, Interior decoration, Furniture & Fixtures, Health Club, Swimming Pool, etc.
		Information technology:	Loan may be sanctioned to promote all type of projects/activities related to Information Technology. However, Educational/Training Institutes shall be outside the purview.
03	Scheme for textile industry under technology up gradation fund (rtuf)	To provide encouragement to textile industrial units in the small scale/medium scale sector for taking up technology up-gradation. The scheme envisages interest incentive of 5% points on the loans availed by SME, however, for the spinning machinery the reimbursement will be 4% points only.	
04	Saral scheme for SME sector (existing industrial running units)	Loan from Rs. 2 lacs to Rs. 10 crore (upto the extent of 60% of MRV of land and building for FY 2011-12) is available to the existing industrial running units in the micro, small and medium scale sectors and all existing running hotels located at District Head Quarter	
05	Single window scheme	A scheme for small borrowers to ensure adequate finance by providing single window facility for availing of Term Loan for fixed assets and Working Capital finance from one institution only. Project cost should not exceed Rs 200 lacs.	
06	Scheme for financing against assets	Loan upto Rs 10.00 crores to industrial concerns of MSME and CRE Sector for meeting their industrial financial requirements provided the prime security is mortgaged to the Corporation under first charge is free from all encumbrances.	
07	Scheme for CRE projects	A. Loan for construction of commercial complexes, showrooms and sales outlets independent of hotel business. B. Financial assistance may be granted to eligible borrowers for cost of land, construction of building for housing complexes / apartments (commercial cum residential complex), acquisition of required plant and machinery / equipment like lifts, air conditioning plant and fire fighting equipments, other safety devices and also other plants and equipments required for modern type of housing complexes and flats.	
08	Scheme for qualified professionals	Assistance to qualified professionals in the field of management, accountancy, medicine, architecture, engineering, law etc. for setting up professional practice/consultancy ventures for the first time. The cost of the project should be need-based and not exceeding Rs.20.00 Lac.	
09	Top-up loan scheme for existing borrowers	Top-up loan on easy terms and conditions and with simplifies procedure, is available for existing financed and running units (excluding Good Borrowers and Real Estate cases) which are having standard account and repaid at least 4 quarterly installments regularly.	
10	Loan to units intending to switchover their loan accounts from banks and other financial institutions to RFC	Loan for repayment of outstanding loan of the other FIs/ Banks and for acquisition of further fixed assets for modernization, diversification, expansion etc.	

11	Schemes For good Borrowers: Attractive loan schemes for existing Good Borrowers of the Corporation and Good Borrowers of other Financial Institutions on very liberal terms and conditions.	Short term loan	Speedy sanction and disbursement for expansion, modernization, replacement, diversification and purchase of balancing equipments.
		Unit promoted by good borrower	Financing for new unit promoted by the existing good borrower on attractive rate of interest
		Working capital term loan	For providing working capital term loan to meet out the gap in their working capital requirement and the available bank limit.
		Working capital term loan to non assisted units	For providing working capital term loan to meet out the gap in their working capital requirement and the available bank limit.
		Special working capital term loan	For acquisition of diamond blades and / or segments, Back-up roll, work-roll and bearings, replacement of card clothing, replacement of machinery part of textile unit and SS rolling mills etc.
		Gold card	Speedy and easy sanction for acquisition of fixed assets and/ or meet out working capital requirement.
		Platinum card	Speedy and easy sanction for acquisition of fixed assets and/ or meet out working capital requirement
		Flexi loan	Unique scheme for the good borrowers where Corporation shall provide financial assistance totally flexi in nature i.e. the loan sanctioned can be withdrawn and deposited within LDR any number of times to meet immediate requirement either for acquisition of fixed assets, working capital or for both without going into detail appraisal.
		Flexi loan for new borrowers	A unique scheme for the non assisted having proven track record, where Corporation shall provide financial assistance totally flexi in nature i.e. the loan sanctioned can be withdrawn and deposited within LDR any number of times to meet immediate requirement either for acquisition of fixed assets, working capital or for both.

**ASSISTANCE BY RFC TO MICRO, SMALL AND MEDIUM ENTERPRISES (MSME)**

The Micro, Small and Medium Enterprises (MSMEs) continue to be a vibrant sector of the Indian economy. As per fourth census of 2006-07 that there are about 26 million units (over 90 per cent of total industrial units) in this sector employing nearly 59 million people in India. They not only create job opportunities at lower capital cost comparing to other sectors, but also require lower capital investment and play a vital role for proper utilization of local resources and talent. Organized industrial sector require an investment of Rs.6.66 lakh to generate employment of one person, whereas MSMEs sector generate employment of 1.27 persons with the same investment. This sector contributes nearly 45 percent manufactured output and 40 percent of the total export, it is estimated that

MSMEs contribute around 15 percent of exports indirectly. In a span of over three decades, from financial year 1973-74 to financial year 2006-07, export from MSMEs has increased by more than 514 times. MSMEs sector has consistently registered a higher growth rate than the rest of the industrial sectors. There are over 6000 products ranging from traditional to high-tech items, which are being manufactured by the MSMEs. In India, after agriculture, the MSMEs sector provides the maximum opportunities for both self-employment and jobs in the country. The MSMEs sector in India holds great potential for further expansion and growth in the future. In fact, the employment potential of the sector is un-matched by any other sector of the economy.

Rajasthan is considered as one of the major state in the development of MSMEs sectors. As per fourth census (2006-07) the state share in total registered MSMEs in the country is 3.61% and in total number it is 55,110 units, and total number of unregistered MSMEs in Rajasthan is 12,16,353 and it is 4.95% of total unregistered MSMEs sectors in the country. Different types of enterprises are seen in the Rajasthan and their contribution to state is also considerable. MSMEs sectors are also playing an active role to create employment generation in the state. RFC are playing a pivotal role since its inception to develop the state's MSMEs sectors by providing various types of financial and other assistances. Table:4 shows the financial assistance by RFC to MSMEs sectors.

**TABLE 4: FINANCIAL ASSISTANCE TO MSMEs SECTORS BY RFC (Rs. In Crores)**

Year	Total amount Sanction	Percentage of improvement than previous years (in total amount sanction)	Amount sanction to MSMEs sectors	Percentage of improvement than previous years (sanction to MSMEs)	Percentage of sanction to MSMEs sectors in total sanction.
2005-06	344.27	-----	132.04	-----	38.35%
2006-07	368.44	07.02%	157.59	19.35%	42.77 %
2007-08	438.21	17.31%	268.59	70.44%	61.29%

The aggregate sanction to MSMEs sectors has increased from Rs.132.04 crores in 2005-06 to Rs. 268.59 crores in 2007-08, thus showing a growth of 103.42% during this period. Average growth in this period is 34.47%, a remarkable growth rate. Where for same period the total aggregate sanction has increased from Rs.344.27 crores in 2005-06 to Rs.438.21 crores in 2007-08, thus showing a growth of 27.29% and average growth for the period is 9.09%. So it is clear that RFC are giving more emphasis on MSMEs sector than the other sectors. Total growth in sanction for the period is only 27.29% but it was 103.42% for MSMEs sector. Table: 5 depicted the number of units assisted by RFC.

**TABLE 5: FINANCIAL ASSISTANCE TO NUMBER OF MSMEs SECTORS BY RFC (In Units)**

Year	Total Number of Units assisted.	Percentage of improvement than previous years (in total number)	Number of MSMEs assisted	Percentage of improvement than previous years (number of MSMEs)	Percentage of sanction to MSMEs sectors in total sanction units.
2005-06	771	-----	698	-----	90.53%
2006-07	729	(5.45) %	672	(3.72)	92.18%
2007-08	856	17.42%	814	21.13%	95.09%

90.53% of total units belong to MSMEs sectors in the year of 2005-06 and it have been increased to 95.09% to in the year of 2007-08. Total improvement in number of units was 17.42% in 2007-08 comparing with year of 2006-07 but it was 21.13% for MSMEs sectors for the same period. It was also clear from above table that total sanction to MSMEs sectors have been going increase by year to year.

RFC provides financial assistance to MSMEs sectors by way of various schemes. A brief of their effective interest rate (*Effective from 09.09.2011*), are given in Table No: 6.

**TABLE 6: INTEREST RATE FOR MSMEs SECTORS**

Sl.No.	Particulars	Amount	Rate of Interest
01	MSME Sector Units (Industrial & Service Sector)	Upto Rs. 50,000/.	11.25%
02	MSME Sector Units (Industrial projects)	above Rs. 50,000/- & upto Rs. 20.00 Crores.	13.50%
03	MSME Service Sector projects (including Hotels projects, Technical/ Professional Educational Projects/Guest-House projects, Tourism Projects, Hospitals/ Nursing Home Projects and Medical Equipment Scheme cases)	Up to Rs. 20.00 Crores.	14.25%
04	a) Scheme for Financing Against Assets b)Scheme for Financing for Builders/commercial /residential complexes/ Multiplexes, Hotels, Hospitals etc. for purchase of land & building c)Saral Scheme for SME sector	Up to Rs. 20.00 Crores.	a)16.50% b)18.50% c)15.50%
05	Projects for Construction of Commercial /Residential Complexes	Up to Rs. 20.00 Crores.	16.25%

## CONCLUSION

Industrial development and state financial corporation are very close to each other; SFCs are playing a vital role for country's overall industrial development. With the changing situation SFCs also changed their policies, various loans schemes so that industries can easily obtain and utilized the funds. Entire 18 state financial corporations are very active and aware about industrial needs although their loan sanction amount going to decreases year by year, this are mainly due to high NPA and competition with other financial institutions but overall it can clearly say that they are very aware about industrial needs and their roles also easily under stand able by seeing their loan sanctions and disbursement patterns and various schemes for industries.

RFC one of the leading financial corporation and very actives to provides various types of financial assistances to state industries. They also specially give attentions to MSMEs sectors and there are various attractive schemes for MSMEs sectors. Their performance levels are growing and performance is far better than overall SFCs. During last 57 years RFC are playing an actives role for state industrial development. Their financial assistances are year-by-year increasing one and RFC is one of the leading state financial corporations in terms of their growing activities.

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## A STUDY OF CUSTOMER LOYALTY WITH REFERENCE TO PRIVATE AND PUBLIC SECTOR BANKS IN WESTERN MAHARASHTRA

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### ABSTRACT

Every time a customer approaches your business, they arrive with the set of expectations; it may be related to services offered or new product developments. They have an expectation that accompanies their interest in your business. A good experience may increase their loyalty and tendency to purchase again and poor experience may transfer their business to competitor. The ability to recognize this process forms the basis for studying customer loyalty which is the main objective of the present research work. Loyal repeat customers can form a significant competitive advantage. This helps to form a strong market share base. Thus cost to sale for existing customers is far less than the cost of acquiring new customers. Today Bankers can no longer view the customers in snapshot. But it's time to adopt a comprehensive view of the lifecycle of the relationship.

### KEYWORDS

customer loyalty, snapshot, lifecycle, competitive advantage, market share base.

### INTRODUCTION

Every time a customer approaches your business, they arrive with the set of expectations; it may be related to services offered or new product developments. They have an expectation that accompanies their interest in your business. A good experience may increase their loyalty and tendency to purchase again and poor experience may transfer their business to competitor. The ability to recognize this process forms the basis for customer relationship management. Loyal repeat customers can form a significant competitive advantage for a business in many ways. Truly loyal customers form a strong market share base. Thus cost to sale for existing customers is far less than the cost of acquiring new customers.

Today Bankers can no longer view the customers from the perspective of specific products or a snapshot in time. To maximize lifetime profitability from valued customers, banks must abandon the traditional silo mindset. In simpler days; it was easy for one to select the bank. One used to choose the local bank; the branch manager knew him or her by name, because the family had conducted business for years. Technology, commoditization, and globalization forever changed the face of banking. The model of the personal neighborhood bank is a quaint memory, replaced by national and multi-national service providers, ATMs, Internet banking, and a proliferation of product choices, this competitive scene has brought a wealth of choices, yet it has eliminated the personalized nature of traditional banking. A typical financial institution has thousands of local, regional, national and global competitors. Most players hold a relatively small and unreliable market share. It's time to adopt a comprehensive view of the customer as part of a continuum, not just a sale, and to manage, but the *lifecycle* of the relationship.

There are few reasons to retain the customers.

- Customer stays loyal for longer time
- Buys more as the bank introduces new services and upgrades existing services
- Talks favorably about the bank and its services
- Pays less attention to competing brands and advertising and are less sensitive to price.
- Acquiring new customers can cost five times more than the cost involved in satisfying and retaining existing customers due to routinized transactions.

Hence identifying potential customers, treating them according to the service level they deserve track and record the details of transactions for further reference through supply chain and other modes of intermediaries, enterprise has to introspect customer relationship management and set business policies and procedures that are designed to create and grow long term –relationships, which is foundation of competitive advantage, growth and profitability. Therefore researcher has selected the study entitled “*A study of customer loyalty with reference to private and public sector banks in western Maharashtra*” for further in depth study.

### OBJECTIVES OF THE STUDY

The present research work is undertaken with the prime objective of studying customer relationship management in banks in western Maharashtra. This prime objective is supported by following sub objectives.

1. To study the existing customer organization relationships
2. To know the customers expectations from their banker along with their relative importance.
3. To understand the problems of banking sector in managing customer relationships
4. To know who the major competitors are in banking sector.
5. The existing customer base of the respective competitor.
6. The potential growth prospects by managing customer organization relationships.
7. To put forth constructive suggestions on the basis of the study.

### RESEARCH METHODOLOGY

#### HYPOTHESES OF THE STUDY

Ho: Income level the respondents and choice of deposits are independent

Ho: Maintaining long term relationship with customers of bank and increase in deposit business of bank are independent.

#### SCOPE OF THE STUDY

The scope of the study is limited in respect of topical coverage, geographical coverage and analytical coverage. Topical scope of the study is limited being the researcher has studied customer relationship management which is one part of marketing process. Again focusing on some of the many units in western Maharashtra region couldn't reveal deeper aspects of the study.

#### QUOTA SAMPLING METHOD

Quota sampling a special type of stratified sampling method is applied considering characteristics of the population under study.

#### SURVEY METHOD

A survey method was adopted; at the outset a pilot survey was conducted to finalize certain key issues. After the pilot survey, the selected units i.e. 10 banks were visited and responses collected. A comprehensive questionnaire was administered by personally visiting the selected organizations.

**1) PRIMARY DATA**

These were collected through the use of structured questionnaire, pretested and then suitably amended. The questionnaire was administered by personally visiting to the concerned banks offices in the selected units. While preparing the questionnaire care was taken to develop likerts type scale for certain questions.

**2) SECONDARY DATA FOR THEORETICAL FRAMEWORK**

Review of the literature and statistical data in respect of the present study were necessary, and hence secondary sources were made use of for this purpose the data has been collected through.

**SAMPLE DESIGN**

In the sample design, sufficient care has been taken to embody the universe comprehensively by selecting the banks from each district in western Maharashtra. The researcher has selected overall 500 customers of selected bank units in western Maharashtra as a sample size for its study.

While selecting two sampled banks from the study universe, western Maharashtra, ample care has been taken. Researcher has adopted following criteria to select the banks from the universe.

- 1) To have the best sample as against the total population from each bank researcher has chosen quota sampling technique for selecting 500 respondents' bank customers as each from two sampled banks (i.e. 50 from private sector and 50 from public sector) from total 10 banks.
- 2) For the final selection of banks, the researcher has taken into consideration 10% of average customer base of the bank branch in the study universe i.e. 5000 customers per branch. The average customer growth rate per year of the bank branches is 10% and thus this criterion is considered for selecting sample size for the present study.
- 3) To maintain the consistency and for effective comparison amongst private and public sector banks 50 customers from each bank branch from the study area western Maharashtra were selected.
- 4) In order to solicit the proper responses the researcher has focused on those respondents who are willing to participate and cooperate in doing the present study. Therefore researcher has made use of convenient quota sampling method in this study.
- 5) Diverse categories of customer groups including business class, service class, housewife's, and students were selected with the intention to get clear picture about customer relationship management with respect to all types of customers to obtain comprehensive picture of customer relationship management practices adopted in the study universe, western Maharashtra.

**CHOICE OF THE REGION**

The area of western Maharashtra comprises five districts viz Kolhapur, Sangli, Satara, Solapur, Pune which comes under Pune administrative region. This region is selected for the present study as, most of the regional head quarters are in Pune.

**CRITERIA FOR BANK SELECTION**

The researcher has selected the banks in western Maharashtra keeping in view the following parameters.

- 1) **Largest in its operation**-Total No. of branches, ATMS, and asset size
- 2) **Ease in access**: Due to the diverse spread of the study area the bank those are accessible were selected.

**TABLE - 1.1: BANK WISE SELECTION OF CUSTOMERS**

Sr. No	Western Maharashtra Regions	No.of.customers selected (Public sector)	No of customers selected (Private sector)	Total
1	Kolhapur district	Bank of India (50)	Kotak Mahindra (50)	100
2	Sangli district	Bank of Baroda (50)	HDFC Bank (50)	100
3	Satara district	Union bank of India (50)	AXIS Bank (50)	100
4	Solapur district	State bank of India (50)	ICICI Bank (50)	100
5.	Pune district	Corporation Bank (50)	INDUSIND Bank (50)	100
	Total customers	250	250	500

**DATA PRESENTATION AND ANALYSIS**

**TABLE 3.1: GENDER WISE CLASSIFICATION**

S.No	Responses		No .of. Respondents		Percentage	
			Private	Public	Private	Public
1	Gender	Male	222	208	88.8 %	83.2 %
		Female	28	42	11.2%	16.8 %

The above data in this table represents the gender response rate of the survey and it is found that 222(88.8%) respondents are males and only 28(11.2%) are females in private banks and similarly 208(83.2%) respondents are males and only 42(16.8%) are females in public sector banks respectively. Furthermore it is also evident that these females are either having their salary account as savings account or they are holding the account as alternative joint signatory authority for current account which is mandatory to hold the account.

It seems that less number of females are active in banking .Gender issues need significant attention to improve banker- customer relationship.

**TABLE 3.2: AGE WISE CLASSIFICATION**

Sr. No	Responses		No .of. Respondents		Percentage	
			Private	Public	Private	Public
2	Age	16-25	27	40	10.8%	16%
		25-35	105	97	42.0%	38.8%
		35-50	89	79	35.6%	31.6%
		50-60	25	26	10.0%	10.4%
		60 & Above	04	08	1.6%	3.2%

The aforesaid table brings out the information about age wise classification of the respondents holding the accounts in private and public sector banks. Age is an important influencing factor. And from the study it is understood that majority of the respondents i.e. 105(42%) young respondents in private and 97(38.8%) respondents transact with public sector banks, followed by 89(35.6%) in private & 79(31.6%) in public sector belong to middle age group of 35-50.10.8% in private & 16% in public sector are very young under the age group of 16-25 and 10% both in private and public sector belong to the age group of above 50 including the senior citizens.

In terms of age it is further revealed that most of the respondents in private sector are youngsters.

**TABLE 3.3: OCCUPATION**

S.No	Responses		No .of. Respondents		Percentage	
			Private	Public	Private	Public
4	Occupation	Business	105	69	42.0%	27.6%
		Professional	24	31	9.6%	12.4%
		Employee	105	109	42%	43.6%
		Others	16	41	6.4%	16.4%

The above table depicts occupation of the respondents. Occupation is the predominant factor that reveals the consumers social class, life style and willingness to buy and ability to buy because occupation provides the income which influences the purchases and services. From the table it is evident that 105 (42%) in private and 69(27.6%) in public sector banks are businessmen. similarly 105(42%) in private and 109(43.6%) in public sector banks are employees those work for various private and government organizations. Followed by 24(9.6%) in private and 31(12.4%) in public sector banks are professionals like engineers, lawyers and chartered accountants. And remaining 16(6.4%) in private and comparatively higher 41(16.4%) of the public sector belong to the others category like house wives, students, contract workers etc.

It seems that income and occupation are closely interrelated in preferring various banking services. Service class customers i.e. employees in both private and public sector dominate the business group. Professionals have shown more preference to private sector banks due to their busy schedule they expect quick service.

TABLE 3.4: ANNUAL INCOME

S.No	Responses		No .of .Respondents		Percentage	
			Private	Public	Private	Public
6	Annual income	Below Rs.1 lakh	31	49	12.4%	19.6%
		Rs.1-5 lakh	124	148	49.6%	59.2%
		Rs.5-10 lakh	62	39	24.8%	15.6%
		Rs.Above 10 lakh	33	14	13.2%	5.6%

The aforesaid table brings out the information pertaining to income level of the respondents and it is evident from the fact that majority of the respondents both in private and public sector banks i.e. 124(49.6%) and 148(59.2%) respectively belong to the income group of 1-5 lakhs.

Followed by 62 (24.8%) in private and 39 (15.6%) belong to income range of 5-10 lakh. Further it is observed that 31(12.4%) in private and 49(19.6%) in public sector belong to lower income group. Remaining 33 (13.2%) in private and 14 (5.6%) in public sector bank are in the range of above 10 lakhs annual income category.

The results of the study indicate that private sector banks are offering services for special group of customers i.e. class banking surprisingly it was further revealed that high income customers do not bother in paying extra charges levied by the banks for variety of personalized and value added services rendered by these banks. Whereas public sector banks are rendering services to the mass customers with its wide product range, infrastructure and investment.

TABLE 3.5: HOW LONG ASSOCIATED WITH BANK

S. No	Responses		No of respondents		Percentage	
			Private	Public	Private	Public
1	Holding account since	1-3 Yrs	134	100	53.6%	40%
		4-6 yrs	82	87	32.8%	34.8%
		7-9 yrs	20	34	8%	13.6%
		More than 9 yrs	14	29	5.6%	11.6%

The above table deals with the fact to know how long the customers are associated with the bank.It are very crucial for the banks to have competitive advantage to retain the customers on long term basis.

From the above table it is inferred that great majority of the respondents i.e. 134(53.6%) private and 100(40%) public sector banks have association of 1-3 yrs. Whereas 82(32.8%) private and 87(34.8%) public sector bank customers are associated with their bank since 4-6 yrs.Followed by 20(8%) private and 34(13.6%) public sector banks customers have longer association with their banks. Significantly it is found that 14(5.6%) private and 29(11.6%) public sector bank customers have a very long association with their banks. Hence it is clear that majority of the respondents from public sector bank customers are holding longer relationship with their banks as compare to private sector banks. It is credit worthy that they have sustained and maintained these customers for a very longer period they should not neglect these customer but now they have to see how this loyalty bond will be stronger. Also they have to ensure to make these customers profitable for long term.

TABLE 3.6: (A) PREFERRED TO OPEN ACCOUNT BECAUSE-PRIVATE BANK

Sr. No	Responses	No of respondents ranking					Mean score	Percentile	Rank
		Lowest	Low	Med	High	highest			
1	Convenient Location	6	8	31	95	105	4.16	83.26	Excellent
2	Reputation of the Bank	2	4	51	125	63	3.99	79.83	Good
3	The Bank is Fully Aware of Customers Problem	4	17	44	97	83	3.97	79.42	Good
4	Does Not Take Much Time in Opening the Bank A/C	4	8	33	121	79	4.7	81.46	Excellent
5	You are Not Kept Waiting for Long Time	6	17	38	106	78	3.95	79	Good
6	The Employees of Bank are Cooperative	5	14	43	99	84	3.99	79.8	Good
7	You Feel Deposits are Safe in this Bank	6	7	24	129	79	4.09	81.87	Excellent

TABLE 3.6: (B) PREFERRED TO OPEN ACCOUNT BECAUSE-PUBLIC BANK

Sr. no	Responses	No of respondents ranking					Mean score	Percentile	Rank
		Lowest	Low	Med	High	highest			
1	Convenient Location	11	14	35	72	112	4.06	92	Superb
2	Reputation Of The Bank	13	12	47	97	75	3.85	77	Good
3	The Bank Is Fully Aware Of Customers Problem	17	31	59	77	60	3.54	70.8	Good
4	Does Not Take Much Time In Opening The Bank A/C	16	21	50	88	69	3.70	74	Good
5	You Are Not Kept Waiting For Long Time	17	33	63	68	63	3.52	70.4	Good
6	The Employees Of Bank Are Cooperative	18	17	58	73	78	3.72	74.4	Good
7	You Feel Deposits Are Safe In This Bank	7	11	42	71	113	4.11	82.2	Excellent

An attempt was made to study the factors for which customers prefer to open bank account with particular bank especially with respect to private and public sector banks and the respondents on aforesaid dimensions have revealed some important facts and it is observed as follows.

**Convenient Location** :The statement has received Excellent mean score by private sector respondents of 4.16 (83.26) and 4.6(92) Superb ranking mean score by public sector respondents which is slightly higher criteria preference than private sector bank respondents.

**Reputation of the Bank** : The statement has received Good mean score by private sector respondents of 3.99 (79.83) and 3.85(77) Good ranking mean score by public sector respondents which is very similar.

**THE BANK IS FULLY AWARE OF CUSTOMERS PROBLEM**

It is observed that the statement has received Good mean score by private sector respondents of 3.97(79.42) and 3.54(70.8) Good ranking mean score by the public sector respondents which is also the near equal criteria.

**Does Not Take Much Time in Opening the Bank A/C**:The statement has received Excellent mean score by private sector bank respondents of 4.7(81.46) and 3.70(74) Good ranking mean score by public sector banks which is quite lower as compared to private sector banks respondents.

**You Are Not Kept Waiting For Long Time:** The statement has received Good mean score by private sector bank respondents of 3.95(79) and 3.52(70.4) Good ranking mean score by public sector banks which is nearly equal.

**The Employees of Bank Are Cooperative:** The statement has received Good mean score by private sector bank respondents of 3.99(79.8) and 3.72(74.4) Good ranking mean score by public sector banks which is nearly equal.

**You Feel Deposits Are Safe In This Bank:** The statement has received Excellent mean score by private sector bank respondents of 4.09(81.87) and 4.11(82.2) Excellent ranking mean score by public sector banks which is closely related.

As it is seen from the graphical representation of the mean scores majority of the respondents responses fall above average level this indicates respondents show positive criteria's. The ranges of the mean values are to 79-83.26 in private sector and 70.4 to 92 respectively in public sector. Equal scores in both private and public sector banks indicate that all the factors are quite important and relevant.

The fact remains crystal clear that proximity to residence or work place i.e. convenient banking service and safety of deposits are the prime factors for both private and public sector banks for opting to open the account in bank.

**TABLE 3.7: CUSTOMERS PREFERRING DEPOSIT SCHEMES**

S.No	Responses		No .of Respondents		Percentage	
			Private	Public	Private	Public
1	Dealing with deposits	Yes	70	117	28%	46.8%
		No	180	133	72%	53.2%

The above table focuses on the preferences and customers dealing with deposit schemes and it is observed that out of 500 customers from both private and public sector banks 180(72%) of private and 133(53.2%) of public sector banks are not dealing with any type of deposit schemes offered by the banks.

Rest 70 (28%) of the private sector and 117(46.8%) of the respondents deal with different types of deposits schemes. It is revealed that public sector banks surpass the private sector banks in providing and attracting the mass class for deposits business due to one very important attribute that private sector cannot assure is safety of the deposits.

**TABLE 3.8: KINDS OF DEPOSIT SCHEMES**

S.No	Responses		No .of Respondents		Percentage	
			Private	Public	Private	Public
1	Kinds of deposits	Fixed	57	86	81.4%	73.50%
		Recurring	12	23	17.14%	19.65%
		Demand	3	17	4.28%	14.52%
		Tax saver	13	8	18.57%	6.8%

From the above table it is found that out of total 187 customers preferring deposit schemes from private and public sector banks are categorized as follows.

57(81.4%) of private and 86(73.50%) of public sector banks are dealing with fixed deposits schemes offered by the banks. Again it is seen that 12(17.14%) private and 23(19.65%) public sector banks customers are dealing with Recurring type of deposit schemes offered by the banks

Very few 3(4.28%) of the private sector and 17(14.52%) public sector bank customers are dealing with demand deposit schemes.

Rest 13(18.57%) of the private sector and 8(6.8%) public sector bank customers are dealing with Tax saver deposit schemes

Interestingly it is revealed that different perceptual factors like security, influence of Medias, advantage of saving tax, investment avenues are some of the important preferred criteria's customers consider in availing the deposit schemes. Furthermore it is also observed from the table that there are multiple deposit account holders out of total 187 depositors some of the depositors hold two to three deposit accounts consisting of total 219 deposit accounts.

**TABLE 3.9: REASONS FOR PREFERRING DEPOSIT SCHEMES**

Responses		No of.respondents		Percentage	
		Private	Public	Private	Public
Reasons for preferring the deposit	Service	36	21	51.42%	17.94%
	Varieties of schemes	13	5	18.57%	4.2%
	Safety	16	84	22.85%	71.79%
	Interest rates	5	7	7.14%	5.98%

To figure out which factors specifically play a crucial role in attracting the depositors for preferring the deposit schemes it was analyzed that Majority of the respondents i.e. 36(51.42%) of the private bank respondents preferred to opt for deposit schemes for better service provided by the banks and remarkably less 21 (17.94%) of the public sector bank customers preferred it for services rendered.

On the contrary 84(71.79%) of public sector banks customers preferred to various deposit schemes for the safety of deposits as against 16(22.85%) of the private sector bank depositors. Remaining 13 (18.57%) of the private and 5(4.2%) of the public sector respondents opined that they preferred the deposit schemes for varieties of schemes offered by the bank. Rest very few respondents i.e. 5(7.14%) of private and 7(5.98%) of public sector banks respondents opined that interest rates as important criteria for preferring deposit schemes. It reveals from the fact that safety of the deposits is important factor considered to prefer the public sector banks by the depositors and quick and prompt service by the private sector banks in opting for various deposit schemes offered by the bank.

**TABLE 3.10: CUSTOMERS AVAILED LOAN FROM BANK**

S.No	Responses		No .of Respondents		Percentage	
			Private	Public	Private	Public
1	Avail any loan from bank	Yes	40	94	16%	37.6%
		No	210	156	84%	62.4%

The above table focuses on the preferences and customers dealing with loan facilities provided by the banks and it is observed that out of 500 customers from both private and public sector banks 40(16%) of private and 94(37.6%) of public sector banks are availing loan facilities. Rest very high 210 (84%) of the private sector and 156(62.4%) of the respondents are not availing loan facilities. It is revealed that public sector banks surpass the private sector banks in providing and attracting the mass class for loan facilities also. Surprisingly researcher has found that not a single private sector bank is inclined towards providing loan facilities to the mass class. The credit appraisal system of private sector bank specifically offers the loan facilities only to high net worth individuals.

**TABLE 3.11: KINDS OF LOAN AVAILED**

S.No	Responses		No .of Respondents		Percentage	
			Private	Public	Private	Public
1	Kinds of loan	Housing loan	18	34	45%	36.17%
		Personal loan	8	24	20%	25.53%
		Business loan	19	27	47.5%	28.72%
		Jewel loan	1	7	2.5%	7.44%
		Vehicle loan	4	32	10%	34.04%
		Agriculture loan	0	8	0	8.51%

From the above table it is found that out of total 134 customers preferring loan facilities from private and public sector banks are categorized as follows. 19(47.5%) of private and 27(28.72%) of public sector banks are availing business loans offered by the banks. Again it is seen that 18(45%) private and 34(36.17%) of public sector banks customers are availing housing loan facilities offered by the banks. Furthermore 8(20%) of the private and 24(25.53) of the public sector banks respondents avail personal loan. Again 4(10%) of private and 32(34.04%) of public sector banks respondents avail jewel loan. Very few 8(8.51%) of the public sector bank respondents are availing agricultural loan.

It is evident from the fact that private sector banks are reluctant in providing loan facilities. And these banks focus more attention towards business loans and selected category of home loans and other loan products. One can conclude that public sector banks are providing various kinds of loans for all purpose and purpose.

Furthermore it is also observed from the table that there are multiple loan accounts. Account holders having business loans also have other categories of loans like housing, vehicle, from their respective banks. From the table it is evident that out of total 134 loan customers there are 182 loan accounts which indicate positive and significant relationship ties with their respective banks.

TABLE 3.12: (A) MOST PREFERRED COMPETITORS

Sr. no	Responses	No of Respondents ranking					Mean score	Percentile	Rank
		Lowest	Low	Med	High	highest			
1	AXIS	35	26	64	62	54	3.30	66	Fair
2	ICICI	23	26	47	83	62	3.56	71.2	Good
3	STATE BANK OF INDIA	10	16	36	66	113	4.06	92	Superb
4	UNION BANK	12	38	70	78	43	3.42	68.4	Fair
5	HDFC	22	22	69	67	61	3.51	70.2	Good
6	BANK OF BARODA	24	26	84	48	59	3.38	67.6	Fair
7	CORPORATION BANK	30	55	77	43	36	3.0	60	Fair
8	BANK OF INDIA	27	18	55	74	67	3.56	71.2	Good
9	KOTAK MAHINDRA	39	70	75	37	20	2.70	54	Poor
10	INDUSLAND BANK	40	90	56	34	21	2.60	52	Poor
	NR	9							

TABLE 3.12: (B) MOST PREFERRED COMPETITORS

Sr. no	Responses	No of respondents ranking					Mean score	Percentile	Rank
		Lowest	Low	Med	High	highest			
1	AXIS	9	13	54	75	91	3.93	78.67	Good
2	ICICI	11	9	41	104	77	3.93	78.76	Good
3	STATE BANK OF INDIA	10	28	50	68	86	3.79	75.86	Good
4	UNION BANK	6	36	93	86	21	3.33	66.61	Fair
5	HDFC	5	6	56	68	107	4.09	81.98	Excellent
6	BANK OF BARODA	13	27	90	89	23	3.33	66.77	Fair
7	CORPORATION BANK	16	35	89	84	18	3.21	64.38	Fair
8	BANK OF INDIA	12	20	68	75	67	3.68	73.63	Good
9	KOTAK MAHINDRA	31	26	72	63	50	3.30	66.19	Fair
10	INDUSIND BANK	25	44	74	55	44	3.20	64.04	Fair

From the above table customer's preference to the most preferred banks with respect to private and public sector banks is studied and it is observed as follows. **AXIS:** The bank has received Fair mean score by private sector respondents of 3.30 (66) and 3.93(78.67) Good ranking mean score by public sector respondents which is slightly higher than private criteria preference.

**ICICI:** The bank has received Good mean score by private sector respondents of 3.56 (71.2) and 3.93(78.76) Good ranking mean score by public sector respondents which is quite similar.

**STATE BANK OF INDIA:** It is observed that the bank has received moderate range Superb mean score by private sector respondents of 4.6(92) and 3.79(75.8) Good ranking mean score by the public sector respondents which is also the closer criteria.

**UNION BANK:** The bank has received Fair mean score by private sector bank respondents of 3.42(68.4) and 3.33(66.61) Fair ranking mean score by public sector banks which is closely related.

**HDFC:**The bank has received Good mean score by private sector bank respondents of 3.51(70.2) and 4.09(81.98) Excellent ranking mean score by public sector banks which is slightly higher than the private sector bank respondents.

**BANK OF BARODA:** The bank has received Fair mean score by private sector bank respondents of 3.38(67.6) and 3.33(66.77) Fair ranking mean score by public sector banks which is nearly equal.

**CORPORATION BANK:** The bank has received Fair mean score by private sector bank respondents of 3(60) and 3.21(64.38) Fair ranking mean score by public sector banks which is again a closer criteria.

**BANK OF INDIA:** The bank has received Good mean score by private sector bank respondents of 3.56(71.2) and 3.68(73.63) Good ranking mean score by public sector banks which is slightly similar.

**KOTAK MAHINDRA:** The bank has received Poor mean score by private sector bank respondents of 2.70(54) and 3.30(66.19) Fair ranking mean score by public sector banks which is slightly higher than the private sector bank respondents

**INDUSIND BANK :**The bank has received Poor mean score by private sector bank respondents of 2.60(52) and 3.20(64.4) Fair ranking mean score by public sector banks which is slightly higher than the private sector bank respondents.

As it is seen from the graphical representation of the mean scores majority of the respondents responses fall above average level this indicates respondents show positive criteria's. The ranges of the mean values are 52 to 92 in private sector and 64.04 to 81.98 respectively in public sector. Equal scores in both private and public sector banks indicate that all the factors are quite important and relevant.

One can conclude from the fact that state bank of India (SBI) is the most preferred criteria by the private sector bank respondents whereas HDFC bank is one most preferred prime factor criteria bank by public sector banks in comparison with other banks.

TABLE 3.13: (A) COMPARATIVE RATING SCALES BETWEEN BANK AND ITS COMPETITORS

Sr. no	Responses	No of respondents ranking					Mean score	Percentile	Rank
		Lowest	Low	Med	High	highest			
1	Quality in service	9	14	54	105	66	3.82	76.53	Good
2	Interest Rates	1	19	98	80	50	3.64	72.82	Good
3	Quick service	6	11	49	101	81	3.96	79.35	Good
4	Reliability	6	13	55	118	56	3.82	76.53	Good
5	Security	5	7	49	115	72	3.97	79.51	Good

**TABLE 3.13: (B) COMPARATIVE RATING SCALES BETWEEN BANK AND ITS COMPETITORS**

Sr. no	Responses	No of respondents ranking					Mean score	Percentile	Rank
		Lowest	Low	Med	High	highest			
1	Quality in service	18	11	54	82	82	3.80	76	Good
2	Interest Rates	6	15	88	89	49	3.64	72.8	Good
3	Quick service	19	21	53	78	76	3.69	73.8	Good
4	Reliability	8	17	64	75	83	3.84	76.8	Good
5	Security	11	5	48	87	96	4.02	84	Excellent

From the above table customers comparison with its competitors criteria's are assessed with five parameters of important banking services with Respect to private and public sector banks respondents on aforesaid dimensions have revealed some interesting facts and it is observed as follows.

**Quality in service**

The statement has received Good mean score by private sector respondents of 3.82 (76.53) and 3.80(76) Good ranking mean score by public sector respondents which is very closer criteria preference.

**Interest Rates**

The statement has received Good mean score by private sector respondents of 3.64 (72.82) and 3.64(72.8) Good ranking mean score by public sector respondents which is very similar.

**Quick service**

It is observed that the statement has received higher range Good mean score by private sector respondents of 3.96(79.53) and 3.69(73.8) lower range Good ranking

Mean score by the public sector respondents which is also the closer criteria.

**Reliability**

The statement has received Good mean score by private sector bank respondents of 3.84(76.53) and 3.84(76.8) Good ranking mean score by public sector banks which is closely related.

**Security**

The statement has received Good mean score by private sector bank respondents of 3.97(79.51) and 4.02(84) Excellent ranking mean score by public sector banks which is slightly higher than the private sector bank respondents.

As it is seen from the graphical representation of the mean scores majority of the respondents responses fall above average level this indicates respondents show positive criteria's. The ranges of the mean values are 72.82 to 79.53 in private sector and 72.8 to 84 respectively in public sector. Equal scores in both private and public sector banks indicate that all the factors are quite important and relevant.

Furthermore it can be concluded that quick service is the important criteria preferred by the private sector bank respondents whereas security is one of the prime factor criteria preferred by public sector banks in comparison with its competitors.

**TABLE 3.14: SATISFACTORY LEVEL OF VALUE ADDED SERVICES YOU HAVE EXPERIENCED**

Value added services		Good	Moderate	Poor	Total weight	Average	Rank
	Weight(W)	5	4	3	(WX)	(WX/W)	
ATM	Private	203	30	9	1162	96.83	Superb
	Public	160	37	23	1017	84.75	Excellent
Locker facility	Private	121	80	02	931	77.58	Good
	Public	92	40	9	647	53.91	Poor
Net banking	Private	169	43	02	1023	85.25	Excellent
	Public	85	56	16	697	58.08	Poor
Mobile banking	Private	165	40	02	991	82.58	Excellent
	Public	98	31	22	680	56.66	Poor

An attempt made to scrutinize different modern value added services used by the customers that influence and help attracting and maintaining better relationship with its customers in both private and public sector banks and it is observed considering following several value added services. ATM services received superb weight score by private sector respondents of 96.83 as against 84.75 Excellent by the public sector banks respondents. Again Locker facility received Good weight score by private sector respondents of 77.58 as against 53.91 Poor by the public sector banks respondents. Furthermore Net banking facility received excellent weight score by private sector respondents of 85.25 as against 58.08 Poor by the public sector banks respondents. Finally mobile banking services received excellent weight score by private sector respondents of 82.58 as against 56.66 Poor by the public sector banks respondents. It is crystal clear from the above table that private sector banks surpass the public sector banks in modern value added services. Customers of public sector banks were found to be using fewer IT enabled services as compared to private sector banks.

**HYPOTHESIS TESTING -1**

Ho: Income level of the respondents and choice of deposits are independent.

H1: Income level of the individuals is beneficial to consider for choice of deposits.

**TABLE 3.15:- INDIVIDUALS INCOME INFLUENCE ON DEPOSITS BUSINESS**

Deposits Income level	Fixed deposits	Demand Deposits	Recurring Deposits	Tax saver Deposits	Total
Below 1 lakh	12	1	3	1	17
1-5 lakh	85	15	16	6	122
Above 5 lakh	40	3	23	14	80
Total	137	19	42	21	219

Chi-square value : 21.8 ;Degrees of freedom: 6 Level of significance:5% P value=0.001

Source: Field survey

**TABLE 3.15- INDIVIDUALS INCOME INFLUENCE ON DEPOSITS BUSINESS**

Deposits Income Level	Fixed deposits	Demand Deposits	Recurring Deposits	Tax saver Deposits	Total
Below 1 lakh	10.6	1.47	3.26	1.63	17
1-5 lakh	76.3	10.6	23.4	11.7	122
Above 5 lakh	50.0	6.94	15.3	7.67	80
Total	137	19	42	21	219

Chi-square value : 21.8 ;Degrees of freedom: 6 Level of significance:5% P value=0.001

Source: Using MS Excel 2007

It is divulged from the Table 3.15 that the calculated chi-square value is greater than the P value and the result is significant at 5 % level. Hence the Hypothesis Ho is rejected and the alternative hypothesis H1 is selected .from the analysis, it is concluded that Income level of the individuals is beneficial to consider for choice of deposits.

#### HYPOTHESIS TESTING –II

Ho: Maintaining long term relationship with customers of bank and increase in deposit business of bank are independent.

H1: Banks which maintain long term relationships with its customers generally experience increase in its deposit business

TABLE 3.16: ASSOCIATION WITH BANK AND ITS INFLUENCE ON DEPOSITS

Deposits No. of yrs associated	Fixed deposits	Demand Deposits	Recurring Deposits	Tax saver deposits	Total
1-3 years	51	4	21	11	87
4-6 years	51	10	11	7	79
Above 7 years	37	5	9	2	53
Total	139	19	41	20	219

Chi-square value : 9.09 ; Degrees of freedom:6 Level of significance:5% P value=0.169

Source: Field survey

TABLE 3.16: ASSOCIATION WITH BANK AND ITS INFLUENCE ON DEPOSITS

Deposits No. of yrs associated	Fixed deposits	Demand Deposits	Recurring Deposits	Tax saver deposits	Total
1-3 years	55.2	7.55	16.3	7.95	87
4-6 years	50.1	6.85	14.8	7.21	79
Above 7 years	33.6	4.60	9.92	4.84	53
Total	139	19	41	20	219

Chi-square value : 9.09 ; Degrees of freedom:6 Level of significance:5% P value=0.169

Source: Using MS Excel 2007

It is divulged from the Table 22 that the calculated chi-square value is greater than the P value. And the result is significant at 5 % level. Hence the Hypothesis Ho is rejected and the alternative hypothesis H1 is selected .from the analysis, it is concluded that Banks which maintain long term relationships with its customers generally experience increase in its deposit business.

## FINDINGS BASED ON CUSTOMER'S OPINION SURVEY

### DEMOGRAPHIC PROFILE FINDINGS

The demographic profile of both private and public sector banks are very diverse, less number of females i.e. (11.2%) of private and (16.8%) of the public sector bank customers are active in banking. and it is seen that major share of respondents i.e. 42.8 of private and 38.8% of public sector bank customers are youngsters. Service class customers i.e. employees 42% & 43.6 % in both private and public sector respectively dominate the business group. Professionals have shown more preference to private sector banks due to their busy schedule and hence they have high expectation of quick service. Income and occupation are closely interrelated in preferring various banking services.

Again it is seen that less educated customers (45.6 %) are preferring public sector banks as compared to private sector banks 62%. This trend is observed due to large presence of public banks and wide range of product. And post graduates and educated respondents are inclined towards private sector banks. Evidently educational levels in both private and public sector bank are significantly higher. Furthermore private sector banks are offering services for special group of customers only i.e. class banking for high income customers (13.2%) for variety of personalized and value added services rendered by these banks thereby charging higher services. Where as public sector banks are rendering services to the masses with wide product range due to its infrastructure and investment. This infers that more customized banking services are needed to be designed and catered to the diverse type and needs of customers. Hence the need of these customers should not be neglected. [Ref.Table 1-6]

### BANKING DETAILS

In bank account holding details it is seen that majority of the private sector bank respondents (28.63%) have their alternative account in State Bank of India ,and public sector bank respondents (18.97%) in Axis bank. Majority of the Account holders both from private and public sector bank customers have savings account i.e. (70% & 73.6%) and (25.2%) customer's hold current account from private sector and (15.2%) are loan account holders in public sector banks. Public sector bank customers are holding longer relationship with their banks as compare to private sector banks. Working hours of private sector banks is round the clock i.e. 8 to 8 banking and it is found that banking convenience is utmost in private sector banks as compare to public sector banks. Private sector banks focus on few customers those are really profitable.

Private sector banks surpass the public sector banks in quick service as compared to public sector banks. On the contrary it is found that public sector banks are highly accessible due to its high network of branches and ATM services. [Ref. Table 7-13]

### CUSTOMERS BANK SELECTION AND PREFERENCE CRITERIA'S

It is also observed that Excellent opinion is obtained on convenient banking service and safety of deposits as the prime factors preferred by the customers for selecting the banking service by both private and public sector bank customers. Public sector banks surpass the private sector banks in providing and attracting the mass class service for deposits business due to one very important attributes i.e. safety of the deposits.

Again it is seen that Safety of the deposits is important factor considered to prefer the public sector banks (71.79%) by the depositors. Where as quick and prompt service provided by the private sector banks (51.42%) is the prime reason customers prefer various deposit schemes offered by these banks. Further it is also observed that for current account or business account customers prefer private sector banks and for fixed deposits and loan, customers prefer public sector banks.

Private sector banks are advertising heavily to attract and retain their high net worth depositors by various schemes and offers by promoting the higher interest rates on current and saving account. In addition to this it is analyzed that majority of the respondents (97.14%) and (85.47%) are satisfied with the deposit schemes offered by both the private and public sector banks respectively. But number of non investors is more as compare to existing depositors. Both private and public sector banks need to provide keen attention on this aspect and try to find out feasible solutions for these as rate of interest is lower and as there are various other options for customers to invest like securities, mutual funds.

Again findings regarding loan facilities revealed that public sector banks(37.6%) surpass the private sector banks(16%) in providing and attracting the mass class service for loan facilities. Surprisingly it is found that not a single private sector bank is inclined towards providing loan facilities to the mass class or general customers. The credit appraisal system of private sector bank specifically offers the loan facilities only to the selected or high net worth individuals. Also it is seen that for both private and public sector banks customers are dissatisfied with the loan processing and sanction. Especially private sector bankers need to consider this factor as pressing problem to retain the customer's in future. Further it is also revealed that most of customers are unaware about loan foreclosure facility and those that are aware are dissatisfied. It is found that private sector banks in comparison with public sector banks are organizing maximum number of customers meet to maintain a very strong bond of relationship with its core customers. From the findings it clearly reveals that customers while selecting and preferring banking services clearly stated that safer, speedier and convenient service as important criteria for selecting banking service. [Ref. Table 14-29]

**SUGGESTIONS****MAINTAIN AND SUSTAIN EXISTING CUSTOMER BASE**

In banking services safer speedier and cost effective service is the prime expectation of customers. As far as safety and reliability is concerned public sector banks has successfully managed its brand image intact due to the long standing banking experience. This is the prime reason it is seen that majority of the customers are holding longer relationship with public sector banks.

Hence public sector bankers are advised to learn from existing customers that as customers have trust in them they have to overcome the speedier and cost effective service by regular interactions with profitable customers those provide various new and rich information in augmenting the banking services.

Similarly the existing major share of customer base should not be overlooked. Because the existing customers are generating new customers for the banks. Similarly the private sector banks are advised to maintain the same quality of banking service they are rendering to its customers. However the potential drawbacks need to be removed from their current banking service like high charge levied on various value added service. Putting oneself in the shoes of customer to feel as he or she feels and by not forgetting old customers while looking for new is the key for understanding truly the customer experience management.

**GENERATE PROSPECTIVE CUSTOMERS THROUGH REFERRALS**

It is suggested to both private and public sector bankers to ensure that every branch should generate at least 10 new and prospective customers list every month, similarly they have to provide satisfactory service levels to existing customers by understanding their problems in their respective regions. So that these customers will generate referral sales. This customers list will be also useful in managing promotional activities and when the respective branch managers will track and record every detail of existing customers they will communicate their problems to their branch heads. And thus there will be more referral generated by existing customers.

**IMPLEMENT LOYALTY PROGRAMS**

As all the banks are offering free account opening and other value added banking services. Customer switching cost is becoming very low. Both the private and public sector banks should focus on strengthening the loyalty of customers. For this they have to implement effective loyalty programs. Specifically for most profitable customers. Some of these techniques include reminders of festivals, birthday or anniversary reminder cards, offering holiday packages, use of corporate gifts, family get together and so on. This will be significant in forming strong contractual and social bonding between customers and banks. Higher cost of switching may maintain relationship but when there is price difference gap customers may switch. It is because commitment that is based affection or calculative commitment.

*Commitments* normally increase the switching costs, such as social bonds, financial bonds, and contractual bonds with the customers. *Affective commitment* is based on feelings towards benefits and *Calculative commitment* is based on monetary losses if customers switched the bank. On the contrary it is observed that *Trust* plays an important role under uncertainty. A perception of genuine concern for customer equity and service may override other short term transactional determinants like relational bonds and termination costs. Contractual bonds are not important to maintain relationship with customers as faith and perception of intention is very important in long term. Similarly it is seen that *Repeat purchase* is because of behavioral loyalty. *Attitudinal loyalty* is due to emotional connect. Bankers are advised to attract the customers on attitudinal loyalty. So that it would be difficult to break the relationship easily with the bank.

**CUSTOMER VALUE MANAGEMENT**

Adding value to the banking service is really challenging which in turn adds value to its customers. Managing value in the banking service can surely help in maintaining long term relationship with the customers. By various campaign management systems there has to be some differential factor over the competitor that may attract and retain the customers. It is necessary for the bankers of both private and public sector to understand their core competence in the service and accordingly they can add the value to the existing service to foster the customer loyalty for gaining maximum market share for the longer period of time.

Public sector banks are advised to concentrate on value added services as compared to its counterparts as they are far behind in providing the value added services. This certainly is necessary for favorable brand image building for the banks in western Maharashtra. When it comes to phone banking, SMS banking, NEFT/ RTGS, and modern third party services, public sector banks are found to be less preferred by the customers instead of these customers prefer private sector banks. Hence due weightage should be given by public sector banks to these services. There is need to address these issues by changing the mindset of public sector bankers in western Maharashtra region to deliver promising service to their customers as value addition.

**CREATE AWARENESS AND ENCOURAGE WOMEN FOR ACTIVE BANKING**

Banks need to be more sensitive to encourage more female customers especially in western Maharashtra because very few women are active in banking and those active are joint account holders only as signatory authority supporting spouse in business as banking partner. Hence by introducing program like special women account benefits,

Can encourage women customers and this segment can emerge as significant share of wallet for bankers. As females are more sensitive they are more emotional than male customers and due care be taken to build socio economical bond with these customers. Micro financing, special housewife account, joint mother and kid's account, micro saving account for self help group, these new and innovative accounts can attract more female customers. Banks can specifically recruit some females to take care of these customers so that clients may feel more comfortable interacting with bank employees similar to them in gender and age group.

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**ANALYSIS OF EARNINGS QUALITY OF SELECTED PUBLIC, PRIVATE AND FOREIGN BANKS IN INDIA**

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**ABSTRACT**

*In the present study, an attempt is made to analyze the earnings quality of selected public, private and foreign banks in India, which is divided into three sections. First section includes a brief review of some of the earlier studies. Second section covers the scope, objectives, hypotheses and research methodology of the study. In third section, an attempt is made to analyze the earnings quality of nine banks selecting three banks from each category i.e. SBI, PNB and BOB from public sector banks; ICICI, HDFC and AXIS from private sector; and Citibank, Standard Chartered and HSBC from foreign banks in India for a period of 12 years, i.e. 2000 to 2011. To achieve the objectives of the study, the use is made of secondary data collected mainly from Report on Trends and Progress of Banking in India, Performance Highlights of Public, Private and Foreign Banks in India, various journals such RBI Bulletin, IBA Bulletin, etc. To test the statistical significance of the results, one-way ANOVA technique has been used. It is found that the quality of earnings is an important criterion that determines the sustainability and growth in earnings in the future. Therefore, from the investors' point of view, PNB, HDFC and Standard Chartered are in a better position as their earnings quality is better in their respective groups which is evident from the ratio of operating profits to average working funds.*

**KEYWORDS**

Operating profits, Working funds, Net-interest Margin, Non-interest Income.

**INTRODUCTION**

After the set back of early nineties when the Government of India had to pledge the gold to acquire foreign currency to meet the severe problem of balance of payment temporarily, the Government planned to liberalize the Indian economy and open its door to the foreigners to speed up the development process as a long-term solution for the ailing economy. The economic liberalization move, which was initiated in 1991 when the new government assumed office, has touched all the spheres of national activity. Perhaps one area where the deregulatory policies had the maximum impact was the banking sector. Until 1991, the banking in India was largely traditional. The bankers were prudent and cautious people who seldom took risks and were content with the normal banking activities i.e. accepting of deposits and lending against them. Labeled as "Agents of Social Change", their outlook was rigidly controlled by the policies of the Government, which were centered more on the alleviation of poverty and the upliftment of the downtrodden. The 1969 and 1980's nationalization of banks, bringing private banks under the state control, had the objective of realizing this government dream. Even as late as 1991-92, the profitability was a forbidden word in banking business. The banks were established to fulfill social objectives and their performance was evaluated on their 'task fulfillment' initiatives. Lending to the priority sectors, opening of rural branches, achievements in the implementation of Government sponsored schemes and adherence to the policies and programmes of the Government were the parameters considered for judging the performance of a bank. Indian banking system has made commendable progress in extending its geographical spread and functional reach. The nationalization of banks helped in increasing the number of branches, volume of deposits and ensured wider dispersal of the advances. Despite impressive quantitative achievements in resource mobilization and in extending the credit reach, some deficiencies have, over the years, crept into the financial system such as decline in the productivity and efficiency of the system, erosion of the profitability of the system, directed lending played a critical role in depressing the profits, the directed investments in the form of SLR and CRR hindered income earning capability and potentials, portfolio quality suffered due to political and administrative interference in credit decision-making, increase in cost structure due to technological backwardness, average ratio of capital funds to RWAs remained low which created problems in international operations and the system remained de-linked from sound international banking practices. Realizing all these ill effects, the efforts were made to bring reforms in the financial system of the country. The seed of the reforms in India were sown by the Narasimham Committee appointed by the RBI under the chairmanship of M. Narasimham, the former Governor of RBI, to examine the aspects relating to the structure, organization, functions and procedures of the financial system and suggest remedial measures. The Committee submitted its reports in November 1991 and thus, began a new chapter in Indian banking. Induced by the forgoing revelations, an attempt is made to analyze the earnings quality of selected public, private and foreign banks in India, which is divided into three sections. First section includes a brief review of some of the earlier studies. Second section covers the scope, objectives, hypotheses and research methodology of the study. In third section, an attempt is made to analyze the earnings quality of selected public (03), private (03) and foreign (03) banks in India.

**LITERATURE REVIEW**

The articles published on different facets of Indian banking reforms are restrictive in nature and have been found wanting in terms of the assessment of the impact of the reforms on the banking sector. Rao (2002) concluded that the international regulations are forcing the Indian banks to adopt better operational strategies and upgrade the skills. The system requires new technologies, well-guarded risk and credit appraisal system, treasury management, product diversification, internal control, external regulation as well as skilled human resources to achieve the international excellence and to face the global challenges. Muniappan (2003) focused on two areas - firstly, challenges faced by the Indian banks and secondly, the management of these challenges. Every aspect of the banking industry, be it profitability, NPA management, customer service, risk management, HRD etc., has to undergo the process of transformation of aligning with the international best practices. He concluded that the future of Indian banking system needs a long-term strategy, which should cover areas like structural aspects, business strategies, prudential control systems, integration of markets, technology issues, credit delivery mechanism and information sharing, etc. Mohan (2006) focused on the changes in efficiency and productivity in Indian banking and stated that the patterns of efficiency and technological change witnessed in Indian banking can be viewed as consistent with expectations in an industry undergoing rapid change in response to the forces of deregulation. In reaction to evolving market prospects, a few pioneering banks might adjust quickly to seize the emerging opportunities, while others respond slowly and cautiously. Fred, Stephen and Arthur (2009) used a multivariate discriminant model to differentiate between low efficiency and high efficiency community banks (less than \$1 billion in total assets) based upon the efficiency ratio, a commonly used financial performance measure that relates non-interest expenses to total operating income. The discriminant model was applied using data for 2006-2008 and also included the periods of high performance as well as the deteriorating industry conditions associated with the current financial crisis. The model's classification accuracy ranges approximately from 88-96 per cent for both original and cross-validation data sets. Dwivedi and Charyulu (2011) analyzed the impact of various market and regulatory initiatives on efficiency improvements of Indian banks with the help of Data Envelopment Analysis (DEA) and found that national banks, new private banks and foreign banks have showed high efficiency over a period of time than the remaining banks. Uppal (2011) analyzed the performance of major banks in terms of productivity and profitability in the pre and post e-banking period and concluded that performance of all the banks under study is much better in post-e-banking period and further foreign banks are at the top position, whereas the performance of the public sector banks is comparatively very poor. Thiagarajan, Ayyappan and Ramachandran (2011) analysed the role of market discipline on the behaviour of commercial banks with respect to their capital adequacy and concluded that the commercial banks are well capitalized and the ratio is well over the regulatory minimum requirement. The private sector banks show a higher percentage of Tier-I capital over the public

sector banks. However, the public sector banks show a higher level of Tier-II capital. The study also indicated that market forces influenced the banks' behaviour to keep their capital adequacy well above the regulatory norms. The return on equity had a significant positive influence on the cost of deposits for private sector banks. The public sector banks can reduce the cost of deposits by increasing their Tier-I capital.

## SCOPE, OBJECTIVES, HYPOTHESIS AND METHODOLOGY

### SCOPE OF THE STUDY

The present study covers nine banks in all selecting 3 banks from each category i.e. State Bank of India (SBI), Punjab National Bank (PNB) and Bank of Baroda (BOB) from public sector banks; ICICI, HDFC and AXIS from private sector banks; and Citibank, Standard Chartered and HSBC from foreign banks in India for a period of 12 years, i.e. 2000 to 2011.

### OBJECTIVE OF THE STUDY

The present study is conducted to examine the earnings quality of selected public, private and foreign banks in India.

### RESEARCH HYPOTHESIS

The following hypotheses are formulated and tested to achieve the objectives of the study:

1. There is no significant difference in the ratio of operating profits to average working funds in the selected banks.
2. There is no significant difference in the ratio of net interest margin to total assets in the selected banks.
3. There is no significant difference in the ratio of non-interest income to total income in the selected banks.
4. There is no significant difference in the ratio of net profits to total income in the selected banks.

### RESEARCH METHODOLOGY

To achieve the objectives of the study, the use is made of secondary data for a period of 12 years, i.e. 2000 to 2011 collected mainly from the various sources like Report on Trends and Progress of Banking in India, Performance Highlights of Public, Private and Foreign Banks in India, various journals such RBI Bulletin, IBA Bulletin, Professional Banker, ICAI Journal of Bank Management. To test the statistical significance of the results, one-way ANOVA technique has been used.

## RESULTS AND DISCUSSIONS

The quality of earnings is a very important criterion that determines the ability of a bank to earn consistently, going into the future. It basically determines the profitability of the banks. It also explains the sustainability and growth in earnings in the future. This parameter gains importance in the light of the argument that much of a bank's income is earned through non-core activities like investments, treasury operations, and corporate advisory services and so on. The following ratios try to assess the quality of income in terms of income generated by core activity- income from lending operations:

### OPERATING PROFITS TO AVERAGE WORKING FUNDS

This ratio indicates how much a bank can earn from its operations net of the operating expenses for every rupee spent on working funds. This is arrived at by dividing the operating profits by average working funds. Average Working Funds are the total resources (total assets or liabilities) employed by a bank. It is the daily average of the total assets/liabilities during a year. The higher the ratio, the better it is. This ratio determines the operating profits generated out of working funds employed. The better utilization of funds will result in higher operating profits. Thus, this ratio will indicate how a bank has employed its working funds in generating profits. Banks which use their assets efficiently will tend to have a better average than the industry average. As is evident from table-1, average ratio of operating profits to average working funds is highest in PNB, AXIS and Standard Chartered in public, private and foreign banks respectively. There is no significant difference in the average ratio of profits to average working funds of selected public sector banks. However, the difference between average ratio of profits to average working funds in selected private sector banks and foreign banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of profits to average working funds of selected public, private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

### SPREAD OR NET INTEREST MARGIN (NIM) TO TOTAL ASSETS

NIM, being the difference between the interest income and the interest expended, as a percentage of total assets shows the ability of the bank to keep the interest on deposits low and interest on advances high. It is an important measure of a bank's core income (income from lending operations). The interest income includes dividend income and interest expended includes interest paid on deposits, loan from the RBI, and other short term and long term loans. As is evident from table-2, average ratio of spread to total assets is highest in PNB, HDFC and Citibank in public, private and foreign banks respectively. There is a significant difference in the average ratio of net interest margin to total assets of selected public, private and foreign banks. As a whole, there is also a significant difference in the average ratio of net interest margin to total assets of selected public, private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

### NON-INTEREST INCOME TO TOTAL INCOME

Fee-based income accounts for a major portion of a bank's other income. The bank generates higher fee income through innovative products and adapting the technology for sustained service levels. This stream of revenue is not dependent on the bank's capital adequacy and consequent potential to generate income is immense. Thus, this ratio measures the income from operations, other than lending, as a percentage of the total income. Non-interest income is the income earned by the banks excluding income on advances and deposits with the RBI. The higher ratio of non-interest income to total income indicates the fee-based income. As is evident from table-3, average ratio of non-interest income to total income is highest in SBI, ICICI and HSBC in public, private and foreign banks respectively. There is no significant difference in the average ratio of non-interest income to total income of selected public sector banks and foreign banks. However, the difference between the average ratios of non-interest income to total income in selected private sector banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of non-interest income to total income of selected public, private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

### NET PROFITS TO TOTAL INCOME

This ratio is calculated by dividing the net profits by total income, which includes interest income and other income. As is evident from table-4, average ratio of net profits to total income is highest in PNB, AXIS and Citibank in public, private and foreign banks respectively. There is no significant difference in the average ratio of net profits to total income of selected public sector banks. However, the difference between the average ratios of net profits to total income in selected private sector banks and foreign banks is found significant at 5 percent level of significance. As a whole, there is a significant difference in the average ratio of net profits to total income of selected public, private and foreign banks at 5 per cent level when all the individual banks are considered together during the period under study.

Therefore, it is concluded that there is no significant difference in the earnings quality of selected public sector banks except in case of spread to total assets, where the difference is considered significant. On the other hand, the difference is found significant in case of operating profits to average working funds and spread to total assets in foreign banks. However, it is also found significant in private sector banks and when all the individual banks are considered together during the period under study.

## SIGNIFICANCE AND LIMITATIONS

The results obtained from the present study will be helpful to the policy makers, depositors, investors and other stakeholders to take decisions about the earnings quality of the selected public, private and foreign banks in India. As the present study covers the analysis earnings quality of selected public, private and foreign banks (only three banks from each category) for a period of 12 years only, therefore results drawn cannot be applied to the banking sector as whole.

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## TABLES

TABLE: 1 - OPERATING PROFITS TO AVERAGE WORKING FUNDS (Percent)

Years	Public Sector Banks			Private Sector Banks			Foreign Banks		
	SBI	PNB	BOB	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	1.55	1.61	1.79	2.81	4.18	2.60	3.87	4.15	2.85
2001	1.33	1.59	1.64	2.35	2.83	1.50	4.05	4.07	3.18
2002	1.83	2.11	1.84	2.14	2.61	3.46	4.24	5.44	2.77
2003	2.27	2.87	2.25	2.49	2.58	2.50	3.76	4.93	2.49
2004	2.50	3.26	3.00	2.09	2.58	3.49	4.42	4.95	3.54
2005	2.61	2.25	2.45	2.18	2.56	2.04	3.81	3.50	3.79
2006	2.27	2.18	1.92	1.98	2.75	2.43	4.02	4.74	3.77
2007	1.86	2.15	1.94	2.05	2.98	2.27	3.98	5.25	4.09
2008	1.87	2.25	1.96	2.14	3.13	2.57	4.04	5.54	4.23
2009	1.99	2.59	2.22	2.33	2.94	2.95	3.72	5.66	4.39
2010	1.75	2.69	2.03	2.72	3.33	3.48	3.66	6.14	3.73
2011	2.17	2.72	2.22	2.37	3.12	3.17	3.16	4.60	3.08
Average	2.00	2.35	2.10	2.30	2.96	2.70	3.89	4.91	3.49
ANOVA	2.32 (Critical Value-3.28)			5.975* (Critical Value-3.28)			18.464* (Critical Value-3.28)		
Overall ANOVA	45.234* (Critical Value-2.03)								

Source: Data Compiled from the Performance Highlights of selected banks.

\*Significant at 5 percent level of significance.

TABLE: 2 - SPREAD TO TOTAL ASSETS (Percent)

Years	Public Sector Banks			Private Sector Banks			Foreign Banks		
	SBI	PNB	BOB	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	2.65	2.99	2.85	1.54	2.60	1.36	4.55	4.24	2.75
2001	2.61	3.21	3.06	2.05	3.24	0.91	3.97	3.73	3.03
2002	2.61	3.15	2.65	0.57	2.65	1.39	3.76	3.76	2.63
2003	2.65	3.62	2.75	1.33	2.73	1.64	3.76	3.87	2.88
2004	2.74	3.54	3.02	1.50	3.16	2.39	4.58	4.23	3.29
2005	3.03	3.17	3.15	1.69	3.46	1.94	4.29	3.72	3.52
2006	3.16	3.21	2.80	1.87	3.46	2.17	4.53	4.06	3.67
2007	2.83	3.40	2.64	1.93	4.07	2.14	4.05	4.06	4.17
2008	2.17	2.78	2.18	1.83	3.93	2.36	4.36	3.74	3.90
2009	2.21	2.85	2.25	2.21	4.05	2.50	4.19	3.24	3.87
2010	2.25	2.87	2.13	2.23	3.77	2.77	4.25	4.38	3.60
2011	2.66	3.12	2.46	2.22	3.80	2.70	3.65	3.75	3.66
Average	2.63	3.15	2.66	1.75	3.41	2.02	4.16	3.90	3.41
ANOVA	11.17* (Critical Value 3.28)			33.33* (Critical Value-3.28)			11.565* (Critical Value-3.28)		
Overall ANOVA	45.005* (Critical Value-2.03)								

Source: Data Compiled from the Performance Highlights of selected banks.

\* Significant at 5 percent level of significance.

TABLE: 3 NON-INTEREST INCOME TO TOTAL INCOME (Percent)

Years	Public Sector Banks			Private Sector Banks			Foreign Banks		
	SBI	PNB	BOB	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	13.85	12.37	11.65	18.54	15.57	15.87	20.65	19.17	20.45
2001	13.38	11.72	10.93	15.05	12.84	15.49	22.97	21.07	23.07
2002	12.28	12.82	14.29	21.08	16.37	26.07	29.59	23.90	24.18
2003	15.59	14.31	17.14	25.22	18.95	21.89	27.63	19.69	24.56
2004	19.99	19.35	21.85	25.63	18.78	21.89	28.01	21.70	26.47
2005	18.00	16.53	16.87	26.63	15.85	25.40	30.00	17.41	28.89
2006	11.77	11.73	13.79	22.62	20.07	20.16	25.39	25.71	29.65
2007	10.25	8.29	11.30	23.24	17.98	17.78	23.49	25.00	25.68
2008	12.60	12.28	14.79	22.25	18.42	20.40	29.09	32.25	29.83
2009	12.53	13.12	15.45	19.65	16.77	21.10	34.37	35.41	29.91
2010	17.41	14.24	14.39	22.53	19.76	25.32	20.77	33.33	29.25
2011	16.28	11.81	11.38	20.38	17.87	23.41	23.35	28.01	25.61
Average	14.49	13.21	14.48	21.90	17.43	21.23	26.27	25.22	26.46
ANOVA	0.748 (Critical Value-3.28)			7.615* (Critical Value-3.28)			0.25 (Critical Value-3.28)		
Overall ANOVA	26.452* (Critical Value-2.03)								

Source: Data Compiled from the Performance Highlights of selected banks.

\* Significant at 5 percent level of significance.

TABLE: 4 -NET PROFITS TO TOTAL INCOME (Percent)

Years	Public Sector Banks			Private Sector Banks			Foreign Banks		
	SBI	PNB	BOB	ICICI	HDFC	AXIS	Citibank	Standard Chartered	HSBC
2000	7.96	6.94	8.58	10.06	14.90	8.87	10.82	13.93	9.74
2001	5.34	6.98	4.25	11.02	14.54	8.18	12.55	13.00	11.70
2002	7.16	7.37	7.86	9.47	14.59	8.41	12.00	18.97	8.42
2003	8.43	9.64	10.50	9.63	15.53	10.25	14.31	30.02	7.66
2004	9.67	11.49	12.29	13.57	16.82	13.01	18.05	18.51	9.33
2005	10.88	13.91	8.75	15.63	17.77	14.30	19.07	19.93	14.72
2006	10.15	13.25	10.11	13.74	15.55	13.40	17.17	21.99	16.45
2007	10.03	12.24	9.88	10.75	13.58	11.83	15.71	25.31	17.91
2008	11.67	12.60	10.35	10.50	12.83	12.17	21.45	23.70	16.80
2009	11.93	13.89	12.48	9.71	11.44	13.22	20.85	21.80	14.30
2010	10.66	15.60	15.68	12.13	14.63	16.13	11.23	24.98	11.09
2011	8.50	14.49	17.18	15.79	16.18	17.12	17.34	23.34	21.87
Average	9.37	11.53	10.66	11.83	14.86	28.90	15.88	21.29	13.33
ANOVA	1.7007 (Critical Value-3.28)			5.822* (Critical Value-3.28)			10.611* (Critical Value-3.28)		
Overall ANOVA	14.005* (Critical Value-2.03)								

Source: Data Compiled from the Performance Highlights of selected banks.

\*Significant at 5 percent level of significance.

## SOLUTION OF MULTICOLLINEARITY BY RIDGE REGRESSION

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## ABSTRACT

Adequate attention is required to give on the presence of multicollinearity and its solution through some variants of ordinary least square (OLS). The traditional solution is to collect more observations or to drop one or more variables, which may often be impracticable in many situations. Hence, an attempt is made to squeeze out maximum information from whatever data one has at one's disposal. At first detect the presence of multicollinearity and remedial measures then can be applied to alleviate those. It is proposed that in face of multicollinearity one may use: Ridge Regression (RR), Principal Component Regression (PCR) or Generalized Inverse Regression (GIR). This paper axiomatically looks into ridge regression only to solve the problem of multicollinearity. Tychonoff (1943) proposed a regularization, which is known as 'Tikhonov Regularization' and used most commonly for ill-posed problems. In Statistics, this is known as RR. Hoerl and Kennard (H-K) proposed the technique of RR, which became popular tool with data analysis faced with a high degree of multicollinearity in the data. H-K (1970 a, b) have suggested adding a small positive quantity in the diagonal elements of the design matrix,  $X'X$  before inverting it. It is intriguing to notice that this method was in frequent use since 1943. No wonder that Tychonoff published it in 1943 in Russian journal named 'Doklady Akademii Nauk SSSR'. However, it was the time when more and more qualities of RR came to light that the controversy arose about who should take the credit – Tychonoff who has been using it and published it in 1943 in Russian or H-K who published it in 1970 in English.

## KEYWORDS

Multicollinearity, Ridge Regression, Biasing Parameter, Variance Inflation Factor and Tikhonov Regularization.

## INTRODUCTION

Multicollinearity and singularity are issues derived from a correlation matrix with too high of correlation among explanatory variables. Multicollinearity is when variables are highly correlated and singularity is when the variables are perfectly correlated. In the presence of multicollinearity, the OLS estimate is not obtainable. Multicollinearity exposes the redundancy of variables and it can cause both logical and statistical problems. Logically, redundant variables weaken the analysis (except in the case of factor analysis), through reduction of degrees of freedom error.

The traditional solution is to collect more data or to drop one or more variables. Collecting more data may often be expensive or not practicable in many situations and to drop one or more variables from the model to alleviate the problem of multicollinearity may lead to the specification bias and hence the solution may be worse than the disease in certain situations. One may be interested to squeeze out maximum information from whatever data one has at one's disposal. This has motivated the researchers to the development of some very ingenious statistical methods namely ridge regression, principal component regression and generalized inverse regression. These could fruitfully be applied to solve the problem of multicollinearity. This paper looks into RR only to solve the problem of multicollinearity.

Tychonoff (1943) proposed  $\hat{\beta} = (A'A + \Gamma'\Gamma)^{-1} A'Y$ . This is popularly known as 'Tikhonov Regularization' (TR) and the most common used regularization of ill-posed problems. In Statistics, TR is also known as RR. H-K (1970 a, b) proposed the technique of RR and then suggested adding a small positive quantity in the diagonal elements of the design matrix,  $X'X$  before inverting it. In other words, they proposed  $\hat{\beta}_R = (X'X + kI)^{-1} X'Y$ , where  $\hat{\beta}_R$  is a ridge estimate of the parameter vector,  $\beta$ .

## MULTICOLLINEARITY AND CONSEQUENCES

Multicollinearity may be a possible problem in study with two or more explanatory variables because they measure essentially the same thing. Klein (1960) argued rules of thumb that it is not necessarily a problem unless the intercorrelation is high relative to the overall degree of multiple correlation. Frisch (1934) was the first researcher to seriously study the multicollinearity problem and he defined the term 'multicollinearity'. In the presence of multicollinearity, the OLS

estimate is not obtainable. Presence of multicollinearity brings  $\hat{\beta}$  far away in Euclidian distance from the true vector ( $\beta$ ) that means we have garbage the estimates. One of the basic implicit assumptions of the classical linear regression model  $Y = X\beta + U$  is that there are no exact linear relations holding among the observed values of the explanatory variables. In this situation the parameter vector is not estimable. Thus, the least square estimation procedure breaks down.

In practice an exact linear relationship is highly improbable, but the general interdependence of economic phenomena may easily result in the appearance of approximate linear relationships in the explanatory variables. Johnson, Reimer and Rothrock (1973) resorted to a symptomatic definition: "Multicollinearity is the name given to general problem which arises where some or all of the explanatory variables in a relation are so highly correlated one with another that it becomes very difficult, if not impossible, to disentangle their separate influence and obtain a reasonably precise estimate of their relative effects". Cicci and Tapley (1988) discussed, 'When normal matrix contains one or more very small eigenvalues, multicollinearity is said to exist and when one or more eigenvalues

are precisely zero, the multicollinearity is said to be exact'. A measure that is specifically directed at X is the condition number of  $X'X$ , which is the square-root ratio of the largest characteristic root of  $X'X$  (after scaling each column so that it has unit length) to the smallest. Greene (2002) found that a measure that is specifically directed at X is the condition number of  $X'X$ , is the square-root ratio of the largest characteristic root of  $X'X$  (after scaling each column so that it has unit length) to the smallest.

If goal is simply to predict Y from a set of X variables, then multicollinearity is not a problem. The predictions will still be accurate, and overall  $R^2$  (or adjusted  $R^2$ )

quantifies how well the model predicts the Y values. If our goal is to understand how the various X variables impact Y, then multicollinearity is a big problem. The presence of multicollinearity has a number of potentially serious effects on the least squares estimates of the regression coefficients. This is true that multicollinearity does not destroy the property of minimum variance. But this does not mean that variance of an OLS estimator will necessarily be small (in relation to the value of the estimator) in any given samples. Multicollinearity may inflate all the variances and consequently deflate all the t-values. We must see what happens or is likely to happen in any sample.

For multicollinearity,  $\lambda^p \rightarrow 0$  and  $MSE(\hat{\beta})$  tends to infinity,  $\hat{\beta}$  is subject to very large variance. Often this reveals the low values of the usual t-ratio whose denominator has the square root of the diagonal elements of  $(X'X)^{-1}$ . Marquardt termed it as variance inflation factor (VIF) and suggests a rule of thumb according to which  $VIF(i) = r_{ii}^2 > 5$  indicates harmful multicollinearity, where  $r_{ii}$  is the  $(i, i)^{th}$  element of the inverse  $(X'X)^{-1}$  in the standardized data.

and Glauber (1967) first suggested looking at the values of  $r_{ii}$  to diagnose multicollinearity. Theil (1971) shows that  $r_{ii} = \frac{1}{(1 - R_i^2)} \|x_i\|^2$

Where  $\|x_i\|^2 = x_i'x_i$  and  $R_i^2$  is the squared multiple correlation coefficient when  $x_i$  is regressed on the remaining  $(p - 1)$  regressors. For geometrically appealing discussion of the fact that nonorthogonality leads to wide confidence intervals for the regression coefficients. Another practical difficulty with the estimated Student's t value based on multicollinear data is that these values are highly unstable, and often change their sign and relative magnitudes with minor perturbations in the data.

Multicollinearity can also result in  $\beta^i$  appearing to "have the wrong sign", i.e., opposite to a priori expectations of the researcher. The exact causes of wrong signs may be many, and what appears to be a wrong sign may not even be wrong. Most regression practitioners know about the problem, even though it is not a well-defined problem, in a puristic sense. Visco (1978) showed omitting a variable with relatively low t-value couldn't correct the wrong sign of a regressor having a higher t-value.

Von Neumann (1941), Wilkinson (1965) and others developed the concept of stability of  $\beta^i$  vales with the use of some classical concepts in perturbation theory. Beaton, Rubin and Barone (1976) perturb the available data on GNP, unemployment, etc. by adding uniform random number from - 0.500 to + 0.499, observed that these minuscule variations drastically change most  $\beta^i$  (e.g. from - 232 to + 237) and conventional tests of significance do not provide adequate information about this kind of stability. In fact, Vinod (1981) showed the student's t values are themselves quite unstable.

**DETECTION AND MEASUREMENT OF MULTICOLLINEARITY**

Determination of the severity and form of near exact linear dependencies is an obvious initial step before any remedial measures. The existence and form of near exact linear dependencies should be measured.

if  $|X'X| = 0$ , one or more exact linear dependencies exist among the columns of X and if  $|X'X| = 1$ , the column of X are orthogonal. Farrar

and Glauber (1967) defined a standard of comparison for  $|X'X|$  by defining multicollinearity as a departure of the matrix from orthogonality. The estimates of both coefficient vector and its dispersion matrix require this operation. Using Wishart distribution, Wilks (1932) derives the moments & distribution of the determinant of the sample covariance matrix. He then obtained the moments and the distribution of determinants for sample correlation matrices as well. Explicit solutions for the distribution have not been obtained. However, Bartlett compares the lower moments of the Wilks distribution with those of chi-square distribution obtained a transformation of |R| as

$$\chi^2 = -[n - 1 - \frac{1}{6}(2p + 5)] \log |R|$$

That is distributed approximately as chi-square with  $\frac{1}{2} p(p - 1)$  degrees of freedom, where n = size of the sample and p = number of variables. A high value of  $\chi^2$  indicates the existence of multicollinearity. Its severity can be measured by the level of significance at which the null hypothesis viz.  $H^0 : |R| = 1$  is rejected. Cooley and Lohnes (1971) have completed a Monte Carlo study of this test.

Haitovsky (1969) gave a heuristic statistic, which is consistent with this concept. A small value of  $\chi^2$  indicates the existence of multicollinearity; its severity can be measured by the level of significance at which the null hypothesis  $H^0 : |R| = 0$  is accepted.

Multicollinearity is essentially a problem of small |R|, and it is irrelevant what the specific elements of R are that produces |R|. More to the point, if  $\lambda^1, \lambda^2, \dots,$

$\lambda^p$  are the eigenvalues of R (not necessarily distinct), then  $|R| = \prod_{i=1}^p \lambda_i$ . The small eigenvalues, therefore, result in small R. In fact, a singular matrix implies the existence of one or more zero eigenvalues. A rule can be established to constrain the smallest eigenvalue to be greater than a specific value. Dalling and Tamura (1970) suggested 0.3 as the specified value.

Klein suggests that the multicollinearity is said to be harmful if  $|r^{ij}| > R^y$  for all  $i \neq j$ , where  $r^{ij}$  is the zero order correlation between two predictor variables.

Farrar and Glauber found some drawbacks in Klein's rule and they developed a set of three tests for multicollinearity. The first test is based on  $\chi^2$  that has been discussed above. The second test is based on F test for locating which variables are multicollinear. Yet another test is a t test for finding out the pattern of multicollinearity, that is, for determining which variables are responsible for appearance of multicollinearity.

Compute the variance of regression coefficients  $\sigma_{\hat{\beta}}^2 = \sigma^2 (X'X)^{-1}$  and then compute variance based on standardized variables as  $\sigma_{\hat{\beta}'}^2 = (\sigma')^2$

$r_{xx}^{-1}$ . The elements of the diagonal of the  $r_{xx}^{-1}$  matrix are the variance inflation factors (VIF). These are  $VIF^i = (1 - R_i^2)^{-1}$ . The value of VIF is unity when

$R_i^2 = 0$  and this situation variable  $X^i$  is not correlated to other independent variables. The value of VIF is greater than unity in otherwise. The largest value of VIF (should not exceed 10) is an indicator of the multicollinearity. The mean of VIF is related to the severity of multicollinearity.

The Eigen values are extracted from the explanatory variables. These are variances of linear combinations of the explanatory variables. Now arrange these values in descending order of magnitude. If one or more, at the end, are zero then the matrix is not full rank. These sum to p, and if the  $X^i$  were independent,

each would equal to zero. The condition number is the square root of the ratio of the largest (always the first) to each of the others. If this value exceeds 30 then multicollinearity will be a problem.

**RIDGE REGRESSION**

The best solution is to understand the cause of multicollinearity and then apply RR, PCR or GIR. RR only could be one of the solutions of multicollinearity in this paper. Tychonoff (1943) discussed a regularization, which became popular as ‘Tikhonov Regularization’ (TR) and the most common used in case of ill-posed

problems. He proposed  $\hat{x} = (A'A + \Gamma'\Gamma)^{-1} A'\hat{\beta}$ . TR has been invented independently in many different contexts. It became popular with its application to integral equations from the work of A. N. Tikhonov and D. L. Phillips. That is why some of authors call it ‘Tikhonov-Phillips Regularization’. Hoerl expounded the finite dimensional case only by a statistical approach and it is known as RR. M. Foster interpreted TR as a Wiener-Kolmogorov filter. The regularization of the total least squares problem is based on TR and a generalized version of Tikhonov’s method takes for the linear least square problem. Nair, Hegland and Anderssen (1997) applied TR to ill-posed operator equations. They proposed that assumptions must be made about the choice of the semi norm in the TR and the regularity of the least squares solutions, which one looks for. Qi-nian (1999) proposed a posteriori parameter choice strategy to choose the regularization parameter considering the finite-dimensional approximations of TR for nonlinear ill-posed problems with approximately given right-hand side. Saitoh (2007) used TR for a problem related to inverse problem. He introduced a general theory of TR using the theory of reproducing kernels including error estimates and convergence rates.

H-K (1970 a, b) proposed the technique of RR, which became a popular tool with data analysis faced with a high degree of multicollinearity in their data. They

have suggested adding a small positive quantity in the diagonal elements of the design matrix,  $X'X$  before inverting it, i.e., they proposed  $\hat{\beta}_R = (X'X + kI)^{-1} X'Y$  in lieu of  $\hat{\beta} = (X'X)^{-1} X'Y$ . They showed that  $\hat{\beta}_R$  has smaller mean square error than the OLS estimator, provided k is small enough and the standard regression model holds. Later, H-K (1976) published another popularized article that explored ridge regression as an approach to multiple linear regressions involving ‘poorly-conditioned’ data, that is, non-orthogonal predictor variable matrices. The genesis of RR lies with a paper written by Hoerl (1959) in which he discussed optimization from the response surface point of view. The next step in the development of ridge regression was the paper by Draper (1963), which provided the proofs lacking in Hoerl’s paper. However, H-K (1970 a, b) developed a rigorous statistical basis for the application of ridge regression to the

problem of multicollinearity in multiple linear regression models. Let  $\hat{\beta}_R$  is the ridge estimate of the parameter vector,  $\beta$  in the linear model. Then

$$\hat{\beta}_R = (X'X + kI)^{-1} X'Y \quad 0 < k < 1$$

RR was originally suggested as a procedure for investigating the sensitivity of least squares based on data exhibiting near extreme multicollinearity, where small perturbations in the data may produce large changes in the magnitude of the estimated coefficients. H-K (1970 a, b) introduce the generalized RR estimator (GRE) as

$$\hat{\beta}_{GR} = [X'X + PDP']^{-1} X'Y$$

Where P is the matrix whose columns are orthonormal characteristic vectors of  $X'X$  and D is a diagonal matrix of constants  $d^i \geq 0$ .

If the constants  $d^i$  are all equal and take the value  $d^i = k$ , the GRE reduces to the RE as  $\hat{\beta}_R = (X'X + kI)^{-1} X'Y$ . The procedure of RE actually defines a family of estimators of which OLS estimator is a member for  $k = 0$ , i.e., with  $k = 0$  the RE reduces to OLS estimator. The relation between OLS and RE estimators is as

$$[I + k(X'X)^{-1}] \hat{\beta}_R = \hat{\beta} \text{ and } V(\hat{\beta}_R) = \sigma^2 (X'X + kI)^{-1} X'X (X'X + kI)^{-1}, \text{ where}$$

$V(Y) = \sigma^2 I$  under the classical regression assumption.

Gauss (1809) suggested MSE as the most relevant criterion for choice among estimators. H-K (1970 a, b) gave theoretical justification for RR with the existence

of strictly positive k as  $MSE(\hat{\beta}_R) < MSE(\hat{\beta})$ . Vinod (1976) proved for positive and stochastic  $k^i$   $MSE(\hat{\beta}_{GR}) < MSE(\hat{\beta})$  by interpreting Battacharya’s (1966) estimator as a form of generalized RR. The estimated regression coefficients using RR and OLS are compared in terms of MSE, i. e., the average squared Euclidian distance between the estimate and the parameter. Hawkins (1975) outlined a technique named eigenanalysis and used as estimator, which is identical with RE.

The data matrix  $D = (Y: X)$  could be used to form another matrix  $T = D'D$  which could be diagonalized through an orthogonal matrix A such that  $ATA' = \text{diag}(\lambda^i)$ , where  $\lambda^i$  are eigenvalues of T. If a matrix  $T(k) = T + kI$  is obtained by suitably augmenting the data matrix with dummy observations, then since  $AT(k)A' = \text{diag}(\lambda^i + k)$ , a direct application of the result of Hawkins would lead to estimators which are identical with ridge estimate (RE). RR is closely related to the Bayesian estimation. Generally, if a p-variable normal distribution mean vector  $\beta_0$  and variance-covariance matrix  $V_0$  describes prior information about  $\beta$ , the Bayesian

estimator of  $\beta$  is  $\hat{\beta}_B = [\frac{1}{\sigma^2} X'X + V_0^{-1}]^{-1} [\frac{1}{\sigma^2} X'X + V_0^{-1}] \beta$ . Many authors like Leamer (1978), Zellner (1971), etc. discussed the use of Bayesian method in regression. However, if we select prior mean  $\beta_0 = 0$  and  $V_0 = \sigma_0^2 I$ , then  $\hat{\beta}_B = (X'X + kI)^{-1} X'Y \equiv \hat{\beta}_R$  reduces to the usual ORE, when  $k = \sigma_0^2$ .

**CHOICE OF BIASING PARAMETER**

Much controversy concerning RR centres on the choice of biasing parameter, k. Several authors have suggested methods for selecting the biasing parameter, k in the literatures. No firm recommendation to optimal choice of k seems to emerge. Some of them are as.

Wermuth (1972) suggested the value of k by minimizing the mean squared error of  $\hat{\alpha}_R$  with respect to k.

$$k = \frac{\hat{\sigma}^2 \sum_{i=1}^p \lambda_i (\lambda_i + k)^{-3}}{\sum_{i=1}^p \lambda_i \hat{\alpha}_i^2 (\lambda_i + k)^{-3}}, \text{ where } \hat{\alpha} = P' \hat{\beta} \text{ and } \hat{\alpha}_R = P' \hat{\beta}_R.$$

Dempster (1973) developed an empirical Bayes estimator for a prior distribution of  $\alpha$  given as  $\alpha \sim N(0, W^{-2}I)$ . He then suggested replacing  $\sigma^2$  by  $\hat{\sigma}^2$  and the value of  $k$  is estimated by solving the equation.

$$p = \frac{\sum_{i=1}^p \hat{\alpha}_i^2}{\hat{\sigma}^2 \left( \frac{1}{k} + \frac{1}{\lambda_i} \right)}$$

The ridge trace, as suggested by H-K (1970 a, b), is a two-dimensional plot of  $\hat{\beta}_R$  against  $k$  in the interval  $[0, 1]$ . The second aspect is to determine the value of  $k$ , which gives a better estimate of  $\beta$ .

Theobald (1974) showed the difference of the MSE for  $\hat{\beta}$  and  $\hat{\beta}_R$  is a positive definite matrix, if  $k < \frac{2\sigma^2}{\hat{\beta}'\hat{\beta}}$ . Farebrother (1975) suggested the value of  $k$  that

was empirically smaller optimal value of  $k$  than that of H-K (1970 a, b) and it is  $k = \frac{\hat{\sigma}^2}{\hat{\beta}'\hat{\beta}}$ . H-K and Baldwin (1975) suggested an appropriate choice for  $k$  as

$$k_{\text{HKB}} = \frac{p\hat{\sigma}^2}{\hat{\beta}'\hat{\beta}}, \text{ where } \hat{\beta} \text{ is OLS estimate of } \beta, \hat{\sigma}^2 = (Y - X\hat{\beta})'(Y - X\hat{\beta}) \text{ and } p \text{ is the number of explanatory variables.}$$

Thisted (1976) modified the HKB estimator due to over shrinking towards zero and proposed  $k^T$  as an estimate.

$$k^T = \frac{(p-2)\hat{\sigma}^2}{\hat{\beta}'\hat{\beta}}$$

Schmidt (1976) suggested the value of  $k = \frac{\sigma^2}{\max(\gamma_i)}$ , which unfortunately gives a negative value of  $k$ . Vinod (1978) corrected it that is inefficient compared to Theobald's estimate.

In a subsequent paper H-K (1976) proposed an iterative estimation procedure based on  $k^{\text{HKB}}$ . They suggested the sequence of estimates of  $\beta$  and  $k$ .

$$\begin{aligned} \hat{\beta} &: k^0 = \frac{\hat{\sigma}^2}{\hat{\beta}'\hat{\beta}} \\ \hat{\beta}_R(k_0) &: k^1 = \frac{p\hat{\sigma}^2}{\hat{\beta}_R(k_0)'\hat{\beta}_R(k_0)} \\ \hat{\beta}_R(k_1) &: k^2 = \frac{p\hat{\sigma}^2}{\hat{\beta}_R(k_1)'\hat{\beta}_R(k_1)} \\ &\vdots \\ &\vdots \end{aligned}$$

H-K proved superiority of RE over OLS estimator of a positive  $k$  whose range is  $0 < k < \frac{\sigma^2}{\gamma_0^2}$ , where  $\gamma_0$  is the largest element of vector  $\gamma = P'\beta$ . Vinod (1976 b) advocated a modification of H-K's ridge trace (RT) method to make the optimal choice of biasing parameter more objective and meaningful. One suggestion of Vinod was to plot the regression estimates against  $m$  instead of  $k$ .

$$m = p - \sum_{i=1}^p \lambda_i (\lambda_i + k_i)^{-1}$$

The three main advantages are: (i) it can be used for generalized ridge regression (GRR) too, (ii) it narrows down the range of choice of  $k$  since  $0 \leq k \leq \infty$  corresponds to  $1 \leq m \leq p$ , and (iii) it does not have the unfortunate property of Hoerl and Kennard's RT where even for completely orthogonal data the RT may appear more stable for larger value of  $k$ .

Ullah, Vinod and Kediya (1981) suggested a family of double h-class ridge estimators, of which many earlier methods are special cases. They showed on the basis of MSE criterion the GRR would dominate over OLS estimate for

$$k_i = h^1 \sigma^2 (r_i^1 - h^2 \sigma^2 \lambda_i^{-1})^{-1}$$

They further obtained a single value k as.

$$k = ph^1 \hat{\sigma}^2 (C'C - h^2 \hat{\sigma}^2 \sum \lambda_i^{-1})^{-1} \quad \text{where C is the OLSE of vector Y.}$$

This value of k coincides with those suggested by H-K & Baldwin (1975) and Farebrother (1975) for  $(h^1 = 1, h^2 = 0)$  and  $(h^1 = \frac{1}{P} \text{ and } h^2 = 0)$  respectively.

## CONCLUDING REMARKS

Multicollinearity is suspected frequently for both a theoretical problem and problem with a particular sample of data. The problem of multicollinearity is as old as econometrics itself. At first detect the presence of multicollinearity in the data. Because of its presence in the data the design matrix becomes close to singular and hence the OLS estimate cannot be carried out. RR is an alternative estimation method when there is an extremely high degree of multicollinearity present in the data set (Darlington in 1978). RR is more advanced solution of multicollinearity and it injects small bias but generally greatly reduces the MSE giving more reliable estimates of  $\beta$ .

Singh (2010 b) discussed that a Russian article published by Tychonoff in 1943 became popular as 'Tikhonov Regularization' (TR). TR has been invented independently in many different contexts. It became widely known from its application to integral equations from the work of A. N. Tychonoff and D. L. Phillips. Some authors call the term Tikhonov-Phillips regularization. A. E. Hoerl expounded the finite dimensional case under statistical approach. M. Foster interpreted this method as a Wiener-Kolmogorov filter. Following Hoerl, it is known in the statistics literature as RR. TR is the most commonly used method of regularization of ill-posed problems and in Statistics, the method is also known as RR. It has relation to singular value decomposition and Wiener filter. Anders (2001) suggests that RR is an application of Tikhonov regularization, a method that has been explored in the approximation theory literature for about as long as RR has been used in Statistics.

The RE, different from OLS estimator, is a small positive increment (called biasing parameter) made to the diagonal element of the design matrix before inverting it. However, RE is biased; it has smaller mean square error than OLSE. RE is compared with other biased estimators. The ordinary ridge estimator with a given k is

a biased linear estimator but value of  $\hat{\beta}_R$  in certain interval has smaller mean square error than the OLS estimator. When the value of k is not given a prior and has to be determined from sample observations, the resulting OR estimators are no longer linear and can compete with OLS estimators on equal terms of the same prior information. Shapiro (1984) found that Vinod (1981) demonstrates estimated t-values are highly unstable with collinear data and often change their signs and relative magnitudes, even when the perturbations are minor. Vinod and Ullah (1981) found in general, any violations of the basic assumptions of least squares procedures tend to be more serious in the presence of multicollinearity.

McDonald and Schwing (1973) used the ridge regression procedure for analyzing mortality rates by various socio-economic (weather and pollution) variables. Vinod (1974) modified the canonical correlation analysis in the light of RR and used for estimating a joint production function.

In drawing conclusions one should remind of the fact that the assessment of the ORE and OLSE is based on entirely on the loss in estimation. Since the small sample properties of the non-linear ORE are not known, the ORR procedure is not suited for testing hypotheses. This makes ORR uninteresting for many econometricians and applied statisticians. It would be seen that the ORR might well become a powerful tool in forecasting, particularly in situations where a high degree of multicollinearity makes the OLS forecast unstable.

Although measure of credit is attributed to H-K for RR, which was published latter in the year 1970 in an English publication, widely circulated and read by the researchers. In contravention to the actual credit of Tychonoff for TR, this was published much earlier in the year 1943 in Russian language, which neither was widely circulated nor popular among the researchers. Moreover, it is appropriate to give higher credit to TR which gives findings of more general nature than RR by H-K which highly contextual in nature. Therefore, this controversy of attributing credit remains putting TR at disadvantage for lesser circulation in language of limited readership. Singh (2011) concluded that it is highly appropriate and legitimate to give credit to Tychonoff's TR which gave findings of more general than H-K's RR which highly contextual in nature. Singh (2010 a) found that it is similar to disadvantage born by Gauss who was profounder and user of 'Method of Least Squares' since 1794 without publishing whereas the credit was taken by Legendre who published the method much latter in 1805.

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**AN IMPACT OF CELEBRITY ENDORSEMENT ON THE BUYING BEHAVIOR OF YOUTH**

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**ABSTRACT**

*The crescendo of celebrities endorsing brands has been steadily increasing over the past 20 years or so. Marketers overtly acknowledge the power of celebrity in influencing buyer's purchase decision. They have firm believe that likeability or a favorable attitude towards a brand is created by the use of a celebrity. Celebrity endorsement can bestow unique features or special attributes upon a product that it may have lacked otherwise. Marketers had identifies this need and had come up with the concept of celebrity endorsements which is a very potential mean of alluring and enticing the youth towards their product or service offerings. Marketers are spending huge amount of money for celebrity endorsements so it is of utmost importance to understand the credibility of these advertisements. Because if young population is not influenced by the celebrity endorsers then the money spent is nothing but a waste. Objectives of this study behind this research paper which we are going to conduct on the Impact of Celebrity Endorsement on the Buying Behavior of Youth are: (1) To study the youth's attitudes and beliefs towards celebrity endorsement. (2) To study the impact of celebrity endorsement on instant brand awareness and recall. (3) To find out the relationship between the celebrity endorsement and youth buying behavior if any. In this study, the research design will be Descriptive Research Design.*

**KEYWORDS**

Celebrity endorsement, Consumer buying behavior, Brand Awareness, Advertising.

**INTRODUCTION**

In India from late 1970's and early 80's the new trend in advertising started. Brands started being endorsed by celebrities. Hindi film and TV stars as well as sportspersons were roped in to endorse prominent brands. Advertisements featuring stars like Late Jalal Agha (Pan Parag), Tabassum (Prestige cookers), and Sunil Gavaskar for Dinesh Suiting, Ravi Shastri and Vivian Richards (Vimal), Kapil Dev (Palmolive Shaving cream) became Common man.

Though marketers should remember that celebrities are mere living beings like us and if they can highlight the benefits or advantages of a brand they can also have some uncanny negative impact. Theory and practice suggests that the use of stars and their unleashing power in advertising generate a lot of publicity and attention from the public but the underline questions are, do these stars really help a brand by increasing its sales? On the other hand, can they really have an Impact on the person's consumption pattern, thereby changing his brand preference? How an advertisement featuring a celebrity can influence consumers buying decision and can create an association between a brand and a common man.

To answer these questions, the research paper will examine the relationship between celebrity endorsements and brands, and the Impact of Celebrity Endorsement on Buying Behavior of Youth. We will apply a wide range of accepted principles of how consumers brand attitudes and preferences can be influenced, how buyer's behavior can be influenced, how buyer's behavior can be molded. We will use the principles of credibility of source and attractiveness, the match-up hypothesis, the consumer decision-making model to understand this phenomenon.

**BRAND- A LAYMAN PERSPECTIVE**

Brand is the proprietary visual, emotional, rational and cultural image that you can associate with a company or the product. Few examples will bring the meaning i.e. Amul - utterly butterly delicious; Coke – thanda matlab coca-cola; Pepsi – Yeh dil mange more; Kurkure- Masti bole to kurkure and Daewoo ka India. These examples convey one message that when people watch advertisement a connect is being created and result is that people go for experience of buying. People feel by using the brand they will portray certain traits or characteristics that otherwise they do not have. This generates a certain level of emotional affiliation and a sense of fulfillment. It is this emotional relationship with brands that make them so powerful.

**CELEBRITY**

Celebrities are the people who enjoy public recognition and mostly they are the experts of their respective fields having wider influence in public life and societal domain. Attributes like attractiveness, extraordinary life style or special skills, larger than life image and status can be associated with them. Celebrities appear in public in different ways. To start, they appear in public when fulfilling their professional commitments **example:** Mahendra Singh Dhoni, who played cricket in front of an audience in Twenty-Twenty World Cup. Furthermore, celebrities appear in public by attending special celebrity events, **example:** the movie award nights; special screening; world premieres of movies or for social causes. These celebrities have universal presence and appeal, they are present everywhere, in news, fashion shows and magazines, tabloids and above all advertisements.

Celebrity endorsements are powerful, has become evident from the above two examples but, why is it so? This power is offered by the following elements, which also creates a "Top of the Mind Position".

- Instant Awareness, knowledge about the brand and easy recall
- Values and image of the brand is defined, highlighted and refreshed by the celebrity
- The celebrity adds new edge and dimension to the brand
- Credibility, trust, association and connectivity to brand
- Belief in efficiency and new appearance that will result in at least trial usage

**UNDERSTANDING CONSUMER BEHAVIOR**

Consumer behavior is the study of how people buy, what they buy, when they buy and why they buy. It blends elements from psychology, sociology, social psychology and economics. It attempts to understand the buyer decision-making process, both individually and in groups. It studies characteristics of individual consumers such as demographics, psychographics, and behavioral variables in an attempt to understand people's wants. It also tries to assess influences on the consumer from groups such as family, friends, reference groups, and society in general.

The study and knowledge of consumer behavior helps firms and organizations to improve their marketing strategies and product offerings. Following are the important issues that have significant influence on consumer's psyche and their ability to take decisions:

- The psychology of how consumers think, feel, reason, and select between different alternatives (e.g., brands, products)
- The psychology of how the consumer is influenced by his or her environment (e.g., culture, family, signs, media)
- The behavior of consumers while shopping or making other marketing decisions
- Limitations in consumer knowledge or information processing abilities influence decisions and marketing outcome
- How consumer motivation and decision strategies differ between products that differ in their level of importance or interest that they entail for the consumer
- How marketers can adapt and improve their marketing campaigns and marketing strategies to more effectively reach the consumer
- Their Age, Religion, Culture, Income, informal group and Referent Group

## CELEBRITY ENDORSEMENT IN INDIA

### ➤ PHASE 1: THE PIONEERING PHASE (1950-1980)

This phase was characterized by: -

1. Limited channels of communication
2. Demand exceeded supply
3. Heavy regulation and governmental regulations

Some bigger companies from their global experience introduced the concept of celebrity endorsement. HLL has used Hindi film stars to endorse their beauty soap Lux since the fifties.

### ➤ PHASE 2: THE GROWTH PHASE (1980-1990)

The introduction of television added a variable effective medium of communication. Indian stars going global with events like World Cup victory. Vimal, Thums-Up, Gwalior and Dinesh are some of the other brands that used star-appeal in the early days of mass advertising.

There was a spurt of advertising, featuring stars like Tabassum (Prestige Pressure-cooker), Jalal Agha (Pan Parag Pan-masaala), Kapil Dev (Palmolive Shaving Cream) and Sunil Gavaskar (Dinesh Suitings)

### ➤ PHASE 3: GLOBALIZATION

In highly competitive markets, the following realities about brand management exist: -

1. Product differentiating factors are duplicable and imitable
2. All long existing and successful brands imbue their products with a meaning

## REVIEW OF LITERATURE

**Byrne, Whitehead and Breen (2003)** has observed in their study on "The Naked Truth of Celebrity Endorsement" that the use of celebrity endorsement in the formation of the retail image of leading European grocery distribution group J. Sainsbury, in particular, the process of transference of celebrity images to the product's image. The incorporation of Jamie Oliver (well known as television celebrity The Naked Chef) into the promotions of one of Britain's leading grocery chains involves a high profile campaign that has been adopted in order to imbue the company's products with an image of quality.

**Combs (2008)** observed in his study on "Impact of Celebrity Endorsement on overall Brand" that "Overall, celebrities has the power to motivate civic engagement regardless of their own grasp of the issues at hand," the researchers concluded. "Celebrity' presence and support of political involvement continue to be prominent in our society today, especially during this 2008 Presidential election."

**Dwane Hal Dean (1999)** has conducted a study "Capitalizing on the Value of a Brand Name for Manufacturer Prospective" and he observed that the effects of 3 extrinsic cues viz. Third party endorsement, event sponsorship and brand popularity on brand/manufacturer evaluation. It was observed that endorsement significantly affected only product variables (quality and uniqueness) and one image variable (esteem). The third party endorsement hence may be perceived as a signal of product quality.

**Forkan (1975)** has observed in his study on "Importance of Celebrity Endorsement" that use of celebrity spokespersons has been on the rise. A 1975 Gallup and Robinson study estimated that 15 percent of prime time television commercials featured celebrities. By 1978, the number was reported to be over 20 percent. According to a recent report, individuals in the advertising field were said to agree that celebrities are being sought out to endorse products as never before. Given this increase in use, research on celebrity endorsements becomes increasingly important to advertisers. This is especially true since past empirical research has shown celebrities to be well liked and oftentimes attractive, though not always credible and effective spokespersons.

**Freiden (1994)** has conducted a study on "Celebrity Endorser as Credible Spokesperson" and He concluded that celebrities are particularly effective spokespersons because they are viewed as highly trustworthy, believable, persuasive, and likeable. A credible spokesperson is, other things being equal, more effective than a less credible spokesperson.

**Friedmen (1976)** has conducted a study on "The Power of Brand" and he analyzed in his study that Using advertisements with celebrities and non-celebrities for a fictitious brand of sangria wine, found that the celebrity version of the advertisement had higher scores on probable taste, advertising believability, and purchase intention – the three dependent variables. However, the wine was a fictitious brand, and the celebrity simply brought recognition to the name. The paucity of research comparing celebrity with non-celebrity spokespersons highlights the need for continued investigation into this area. It is important for advertisers to clearly understand both the pros and cons of using such individuals to represent their products, causes, or organizations; and ultimately the advertisers must assess the effectiveness of such a message.

**Gupta (2007)** has conducted a study on "Impact of Celebrity Endorsement on Consumer Buying Behavior" and has analyzed in the study that the field of consumer behavior is the study of individuals, groups or organizations. Understanding the consumer behavior is the prime and very difficult task for every marketer. There are a lot of factors, which influence consumer buyer behavior. Marketers pay millions of dollars to celebrity endorsee hoping that the stars will bring their magic to brand they endorse and make them more appealing and successful. Celebrity attracts more attention through the advertisement than other local advertisements without the celebrity. Consumers may identify with or desire to emulate the celebrity.

**Hovland (1953)** has conducted a study on "Whom to Choose as Celebrity?" and has observed that in encoding the message in the context of celebrity endorsement, perhaps the most important decision to be made, besides choosing whether or not to use celebrity endorsers at all, is the choice of celebrity. Much research has been made in this area and several models have been made to explain and assist in the celebrity endorsement selection process.

**Kambitsis (2002)** has conducted a study in which he studied that Celebrity endorsement is a billion dollar industry today with companies signing deals with celebrities hoping that they can help them stand out from the clutter and give them a unique and relevant position in the mind of the consumer. The reason for using celebrity endorsement involves its potential to create awareness, positive feelings towards their advertising and brand. Advertisement featuring celebrity endorsement is often also perceived to be entertaining.

**Katyal (2008)** has conducted a study on "Successful celebrity endorsements for a brand- An Indian perspective" and has analyzed that India is one country, which has always idolized the stars of the celluloid world. Therefore it makes tremendous sense for a brand to procure a celebrity for its endorsement. In India there is an exponential potential for a celebrity endorsement to be perceived as genuinely relevant, thereby motivating consumers to go in for the product. This would especially prove true if the endorser and the category are a natural lifestyle fit like sportspersons and footwear, Kapil - Sachin and Boost or film stars and beauty products.

**King (1991)** argues that a good strategy to build strong brand equity is to create an "original metaphor for the brands' personality" They talk about the factors involved in building a brand such as: Presence, Relevance, Differentiate, Credibility, and Imagery. The credibility factor especially has been looked at by several

researchers in celebrity endorsement the same has presence and also to some extent imagery and differentiate. Relevance in this context can be looked at as a result of success in the other areas, as it concerns being perceived as relevant for the consumer.

**King (1998)** has conducted a study on "The Relative Effectiveness of Celebrity Endorsement for Beauty, High and Low Involvement Product Print Advertisements" and has analyzed that the paper consists of two research projects. In the first research project, the matches between the products concerned and a number of celebrities were analyzed. In the second research project advertisements with the best and worst product-celebrity matches, respectively, are compared with advertisements with a picture of an anonymous person and advertisements without a celebrity or picture.

**Mukherjee (2009)** has conducted the study on "Impact of Celebrity Endorsements on Brand Image" and has observed in his study that Celebrity endorsement has been established as one of the most popular tools of advertising in recent time. It has become a trend and perceived as a winning formula for product marketing and brand building. It is easy to choose a celebrity but it is tough to establish a strong association between the product and the endorser.

**Obanian (1990)** has conducted a study "The Role of Emotions in Marketing" and he analyzed in his study that developed a source credibility measure that operationalizes credibility as consisting of the underlying dimensions of expertise, trustworthiness and attractiveness.

**Prasad and Girdhar (2005)** has conducted a study on "Impact of Celebrity Endorsement on Overall Brand" and has analyzes that Celebrity endorsements are an omnipresent feature of present day marketing. The modern corporation invests significant amounts of money to align itself and its products with big-name celebrities in the belief that they will (a) draw attention to the endorsed products/services and (b) transfer image values to these products/services by virtue of their celebrity profile and engaging attributes. The consumer of today is becoming smarter and takes well informed decisions.

**Solomon (2002)** has conducted the study on "Celebrity Endorsement in Risk Regime" and has observed that celebrities being most effective in situations involving high social risk, where the buyer is aware of the impression peers will have of him or her. According to him, a celebrity endorser is relatively more effective for products high in psychological or social risk, involving elements as good taste, self image, and opinion of others, compared to a "normal" spokesperson. Expert opinions were considered most useful when the product endorsed was perceived to involve high, financial, performance, or physical risk.

## OBJECTIVES OF THE STUDY

### 1. TO STUDY THE YOUTH'S ATTITUDES AND BELIEFS TOWARDS CELEBRITY ENDORSEMENT

This objective will try helping understand about the attitudes and beliefs of young population towards celebrity endorsement. Definitely positive attitudes and beliefs will show that the celebrity endorsement has some positive impact on the young consumers.

### 2. TO STUDY THE IMPACT OF CELEBRITY ENDORSEMENT ON INSTANT BRAND AWARENESS AND RECALL

The rationale behind this objective is to determine if celebrity endorsement help in creating brand awareness and recall for a particular brand or not. The objective of advertisements is to create awareness amongst the customers regarding a particular offering. Hence studying this as an objective will help in determining the importance of celebrity endorsement in brand awareness and brand recall.

### 3. TO FIND OUT THE RELATIONSHIP BETWEEN THE CELEBRITY ENDORSEMENT AND YOUNG CONSUMERS' BUYING BEHAVIOR IF ANY

The rationale behind this objective is to find out if there is some relation between celebrity endorsement and young population's buying behavior. Positive relation will show that celebrity endorsement can help driving the sales of particular product or service by influencing the buying behavior.

## NEED FOR THE STUDY

Humans have always been attracted by role models. India is a growing and young country because most of the population in India is young and for these young population celebrities act as role model who they try to match in cloths, accessories and many other things.

Marketers had identifies this need and had come up with the concept of celebrity endorsements which is a very potential mean of alluring and enticing the youth towards their product or service offerings. Marketers are spending huge amount of money for celebrity endorsements so it is of utmost importance to understand the credibility of these advertisements. Because if young population is not influenced by the celebrity endorsers then the money spent is nothing but a waste.

As in this competition era you must be aware about the customer needs & wants and what a consumer expects from the company. You must have this information or a customer data base if u wants to stay in the market to get competitive edge in the market. After conducting this study we must be able to understand: what is the impact of celebrities, advertising the product of the company, on the buying behavior of the customers, what are the factors which forces them to purchase that particular brand. So the study is very important in assessing the importance of celebrity endorsement. The study will try to throw some light on the various aspects of the celebrity endorsement.

## SCOPE OF THE STUDY

The study will be conducted on the young population so as to know the impact of celebrity endorsements on them and their buying behavior. This study will be conducted only on youth and hence will be one of its kinds in the region of Jalandhar city (Punjab).

The study will try to throw light on this topic of Celebrity Endorsement. This study will be helpful for the companies who are in their respective business segment. They will be able to know the attitudes, beliefs of young consumer towards celebrity endorsement & also will help them to change the non user into user of their brand & retain their existing customer by providing them the products which they want from the company. This study will help them to formulate & implementing the marketing strategies.

## RESEARCH METHODOLOGY

### RESEARCH DESIGN

Research Design is a map or blueprint according to which the research is to be conducted. In the present study, the research design will be **Descriptive Research Design**. Descriptive research includes survey and fact finding enquiries. The research design specifies the method of data collection and data analysis.

### DATA COLLECTION METHOD

A research design is an arrangement of conditions for collection and analysis of Data in a manner that aims to combine relevance to the research purpose with Economy in procedure. It constitutes the blueprint for collection, measurement and analysis of data.

- Primary data:** These are those data which are collected afresh and for the first time, and thus happen to be original in character. We will be using the structured questioners.
- Secondary data:** These are those which have already been collected by someone else and which have already been passed through the statistical process. We will collect it from the sources like internet, published data etc.

### SAMPLING PLAN

#### Sampling Technique

First step in sampling plan is to decide the Sampling Technique, Universe or Population.

We will be going to choose the sample according to the "Convenience Sampling". Once the universe is decided the researcher must concern himself to find:

- What sampling unit should be studied?
- What should be the sampling size?
- What sampling procedure should be used?

#### Universe

The first step in developing any sample design is to clearly define the set of objects, technically called the universe. In present research, universe will be the ultimate consumers of the product in Jalandhar city (Punjab).

**Geographical Location**

The present research will be conducted in Jalandhar city.

**Sampling Unit**

The basic thing is to be decided in sampling unit who is to be surveyed. In the present study, the sampling units will be the respondents who are the ultimate consumers of the product i.e. Young population ranging between the ages of 16 to 25.

**Sample Size**

The second issue is to be decided is 'The Sample Size'. The whole of the universe can't be studied in a single research work. The researcher has to select a relevant fraction of the population or universe. In the present study the sample size will be of 200 Respondents.

**HYPOTHESIS**

**Objective 1: To study the youth's attitudes and beliefs towards celebrity endorsement.**

**H0:** The Attitudes and Beliefs of Youth towards Celebrity Endorsement are negative

**H1:** The Attitudes and Beliefs of Youth towards Celebrity Endorsement are positive

**Objective 2: To study the impact of celebrity endorsement on instant brand awareness and recall.**

**H0:** Celebrity Endorsement does not have an Impact on Brand Awareness

**H1:** Celebrity Endorsement has an Impact on Brand Awareness

**Objective 3: To find out the relationship between the celebrity endorsement and youth buying behavior if any.**

**H0:** There is no significant relationship between the celebrity endorsement and buying behavior of youth.

**H1:** There is a relation between the Celebrity Endorsement and Youth Buying Behavior.

**DATA ANALYSIS & INTERPRETATION**

➤ **If the product is good, it doesn't need any advertisement by Stars/Actors/Celebrities**

χ<sup>2</sup> Tests

	Value	df	Asymp.Sig.2-(Sided)
Pearson χ <sup>2</sup>	9.405 <sup>2</sup>	4	.052
Likelihood Ratio	7.758	4	.101
No. of valid cases	200		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 1.25.

**Interpretation:** As per the above result, 'P' value is equal to 0.052 which states that Null Hypothesis is accepted because 'P' value is greater than Level of Significance which was 0.05. So in this case, Alternative Hypothesis is not accepted and we can say that there is no significant relation between Celebrity endorsement and Buying Behavior of Youth and also there is no Impact of endorsing Celebrity in the advertisements on Buying Behavior of Youth.

➤ **Companies are laying more emphasis on celebrity endorses rather than product attributes/features**

χ<sup>2</sup> Tests

	Value	df	Asymp.Sig.2-(Sided)
Pearson χ <sup>2</sup>	2.882 <sup>2</sup>	4	.578
Likelihood Ratio	2.909	4	.573
No. of valid cases	200		

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.90

**Interpretation:** As we can see in the result, 'P' value is equal to 0.578 which states that Null Hypothesis is accepted because 'P' value is greater than Level of Significance which was 0.05. So in this case, Alternative Hypothesis is not accepted and we can say that there is no significance relation between Celebrity endorsement and Buying Behavior of Youth and also there is no Impact of endorsing Celebrity in the advertisements on Buying Behavior of Youth.

➤ **Products & Services endorsed by celebrities are 'classy' (high class)**

χ<sup>2</sup> Tests

	value	df	Asymp.Sig.2-(Sided)
Pearson χ <sup>2</sup>	2.640 <sup>2</sup>	4	.620
Likelihood Ratio	2.651	4	.618
No. of valid cases	200		

c. .2 cells (20.0%) have expected count less than 5. The minimum expected count is 2.30

**Interpretation:** As we can see in the result, 'P' value is equal to 0.620 which states that Null Hypothesis is accepted because 'P' value is greater than Level of Significance which was 0.05. So in this case, Alternative Hypothesis is not accepted and we can say that there is no significance relation between Celebrity endorsement and Buying Behavior of Youth and also there is no Impact of endorsing Celebrity in the advertisements on Buying Behavior of Youth.

➤ **Advertisements endorsed by celebrities are irritating**

χ<sup>2</sup> Tests

	value	df	Asymp.Sig.2-(Sided)
Pearson χ <sup>2</sup>	3.336 <sup>2</sup>	4	.503
Likelihood Ratio	3.348	4	.501
No. of valid cases	200		

d. 0 cells (.0%) have expected count less than 5. The minimum expected count is .598

**Interpretation:** As we can see in the result, 'P' value is equal to 0.503 which states that Null Hypothesis is accepted because 'P' value is greater than Level of Significance which was 0.05. So in this case, Alternative Hypothesis is not accepted and we can say that there is no significance relation between Celebrity endorsement and Buying Behavior of Youth and also there is no Impact of endorsing Celebrity in the advertisements on Buying Behavior of Youth.

➤ **Products & Services endorsed by celebrities are expensive**

χ<sup>2</sup> Tests

	Value	df	Asymp.Sig.2-(Sided)
Pearson χ <sup>2</sup>	4.863 <sup>2</sup>	4	.302
Likelihood Ratio	4.743	4	.315
No. of valid cases	200		

e. 4 cells (40.0%) have expected count less than 5. The minimum expected count is .38

**Interpretation:** As per the above result, 'P' value is equal to 0.302 which means that Null Hypothesis is accepted because 'P' value is greater than Level of Significance which was 0.05. So in this case, Alternative Hypothesis is not accepted and because there is huge difference between 'P' value and Level of Significance we can say that there is no Impact of endorsing Celebrity in the advertisements on Buying Behavior of Youth.

➤ **Celebrity Endorsement is increasing hedonism & materialism in youth/society** $\chi^2$  Tests

	Value	df	Asymp.Sig.2-(Sided)
Pearson $\chi^2$	1.905 <sup>2</sup>	4	.753
Likelihood Ratio	1.732	4	.785
No. of valid cases	200		

f. 4 cells (40.0%) have expected count less than 5. The minimum expected count is .38

**Interpretation:** As per the above result, 'P' value is equal to 0.753 which tells us that Null Hypothesis is accepted because 'P' value is greater than Level of Significance which was 0.05. So in this case, Alternative Hypothesis is not accepted and we can say that there is no significant relation between Celebrity endorsement and Buying Behavior of Youth and also there is no Impact of endorsing Celebrity in the advertisements on Buying Behavior of Youth.

➤ **Advertisements endorsed by celebrities are reliable** $\chi^2$  Tests

	Value	df	Asymp.Sig.2-(Sided)
Pearson $\chi^2$	1.259 <sup>2</sup>	4	.868
Likelihood Ratio	1.155	4	.885
No. of valid cases	200		

g. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 1.50.

**Interpretation:** As we can see in the result, 'P' value is equal to 0.868 which states that Null Hypothesis is accepted because 'P' value is greater than Level of Significance which was 0.05. So in this case, Alternative Hypothesis is not accepted and because of huge gap between 'P' value and Level of Significance we can say that there is no significance relation between Celebrity endorsement and Buying Behavior of Youth and also there is no Impact of endorsing Celebrity in the advertisements on Buying Behavior of Youth.

➤ **Advertisements endorsed by celebrities are amusing**

## CHI-SQUARE TESTS

	Value	df	Asymp.Sig.2-(Sided)
Pearson $\chi^2$	4.556 <sup>2</sup>	4	.336
Likelihood Ratio	4.229	4	.376
No. of valid cases	200		

h. 4 cells (40.0%) have expected count less than 5. The minimum expected count is .63.

**Interpretation:** As we can see in the result, 'P' value is equal to 0.336 which states that Null Hypothesis is accepted because 'P' value is greater than Level of Significance which was 0.05. So in this case, Alternative Hypothesis is not accepted and we can say that there is no significant relation between Celebrity endorsement and Buying Behavior of Youth and also there is no Impact of endorsing Celebrity in the advertisements on Buying Behavior of Youth.

➤ **Celebrities should be used in advertisements**

## CHI-SQUARE TESTS

	Value	df	Asymp.Sig.2-(Sided)
Pearson $\chi^2$	7.758 <sup>2</sup>	4	.101
Likelihood Ratio	7.016	4	.135
No. of valid cases	200		

i. 4 cells (40.0%) have expected count less than 5. The minimum expected count is .63.

**Interpretation:** As we can see in the result, 'P' value is equal to 0.101 which states that Null Hypothesis is accepted because 'P' value is greater than Level of Significance which was 0.05. So in this case, Alternative Hypothesis is not accepted and we can say that there is no significance relation between Celebrity endorsement and Buying Behavior of Youth and also there is no Impact of endorsing Celebrity in the advertisements on Buying Behavior of Youth.

➤ **Use of celebrity in advertisements has any impact on purchase decision of Buyers**

## CHI-SQUARE TESTS

	Value	df	Asymp.Sig.2-(Sided)
Pearson $\chi^2$	2.777 <sup>2</sup>	4	.596
Likelihood Ratio	2.866	4	.580
No. of valid cases	199		

j. 4 cells (40.0%) have expected count less than 5. The minimum expected count is .50.

**Interpretation:** As we can see in the result, 'P' value is equal to 0.748 which states that Null Hypothesis is accepted because 'P' value is greater than Level of Significance which was 0.05. So in this case, Alternative Hypothesis is not accepted and we can say that there is no significance relation between Celebrity endorsement and Buying Behavior of Youth and also there is no Impact of endorsing Celebrity in the advertisements on Buying Behavior of Youth.

**CONCLUSION**

In the end we can conclude on the basis of the above research that there is a positive attitude and beliefs of youth towards celebrity endorsement because in the above research most of the respondents show positive attitude towards celebrity endorsement. But endorsing the celebrity in the advertisements doesn't have an impact on the brand awareness and it was shown in the above research with the help of Chi – square test which shows that Celebrity Endorsement does not have any Impact on Brand Awareness among the people. Again as per the above findings, there is no significant relationship between the celebrity endorsement and the buying behavior of youth which states that youth buy the products as per their own wish and not because of any celebrity.

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## A STUDY ON ANALYSIS OF SHARE PRICE MOVEMENTS OF THE SELECTED INDUSTRIES BASED ON NIFTY STOCKS

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### ABSTRACT

*The Indian capital market is one of the oldest and largest capital markets of the world. The Indian capital market has witnessed a tremendous growth. The rapid industrialization in the country since independence has given to the capital market. Investment play an important part of the economy of any nation in various investment options available to the people, the money acts as the drive for growth of the country. Indian financial scene too presents multiple avenues to the investors. Though not the best or deepest of markets in the world, it has ignited the growth rate in share market to provide reasonable options for an ordinary man to invest his savings. Securities are investment vehicles that help small investors to take a big ride through capital market, which is not possible individually with small amount of investment. It includes high risk and high profit. In this study the performance of the share price movements based on special reference to the nifty stocks has been analyzed using the various performance analysis tools namely moving average, beta analysis, correlation analysis has been used to analyze the performance and to measure the risk and return of the nifty stocks.*

### KEYWORDS

share price movements, NIFTY exchange.

### INTRODUCTION

The Indian capital market is one of the oldest and largest capital markets of the world. The Indian capital market has witnessed a tremendous growth. The rapid industrialization in the country since independence has given to the capital market. The world equity market of the country has to contribute for the drastic growth in the economy of the country. A marked awareness in equity investment is evident throughout the world nowadays. Equity shares serve as a first-class medium for investment. They bring in reasonable returns with prospects of capital appreciation. They are safe, easily marketable and have liquidity. The security markets in India have made enormous progress in developing sophisticated instruments and modern markets mechanisms. The real strength of the Indian securities market lies in the quality of regulation. The market regulator, Securities and Exchange Board of India (SEBI) is an independent and effective regulator. It has put in place sound regulations in respect of intermediaries, trading mechanism, settlement cycles, risk management, derivatives trading and takeover of companies. The growing number of market participants, the growth in volume of securities transaction, the reduction in transaction costs, the significant improvement in efficiency, transparency and safety and the level of compliance with international standards have earned for the Indian securities market a new respect in the world. Investment is the choice by the individual to risk his savings with the hope of gain. Rather than store the good produced, or its money equivalent, the investor chooses to use that good either to create a durable consumer or producer good, or to lend the original saved good to another in exchange for either interest or a share of the profits. In the first case, the individual creates durable consumer goods, hoping the services from the good will make his life better. In the second, the individual becomes an entrepreneur using the resource to produce goods and services for others in the hope of a profitable sale. The third case describes a lender, and the fourth describes an investor in a share of the business.

### STATEMENT OF THE PROBLEM

Any investment is the postponement present consumption and the same will be consumed in later period expecting more return or make available of more value for the future consumption. But there are so many avenues for the investors among which the recently popular and the widely accepted option of investment are corporate shares. In this, the investors indirectly participating in the profit of the organization. The investors investing in stocks not only for the share in profit but also capital appreciation. But in a stock investment there are two types of factors affecting the share price movements. One is fundamentals of the economy and the corporate, another technical movements or market psychology.

Any positive or negative news affects the market price of the Shares; therefore there is a risk in investing in the shares because of the volatility in the stock market due to the news about the economy performance of the company or any news.

### HENCE THE FOLLOWING QUESTIONS RAISED IN THE MIND OF THE RESEARCHER,

- The NIFTY companies are set to be safe for investment. If so what is the changes in the share price for the specific period..?
- What is the percentage of change in return..?
- What is the volatility in the NIFTY share..?

### OBJECTIVES OF THE STUDY

- To study the share price movements of the selected nifty shares.
- To study the average return of the share and its consistency.
- To study the volatility in the NIFTY shares.

### HYPOTHESIS

- The NIFTY share prices consistently increased over the period.
- The NIFTY share prices are not much volatile.

### SCOPE OF THE STUDY

Index movement of the stock exchange is the clear indicator of the fluctuation which acts as guideline for the investors. The movement of index can be captured by the nature of relationship between beta, returns and volatility. This study has been attempted to find out how far the beta will act as an indicator for the investors to take decision. The study was also helpful for the new investors, researchers, brokers etc., for decision making.

**METHODOLOGY**

Research is an organized, systematic, data based, critical, objective, scientific inquiry, or investigation in to a specific problem, undertaken with the purpose of finding answers of solutions to it. Research design is the plan, structure, and strategy of investigation conceived to obtain answers to research questions and to control variance. In other words, Research design is the blue print for the collection measurements and analysis data.

**TYPE OF RESEARCH**

Since the researcher has used facts and information already available and analyzes these to make a critical evaluation of material, it is an Analytical research

**SOURCE OF DATA**

All the data are collected from various websites like nseindia.com and bseindia.com for the share prices and SENSEX, indiainfoline.com and corresponding websites of each company.

**NATURE OF DATA**

Since all the data were collected from already available websites the nature of data is secondary.

**PERIOD OF STUDY**

The period of study is five years from 2005-2010.

**DATA COLLECTION**

Data collection methods are an integral part of research design. There are several data collection methods, each with its own advantages and disadvantages. Problems researched with the use of appropriate methods greatly enhance the value of the research.

Data can be collected in a variety of ways, in different settings field or lab and from different sources. The data are classified in to two categories, primary and secondary data.

**SECONDARY DATA**

Secondary data can be obtained from company records or archives, Government publication, Industry analysis offered by the media, Website, The Internet, and so on. In this survey the secondary data are collected from the books, magazines, journals and websites.

**TOOLS OF ANALYSIS**

- Moving Average
- Beta

**MOVING AVERAGE**

The word moving average means that the body of the data moves ahead to include the recent observations. If it is a five day moving average on the sixth day the body of the data moves to include the sixth day observation. Likewise it continues. In the moving average calculation closing price of the stock is used.

**BETA**

Beta is the slope of the characteristic regression line. Beta describes the relationship between the stock's return and index returns.

**BETA = + 1.0**

One percent change in the market index return causes exactly one percent change in the stock return. It indicates that the stock moves in tandem with the market.

**BETA = + 0.5**

One percent change in the market index return causes 0.5 percent change in the stock return. The stock is less volatile compared to the market.

**BETA = + 2.0**

One percent change in the market index return causes 2 percent change in stock return. The stock return is most volatile. When there is a decline of 10 percent in the market return. The stock with the beta of 2 would give negative return of 20 percent. The stock with more return than 1 beta value is considered to be risky.

**NEGATIVE BETA**

Negative beta value indicates that the stock return moves in the opposite direction to the market return. A stock with the negative of - 1 would provide a return of 10 percent, if the market return declines by 10 percent and vice versa.

Stock with negative beta, resist the decline in the market return, but stocks with negative returns are very rare.

**ANALYSIS AND INTERPRETATION****ANALYSIS**

Analysis of data means studying the tabulation material in order to determine inherent facts these means breaking down the complex factors in new arrangements of simpler parts for the purpose of interpretation.

**INTERPRETATION**

Interpretation refers to the task of drawing inference from the collected facts after an analytical and or experimental study. In fact, it is a search for broader meaning of research findings. The task of interpretation has major two aspects viz., (i) the effort to establish continuity in research through linking the result of a given study with those of another and (ii) the establishment of some explanatory concepts.

**MOVING AVERAGE**

The market indices do not rise or fall in a straight line. The upward and downward movements are interrupted by counter moves. The underlying trend can be studied by smoothening the data. To smooth the data moving average technique is used.

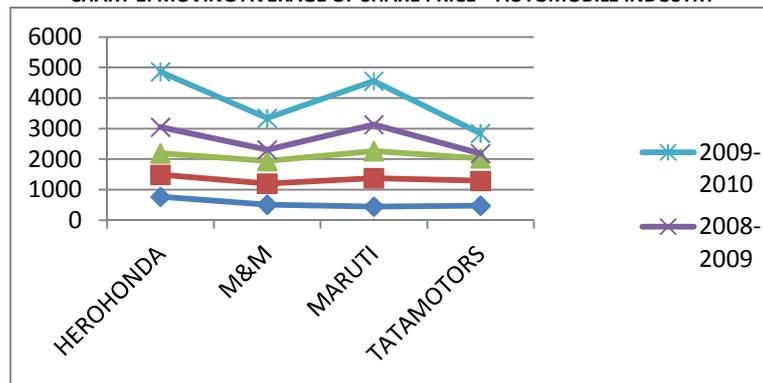
**ANALYSIS OF MOVING AVERAGE OF AUTOMOBILE INDUSTRY**

The following table shows the yearly average of companies which are coming under automobile industry of NIFTY shares. These average have been calculated by taking the daily share price (closing price).

**TABLE 1: SHOWING MOVING AVERAGE OF SHARE PRICE (Values in Rs.)**

Company/Year	2005-2006	2006-2007	2007-2008	2008-2009	2008-2010
HEROHONDA	764.97	722.3	699.94	857.81	1811.94
M&M	512.9	686.21	744.93	361.86	1031.79
MARUTI	445.42	931.63	887.97	865.15	1425.63
TATAMOTORS	474.56	813.47	740.97	155.33	657.57

CHART 1: MOVING AVERAGE OF SHARE PRICE – AUTOMOBILE INDUSTRY



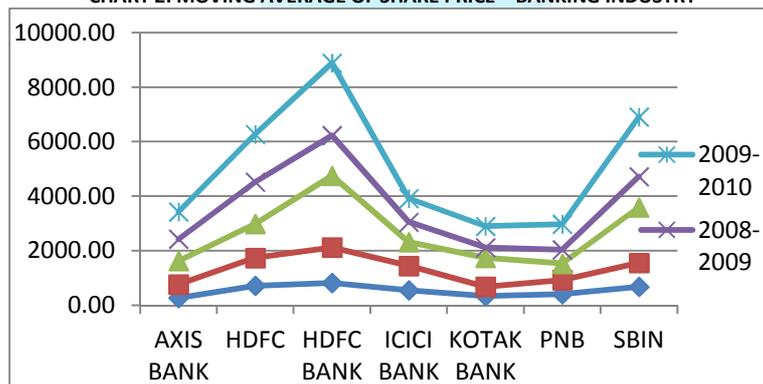
**ANALYSIS OF MOVING AVERAGE OF BANKING INDUSTRY**

The following table shows the yearly average of companies which are coming under automobile industry of NIFTY shares. These averages have been calculated by taking the daily share price (closing price).

TABLE 2: SHOWING MOVING AVERAGE OF SHARE PRICE (Values in Rs.)

Company/Year	2005-2006	2006-2007	2007-2008	2008-2009	2008-2010
AXIS BANK	274.33	490.91	864.90	800.00	995.71
HDFC	718.91	1022.05	1251.13	1527.90	1749.5
HDFC BANK	825.89	1297.98	2628.65	1478.68	2647.81
ICICI BANK	554.55	893.11	873.63	731.97	864.46
KOTAK BANK	343.77	339.69	1067.79	368.07	780.42
PNB	415.59	516.75	598.42	509.50	937.84
SBIN	682.77	874.49	2034.32	1129.36	2186.75

CHART 2: MOVING AVERAGE OF SHARE PRICE – BANKING INDUSTRY



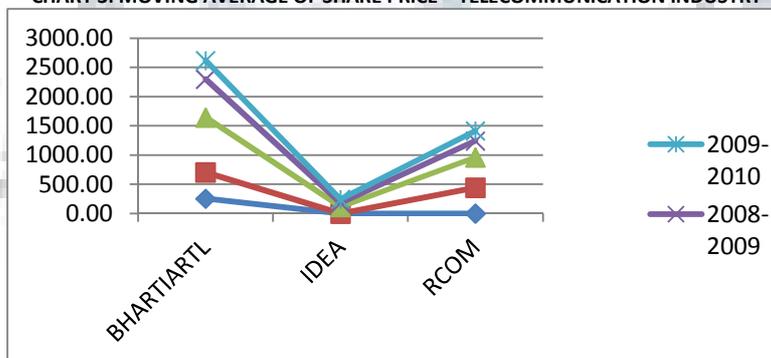
**ANALYSIS OF MOVING AVERAGE OF TELECOMMUNICATION INDUSTRY**

The following table shows the yearly average of companies which are coming under automobile industry of NIFTY shares. These averages have been calculated by taking the daily share price (closing price).

TABLE 3: SHOWING MOVING AVERAGE OF SHARE PRICE (Values in Rs.)

Company/Year	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
BHARTIARTL	254.68	449.75	937.86	656.65	318.88
IDEA	-	-	112.10	69.10	63.71
RCOM	-	443.82	517.35	280.97	173.43

CHART 3: MOVING AVERAGE OF SHARE PRICE – TELECOMMUNICATION INDUSTRY



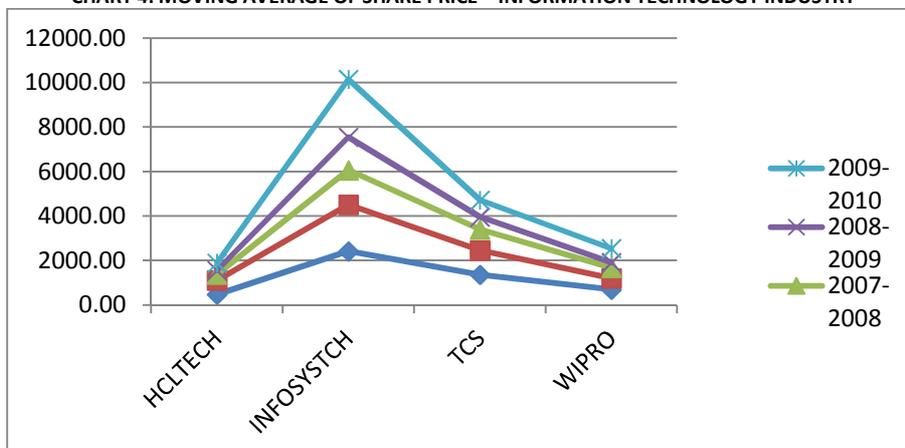
**ANALYSIS OF MOVING AVERAGE OF INFORMATION TECHNOLOGY INDUSTRY**

The following table shows the yearly average of companies which are coming under automobile industry of NIFTY shares. These average have been calculated by taking the daily share price (closing price).

TABLE 4: SHOWING MOVING AVERAGE OF SHARE PRICE VALUE

Company/Year	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
HCLTECH	472.43	631.85	272.38	178.81	328.71
INFOSYSTCH	2414.60	2089.49	1555.46	1483.31	2603.62
TCS	1358.73	1095.41	941.59	561.15	754.99
WIPRO	691.60	505.37	478.36	233.73	630.09

CHART 4: MOVING AVERAGE OF SHARE PRICE – INFORMATION TECHNOLOGY INDUSTRY



**BETA ANALYSIS**

The degree, to which different portfolios are affected by these systematic risks as compared to the effect on the market as a whole, is different and measured by the beta. To put it differently, the systematic risks of various securities differ due to their relationship with the market. The beta factor describes the movement in a stock's or a portfolio's returns in relation to that of the market return. For all practical purposes, the market returns are measured by the returns on the index (Nifty, Mid-cap etc.), since the index is a good reflector of the market.

**BETA CALCULATION OF AUTOMOBILE INDUSTRY**

The following table shows the beta values of companies under the automobile sector. The NIFTY movements and individual companies share price movements and beta value is calculated.

TABLE 5: TABLE SHOWING BETA VALUE OF AUTOMOBILE SECTOR

Company	Beta
HERO HONDA	0.92
M&M	0.99
MARUTI	0.96
TATA MOTOR	0.98

**INFERENCE**

Almost all the company has less than one this indicates the stocks of automobile industry are less volatile.

**BETA CALCULATION OF BANKING INDUSTRY**

The following table shows the beta values of companies under the automobile sector. The NIFTY movements and individual companies share price movements and beta value is calculated.

TABLE 6: TABLE SHOWING BETA VALUE OF BANKING SECTOR

Company	Beta
AXIS BANK	0.97
HDFC BANK	0.98
HDFC	0.99
ICICI BANK	0.98
KOTAK BANK	0.98
PNB	0.96
SBIN	0.98

**INFERENCE**

Almost all the company has less than one this indicates the stocks of banking industry are less volatile.

**BETA CALCULATION OF TELECOMMUNICATION INDUSTRY**

The following table shows the beta values of companies under the automobile sector. The NIFTY movements and individual companies share price movements and beta value is calculated.

TABLE 7: TABLE SHOWING BETA VALUE OF TELECOMMUNICATION INDUSTRY

Company	Beta
BHARTIARTL	1.02
IDEA	1.01
RCOM	1.02

**INFERENCE**

Almost all the company has more than one this indicates the stock of telecommunication industry are high volatile.

**BETA CALCULATION OF ITS INDUSTRY**

The following table shows the beta values of companies under the automobile sector. The NIFTY movements and individual companies share price movements and beta value is calculated.

TABLE 8: TABLE SHOWING BETA VALUE OF ITS INDUSTRY

Company	Beta
HCLTECH	0.97
INFOSYS	0.96
TCS	0.98
WIPRO	0.97

**INFERENCE**

Almost all the company has less than one this indicates the stocks of automobile industry are less volatile except M&M.

**FINDINGS****AUTOMOBILE INDUSTRY**

- It shows a constant growth in these five years period of the study there is no peak or decline.
- Except HERO HONDA rest of the companies shows high net gain.

**BANKING INDUSTRY**

- The net gain is more during the year 2007-2008
- The entire companies share has grown during the period of the study except HINDALCO

**TELECOMMUNICATION INDUSTRIES**

- The BHARTIARTL has a rapid growth among all the companies.
- The IDEA is growing well.

**ITS INDUSTRIES**

- All the company's in this sector is now gradually growing.
- Investors in this sector are getting minimum profit.

**SUGGESTIONS**

- In today's fluctuating market banking industry and computer software industry are highly sensitive
- So if investor wishes to get high return they can invest in banking industry especially in SBIN.
- It is also to be noted that the risk is also in investing these stocks since it depends on societal variation.
- All the NIFTY company performing well, due to innovation & technology advancement. So we can expect a increase in share price as well stable income in the form of dividend.
- A proper portfolio of this scrip's combination is profitable to the investor and can get high returns bearing a reasonable risk.
- Increasing profit is more important than increasing net sales so the companies should concentrate on its profit by enhancing the quality of the product or services rather than selling its product or services to cheaper rate with very low quality.

**CONCLUSION**

The present study attempted to find whether GDP and inflation influence the return of equity shares. The analysis proved that in the Indian stock market conditions GDP and inflation might be impact the future returns of equity shares. Through the results were carefully obtained, it is mandatory necessary to mention here that the result is subject to the limitations as mentioned earlier in this study. It would be better if an analysis is carried out with a large sample to throw better light in the field. However it is conclude that GDP and inflation cannot be the only factor which affects the future returns of the equity shares in the Indian environment, as there are many parameters and indicators which shake the near fundamental of a stock market, like P/E ratio, market capitalization, flow of funds has domestic as well as international investor.

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## INCREASING NETWORK LIFETIME WITH ANGLED-LEACH PROTOCOL IN WSNs

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### ABSTRACT

Increasing scalability, network lifetime and load balancing are important factors for wireless sensor networks. Clustering is a useful technique through which we can affect these factors. In this paper, we propose a new method of clustering (Angled-LEACH) which prolongs network lifetime. Links between nodes in sensor networks are vulnerable to breakage because of the dynamic nature of the networks. Angled-LEACH is based on the direction of the adjacent mobile nodes of the networks. Each pair of nodes that are taking part in the transmission should ideally be moving in the same or similar direction. This helps in reducing the traffic and delay in the network. It also helps in having less number of collisions between the nodes and hence helps in energy efficiency and increases network lifetime. Simulation results demonstrate that using the proposed method offers significant improvement in network lifetime in comparison with the LEACH and SEP methods.

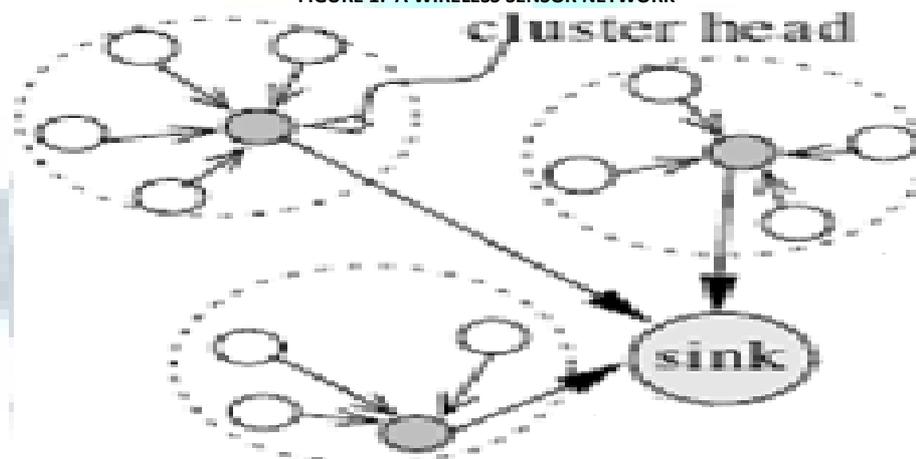
### KEYWORDS

WSN, Network Protocols, Clustering, Energy Efficiency, Delay, Traffic, LEACH, SEP.

### INTRODUCTION

Wireless sensor networks are being used all over the world in many applications including traffic monitoring, military surveillance, habitat monitoring, combat field reconnaissance, object tracking, etc. This has been made practically feasible by significant advances in micro electro-mechanical systems (MEMS) technology, radio communications and digital electronics. Sensors are tiny devices that are deployed in an ad-hoc manner in the area of interest to monitor events and gather data about the environment. The WSNs consist of hundreds or thousands of inexpensive sensor nodes. They have the ability of sensing, data processing and communicating with each other. Basic features of sensor networks are self-organizing capabilities, mobility of nodes, dynamic network topology, multi-hop routing, limited computational and communication power, node failures, short-range broadcast communication and large scale of deployment. The WSNs have features of flexibility and scalability. Multi-hopping in the networks can cause a sensor node to communicate with a node which is far away from it. In WSNs, each of the sensor nodes collects and route data either to an external base station (BS) or to other sensors. Therefore, each node plays the dual role of data originator and data router in a multi-hop sensor network. A sensor node is a microelectronic device which can only be equipped with a limited power source. The sensor nodes communicate either among each other or directly to an external base station. A base station may be a fixed or mobile node which helps in communications among the sensor nodes. The sensor nodes are self organizing in nature. A large number of sensor nodes are distributed over large geographic regions. They collaborate with each other to accomplish the task. Networking together thousands of sensor nodes allows users to accurately monitor a remote environment by combining the data from the individual nodes. The following figure represents a WSN where sensor nodes send the data to their respective cluster heads and they further send the data to the sink node.

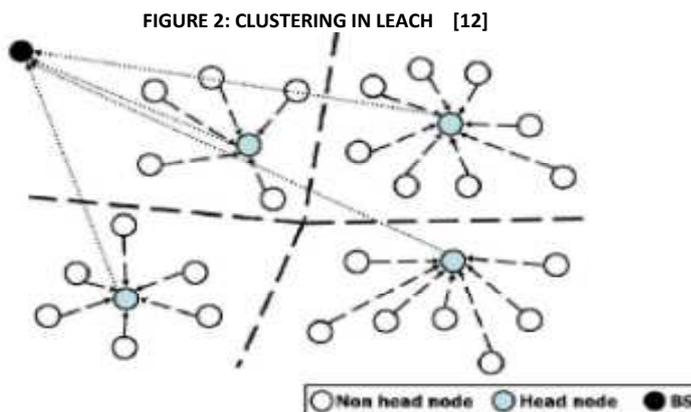
FIGURE 1: A WIRELESS SENSOR NETWORK



The key limitations of WSNs are the storage, data processing and efficient energy consumption. Due to dense deployment nature of WSNs, the node batteries of these sensor nodes are difficult to recharge. Also it is not feasible to replace the batteries of thousands of nodes. Hence, energy awareness and maximizing the lifetime of the sensors are essential design issues in WSNs. The WSN protocols can be classified into two types, planar routing protocol and hierarchical routing protocol. Hierarchical routing based clustering not only advance network scalability and reduces delay, but also it supports data aggregation [15] to prolong the network lifetime. In WSNs, it is seen from the literature, 70% of the total energy is consumed for data transmission. Hence the methods used for data collection and transmission can greatly help in achieving energy efficiency. Since long transmissions consume much more energy, we can minimize long transmissions with clustering and reduce data redundancy in the transmissions to conserve the scarce energy resources. The sleep-awake cycles, clustering etc techniques have been proposed for reducing the energy consumption.

**RELATED WORK**

LEACH: LEACH (Low Power Adaptive Clustering Hierarchy) is a hierarchical clustering method in WSNs. In this algorithm, a node randomly elects itself to become cluster head and then broadcasts an advertisement message to all of the remaining nodes.



The nodes receiving the message join the nearest cluster head. Once the cluster heads are formed, the sensor nodes send information to the base station through the corresponding cluster head. This time along with the time required for formation of a cluster is known as a round time. The clustering process repeats after each round. Another set of nodes become the cluster head in other rounds. The CH node creates a TDMA schedule [16] and assigns each child node a time slot when it can transmit. This schedule is broadcast to all the nodes in the cluster. In this approach, there is a formula in which every node has probability to be cluster head in every round. At the beginning of every round, every node chooses a random number between 0 and 1. There is a threshold number  $T(n)$  which varies in every round. The node can be a cluster head in the current round if the random number chosen by it is less than  $T(n)$ . The LEACH probability formula is:

$$T(n) = \frac{p(n)}{(1-p(n)) * (r \text{ mod } (1/p(n)))} \forall n \in G. [12]$$

Where  $n$  is the number of network nodes,  $r$  is the number of the round,  $G$  is the set of nodes that haven't been cluster head in the last  $1/p$  rounds and  $p$  is the desired percentage of cluster heads which equals to 0.05. LEACH algorithm has a drawback that it doesn't consider node's residual energy in selecting the CHs. Hence CHs chosen in every round are not always suitable for the network.

**THE PROPOSED ANGLED-LEACH**

The main motivation of the proposed Angled-LEACH is to reduce the number of collisions between the nodes, the breakage of the links between nodes and the traffic in the network, resulting in a new robust clustering technique, called Angled-LEACH. The model and algorithm of the proposed scheme are given below.

**ANGLED-LEACH SCHEME**

The Angled-LEACH assumes that the sensor nodes are placed randomly within a WSN and some of the nodes introduce themselves to be the cluster heads by broadcasting advertisement messages to the other nodes. All the nodes would be collecting the data at their respective cluster heads and the cluster heads would be transferring the data to the sink node. This causes links breakage between the nodes and traffic in the network and affects load balancing and hence energy efficiency too. Angled-LEACH scheme calculates the angles between the adjacent nodes. The nodes would be transferring the data to the cluster heads which would be reachable to it and lies in the direction of the destination. This reduces the overall traffic and delay in the network and gives efficient energy utilization.

**METHOD OF ANGLED-LEACH**

**CHECK FOR REACHABILITY OF THE NODES**

The reachability of the nodes to the other nearby nodes can be calculated by the distance formula where the distances between the nodes, distances between the nodes and the cluster heads and the distances between the cluster heads and sink node can be calculated.

**CALCULATING THE ANGLES BETWEEN THE NODES**

The angles of the nodes to their respective cluster heads and the sink node is calculated by the dot product of the position of the nodes, cluster heads and the sink. If the angle calculated lies between  $0^\circ$  and  $45^\circ$  (in the direction of the destination), then the energy utilization is less else the energy utilization is more.

**CALCULATING THE TOTAL TIME FOR WHICH THE NETWORK WORKS**

The time taken by the algorithm in Matlab can be calculated by tic and toc formulae. The trace of tic and toc can be traced by loading its trace file and then displaying both with the display formula. The more the value of the difference of tic and toc, the more is the efficiency of the algorithm.

**PERFORMANCE EVALUATION**

The performance analysis of routing protocols is evaluated with the MATLAB simulator. Then our proposed protocol is compared to the LEACH and SEP (Stable Election Protocol) algorithms in terms of the network lifetime.

**SIMULATION ENVIRONMENT**

In this simulation, our experiment model performed on 100 nodes which were randomly deployed and distributed in a  $100 \times 100$  square meter area. We assume that all nodes are mobile in nature and can move within the specified area. Our simulation model uses the parameters as shown in table 1.

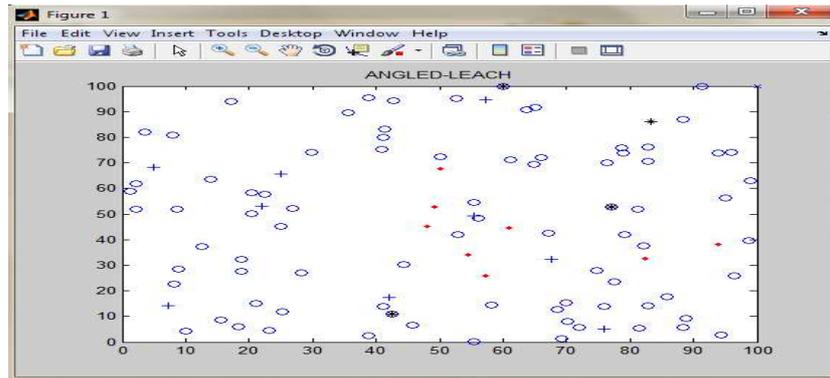
**TABLE 1: SIMULATION PARAMETERS**

Parameters	Values
Network size	100m * 100m
Location of the sink node	[100,100]
Number of nodes	100
Number of clusters	10
Initial energy of each node	0.5J
Maximum number of rounds	7000
Percentage of CH nodes	0.05
Fraction of advanced nodes	0.1
Additional energy factor between advanced and normal nodes	1

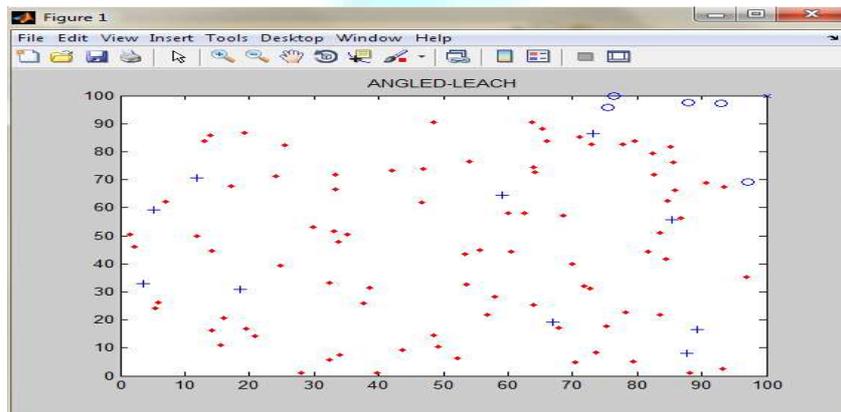
**SIMULATION RESULTS**

To compare the network lifetime of the algorithms, following results have been observed.

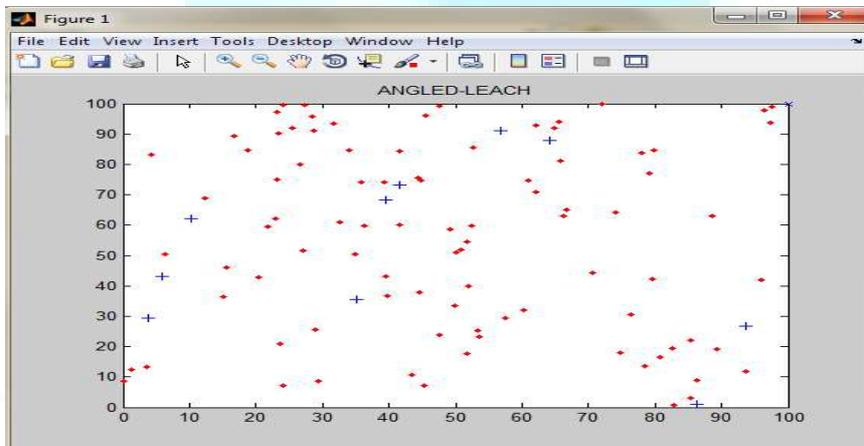
A SNAPSHOT OF THE ANGLED-LEACH NETWORK AFTER 1000 ROUNDS



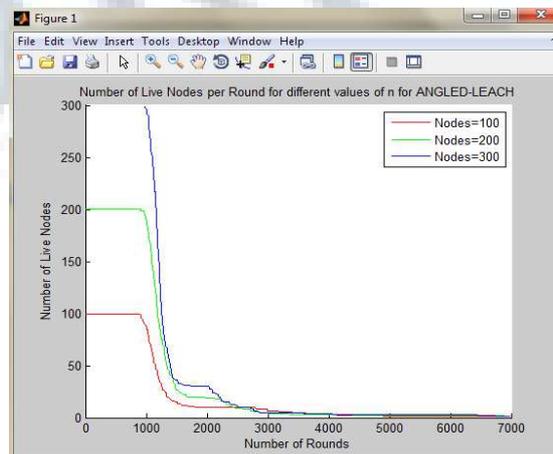
A SNAPSHOT OF THE ANGLED-LEACH NETWORK AFTER 1500 ROUNDS



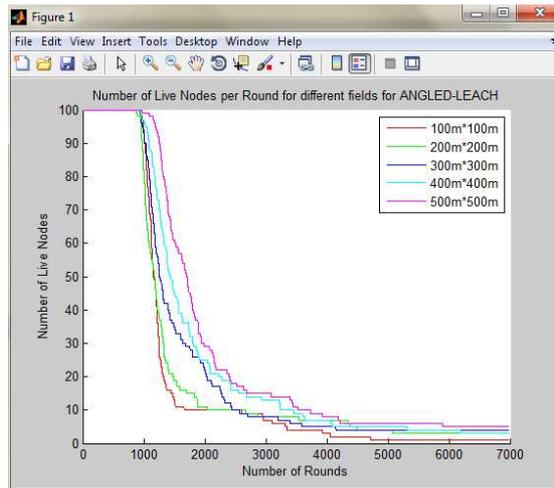
A SNAPSHOT OF THE ANGLED-LEACH NETWORK AFTER 2500 ROUNDS



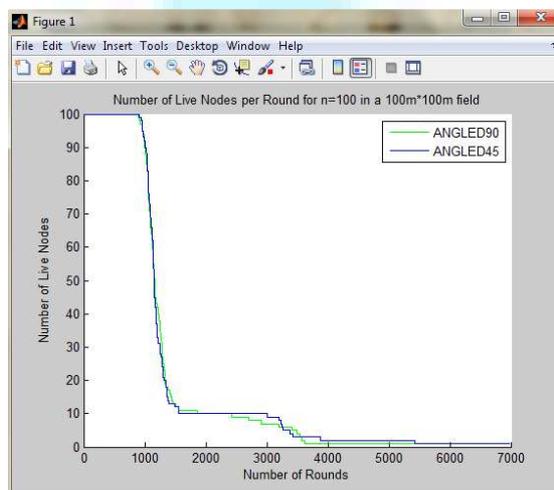
PLOT FOR NUMBER OF LIVE NODES PER ROUND OF ANGLED-LEACH PROTOCOL FOR DIFFERENT NUMBER OF NODES 'n'



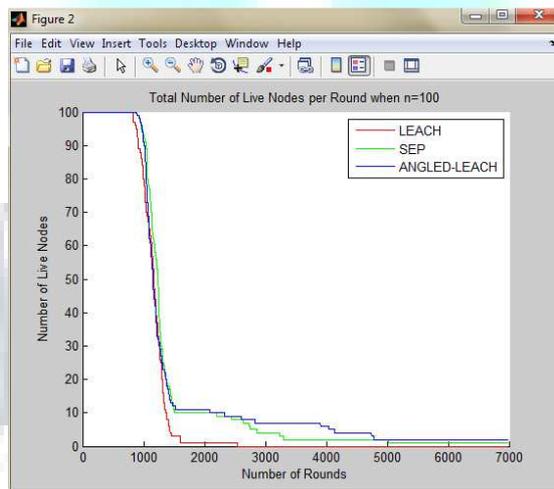
PLOT FOR NUMBER OF LIVE NODES PER ROUND OF ANGLED-LEACH PROTOCOL VARYING THE NETWORK FIELD



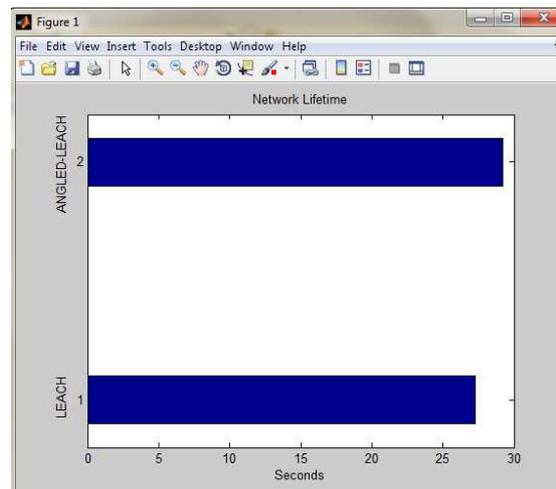
PLOT FOR NUMBER OF LIVE NODES PER ROUND FOR N=100 IN A 100M \* 100M FIELD OF ANGLED-LEACH PROTOCOL FOR DIFFERENT ANGLES



PLOT FOR TOTAL NUMBER OF LIVE NODES PER ROUND FOR LEACH, SEP AND ANGLED-LEACH PROTOCOLS WHEN n=100



## PLOT BETWEEN NETWORK LIFETIME FOR LEACH AND ANGLED-LEACH PROTOCOLS



## CONCLUSIONS

Hierarchical clustering has proven to be an effective approach for efficient energy and bandwidth utilization. We have classified a comprehensive survey of LEACH protocol in WSNs. The clustering algorithms aim to maximize the lifetime of the networks while not compromising data delivery and accuracy. It is seen from the literature that about 70% of the total energy is consumed in data transmission. Hence the methods used for data collection and transmission can greatly help in reducing energy consumption in the networks. Traffic induces delays and most of the nodes may get die due to collisions. Many of the links break due to collisions between the nodes. We can reduce the traffic by having communications between the nodes such that the source and the destinations must lie in the same or similar directions. This will reduce the number of collisions between the sensor nodes, traffic and delay and helps in achieving energy efficiency in the wireless networks. The above simulation results show that Angled-LEACH protocol enhances the network lifetime in comparison with LEACH and SEP.

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## THE IMPACT OF CONTENTS ON NATIONAL AND INTERNATIONAL UNIVERSITY WEBSITES NAVIGATION BEHAVIOUR

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### ABSTRACT

*The web offers unprecedented opportunities for worldwide access to information resources, regardless of the user's country of origin. The design of information architecture has a significant impact on people's ability to find information on a website. The present paper studies how university websites could be more informative to users. A potential method to accomplish this would be to consider for what purposes other universities use their websites. A content analysis of national and international university's websites indicates that there are significant differences in the contents / features of Indian and foreign web sites of universities.*

### KEYWORDS

Browser, HTTP, Internet, World Wide Web, Website.

### INTRODUCTION

Internet is a massive network of networks, a networking infrastructure. It connects millions of computers together globally. The World Wide Web, or simply Web, on the other hand is a way of accessing information over the medium of Internet. It is an 'information-sharing model' that is built on top of the Internet. HTTP (Hypertext Transfer Protocol) is only one of the communication protocols used on the Internet. The Web is like a huge encyclopedia of information. The Web also utilizes browsers, such as Internet Explorer or Firefox, to access Web documents called Web pages that are linked to each other via hyperlinks. Web documents also contain graphics, sounds, text and video.

### RELATED STUDIES

There is a growing interest in social responsibility of the corporations among academicians and practitioners. Companies now are not only expected to be responsible to their shareholders but to society in general. Universities, as the centers of knowledge generation and sharing, play a very important role in solving world's problems by ensuring a sustainable tomorrow. However, it is questionable whether world leading universities are concerned about CSR and if they do, to what extent they are committed to their social responsibilities. According to Mehran, Azadeh, Yashar and Mohammadreza in their study of 'Corporate social responsibility and universities: A study of top 10 world universities websites' find that world leading universities are committed to their social responsibility and they provide sufficient information on most of the core areas of corporate social responsibility (CSR).

The web offers unprecedented opportunities for worldwide access to information resources, regardless of the user's country of origin. However, providing information globally raises the question of whether to offer a standardized or a culturally adapted website, often connected to important investment decisions (e.g., Anett Kralisch, Bettina Berendt, Martin Eisend, 2001). The results shows that users' cultural backgrounds influence their navigation patterns in terms of time, amount of accessed information, and (non)linearity of information access.

Prior studies have suggested that a good Website design which facilitates a user's Web browsing behaviour would generally lead to better user performance. Gek Woo Tan, Kwok Kee Wei in their research, examines that user Website behaviour as a way to understand Website design using a "think aloud" protocol analysis. Main theoretical contributions of their research are the illustration of the flow of cognitive processes during the Website browsing and the establishment of Website design dimensions – the meaning and content implied by Website content, its outward form, and the structure and navigation – in relation to user performance.

A university website has two kinds of audiences: internal users and external users. Internal users include current students enrolled at the university, faculty and staff. External users include prospective students, faculty and staff. Middleton (1999) recommended the content/ features for internal users such as Telephone directory, Library catalogues, News, Internal social groups / clubs activities, Timetable etc. They have also recommended the content/ features for External users such as Courses offered, Prospectus, Local city information, Mission statement, University contact, Job openings, Support and pay offered to staff and faculty, Entertainment information, Faculty contact information, Faculty research information etc. They further recommended a search features for university websites. Search feature would make it easier for users to search for specific information they are looking for. There are some features common to both internal and external users. For example, a telephone directory is useful for both internal and external users.

### RESEARCH QUESTION

In view of the foregoing discussion and considering the nature of present study, the researcher has laid down following research questions.

H<sub>0</sub> International and National universities are equal component in website designing with contents.

H<sub>1</sub> The contents in websites of both National and International universities is not much significant (same).

### DATA PRESENTATION AND DATA ANALYSIS

The methodology used for this study is content analysis. Only universities which offered bachelors and/or masters degrees (or equivalent) were selected in order to preserve the integrity of the sample. A stratified random sampling procedure is used to draw the samples to be analyzed. 30% of the Indian university websites from each of the 4 types and 10% of the International University websites are selected randomly for analysis. Table 1 below shows the details of number of websites taken as sample of Indian university websites and Table 2 shows the details of number of websites taken as sample of International university websites.

**TABLE 1: NUMBER OF SAMPLE WEBSITES (NATIONAL UNIVERSITIES)**

Type of university	Total No.	Universities selected for the study (30%)
Central universities	39	13
Open universities	10	3
Deemed universities	130	39
State universities	95	29
<b>Total</b>	<b>274</b>	<b>83</b>

Source: Primary data

**TABLE 2: NUMBER OF SAMPLE WEBSITES (INTERNATIONAL UNIVERSITIES)**

Name of Country	No of universities	Universities selected for the study (10%)
Australia	39	4
Belgium	16	2
Canada	69	7
China	90	9
Hong Kong	8	1
Ireland	8	1
Japan	90	9
Seoul, South Korea	34	4
New Zealand	8	1
Singapore	12	1
Sweden	14	2
UK	121	12
USA	94	10
<b>Total</b>	<b>615</b>	<b>63</b>

Source: Primary data

A university website has two kinds of audience's internal users and external users. Internal users of university websites could be current students, current faculty and current staff working in university while external users could be prospective students, prospective faculty and staff, business people, alumni, visitors and local community visitors interested in news, events, etc.

**CODING:** A coding scheme is developed using the analytical framework proposed by Middleton et al.(1999) and Mateos et al.(2001). For this purpose 83 Indian and 63 international university websites are analyzed.

**UNIT OF ANALYSIS:** - Some of the content / features to be analyzed not present on or not linked from the home page. Although it is the design consideration whether to include link to something on the home page, so it is decided to use entire website contents / features as the unit of analysis for this study. Value 0 is assigned for absent and 1 is assigned for present for every content/feature.

### FINDING OF THE STUDY

Pursuant to research question  $H_0$  mentioned here in above, it is found that some contents are common in both types. Table3 shows the number of contents present in website designing with using 52 contents in national and international university websites.

**TABLE 3: THE NUMBER OF CONTENTS PRESENT IN WEBSITE DESIGNING WITH USING 52 CONTENTS IN NATIONAL & INTERNATIONAL UNIVERSITY WEBSITES**

Sr. No.	Content / Features of websites	National University		International University	
		Number of Websites (Total=83)	% Value	Number of Websites (Total=63)	% Value
1	About Us	83	100	63	100
2	University information [Email /Phone no / Map ]	83	100	63	100
3	Courses/Programs Offered [under graduate / graduate / post graduate / distance education ]	83	100	62	98.41
4	Admission information / Application[term dates]	82	98.79	63	100
5	Other information [syllabus, date sheet, revolution forms / procedure]	53	63.85	16	25.39
6	Exam Results	58	69.87	7	11.11
7	Departments / Institutes	83	100	60	95.23
8	University News	82	98.79	61	96.82
9	Facilities / Amenities and Services	61	73.49	40	63.49
10	Library Catalogues	74	89.15	53	84.12
11	Alumni Information	46	55.42	49	77.77
12	Internal social groups / Clubs activities / student union	48	57.83	41	65.07
13	Accommodation	54	65.06	50	79.36
14	Placement cell	57	68.67	38	60.31
15	Culture and Sports	61	73.49	43	68.25
16	Health service	51	61.44	49	77.77
17	Old Exam papers	06	7.22	01	1.58
18	Current stud / Future stud	14	16.86	36	57.14
19	International students	30	36.14	57	90.47
20	Student Development	25	30.12	15	23.80
21	Student Exchange	10	12.04	45	71.42
22	Funds / Awards / Polices / Scholarships	62	74.69	57	90.47
23	Apply Online	P-53,P/F-9,N-21	74.69	P-28,P/F-18,N-15,F-2	76.19
24	Faculty research / specialization	62	74.69	55	87.30
25	Faculty contact	55	66.26	34	53.96
26	Telephone Directory	20	24.09	19	30.15
27	Electronic Media	42	50.60	29	46.03
28	Search Features	40	48.19	54	85.71
29	Events	78	93.97	60	95.23
30	Date retrieved	19	22.89	18	28.57
31	Website language [English / Regional / Both]	E-68, B-15	100	E-32,B-31	100
32	Jobs	50	60.24	47	74.60
33	Parents	3	3.61	18	28.57
34	International [support / services ]	26	31.32	43	68.25
35	Video / Audio Ideas:	12	14.45	25	39.68
36	Quick Links	61	73.49	41	65.07
37	Visitors	37	44.57	14	22.22
38	Publications [University Journals / Books / Publication by Faculty]	53	63.85	24	38.09
39	Tenders / Circulars	44	53.01	09	14.28
40	Frequently Asked Questions	29	34.93	34	53.96
41	Virtual Classrooms / Virtual Tour	15	18.07	22	34.92
42	Feedback	23	27.71	20	31.74
43	Forth coming events	64	77.10	51	80.95
44	Freedom Of Information Act / Right To Information Act	F-0,R-47,N-36	56.62	F-17,R-0,N-46	26.98
45	Learning and Teaching	01	1.20	14	22.22
46	Local City / Town Information	18	21.68	31	49.20
47	Media	16	19.27	26	41.26
48	Business	07	8.43	24	38.09
49	Open Days	0	0	29	46.03
50	Developed By	H/O-7,H-17,O-28,N-31	62.65	H/O-1,H-5,O-0,N-5	9.52
51	Accreditation	33	39.75	26	41.26
52	Memorandums of understanding with other universities	42	50.60	19	30.15
	<b>Total</b>		<b>52.435</b>		<b>57.65</b>

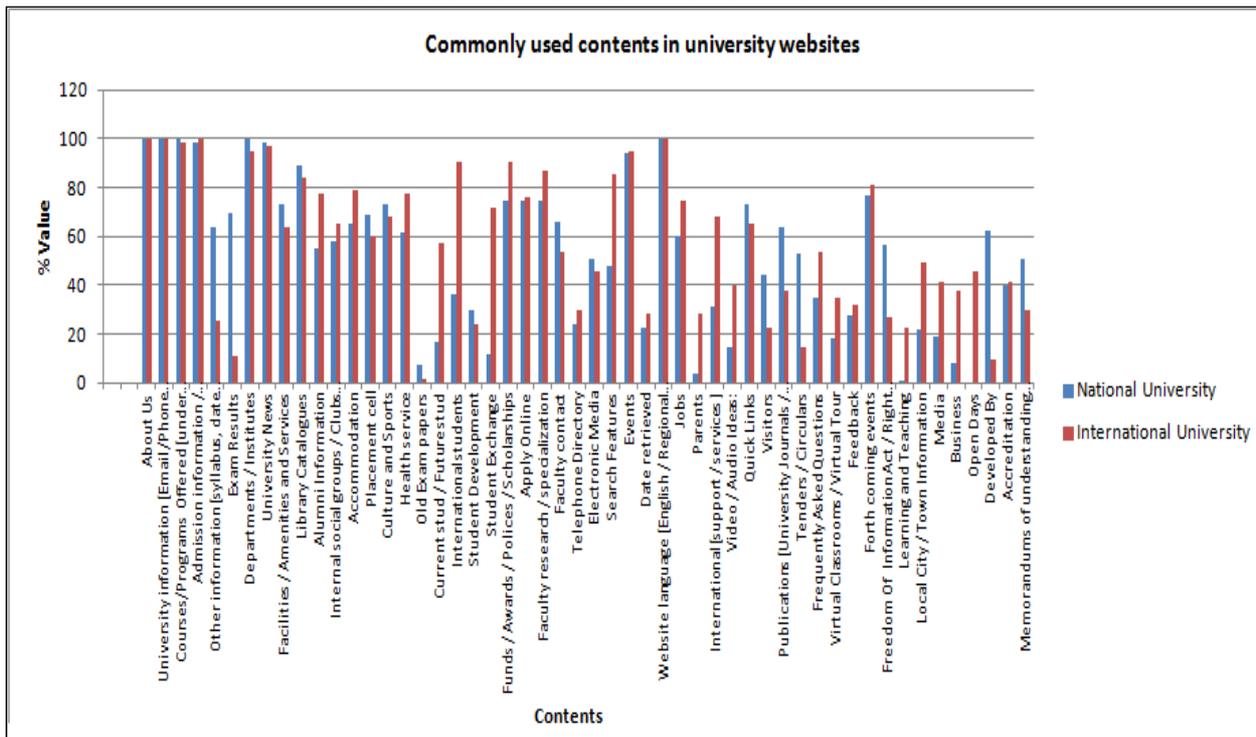
Table4 shows Chi-square test for comparison between below 50 and above 50 contents present in university websites while Figure1 shows, commonly used contents in university websites as below.

**TABLE 4: CHI-SQUARE TEST FOR COMPARISON OF UNIVERSITY WEBSITES**

Contents Used	National Universities	International Universities	Total
Below 50	21 (20.19%)	23 (22.11%)	44 (50%)
Above 50	31 (29.80%)	29 (27.88%)	60 (50%)
Total	52 (50%)	52 (50%)	104

Using Table4 we can conclude that more than 26 contents are used by majority of the international(27.88%) and National(29.80%) universities.

FIGURE 1: COMMONLY USED CONTENTS IN UNIVERSITY WEBSITES



Pursuant to research question H<sub>1</sub> mentioned here in above, it is found that some contents are common in both types. Table 5 shows the number of content /feature present for international and national university websites and Table 6 shows Average number of content present in university websites.

TABLE 5: THE NUMBER OF CONTENT /FEATURE ON INTERNATIONAL AND NATIONAL UNIVERSITY WEBSITES

Sr. No.	National Universities	% VALUE	International Universities	% VALUE
1	39	75	49	94.23
2	32	61.53	47	90.38
3	34	65.38	45	86.53
4	13	25.0	48	92.30
5	36	69.23	30	57.69
6	22	42.30	17	32.69
7	15	28.84	30	57.69
8	25	48.07	36	69.23
9	16	30.76	39	75.0
10	33	63.46	37	71.15
11	17	32.69	40	76.92
12	30	57.69	40	76.92
13	31	59.61	25	48.07
14	26	50.0	20	38.46
15	16	30.76	22	42.30
16	26	50.0	24	46.15
17	25	48.07	28	53.84
18	13	25.0	17	32.69
19	31	59.61	25	48.07
20	35	67.30	28	53.84
21	30	57.69	23	44.23
22	25	48.07	11	21.15
23	30	57.69	33	63.46
24	18	34.61	40	76.92
25	28	53.84	27	51.92
26	32	61.53	25	48.07
27	24	46.15	20	38.46
28	24	46.15	32	61.53
29	34	65.38	33	63.46
30	37	71.15	26	50.0
31	33	63.46	10	19.23
32	13	25.0	13	25.0
33	28	53.84	09	17.30
34	30	57.69	20	38.46
35	16	30.76	25	48.07
36	32	61.53	22	42.30
37	32	61.53	32	61.53
38	30	57.69	35	67.30
39	34	65.38	35	67.30

40	33	63.46	31	59.61
41	27	51.92	32	61.53
42	23	44.23	35	67.30
43	24	46.15	22	42.30
44	31	59.61	36	69.23
45	21	40.38	31	59.61
46	24	46.15	38	73.07
47	36	69.23	14	26.92
48	29	55.76	38	73.07
49	27	51.92	39	75.0
50	31	59.61	32	61.53
51	27	51.92	27	51.92
52	37	71.15	35	67.30
53	27	51.92	33	63.46
54	26	50.0	24	46.15
55	29	55.76	33	63.46
56	29	55.76	33	63.46
57	26	50.0	31	59.61
58	15	28.84	26	50.0
59	35	67.30	34	65.38
60	34	65.38	30	57.69
61	30	57.69	30	57.69
62	26	50.0	32	61.53
63	35	67.30	30	57.69
64	29	55.76		
65	20	38.46		
66	32	61.53		
67	29	55.76		
68	32	61.53		
69	27	51.92		
70	33	63.46		
71	43	82.69		
72	29	55.76		
73	24	46.15		
74	24	46.15		
75	31	59.61		
76	34	65.38		
77	37	71.15		
78	19	36.53		
79	18	34.61		
80	34	65.38		
81	35	67.30		
82	15	28.84		
83	28	53.84		

TABLE 6: AVERAGE NUMBER OF CONTENT PRESENT IN UNIVERSITY WEBSITES

	Average	Standard Deviation	Coefficient of Variation
National Universities (Total = 83)	27.71	6.70	24.19%
International Universities (Total = 63)	29.58	8.85	29.93%

It can be concluded that, on an average contents in both Indian (27.71) and International (29.58) Universities are same. The standard deviation of Indian Universities in selection of contents is less than International Universities. International universities (cv = 29.93%) have more available contents than the national universities (cv = 24.19%). Indian universities have used 53% contents while International universities used 57% contents about their information on their websites that is no significant difference between the contents of the websites.

**AMONG THE MOST USED CONTENT / FEATURES ARE**

About us, University information, Courses/Programs Offered, Admission information / Application [term dates], Departments/Institutes, University News, Facilities / Amenities and Services , Library Catalogues, Alumni Information, Internal social groups / Clubs activities / student union, Accommodation, Placement cell, Culture and Sports, Health service, Funds / Awards / Polices / Scholarships ,Apply Online, Faculty research / specialization, Faculty contact, Events, Website language, Jobs, Quick Links and Forth coming events.

**AMONG THE LEAST USED CONTENT / FEATURES ARE**

Exam results, old exam papers, student exchange, telephone directory, Parents, Video/audio ideas, Virtual Classrooms / Virtual Tour, Learning & teaching, Business, and open days.

**CONCLUSIONS**

Evidence has been found to indicate that, the researcher has summarized the entire research problem that has attempted to suggest how university websites are more informative by giving more information in limited time. Indian universities have used 53% contents while International universities used 57% contents about their information on their websites that is no significant difference between the contents of the websites. More than 26 contents are used by majority of the international (27.88%) and National (29.80%) universities. On an average contents in both Indian (27.71) and International (29.58) Universities are same. The standard deviation of Indian Universities in selection of content is less than International Universities. International universities (cv = 29.93%) have more available contents than the national universities (cv = 24.19%). Indian universities have used 53% contents while International universities used 57% contents about their information on their websites that is no significant difference between the contents of the websites.

**LIMITATIONS**

This study has certain limitations. Due to time constraint it is impossible to study contents of all universities in India and abroad. Therefore random universities have been selected from national and international levels. The research does not contain study of design or information organization of university websites. The focus of present study is only on the types of content / features present on websites. As websites are updating frequently, same status of university websites could not be available.

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WORLD

**ULTRA SOUND BREAST CANCER IMAGE ENHANCEMENT AND DENOISING USING WAVELET TRANSFORM****K. HAKKINS RAJ.****RESEARCH SCHOLAR, SRM UNIVERSITY, CHENNAI****ASSOCIATE PROFESSOR****DEPARTMENT OF BIOMEDICAL ENGINEERING****VMKV ENGINEERING COLLEGE****SALEM****ABSTRACT**

Breast cancer is the common form of cancer with 81% of cases occurring in women aged 50 years and over. In medical image processing, image denoising has become a very essential exercise all through the diagnosis because Ultrasound (US) images are normally affected by speckle noise, and it is crucial to operate case to case. Here we proposed an image resolution enhancement and despeckling technique by using Discrete and Stationary wavelet transform for image enhancement and the median filters and average filters are reduce the speckle noise in the Ultrasound breast cancer images.

**KEYWORDS**

Ultrasound, DWT, SWT, IWT.

**INTRODUCTION**

Ultrasound breast cancer images are usually corrupted by different types of noises during the acquisition and transmission of biological signals. The main objective is to enhance the image and reduce the noise and the image should be clear and easy to visualize the cancer nodules in the image by the physician.

**NOISE IN AN IMAGE**

It is generally desirable for image brightness (or film density) to be uniform except where it changes to form an image. There are factors, however, that tend to produce variation in the brightness of a displayed image even when no image detail is present. This variation is usually random and has no particular pattern. In many cases, it reduces image quality and is especially significant when the objects being imaged are small and have relatively low contrast. This random variation in image brightness is designated as noise. This noise can be either image dependent or image independent. All the digital images contain some visual noise. The presence of noise gives an image a mottled, grainy, textured, or snowy appearance.

**TYPES OF NOISES****1) RANDOM NOISE**

Random noise revolves around an increase in intensity of the picture. It occurs through color discrepancies above and below where the intensity changes. It is random, because even if the same settings are used, the noise occurs randomly throughout the image. It is generally affected by exposure length. Random noise is the hardest to get rid of because we cannot predict where it will occur. The digital camera itself cannot account for it, and it has to be lessened in an image editing program.

**2) FIXED PATTERN NOISE**

Fixed pattern noise surrounds hot pixels. Hot pixels are pixel bits that are more intense than others surrounding it and are much brighter than random noise fluctuations. Long exposures and high temperatures cause fixed pattern noise to appear. If pictures are taken under the same settings, the hot pixels will occur in the same place and time. Fixed pattern noise is the easiest type to fix after the fact. Once a digital camera realizes the fixed pattern, it can be adjusted to lessen the affects on the image. However, it can be more dubious to the eye than random noise if not lessened.

**3) BANDING NOISE**

Banding noise depends on the camera as not all digital cameras will create it. During the digital processing steps, the digital camera takes the data being produced from the sensor and creates the noise from that. High speeds, shadows and photo brightening will create banding noise. Gaussian noise, salt & pepper noise, passion noise, and speckle noise are some of the examples of noise.

**4) SPECKLE NOISE**

Speckle noise is defined as multiplicative noise, having a granular pattern it is the inherent property of ultrasound image and SAR image. Another source of reverberations is that a small portion of the returning sound pulse may be reflected back into the tissues by the transducer surface itself, and generates a new echo at twice the depth. Speckle is the result of the diffuse scattering, which occurs when an ultrasound pulse randomly interferes with the small particles or objects on a scale comparable to the sound wavelength. The backscattered echoes from irresolvable random tissue inhomogeneities in ultrasound imaging and from objects in Radar imaging undergo constructive and destructive interferences resulting in mottled b-scan image.

Speckle degrades the quality of US and SAR images and thereby reducing the ability of a human observer to discriminate the fine details of diagnostic examination. This artifact introduces fine-false structures whose apparent resolution is beyond the capabilities of imaging system, reducing image contrast and masking the real boundaries of the tissue leading to the decrease in the efficiency of further image processing such as edge detection, automatic segmentation, and registration techniques. Another problem in Ultrasound data is that the received data from the structures lying parallel to the radial direction can be very weak, where as structures lying normal to the radial direction give stronger echo.

**SPECKLE NOISE IN ULTRASOUND IMAGES**

These scans use high frequency sound waves which are emitted from a probe. The echoes that bounce back from structures in the body are shown on a screen. The structures can be much more clearly seen when moving the probe over the body and watching the image on the screen. The main problem in these scans is the presence of speckle noise which reduces the diagnosis ability. It provides live images, where the operator can select the most useful section for diagnosing thus facilitating quick diagnoses.

**WAVELET TRANSFORM**

The wavelet transform has become a useful computational tool for a variety of signal and image processing applications. For example, the wavelet transform is useful for the compression and enhance the digital image files

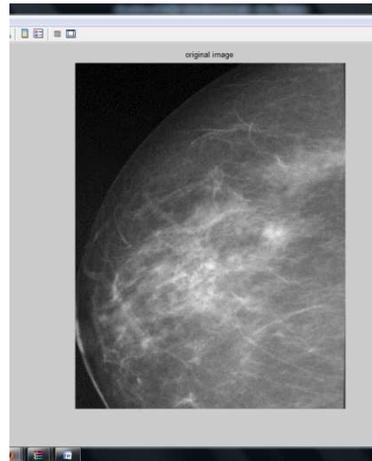
Wavelet transforms are classified into discrete wavelet transforms (DWTs) and continuous wavelet transforms (CWTs). Note that both DWT and CWT are continuous-time (analog) transforms. They can be used to represent continuous-time (analog) signals. CWTs operate over every possible scale and translation whereas DWTs use a specific subset of scale and translation values or representation grid.

**METHODOLOGY**

The proposed technique uses DWT to decompose a low resolution image Fig.1 into different sub-bands, namely low-low (LL), low high (LH), high-low (HL), and high-high (HH). Then the three high frequency sub-band images have been interpolated using bi-cubic interpolation. Three high frequency sub-bands (LH, HL, and

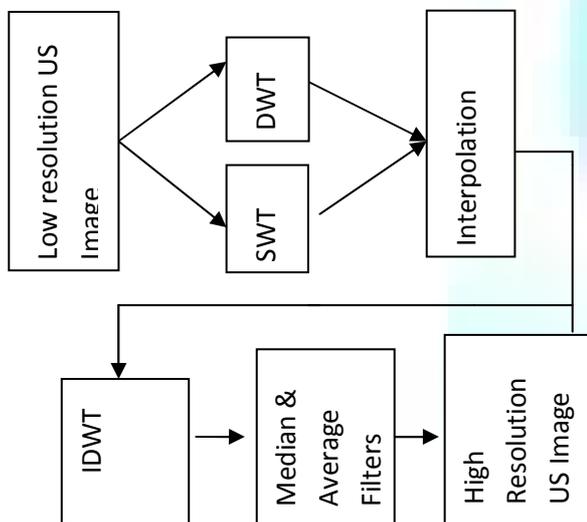
HH) contain the high frequency components of the input image. Down sampling in each of the DWT sub-bands causes information loss in the respective sub-bands. That is why SWT is employed to minimize this loss.

FIG.1 ORIGINAL IMAGE



The high frequency sub-bands obtained by SWT of the input image are being incremented into the interpolated high frequency sub-bands in order to correct the estimated coefficients. In parallel, the input image is also interpolated separately. Finally, corrected interpolated high frequency sub-bands and interpolated input image are combined by using inverse DWT (IDWT) to achieve a high resolution output image.

1. BLOCK DIAGRAM



The median filter is a nonlinear digital filtering technique, often used to remove noise. Such noise reduction is a typical pre-processing step to improve the results of later processing (for example, edge detection on an image). Median filtering is very widely used in digital image processing because, under certain conditions, it preserves edges while removing noise. The main idea of the median filter is to run through the signal entry by entry, replacing each entry with the median of neighboring entries.

Median filtering is one kind of smoothing technique, as is linear Gaussian filtering. All smoothing techniques are effective at removing noise in smooth patches or smooth regions of a signal, but adversely affect edges. Often though, at the same time as reducing the noise in a signal, it is important to preserve the edges. Edges are of critical importance to the visual appearance of images, for example. For small to moderate levels of (Gaussian) noise, the median filter is demonstrably better than Gaussian blur at removing noise whilst preserving edges for a given, fixed window size.

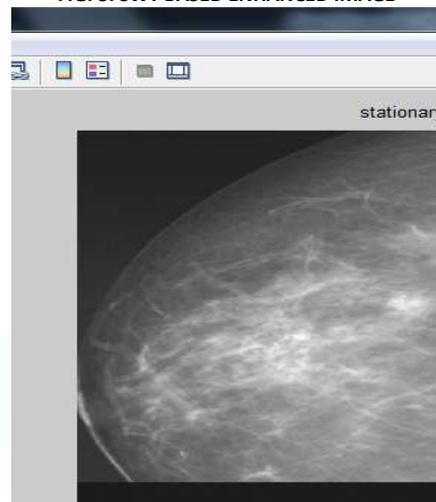
The Average (mean) filter smoothes image data, thus eliminating noise. This filter performs spatial filtering on each individual pixel in an image using the grey level values in a square or rectangular window surrounding each pixel.

FIG. 2: DWT-BASED ENHANCED IMAGE



In image resolution enhancement by using interpolation the main loss is on its high frequency components (i.e., edges), which is due to the smoothing caused by interpolation. In order to increase the quality of the super resolved image, preserving the edges is essential. In this work, DWT has been employed in order to preserve the high frequency components of the image. The redundancy and shift invariance of the DWT mean that DWT coefficients are inherently interpolable. In this correspondence, one level DWT (with Daubechies 9/7 as wavelet function) is used to decompose an input image into different sub band images. Three high frequency sub bands (LH, HL, and HH) contain the high frequency components of the input image. In the proposed technique, bi cubic interpolation with enlargement factor of 2 is applied to high frequency sub band images. Down sampling in each of the DWT sub bands causes information loss in the respective sub bands. That is why SWT is employed to minimize this loss.

FIG. 3: SWT BASED ENHANCED IMAGE



The interpolated high frequency sub bands and the SWT high frequency sub bands have the same size which means they can be added with each other. The new corrected high frequency sub bands can be interpolated further for higher enlargement. Also it is known that in the wavelet domain, the low resolution image is obtained by low pass filtering of the high resolution image. In other words, low frequency sub band is the low resolution of the original image. Therefore, instead of using low frequency sub band, which contains less information than the original high resolution image, here the input image was used for the interpolation of low frequency sub band image. Using input image instead of low frequency Subband increases the quality of the super resolved image. After interpolating input image and high frequency sub bands and then applying IDWT, the output image will contain sharper edges than the interpolated image obtained by interpolation of the input image directly. This is due to the fact that, the interpolation of isolated high frequency components in high frequency sub bands and using the corrections obtained by adding high frequency sub bands of SWT of the input image, will preserve more high frequency components after the interpolation than interpolating input image directly. Further speckle noise of the image is removed using median and average filters which shown in Fig. 4.

FIG. 4: OUTPUT IMAGE (DESPECKLED AND ENHANCED)



## CONCLUSION

Thus we have enhanced and denoised the ultrasound breast cancer image using wavelet transforms and median and average filters, and experimental results shows that this technique is accurate and effective in low resolution ultrasound images.

In future, more wavelet transform techniques can be used for enhancement and denoising of ultrasound breast cancer image which increases the resolution of image and helps the physician to diagnose the image clearly.

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In this age of Commerce, Economics, Computer, I.T. & Management and cut throat competition, a group of intellectuals felt the need to have some platform, where young and budding managers and academicians could express their views and discuss the problems among their peers. This journal was conceived with this noble intention in view. This journal has been introduced to give an opportunity for expressing refined and innovative ideas in this field. It is our humble endeavour to provide a springboard to the upcoming specialists and give a chance to know about the latest in the sphere of research and knowledge. We have taken a small step and we hope that with the active co-operation of like-minded scholars, we shall be able to serve the society with our humble efforts.

### *Our Other Journals*

