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Identifying Factors Playing Important Role in the Increasing Employee Turnover Rate: A Case of Telecom Industry in Pakistan

Tariq Mehmood Rana*, M. Rashid Salaria, Gobind M. Herani*** and Mohammad Ahmed Amin******

ABSTRACT

The objective of this study is to know about the practices of Telecom industry, regarding their employees and to know how they keep up with the intense competition in the industry. The study focuses on factors effecting Employee Turnover and those that factors play an important role in retaining the employees of Telecom industry. The universe of this study was all the employees of Telecom industry in Islamabad, Karachi and Lahore. For this purpose survey method was used by using questionnaire as a tool for data collection. The results have shown that Salary, Working Environment and Benefits are three significant factors effecting employee turnover and correlated with each other. The study was faced by certain limitations, which include time constraints and resources constraints, which limit this research to only Islamabad, Karachi and Lahore offices of the organizations in telecom industry of Pakistan. The present study found support for an independent variable with Employee turnover. Significant negative correlations have been found for the Salary, Work environment and Benefits. Therefore, organizations need to focus on how to develop better Salary plan and reduce strain in the workplace. If staff voluntarily leaves, it is a great loss to the telecom industry. It is expensive to hire, train, and "bring up to speed" new replacements. It is, therefore, important to understand the antecedents of turnover intent of employees before they decide to quit.

JEL. Classification: J28; J63;

Keywords: Employee Turnover, Telecom Industry; Pakistan; Factors.

1. INTRODUCTION

Employee turnover is a global phenomenon. In the present world of economic growth, changing socioeconomic factors, dynamic labor markets and hyperactive macro-environmental factors, of almost all the organizations face the problem of employee turnover. In this very competitive environment no business can enjoy and sustain the success until it deals with this turnover problem efficiently and successfully. In the near past, the competition among the business sectors has been immense which

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has increased the importance of human resource management functions. Now a day Telecom companies are very cautious about the human resource policies and there is a great emphasis on using the human capital efficiently not only to increase the productivity but also to get the competitive advantage. Employees are considered as the basic operating unit of an organization, when organizations invest heavily to attract, recruit and then train the employees. And after all these efforts, losing these employees is a great loss to the concerned organizations. Therefore, there is a great need to first identify the factors that cause the employees to leave the organizations and secondly, devise the strategies to retain them.

1.1 Objective of the Study

The objective of this study is to know about the practices of Telecom industry regarding its employees and how to keep up with the intense competition in the industry. The study focuses on factors effecting *employee turnover* and on factors that play an important role in retaining the employees of Telecom industry.

Employee turnover is becoming a serious problem in today's corporate environment. Very high turnover rate have not only negative impact on the productivity of any organization, but it also stains their reputation. When employees leave the organization the management has to look for their replacement and invest resources into it and the loss of time becomes another problem for the organization.

The lack of opportunities and benefits, low salaries and unsatisfactory working conditions are most important factors effecting *employee turnover* of any organization. A lot of opportunities for advancement and better incentives and benefits for staff are important to glue employees to the organization. On the other hand, equal and standard wage structures are also important to avoid this major problem of increased *employee turnover* because employees always desire to opt for higher paying jobs and they also believe on the phenomenon of equal pays for equal work. Working conditions of any job leads to dissatisfaction of employees and that is why they start looking for a better option.

Employees always desire for satisfactory office environment. Office environment is basically something about the culture or attitudes of any organization, that is why, it includes all those aspects, which are somewhat related to building of a working environment. All those aspects could be declared as working conditions. It also includes working schedule and nature of tasks assigned besides the facility, easy excess, personal space, communication or cooperation among employees. Some employees desire a far more challenging job, and assignment of challenging jobs increase their loyalty to the organization and they do not need to think about switching to other organizations because they always have opportunities to apply and polish their capabilities.

1.2 Organization of Remainder

Section 2 is literature review, section 3 is about methodology, which gives details of the research instruments; data collection, theoretical framework and development of hypotheses. Section 4 gives the correlation and regression analysis. Section 5 gives the research results and discussions. Section 6 gives findings. Section 7 gives concluding remarks and implications of findings, and finally section 8 gives the limitations and deficiencies of this study.

2. LITERATURE REVIEW

The studies relating to employee turnover in organizations are available to identify various factors regarding their influence on the functioning of a Telecom industry.

Study of Abdullah (2006) showed that Employee turnover has become a very critical problem in

Pakistan's Telecom industry as is the case with many others in various countries. Employees are believed to exploit the labor market conditions and shortage of skillful workers in this industry. A larger number of job opportunities, ease of job switching, attractive salaries and huge demand of skilled workers are some of the highlighted reasons of this problem. Social dynamics and effective communication systems are central to the effective performance levels of work teams. Turnover can have a negative effect on the functioning of an organization through loss of team integration, cohesion, and morale. It may also lead to increased, in-group, conflicts and breakdown of interaction with customers. It is widely believed that a significant amount of turnover adversely influences organizational effectiveness and disrupts performance and productivity.

William (2006) identified by relative comparison of all the important factors involved in retention of employee's compensation: salary or wages, benefits, working conditions, chance for promotion plan. Wilson (2000) observed that a competitive salary is most useful for attracting entry-level employees of Telecom industry and also discovered that monetary incentives such as higher pay and better fringe benefits could positively influence the employee's decision to stay on the current job, because it would increase job satisfaction.

Speh (1999) was the first to identify motivational and reward programs as most effective for Telecom employees' retention; however, it was not investigated, which factors are attributed to employee turnover. Autry and Daugherty (2003) examined the relationship between person-organization fit, job satisfaction, coping behavior, and their impact on Telecom employee turnover. Min (2002) examined various incentives that could help to reduce employee turnover and identified key obstacles for the successful implementation of Telecom employee recruitment and retention strategies.

Griffeth (2004) have explored key occupational (experience), organizational (firm size, family-friendly atmosphere), and individual (pay scale, fringe benefits, bonus, job security, advancement opportunity) variables for their potential influence on Telecom employee turnover. Cardenas and Bernas (2004) has pointed out that work overload is another facet of work-environment and defined as a stressor when the employees feel that they have too many responsibilities or tasks in a defined period. Overload results from an interaction between the employee and his/her environment. One employee may feel that the workload is reasonable whereas another may perceive it as over burdening. Work overload is therefore very subjective in nature. Overload may be of two different types: quantitative or qualitative. When employees perceive that they have too much work to do, too many different things to do, or insufficient time to complete assigned work; a condition of quantitative overload exists. Alternatively, qualitative overload occurs when employees feel that they lack the ability to complete their jobs or that performance standards are too high, or they just have too much to do regardless of how much time they have. Therefore, an overburdening workload will require an increase in time and energy to fulfill the job requirements.

According to Campion (1991) work overload contributes to employees' strain, tension, job dissatisfaction and decreasing turnover. High workloads have been shown as lead for negative outcomes; for example, absenteeism, and low job satisfaction.

According to Spector and Jex (1998) a high workload may result in feelings of anxiety and frustration. The rationale for this hypothesis is that perceptions of a high workload by the employee are likely to result in some form of uncertainty about the completion of work tasks, resulting in low job satisfaction.

Ashforth (1996) suggested that socialization opportunities within the organization might increase job tenure among employees (especially new hires) by assimilating those employees into the existing organizational culture and consequently strengthening their organizational commitment. Similarly, observation reveals that some Telecom employees could be motivated to stay on their current jobs by

increased social activities.

According to Lawler (1983) job satisfaction typically originates from two sources: intrinsic and extrinsic. Intrinsic sources refer to attributes that have psychological (emotional) values for an individual. These attributes may include autonomy, freedom, recognition, and ambience. On the other hand, extrinsic sources refer to tangible attributes that originate from outside the individual. These may include competitive pay, fringe benefits, bonuses, job security, and working conditions.

Mobley, Griffeth, Hand and Meglino (1979) pointed out that turnover intent is the cognitive process of thinking, planning, and desiring to leave a job. It is easier to measure turnover intent than voluntary turnover because administrative records may be unavailable, incomplete, or inaccurate. Turnover may be voluntary or involuntary. Regardless of the type of organization, voluntary turnover is disruptive and harmful to the organization. It is also costly, both directly and indirectly. Cascio (1976) has defined, through research, that voluntary turnover is initiated at the choice of the employee whereas employees have no choice in their involuntary turnover i.e., termination (such as long term sickness, death, moving overseas or employer-initiated termination). Voluntary turnover can be predicted (and in turn, controlled) by the construction of turnover intent. According to Dalton and Todor (1979), moderate levels of turnover are acceptable and encouraged as the new employees may contribute fresh ideas, their knowledge, skills and abilities, creative approaches to problem solving, and different working styles can enhance the social capital of the organization.

According to Cotton (1996) in "*Unfolding Model*" defining a very critical factor- "*Lack of work Life Balance*" behind high turnover in the organizations. As every personal in the world have his/her, own life to which he/she wants to give proper time other than work life. So whenever employees found any conflict in between both types of lives, they prefer to move somewhere else, where they could avoid such kind of conflicts.

According to Des and Shaw (2009), one of the main consequences for organizations that have a high turnover is the financial cost. The total costs of employee turnover are hard to measure, in particular the effects on the organization's culture, employee morale, and social capital or loss of organizational memory

North, Rasmussen, Hughes and Finlayson (2005) found the cost of losing a high performer, who has a high degree of knowledge, skills and abilities, or an employee, who is employed in an area where there is a labor market shortage, can be substantial to the organization's performance, productivity, and service delivery. In addition, turnover can have a negative impact on other employees by disrupting group socialization processes and increasing internal conflict, which can lead to triggering additional turnover

According to Blau (1964) the rewards can be tangible, such as income; and intangible, such as being treated with respect, dignity, and fairness. This reciprocal exchange is grounded in social exchange theory and the mutual transaction of benefits to each party shapes the social interactions. It is reasonable to assume that employees are more likely to respond favorably to fair treatment than unfair treatment. Indeed psychological theory states that the importance of fairness is a basic need for the well being and satisfaction of employees

According to the Rusbult and Farrell, (1983) Turnover refers to the characteristic of a given company or industry, relative to rate at which an employer gains and losses staff. If an employer is said to have a high turnover, it most often means that employees of that company have a shorter tenure than those of other companies in the same industry. Similarly, if the average tenure of employees in a particular sector is lower than that in other sectors, that sector can be said to have a relatively high turnover.

When accounting for the costs (both real and opportunity costs), the cost of employee turnover to for-profit organizations has been estimated to be up to 150% of the employees' remuneration package.

3. METHODOLOGY

3.1 Research Instrument

The study is based on primary source of data. Thus instrument used to conduct the research is Structured Questionnaire. Structured questionnaire was floated in the Telecom Industry; the targeted population was the Telecom companies (MOBILINK, Ufone, TELENOR, WARID and ZONG).

3.2 Sample and Data Collection

The sample was chosen on convenient sampling. The sample size for this study was 150 respondents from 30 business centers of these organizations located in Islamabad, Karachi and Lahore. The questionnaire is designed on LIKERT scale and analyzed through Correlation and Regression technique.

3.3 Theoretical Framework

The turnover models have been drawn mainly from William's (2006) process model, which dominated the early research on turnover. Some variables in the turnover models are regarded as independent that have a direct relationship with turnover.

Four main variables in our research are: Employee Turnover, as the dependent variable; and Salary, Work Environment and Benefits, as independent variables. The basic reasons of employee turnover are Salary, Working Conditions and Benefits. All of these factors are having a relationship with employees' turnover and as these factors increase it will directly decrease the employees' turnover of Telecom Industry.

3.4 Conceptualization



3.5 Hypothesis

Salary Vs Employee Turnover

H10: Salary doesn't affect on employee turnover.
H1a: Salary directly affects the employee turnover.

Working Environment Vs. Employee Turnover

H20: Working Environment and employee Turnover are independent of each other.
H2a: Working Environment and employee Turnover are dependent of each other.

Benefits Vs. Employee Turnover

H30: Benefits in terms of bonuses will not satisfy and retain employees.

H3a: Benefits in terms of bonuses will satisfy and retain employees.

4. CORRELATION AND REGRESSION ANALYSIS

4.1 Correlations

Table-1: Descriptive Statistics

	Mean	Std. Deviation	N
Employee Turnover	3.8225	.42161	150
Salary	2.9250	.34043	150
Work Environment	2.6249	.32542	150
Benefits	2.1859	.52341	150

Table-2: Correlations

		Employee Turnover	Salary	Work Environment	Benefits
Employee Turnover	Pearson Correlation	1	-.571(**)	-.428(**)	-.472(**)
	Sig. (2-tailed)		.000	.000	.000
	N	150	150	150	150
Salary	Pearson Correlation	-.571(**)	1	.713(**)	.721(**)
	Sig. (2-tailed)	.000		.000	.000
	N	150	150	150	150
Work Environment	Pearson Correlation	-.428(**)	.713(**)	1	.754(**)
	Sig. (2-tailed)	.000	.000		.000
	N	150	150	150	150
Benefits	Pearson Correlation	-.472(**)	.721(**)	.754(**)	1
	Sig. (2-tailed)	.000	.000	.000	
	N	150	150	150	150

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

4.2 Regression

Table-3: Variables Entered/Removed (b)

Model	Variables Entered	Variables Removed	Method
1	Benefits, Work Environment, Salary		Enter

a All requested variables entered.

b Dependent Variable: Employee Turnover

Table-4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.690(a)	.476	.464	.21745

a. Predictors: (Constant), Benefits, Work Environment and Salary

Table-5: ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.075	3	1.244	29.46	.001(a)
	Residual	28.050	147	.049		
	Total	43.125	150			

a Predictors: (Constant), Benefits, Work Environment and Salary

b Dependent Variable: Employee Turnover

Table-6: Coefficients (a)

		Un-standardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.945	.284		12.820	.000
	Salary	-.591	.135	-.879	-5.841	.000
	Work Environment	-.332	.123	-.473	-2.989	.002
	Benefits	-.221	.108	-.117	-2.501	.004

a. Dependent Variable: Employee Turnover

5. RESEARCH RESULTS AND DISCUSSION

The data was analyzed through SPSS software by using correlation and regression. The correlation test indicates the correlation between the variables. The correlation values show that there is a negative correlation of Employee Turnover with Salary, Working Environment, and Benefits. The regression test implies that model is fit having F value 29.46. The t value for Salary is (-5.841), Working Environment (-2.989), Benefits (-2.501) and all values are greater than 2. According to the rules if t value is greater than 2 ($t > 2$) then null hypothesis will be rejected and alternate hypothesis will be accepted.

5.1 Results and Hypothesis

Salary Vs Employee Turnover

H10: Salary doesn't effects employee turnover. REJECTED.

H1a: Salary directly affects the employee turnover. ACCEPTED.

Working Environment Vs. Employee Turnover

H20: Working Environment and employee Turnover are independent of each other. REJECTED.

H2a: Working Environment and employee Turnover are dependent of each other. ACCEPTED.

Benefits Vs. Employee Turnover

H30: Benefits in terms of bonuses will not satisfy and retain employees. REJECTED

H3a: Benefits in terms of bonuses will satisfy and retain employees. ACCEPTED

6. FINDINGS

An analysis of the research conducted on the Telecom industry's employees to the survey questionnaire indicates that all the independent variables have significant effects on Employee turnover. As Salary increases, Working Environment and Benefits provided are good then Employee turnover drops. Many people desire rewarding, enjoyable, and enriching jobs. If the employees are highly dissatisfied with their Salary, Work environment and Benefits than they may likely want to leave the job that is causing so much pain and discomfort and will be more likely to voice intentions to leave in order to alleviate the negative feelings. The research indicates the individuals, who consistently experience unpleasant or dissatisfying environments or situations have more reasons to turnover. Workers, who are happy with their overall work environment, have far less reason to Employee Turnover. Similarly, as Salary and Benefits increases, the desire to leave the job decreases. It appears that those with higher paid Salary and Benefits have stronger bonds with the organization, and these bonds generally ensure that they will remain members in the organization.

7. CONCLUSION AND POLICY IMPLICATIONS

Conclusions have been drawn after extensive research conducted in order to find out the reasons of turnover of Telecom sector's employees. The present study found support for an independent variables with Employee Turnover and significant negatively correlations have been found for the Salary, Work environment and Benefits. Therefore, organizations need to focus on how to develop better Salary plan and reduce strain in the workplace. The responses gathered after research has proved that hypothesis regarding Salary, Working Environment and Benefits were true; and these independent variables are directly related to increase in turnover of the organization. If staff voluntarily leaves, it is a great loss to the organizations. It is expensive to hire, train, and "bring up to speed" new replacements. It is, therefore, important to understand the antecedents of turnover intent of employees before they decide to quit.

8. RESEARCH LIMITATIONS

The major factors which affected the internal validity of our research are: maturation effect and testing effect.

The study was faced by certain limitations and those limitations included time constraints and resources constraints which limited our research to only the Islamabad Karachi & Lahore office of the Telecom organizations.

Testing effect also affected our research in a way that employees answers to the questions in a way which showed their loyalty to their organization and which sets in the best interest of organization. Another factor, which limited our research was problem in directly accessing employees and convincing them to respond.

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Optimal Inventory Policies for Weibull Deterioration under Trade Credit in Declining Market

Nita H. Shah* and Nidhi Raykundaliya**

ABSTRACT

The aim of this study is to develop mathematical model for Weibull deterioration of items in inventory in declining market when the supplier offers his retailers a credit period to settle the accounts against the dues. The computational steps are explored for a retailer to determine the optimal purchase units which minimize the total inventory cost per time unit. The numerical examples are given to demonstrate the retailer's optimal decision. A sensitivity analysis is carried out to study the variations in the optimal solution.

JEL. Classification: C61; C63; D81;

Keywords: Weibull deterioration, trade credit, declining market.

1. INTRODUCTION

Till early 80's, the inventory models were derived under the assumption that the retailer settles the accounts immediately on receipt of the goods in inventory. Brigham (1995) gave term "net 30" which means a supplier offers 30-days time period to the retailers to settle the accounts against the items procured. The supplier does not charge any interest for the dues if it is paid within 30-days. However, if the payment is not settled within 30-days, then interest is charged on the unsold stock in the retailer's inventory. The retailer can earn the interest on the revenue generated and delay the settlement of account till the last allowable date of permissible credit period by the supplier. Thus, by taking advantage of trade credit, the retailer can reduce his total cost, equivalently, trade credit is discounting. For the supplier, it may be default risk (Teng, Chang and Goyal 2005).

The concept of trade credit inventory model was formulated by Goyal (1985). He discussed interest earned on the unit purchase price and concluded that the cycle time and order quantity increases marginally. Dave (1985) corrected the Goyal's model by assuming the fact that the selling price is higher than its purchase price. The interest earned by the retailer should be computed on the selling price. Shah (1993a) derived a mathematical model when units in inventory are subject to constant deterioration and trade credit is offered to the retailer by the supplier. Shah (1993b, 1993c) formulated the probabilistic inventory model under the assumption of permissible delay in payments. The order level probabilistic inventory model is derived for deteriorating items to study the effect of the permissible delay period in Shah (1993d). Hwang and Shinn (1997) developed the joint pricing and ordering policies

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for the retailer under the scenario of allowable trade credit. Liao, Tsai and Su (2000) developed an inventory model when demand is stock-dependent. Most of the above stated articles and their references ignored the difference between unit sale price and unit purchase cost, concluding to the findings of Goyal (1985).

Jamal, Sarker and Wang (1997, 2001) and Sarker, Jamal, Wang (2000) took the difference between the unit sale price and unit purchase price to establish that the retailer should settle the account as soon as the unit selling price increases relative to the unit purchase price. Teng (2002) provided an alternative conclusion that the saturated retailer should place order of smaller size to avail of the permissible delay more frequently. One can read articles by Abad and Jaggi (2003), Arcelus, Shah and Srinivasan (2001), Arcelus, Shah and Srinivasan (2003), Chung and Dye (2000), Chung and Dye (2001), Chung (1998), Chung (2000), Chung and Huang (2003), Chung and Liao (2004), Chung, Goyal and Huang (2005), Shah (2004), Shah (2006), Gor and Shah (2003), Gor and Shah (2005), Huang (2003), Ouyang, Chang and Teng (2005), Ouyang, Teng, Chuang and Chuang (2005), Salameh, Abbouud, El- Kassar and Ghattas (2003), Shah, Shah, and Shah (2004), Shinn and Hwang (2003). The most of the above cited studies are derived under the assumption of constant and known deterministic demand.

In this article, the demand of a product is assumed to be decreasing with time. The decrease in demand is observed for fashionable garments, seasonal products, air-tickets etc. Shortages are not allowed and replenishment rate is infinite. The units in inventory are subject to deterioration with time. It is assumed that deterioration follow two parameters Weibull distribution. The retailer generates revenue on unit selling price which is necessarily higher than the unit purchase cost. The objective is to minimize the total cost per time unit of an inventory system. The model is supported by numerical examples. The sensitivity analysis is carried out to study the variations in the optimal solution.

2. NOTATIONS AND ASSUMPTIONS

The proposed mathematical model is developed using the following notations and assumptions:

2.1 Notations

$R(t) = a(1-bt)$; the annual demand as a decreasing function of time where $a > 0$ is constant demand and b ($0 < b < 1$) denotes the rate of change of demand with respect to time.

C : the unit purchase cost.

P : the unit selling price with ($P > C$).

h : the inventory holding cost per unit per annum excluding interest charges.

A : the ordering cost per order.

M : the permissible credit period offered by the supplier to the retailer for settling the accounts against the dues.

I_c : the interest charged per monetary unit in stocks per annum by the supplier.

I_e : the interest earned per monetary unit per year.

Note : $I_c > I_e$

Q : the order quantity (a decision variable)

$\theta(t)$: deterioration with respect to time

$\theta(t) = \alpha \beta t^{\beta-1}$ where α denotes the scale parameter; $0 < \alpha < 1$.

β denotes the shape parameter; $\beta > 1$ i.e. deterioration increases with respect to time t.

$I(t)$: the inventory level at any instant of time t, $0 \leq t \leq T$.

T : the replenishment cycle time (a decision variable).

K(T) : the total cost per time unit of an inventory system.

the total cost of inventory system comprises of: (a) ordering cost; OC, (b) cost due to deterioration; DC, (c) inventory holding cost excluding interest charges; IHC, (d) interest charged on unsold item after the allowable trade credit when $M < T$; I_c , and minus (e) interest earned on revenue generated during the allowable permissible delay period; I_e .

2.2 Assumptions

- i. The inventory system under consideration deals with the single item.
- ii. The planning horizon is infinite.
- iii. The demand of the product is decreasing function of the time.
- iv. Shortages are not allowed and lead-time is zero.
- v. The units in inventory deteriorate with respect to time. The deteriorated units can neither be repaired nor replaced during the cycle time.
- vi. The retailer can deposit generated sales revenue in an interest bearing account during the allowable credit period. At the end of this period, the retailer settles the account for all the units sold keeping the difference for day-to-day expenses, and starts paying the interest charges on the unsold items in the inventory system.

3. MATHEMATICAL MODEL

The inventory level; $I(t)$ depletes to meet the demand and deterioration of units. The rate of change of inventory level can be described by the following differential equation :

$$\frac{dI(t)}{dt} + \theta(t)I(t) = -R(t), \quad 0 \leq t \leq T \quad (1)$$

with the initial condition $I(0) = Q$ and the boundary condition $I(T) = 0$. Consequently, the solution of (1) is given by

$$I(t) = - \left[\int_0^t a(1 - bt)e^{\alpha t^\beta} dt + X \right] e^{-\alpha t^\beta} \quad 0 \leq t \leq T \quad (2)$$

where X denotes constant of integration. The solution is obtained using series expansion of exponential and neglecting α^2 and its higher powers because $0 < \alpha < 1$. Using $I(0) = Q$, the order quantity is

$$Q = I(0) = \frac{a}{8(1+\beta)(2+\beta)(1+2\beta)} \begin{bmatrix} 16T + 72\alpha T^{1+\beta} + 32\alpha^2 T^{1+2\beta} - 28T^2 \beta^3 - 28bT^2 \beta - \\ 8b\alpha^2 T^{2\beta+2} - 8b\alpha T^{\beta+2} + 56T\beta + 56T\beta^2 + 16T\beta^3 - 8bT^2 \\ -10b\alpha^2 T^{2\beta+2} - 16b\alpha T^{\beta+2} \beta^2 - 24b\alpha T^{\beta+2} \beta \end{bmatrix} \quad (3)$$

The total cost of inventory system per time unit consists of the following cost components:

a) Ordering cost; $OC = \frac{A}{T}$ (4)

b) Cost due to deterioration; DC per time unit; $DC = \frac{C}{T} \left[Q - \int_0^T R(t) dt \right]$

$$= \frac{C}{T} \left[\frac{a}{8(1+\beta)(2+\beta)(1+2\beta)} \begin{bmatrix} 16T + 72\alpha T^{1+\beta} + 32\alpha^2 T^{1+2\beta} - 28T^2 \beta^3 - 28bT^2 \beta - \\ 8b\alpha^2 T^{2\beta+2} - 8b\alpha T^{\beta+2} + 56T\beta + 56T\beta^2 + 16T\beta^3 - 8bT^2 \\ -10b\alpha^2 T^{2\beta+2} - 16b\alpha T^{\beta+2} \beta^2 - 24b\alpha T^{\beta+2} \beta \end{bmatrix} + \frac{abT^2}{2} - aT \right] \quad (5)$$

c) Inventory holding cost; IHC per time unit;

$$IHC = \frac{h}{T} \int_0^T I(t) dt \quad (6)$$

Regarding interest charges and earned, two cases may arise based on the lengths of the allowable credit period M and cycle time T.

Case1: $M \leq T$.

Under the assumption mentioned in (6) (section 2.2) above, the retailer sells R(M)M units by the end of the permissible tread credit M and has to pay dues CR(M)M to the supplier. For the unsold items in the retailer’s warehouse, the supplier charges an interest rate I_c during interval $[M, T]$. Hence, the interest charged, IC_1 per time unit is

$$IC_1 = \frac{CI_c}{T} \int_M^T I(t) dt \quad (7)$$

During $[0, M]$, the retailer sells the product and deposits the generated revenue into an interest earning account at the rate I_e per monetary unit per annum. Hence, the interest earned, IE_1 during $[0, M]$ per time unit is

$$IE_1 = \frac{PI_e}{T} \int_0^M R(t) dt = \frac{PI_e}{T} \left[\frac{1}{2} aM^2 - \frac{1}{3} bM^3 \right] \quad (8)$$

Hence, the total cost; $K_1(T)$ of an inventory system per time unit is

$$K_1(T) = OC + DC + IHC + IC_1 - IE_1 \quad (9)$$

Case2: $T \leq M$

In this scenario, the retailer sells R(T)T-units in all by the end of the cycle time and has CR(T)T amount in his account to pay the supplier in full by the end of the credit Period M. Hence the interest charges $IC_2 = 0$ (10)

and the interest earned per time unit is

$$IE_2 = \frac{PI_e}{T} \left[\int_0^T R(t) dt + R(T)T(M-T) \right]$$

$$= \frac{PI_e}{T} \left[\frac{-abT^3}{3} + \frac{aT^2}{2} + aTM - aT^2 - abT^2 M + abT^3 \right]$$

Hence, the total cost; $K_2(T)$ of an inventory system per time unit is

$$K_2(T) = OC + DC + IHC + IC_2 - IE_2 \quad (12)$$

As a result, the total cost; $K(T)$ of an inventory system per time unit is

$$K(T) = \begin{cases} K_1(T), & M \leq T \\ K_2(T), & M \geq T \end{cases} \quad (13)$$

For $T = M$, we have $K_1(M) = K_2(M)$.

$$(14)$$

4. Analytic Results:

For $M \leq T$, the value of T can be obtained by solving

$$\frac{\partial K_1(T)}{\partial T} = 0 \quad (15)$$

The obtained $T = T_1$ (say) minimizes the total cost provided

$$\frac{\partial^2 K_1(T)}{\partial T^2} > 0 \quad \text{for } T = T_1 \quad (16)$$

For $M > T$, the value of $T = T_2$ (say) can be obtained by solving

$$\frac{\partial K_2(T)}{\partial T} = 0$$

The obtained $T = T_2$ minimizes the total cost per time unit of an inventory system, provided (17)

$$\frac{\partial^2 K_2(T)}{\partial T^2} > 0 \quad \text{for } T = T_2 \quad (18)$$

5. COMPUTATIONAL ALGORITHM

The outline to obtain optimal solution for retailer is as follows:

Step1: Initialize all the parametric values.

Step2: Compute T_1 from eq.(15). If $M < T_1$ then $K_1(T_1)$ (eq. 9) gives the minimum cost else go to step3.

Step3: Compute T_2 from eq. (17). If $M > T_2$ then $K_2(T_2)$ (eq.12) gives minimum cost for retailer; else go to step 4.

Step4: $K_1(M) = K_2(M)$ (eq. 14) is the minimum cost.

Step5: stop.

5.1 Numerical examples:

Example1: Consider the following parametric values in proper units:

$$[a, b, C, P, h, A, I_c, I_e, M, \alpha, \beta] = [300, 0.2, 20, 40, 1, 200, 12\%, 9\%, 30/365, 0.3, 3.5]$$

Then $T_1 = 0.5270$ years which is less than M . So $K_1(T_1) = \$612.86$ is minimum cost (see

Fig.1) procuring 150.79 units. Also $\frac{\partial^2 K_1(T)}{\partial T^2} = 3878.12 > 0$ proves convexity of the total cost.

Example2: for parametric values :

$$[a, b, C, P, h, A, I_c, I_e, M, \alpha, \beta] = [2500, 0.1, 28, 40, 1, 250, 12\%, 60/365, 0.3, 1.8]$$

Then $T_2 = 0.1591$ years which is greater than M . Using algorithm $K_2(T_2) = \$974.61$ is the minimum cost (see Fig.2) for purchase of 396.17 units. Also $\frac{\partial^2 K_2(T_2)}{\partial T_2^2} = 137787 > 0$ shows

that the total cost per time unit of an inventory system is minimum. Using parametric values defined in example 1, sensitivity analysis is performed by changing values as -40%, -20%, 20%, 40% on decision variable and the objective function

It is observed that increase in deterioration rate decreases cycle time because retailer will have to put order frequently. The more deterioration rate of units increases total cost of an inventory system and to reduce deterioration rate of units he replenishes order of smaller size. Increase in shape parameter of deterioration with respect to time increases cycle time and decreases procurement quantity significantly. The total cost of any inventory system is very sensitive to shape parameter. The permissible delay period decrease cycle time and total cost. Decrease in total cost is due to the fact that the retailer can earn interest on generated sales revenue for a longer period. Increase in the declining demand rate directs retailer to put order of smaller size after a long time and decrease in total cost.

Table-1: Sensitivity Analysis

Parameter	% changes			
		T	Q	K_1
b	-40	-1.85	1.24	0.36
	-20	-0.94	0.63	0.18
	20	1.01	-0.65	-0.17
	40	2.06	-1/32	-0.32
M	-40	0.19	3.83	-0.46
	-20	0.09	1.93	0.10
	20	-0.13	-1.94	-0.12
	40	-0.26	-3.91	-0.25
α	-40	6.64	-3.00	6.07
	-20	2.97	-1.42	2.72
	20	-2.50	1.29	-2.29
	40	-4.74	2.49	-4.26
β	-40	-13.43	15.46	-11.77
	-20	-6.03	5.41	-5.33
	20	4.93	-3.20	4.41
	40	9.01	-5.21	8.07

6. CONCLUSIONS

The effect of time dependent deterioration of units in inventory is studied when demand of the product is decreasing and supplier offers the retailer a credit period to settle the accounts. It is established that the retailer should replenish smaller order more frequently to avail of sales promotional tool as trade credit. The study is interesting by allowing partial backlogging, inflation, stochastic demand etc.

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APPENDIX-1

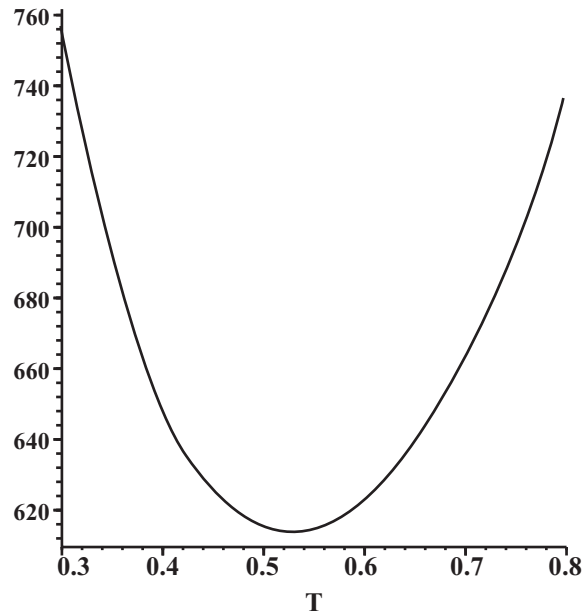


Fig 1: Convexity of total cost when $M \leq T$

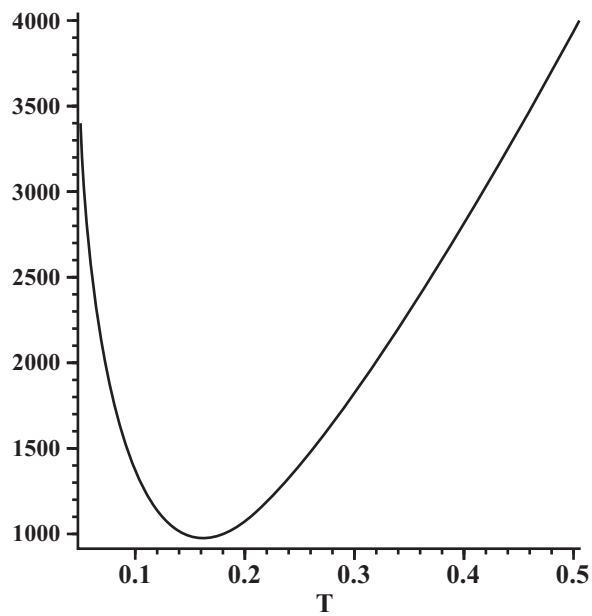


Fig 2 Convexity of total cost when $M \leq T$

Role of Quality Management in Pharmaceutical Development: Evidence from Islamabad and Lahore

Tariq Mehmood Rana*, M. Rashid Salaria, Gobind M. Herani*** and M.A. Qureshi******

ABSTRACT

The aim of this paper is to investigate the employee's perceptions of the impact, of Total Quality Management (TQM), on their roles within the organization and how they perceived the effectiveness of the quality processes in Pakistan Pharmaceutical industry. The universe of this study was the employees of Pharmaceutical industry in Islamabad and Lahore. For this purpose survey method was used by using questionnaire as a tool for data collection. The results have shown that Employee Training and Development, Employee Performance, Quality Process and Team Work are significant factors with the Total Quality Management and correlated with each others. The result shows the application of TQM principles addresses some of the key challenges facing the organization. The study was faced by certain limitations and included time constraints and resources constraints which limited this research to only Islamabad and Lahore offices, of the Pharmaceutical companies. The present study found support that pharmaceutical companies faced the same difficulties with TQM implementations as experienced in other industries. These include achieving a culture of continuous improvement, overcoming a lack of trust and understanding the TQM process itself, and what they were, as a company, trying to achieve. These problems are not new and many companies have difficulties in implementing TQM. Pharmaceutical companies also followed the path of achieving a quality certification; namely, ISO 9000 accreditation, in the pursuit of excellence.

JEL. Classification: D24; I11; J81; L25;

Keywords: Quality Management; pharmaceutical Development; Pakistan; Employee's Perceptions

1. INTRODUCTION

The material presented by the authors does not necessarily represent the viewpoint of editors and the management of the Indus Institute of higher education as well as the authors' institute

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Industry reform is challenging the fundamental focus of the pharmaceutical industry and its customers. Demands for quality have never been higher. Pharmaceutical companies must meet many new challenges to ensure efficient business operations. There are external challenges from competitors, generic drug manufacturers, health-care organization, in addition to internal challenges to decrease the cost of sales, Research and Development (R&D), and manufacturing. Government's guide lines in the form of regulatory requirements need to be received, interpreted and disseminated in timely manner to ensure compliance. Quality is now major differentiator in today's increasingly competitive business environment. The TQM philosophy stresses a systematic integrated, consistent organization -wide perspective involving everyone and everything. Quality standards for pharmaceuticals have been built up for the years from experts from industry, pharmaceutical authorities, regulatory agencies and academia and based on experience and the need to look after the safety and efficacy of the product for the sake of patient's health. TQM is a philosophy that embraces concepts, methods, tools and techniques to form a language which is understood and applied as a business strategy at the "top-floor" and as a functional strategy at the "shop-floor". This approach assists organizations to integrate business activities in leadership, people and customers' focus, planning, quality assurance of processes, and information and analysis. These activities, when effectively linked together, would lead to sustainable world class performance to customers' satisfaction, employee relations, operating performance and business performance. TQM or Continuous Quality Improvement (CQI) is a management philosophy currently used in many industries to improve the "quality" of products and services. Incited by impressive results in other industries, this compelling and logical approach has begun to penetrate into the thinking of health-care organizations. TQM is an organized, integrated system of CQI aimed at meeting customers' expectations.

1.1 Challenges in the Pharmaceutical Industry

The pharmaceutical industry has an increasingly complex and dynamic environment. There have been a lot of change, in the recent years, in the pharmaceutical industry and this trend is likely to continue. The openings of markets, increased buyer-cost sensitivity, global competition and technological advancements have increased levels of uncertainty. There has been an inexorable rise in patient expectations, increased costs of health-care and the inability of economics to meet the increased costs. Consequently governments have introduced a number of measures aimed at increasing competition and accountability and thus reducing costs. One major change has been the emergence of generic drugs, which is threatening the loyalty to major branded drugs. A generic product is product manufactured after patent expiry by another manufacturer, normally at a cheaper price. The growth of many organizations has rested on the success of technological advances in manufacturing new product.

1.2 Smaller Companies Make Inroads

As barriers come down, and customers' demand change then smaller companies begin to make inroad penetration into the marketplace. The smaller companies are competing on flexibility and innovation, adapting to changing market conditions.

In the 1980s, the pharmaceutical marketplace was primarily product driven. Companies have developed and brought medicines to market that were safe, effective and without regulatory compliant. The consumer is now more aware, educated and demanding. Bashe (2000) states that the increase in consumers' power will fundamentally force pharmaceutical companies to change the way they do business.

1.4 Requirement for New Approaches

Technological advances means increasingly clinical development will be done electronically and remotely. Consequently future clinical development and professionals will need to have technical therapeutic skills, IT competency highly developed communication skills and commercial abilities. The pharmaceutical industry will need to move beyond its conservative outlook and embrace an entrepreneurial approach attracts new skills and fresh ideas.

Technological advances means increasingly clinical development consequently future clinical development professionals will need to have technical therapeutic skills, IT competency highly developed communication skills and commercial abilities. The pharmaceutical industry will need to move beyond its conservative outlook and embrace an entrepreneurial approach that embraces new skills and fresh ideas.

1.5 Quality Management in the Pharmaceutical Industry

Along side other industries where safety is critical, the pharmaceutical industry is heavily regulated and for obvious reasons: mistakes in product design or production can have severe and even fatal, consequences for patients. The manufacturer shall establish and implement effective pharmaceutical Quality Assurance (QA) system, involving the active participation of the management and personnel of the service involved. To ensure quality and safety of the products, pharmaceutical companies build their quality approach around good manufacturing practices (GMP).

2. LITERATURE REVIEW

TQM has been defined as a new way of organizing a strategy (Hayes and Wheelwright 1984), achieving excellence (Juran 1951), and meeting and exceeding customer expectations (Buzzell and Gale 1987). A consensus (Dean and Bowen 1994) is however emerging that organizations embracing TQM are founded on three principles. The first is, customer focus, defined as meeting and acceding customer needs. The second is continuous improvement, defined as attempting to create gains in performance from incremental innovations in organizational processes. The third principle is teamwork, defined as collaborating with all organizational members, customers, and suppliers. These principles focus the organization on satisfying current and anticipated customers' needs by creating value through cost and customer-driven features in their markets (Jacob 1993). Implementation of these three principles typically requires "radical change" (Munroe-Faure and Munroe- Faure 1992: 8) or a "paradigm shift" (Blackburn and Rosen 1993) in organizational design.

A fourth type of work has been identified by Tushman (1979), in his studies relating subunit work characteristics to subunits' structure and performance. Such work has non programmed means but programmed ends. This work has clear well-defined and programmed output/goal, but entails changing the means by which work is carried out. Work or task shows "continuous improvement" when done with uninterrupted improvement by line workers, define problems, decipher cause and effect relationships, and propose testing specific approaches for doing the work. These efforts for improvement cannot be completely standardized, because problem solving cannot be routine, by definition, as it relies on creative thinking and active information searching. Work under TQM in this sense is "dual". TQM combines two distinct types of tasks-standardized production and continuous improvement, execution and conceptualization-into one job role.

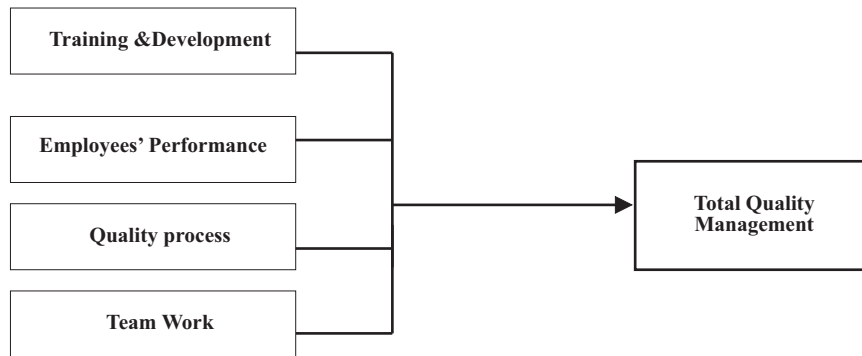
TQM relies on the tools of scientific management and experimentation to define the “best practices” used in production; but not every step of the improvement efforts can be standardized. This is because continuous improvement is problem-solving in nature, requiring information search and analysis to identify underlying relationships, determine feasible solutions, and evaluate alternatives (Lillrank and Kano 1989). However, it would be misleading to characterize this work as innovation (non programmed ends and means), because its objectives are the achievement of well-defined goals such as "increasing quality by 3%" or "reducing defects by 5%," or a broad, but directionally oriented set of goals such as "reduced costs" or "increased quality." We have therefore labeled it continuous improvement.

TQM is ultimately a challenge for each individual employee to accept or reject. Most TQM implementations take place in existing and on-going organizations (Wilkinson, McCabe and Knights 1996) where the worker's role is often limited to the standardized. In such cases, the change to TQM appends continuous improvement tasks to standardized production. The change in role is neither insignificant nor non problematic. The significance of this change for employees is reflected in the imperative given in both the practical and managerial literatures on the “social” aspects of TQM implementations including training, culture, and motivation (Tuckman 1994). When combined in the TQM job, employees may perceive standardized production and continuous improvement work as posing illegitimate, irreconcilable, or conflicting demand.

Human Resource Management (HRM) is known to be a subset of a wide-ranging management process that is oriented towards and incorporated in the company strategy (Graf 2007). Consistent with this perspective, the area of HRM is known, including the processes and practices such as recruiting, selecting, motivating, training, compensating and retaining workers (Stone 2007). This suggests that an organization with successful HRM practices could help to improve the well-being of employees. According to Churchill, Ford and Walker (1976), since the salesmen’s well-being and performance are affected by company policies and management actions, the management may modify company policies and procedures specifically on salesman compensation, promotion and sales training in order to improve the morale level among the sales force. Salesmen are more effective in their jobs when management furnishes them with satisfactory technical backup, information and training to assist them in handling unusual demands arising from the job (Churchill, Ford and Walker 1976). A critical component of TQM initiatives is that of employees’ involvement which requires employees to take responsibility for the quality of their work and demands their active participation in the search for continuous improvement (Wilkinson, McCabe and Knights 1996). Successful implementation of TQM depends heavily on changes in employees' attitudes and activities (Guimaraes 1996). Thus for the employer introducing TQM to gain employee commitment and co-operation rather than just compliance is the most important aspect and for this to occur a change of culture is required to include the greater involvement of employees in the decision-making process (Hill 1991). A central need emphasized (Snape 1996) is the development of a “quality culture” allowing all employees from top management to floor level in order to develop a commitment to continuous improvement as an integral part of their daily work. However, it has been suggested (Snape 1996) that the proponents of TQM have understated the difficulties of winning employee commitment and focus on an overtly limited range of change levers.

On the basis of literature review it is conceptualized that following factors are important for the discussion of theoretical framework.

CONCEPTUAL FRAMEWORK



Source: McAdam, Rodney and Barron, Nigel (2002).

2.1 Conceptual Framework

2.1.1 Total Quality Management (TQM)

A Philosophy of management is driven by customer needs and expectations, and focuses on continual improvement in work process. TQM is an evolving system of practices, tools, and training methods for managing companies to provide customer satisfaction in a rapidly changing world. Quality has been an important issue for organizations for many years. The early focus on quality evolved from inspection to quality control and later to quality assurance.

2.1.2 Training

Training is claimed to be one of the essential features for improving quality (Brown 1994) and to deliver service quality competently and confidently (Berry and Parasuraman 1992). Since poor training is one of the reasons for a lack of quality in human service then training will be able to minimize the risk of service failure.

2.1.3 Teamwork

Teamwork is often seen in the academic literature as a means of supporting willingness to deliver service quality (Berry and Parasuraman 1992). Through support from team members, motivation for providing quality service is likely to continue and effective teamwork tends to develop capabilities for delivering a high level of service quality (Tjosvold, Moy and Sasaki 1999). Other studies have found that weak service performance is strongly associated with a lack of teamwork; hence, service failure can be minimized by team working (Redman and Mathews 1998). When effective, a team tends to develop employee commitment towards customer service, and the capability of delivering a high level of service quality.

2.1.4 Total Quality Process

Quality Process reflects the demands of internal customers, and comes down to effectiveness (the extent to which a process provides required features) and efficiency (being effective at low cost) (Bashe 2000). The concept of quality Process plays an important role in the descriptions above, and in fact, Six-Sigma is usually regarded as a quality improvement strategy.

2.1.5 Employee Performance

The Employee performance standards do provide the bases for the performance development program, contributing in employees work relating skills, knowledge and experience. It offers an opportunity to built on the employees' performance and contribute to organizational goals.

2.2 Purpose of the Study and Hypothesis Development

- i. To understand the employees' perception of the impact of Total Quality Management on their roles within the organization and
- ii. How employees perceived the effectiveness of the quality processes in Pakistani Pharmaceutical industry.

Hypothesis

The study examines the following hypothesis:

H10. There is no positive and significant relationship between employee's perceptions and Total Quality Management

H1a. There is a positive and significant relationship between employee's perceptions and Total Quality Management.

H20. There is a no positive and significant relationship between perceived effectiveness and quality processes

H2a. There is a positive and significant relationship between perceived effectiveness and quality processes.

3. METHODOLOGY

The data for this study were collected in 2009 from 5 different companies of Islamabad, Rawalpindi and Lahore. The result of an employee opinion survey, which was issued to over 175 employees, is summarized. A total of 158 surveys (90) percent were returned.

3.1 Correlation and Regression Analysis

Table-1: Descriptive Statistic

	Mean	Std. Deviation	N
Total Quality Management	6.5250	.79074	158
Training & Development	5.8933	.69971	158
Employee Performance	5.7766	.64412	158
Quality process	5.1000	.54772	158
Team Work	5.8289	.68981	158

Table-2: Correlation

		Total Quality Management	Training & Development	Employee Performance	Quality process	Team Work
Total Quality Management	Pearson Correlation	1	.699**	.651**	.399**	.321*
	Sig.(2-tailed)		.000	.001	.000	.005
	N	158	158	158	158	158
Training & Development	Pearson Correlation	.699**	1	.721**	.455**	.321*
	Sig.(2-tailed)	.000		.000	.000	.002
	N	158	158	158	158	158
Employee Performance	Pearson Correlation	.651**	.721**	1	.431**	.411**
	Sig.(2-tailed)	.001	.000		.000	.000
	N	158	158	158	158	158
Quality process	Pearson Correlation	.399**	.455**	.431**	1	.422**
	Sig.(2-tailed)	.000	.000	.000		.000
	N	158	158	158	158	158
Team Work	Pearson Correlation	.321**	.321*	.411**	.422**	1
	Sig.(2-tailed)	.005	.002	.000	.000	
	N	158	158	158	158	158

* Correlation is significant at the 0.05 level (2-tailed).

Table-3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.787(a)	.619	.427	.2297

Table-4: ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.882	5	6.294	25.174	.000(a)
	Residual	13.440	153	.270		
	Total	34.292	158			

Table-5: Coefficients (A)

Model		Un-standardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.542	.214		13.900	.000
	Training & Development	.499	.102	.959	4.981	.000
	Employee Performance	.339	.115	.433	2.741	.001
	Quality process	.281	.138	.318	2.510	.002
	Team Work	.437	.098	.234	2.497	.002

4. RESULTS AND DISCUSSION

The result of an employees' opinion survey form, which was issued to over 175 employees, is summarized. A total of 158 surveys (90) percent were returned.

H1a. There is a positive and significant relationship between employee's perceptions and Total Quality Management. **ACCEPTED**

H2a. There is a positive and significant relationship between perceived effectiveness and quality processes. **ACCEPTED**

4.1 Training and development

Responses to this category showed a considerable amount of variation with induction and awareness training for new employees receiving the most positive responses, while multi-skilling for existing employees gave the High survey result of employees that tended to agree with the statement that there is adequate opportunity for learning about available job openings.

4.2 Employees' Performance

The High percentage result recorded acknowledged that employees believe that the company does make adequate use of recognition and rewards, other than money, to encourage good performance.

4.3 Quality process

The results from this category were the most positive within the entire employee opinion survey with employees consistently giving favorable results to all questions. The question which gave the most positive response was the employees' acknowledgement that the quality improvement process is considered as an important priority.

4.5 Teamwork

Overall, the favorable response to this category was evaluated. The employees felt most favorable answer to all questions, was "good co-operation between work groups in their department".

6. CONCLUSIONS AND RECOMMENDATIONS

The research undertaken reveals that a significant percentage (over half) have adopted and implemented TQM. It was also clear that those organizations that have implemented TQM did so in response to the difficulties they were facing due to changes in the industry. Increasing customer demands, globalization, the emergence of generic drugs, pressure to reduce costs, particularly in R &D, inroads into the marketplace made by similar companies, are some of key challenges in the pharmaceutical industry. Those pharmaceutical companies faced the same difficulties with TQM implementations as experienced in other industries. These include achieving a culture of continuous improvement, overcoming a lack of trust and understanding the TQM process itself and what they were, as a company, trying to achieve. These problems are not new and many companies have difficulties in implementing TQM. Pharmaceutical companies also followed the path of achieving a quality certification; namely, ISO 9000 accreditation, in the pursuit of excellence. Certification is attractive as a means of impressing new customers and convincing existing ones that they are dealing with a progressive company, which is continually seeking improvements. However certification was seen as a stepping-stone on the journey towards excellence.

Certification was found to represent a milestone, a recognition that progress is being made and TQM efforts are paying off. The survey indicates that commitment to TQM among senior management is high. Strong leadership has directed companies to attempt to make the TQM process "belong to the company" and so foster employees' ownership. Overall, the case results revealed that the organization had made progress in a number of key TQM aspects such as improving process, implementation its quality systems, procedures and using IT to improve the information flow, particularly to external customers.

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Agent Based Market: Framework, Design, and Implementation

Khubaib Ahmed Qureshi*

ABSTRACT

Attempt has been made to design and develop a complete adoptive Multi Agent System pertaining to merchant brokering stage of Customer Buying Behaviour Model with the intent of appropriate framework. Intelligent agents are autonomous entity which observe and act upon an environment. In general, they are software robots and vitally used in variety of e-Business applications. This paper focuses on the discussions on electronic markets and the adoptive role, which agents can play in information transformation for automating e-market transactions. It is proposed to develop a framework for agent-based electronic markets for buyers and sellers totally with the assistance of software agents.

JEL. Classification: ; D85; G14; G24;

Keywords: Agent Oriented e-Business, Agent Oriented e-Markets, Buyer/Seller Agents, Java, Multi Agent Systems

1. INTRODUCTION

Software agents are programs to which one can delegate (aspects of) a task. They differ from traditional software in that they are personalized, continuously running and semi-autonomous. These qualities make agents useful for a wide variety of information and process management tasks (Maes 1994). It should come as no surprise that these same qualities are particularly useful for the information-rich and process-rich environment of e-commerce.

Electronic commerce encompasses a broad range of issues including security, trust, reputation, law, payment mechanisms, advertising, ontologies, on-line catalogs, intermediaries, multimedia shopping experiences, and back-office management. Agent technologies can be applied to any of these areas where a personalized, continuously running, semi-autonomous behavior is desirable. However, certain characteristics will determine to what extent agent technologies are appropriate. For example, how much time or money could be saved if a certain process was partially automated (e.g., comparing products from multiple merchants)? How easy is it to express your preferences for the task (e.g.,

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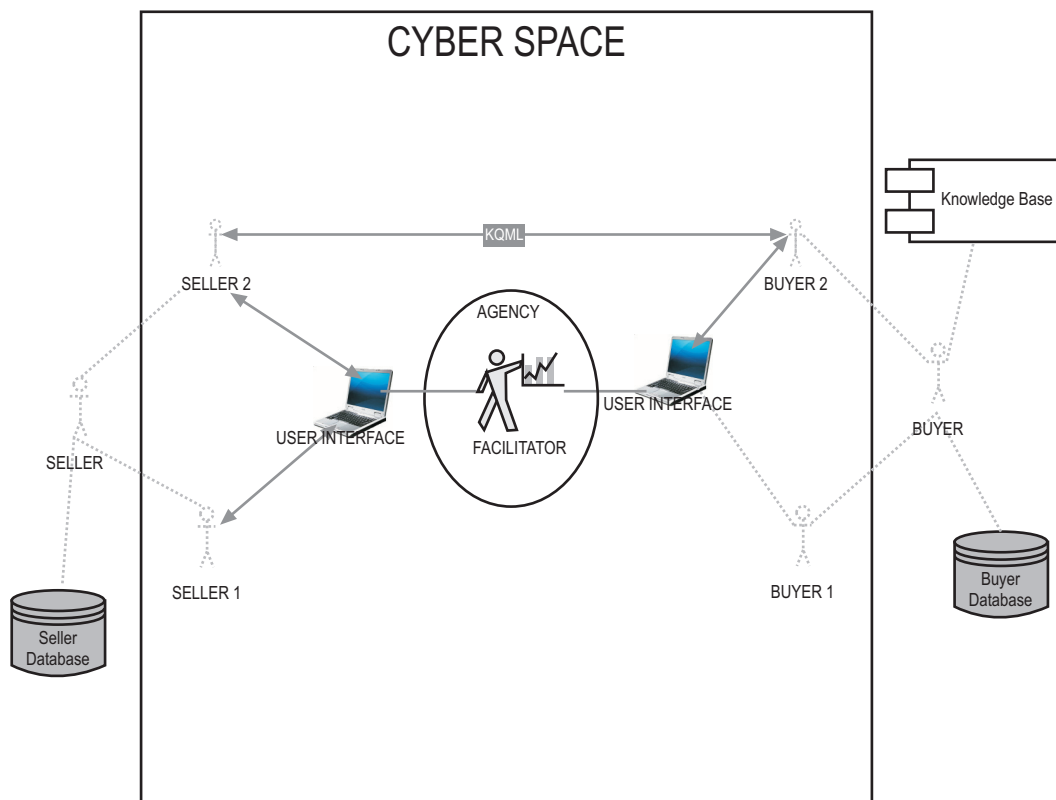
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shopping for a gift)? What are the risks of an agent making a sub-optimal transaction decision (e.g., making stock market buying and selling decisions or buying a car)? What are the consequences for missed opportunities (e.g., not being able to effectively monitor new job postings)? Generally, the more time and money that can be saved through automation, the easier it is to express preferences, the lesser the risks of making sub-optimal transaction decisions, and the greater the loss for missed opportunities, the more appropriate it is to employ agent technologies in electronic commerce.

Software agents will play an increasing variety of roles as mediators in electronic commerce (Bailey and Bakos 1997), which is smartly surveyed by Kurbel and Loutchko (2001). This paper explores these roles, their supporting technologies, and how they relate to electronic commerce with the intent of appropriate design (see figure 1) and appropriate proposed framework.

Figure-1: Appropriate Proposed Framework



Source: Generated by author

2 CONSUMER BUYING BEHAVIOR (CBB) MODEL

There are several descriptive theories and models that attempt to capture consumer buying behavior, although all these different models share similar lists of six fundamental stages guiding consumers' buying behavior. These six stages also elucidate where agent technologies apply to the consumer shopping experience and allow us to more formally categorize existing agent-mediated electronic commerce systems (see figure 2) :

Figure-2: Product Brokering and Merchant Brokering stages

	Persona Logic	Firefly	Bargain Finder	Jango	Kasbah	Auction Bot	Tete-e-Tete
1. Need Identification	Only a few primitive event-alerting tools (e.g., Amazon.com's "Eyes" program) help anticipate consumers' needs and provide paths into the subsequent CBB stages. However, systems like Firefly can alert a consumer with product recommendations when consumers with similar interests purchase specific products						
2. Product Brokering	X	X		X			X
3. Merchant Brokering			X	X	X		X
4. Negotiation					X	X	X
5. Purchase and Delivery	Post-purchase evaluation usually includes feedback about two distinct elements of the shopping process: product brokering and merchant brokering. Traditionally, customer remarks are accessible (and used) by either the marketing staff of manufacturers or the customer satisfaction staff of merchants. However, agent-based distributed trust and reputation mechanisms (like Kasbah's Better Business Bureau) enable customers to share and combine their experiences and use merchant and product reputations as additional aspects of brokering and negotiation.						
6. Product Service & Eval.							

Source: Generated by author

2.1 Fundamental Stages Guiding Consumers Behaviour

i. Need Identification

This stage characterizes the consumer becoming aware of some unmet need. Within this stage, the consumer can be stimulated through product information.

ii. Product Brokering

This stage comprises the retrieval of information to help determine *what* to buy. This encompasses the evaluation of product alternatives based on consumer-provided criteria. The result of this stage is the "consideration set" of products.

iii. Merchant Brokering

This stage combines the "consideration set" from the previous stage with merchant-specific information

to help determine *who* to buy from. This includes the evaluation of merchant alternatives, based on consumer-provided criteria (e.g., price, warranty, availability, delivery time, reputation, etc.).

iv. Negotiation

This stage is about *how* to determine the terms of the transaction. Negotiation varies in duration and complexity depending on the market. In traditional retail markets, prices and other aspects of the transaction are often fixed leaving no room for negotiation. In other markets (e.g., stocks, automobile, fine art, local markets, etc.), the negotiation of price or other aspects of the deal are integral to product and merchant brokering. Traditional CBB models do not identify this stage explicitly, but the conclusion of the Negotiation stage is comparable to the Choice or Decision stage found in other models.

v. Purchase and Delivery

The purchase and delivery of a product can either signal the termination of the negotiation stage or occur sometime afterwards (in either order). In some cases, the available payment (e.g., cash only) or delivery options can influence product and merchant brokering.

vi. Product Service and Evaluation

This post-purchase stage involves product service, customer service, and an evaluation of the satisfaction of the overall buying experience and decision (Zhang and Cohen 2006). The nature of this stage (and others) depends upon for whom the product was purchased. As with most models, these stages represent an approximation and simplification of complex behaviors. As noted, CBB stages often overlap and migration from one to another can be non-linear and iterative.

From this CBB perspective, we can identify the roles of agents as mediators in electronic commerce (He, Jennings and Leung 2003). The personalized, continuously-running autonomous nature of agents makes them well-suited for mediating those consumer behaviors involving information filtering and retrieval, personalized evaluations, complex co-ordinations, and time-based interactions.

2.2 e-Market Applications and their Role

i. Persona Logic

Persona Logic is a tool that enables consumers to narrow down the products that best meet their needs by guiding them through a large product feature space. The system filters out unwanted products within a given domain by allowing shoppers to specify constraints on a product's features. A constraint satisfaction engine then returns an ordered list of only those products that satisfy all of the hard constraints.

ii. Firefly

Firefly recommends products via a "word of mouth" recommendation mechanism called Automated Collaborative Filtering (ACF). ACF first compares a shopper's product ratings with those of other shoppers. After identifying the shopper's "nearest neighbors" (i.e., users with similar tastes), ACF recommends products that they rated highly but which the shopper has not yet rated, potentially resulting in serendipitous finds. Essentially, Firefly uses the opinions of like-minded people to offer recommendations. The system is currently used to recommend commodity products such as music and books.

iii. Jango

Jango can be viewed as an advanced Bargain Finder. The original Jango version solved the merchant blocking issue by having the product requests originate from each consumer's Web browser instead of from a central site as in Bargain Finder. This way, requests to merchants from a Jango-augmented Web browser appeared as requests from 'real' customers. This kind of aggressive interoperability

Jango's modus operandi is simple: once a shopper has identified a specific product, Jango can simultaneously query merchant sites (from a list now maintained by Excite, Inc.) for its price. These results allow a consumer to compare merchant offerings on price.

iv. Kasbah

The MIT Media Lab's Kasbah (Charvez and Maes 1996) is an on-line, multiagent classified ad system. A user wanting to buy or sell a good creates an agent, gives it some strategic direction, and sends it off into a centralized agent marketplace. Kasbah agents proactively seek out potential buyers or sellers and negotiate with them on behalf of their owners. Each agent's goal is to complete an acceptable deal, subject to a set of user-specified constraints such as a desired price, a highest (or lowest) acceptable price, and a date by which to complete the transaction. The latest version of Kasbah incorporates a distributed trust and reputation mechanism called the Better Business Bureau. Upon the completion of a transaction, both parties may rate how well the other party managed their half of the deal (e.g., accuracy of product condition, completion of the transaction, etc.). Agents can then use these ratings to determine if they should negotiate with agents whose owners fall below a user-specified reputation threshold.

v. AuctionBot

AuctionBot is a general purpose Internet auction server at the University of Michigan. Auction Bot users create new auctions to sell products by choosing from a selection of auction types and then specifying its parameters (e.g., clearing times, method for resolving bidding ties, the number of sellers permitted, etc.). Buyers and sellers can then bid according to the multi-lateral distributive negotiation protocols of the created auction. In a typical scenario, a seller would bid a reservation price after creating the auction and let AuctionBot manage and enforce buyer bidding according to the auction protocol and parameters.

What makes AuctionBot different from most other auction sites, however, it provides an Application Programmable Interface (API) for users to create their own software agents to autonomously compete in the AuctionBot marketplace. Such an API provides a semantically sound interface to the marketplace. It is left to the users to encode their own bidding strategies. Fish market is not currently being used as a real-world system, but it has hosted tournaments to compare opponents' hand-crafted bidding strategies along the lines of Axelrod's prisoner's dilemma tournaments.

vi. Tete-a-Tete

Tete-a-Tete provides a unique negotiation approach to retail sales. Unlike most other on-line negotiation systems, which competitively negotiate over price. Tete-a-Tete agents cooperatively negotiate across multiple terms of a transaction e.g., warranties, delivery times, service contracts, return policies, loan options, gift services, and other merchant value added services. Like Kasbah, this negotiation takes the form of multi-agent, bilateral bargaining but not using simple raise or decay functions as in Kasbah. Instead, Tete-a-Tete shopping agents follow an argumentative style of negotiation with sales agents and use the evaluation constraints captured during the Product Brokering and Merchant Brokering

stages as dimensions of a multi-attribute utility. This utility is used by a consumer's shopping agent to rank order merchant offerings based on how well they satisfy the consumer's preferences. In essence, Tete-a-Tete integrates all three of the Product Brokering, Merchant Brokering, and Negotiation CBB stages.

3. FUNCTIONAL SPECIFICATIONS

- Each Store agent represents one retail store and knows the prices and available quantities of the products in its store. Store agents receive requests for price quotes from the Buyer agents and respond by telling the Buyer agent the prices, shipment costs and quantities that they can deliver.
- Agents will be capable of communicating with each other over an intranet or the Internet. These agents communicate with each other using the Knowledge Query and Manipulation Language (KQML).
- Each agent has a graphical interface that allows the user to control the operation of the agent or examine the status of agent activity. The Buyer agent's interface allows the user to select a product and quantity to purchase.
- A pull down menu lists the known products and a text field is available for specifying the quantity to be purchased.
- Pressing the **Shop** button will cause the Buyer agent to begin shopping for the specified product and quantity.
- Pressing the **Quit** button will cause the Buyer agent to send messages to shut down all of the Store agents and then shut down itself.
- Each agent interface also displays the agent's inventory, account balance, and the agent's activities.
- After the user selects a product and quantity and clicks on the **Shop** button, the Buyer agent sends requests for price quotes to the Store agents. The Store agents respond with price quotes for the specified product. The Buyer agent decides which store has the lowest price and sends a purchase request to the Store agent with the lowest price.
- The Store agent then confirms the purchase, decreases its available inventory, adds the purchase price to its account balance, and sends a purchase confirmation message to the Buyer agent. After receiving the purchase confirmation, the Buyer agent increases its inventory and subtracts the purchase price from its account balance.

4. KNOWLEDGE BASE

4.1 Knowledge Representation

There are different methods of knowledge representation like:

- Rules
- Objects
- Frames

In Buyer/Seller Agency we have followed Rule Based Knowledge Representation which is very flexible

and compatible way of representing heuristics.

4.2 Inference Method

There are two standard methods of inference.

- i. Forward Chaining – Data Driven Approach
- ii. Backward Chaining – Goal Driven Approach

Buyer/Seller Agency is making use of Data Driven Approach which is also called Forward Chaining for Selection of best offer according to Buyer's preferences (parameters).

iii. Buyer's Preferences

Buyer Agent will be informed about the following parameters (price of the product, ranking of the seller, and flexibility required in shipment period) against which the best offer will be selected.

iv. Selection Criteria

Buyer Agent will deliver Price, Preferences, and Selected Ranking to the Facilitator Agent (Agency), which will intelligently select appropriate ranked sellers. Facilitator will send Request to the selected sellers. Seller will check its inventory for sufficient quantity of the required product and its shipment option. Then Seller sends an Offer to the Buyer providing non-negotiable price with shipment period. After the Deadline offers from the Sellers will be evaluated. The evaluation will be done on the basis of price and shipment period against the preferences provided by Buyer. For example, in case of higher price preference, offer for higher price will be given priority over lower priced offers. Similarly an offer within stipulated time frame will be given higher priority.

Some of the possible options for Buyer's preferences are described below:

- i) Price (i) High (ii) Medium (iii) Low
- ii) Ranking (i) High (ii) Medium (iii) Low
- iii) Shipment Period (i) On Stipulated time (ii) Within 20% of stipulated time (iii) With 40% of stipulated time

Figure 3 represents the Execution Process of an Agent and how an agent's mental model is changed in its decision making process.

5. KQML

There are different languages for multi-agent interaction (Polad 2007). Including Knowledge Query and Manipulation Language (KQML) which is a high-level language intended to support interoperability among intelligent agents in distributed applications. It is both a message format and a message-handling protocol to support runtime knowledge sharing among agents. KQML can also be used for two or more intelligent systems to share knowledge in support of cooperative problem solving.

Why:

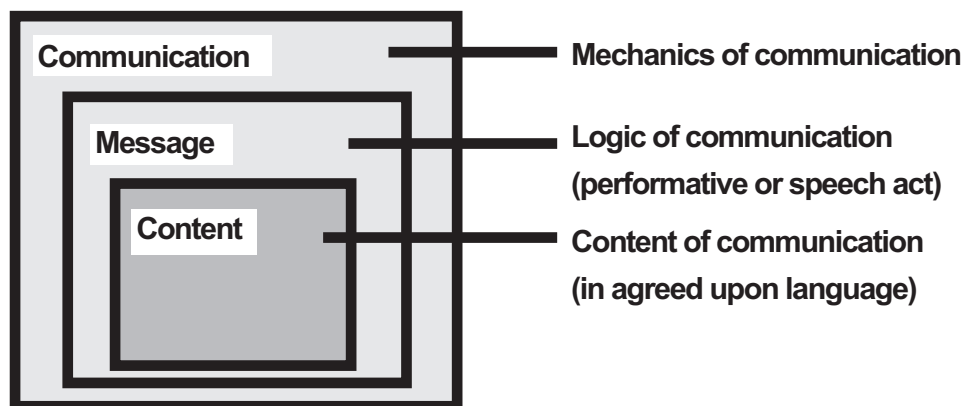
- Existing protocols, such as RPC, are insufficient.
- Nor are there standard models for programming in an environment where some of the data is supplied by processes running on remote machines and some of the results are needed by other similarly distant processes.
- Must be easy and flexible to communicate.

5.1 Layer of Communication

Agents may have different, and even conflicting, agendas. KQML message is defined in terms of constraints on the message sender rather than the message receiver who choose a course of action that is compatible with other aspects of its function and strive for maximal cooperation. KQML language can be viewed as being divided into three layers (see figure 3)

- Content layer,
- Message layer,
- Communication layer.

Figur-3: KQML language Layers of communication



Source: Generated by author

5.2 Content Layer

KQML can carry any representation language, including languages expressed as ASCII strings and those expressed using a binary notation.

5.3 Communication Layer

Encodes a set of features to the message which describe the lower level communication parameters, such as the identity of the sender and recipient, and a unique identifier associated with the communication.

5.4 Message Layer

The message layer forms the core of the language. The primary function of the message layer is to identify the protocol to be used to deliver the message and to supply a speech act, or performative, which the sender attaches to the content. The performative signifies that the content is an assertion, a query, a command, or any of a set of known performatives.

5.5 Message Parts

A KQML message consists of a *performative*, its associated *arguments* which include the real *content of the message*, and a set of *optional arguments*. The main focus of KQML is on its extensible set of performatives, which defines the permissible operations that agents may attempt on each other's knowledge and goal stores at run time.

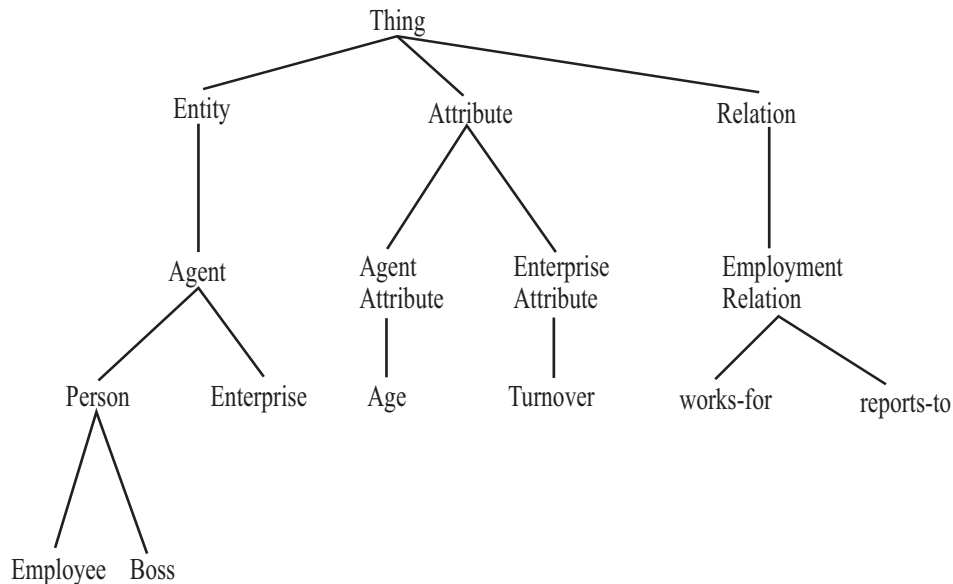
Example:

```
(ask :content (prodoffer purchase(?prod, ?price, ?days) )
:sender buyer1 ← Performative
:receiver seller 1 ← Parameters
:in-reply-to <label of the reply>
:reply-with <label to be replied>
:language KQML ← Value
:ontology buyer-seller)
```

5.6 Ontologies

It describes relevant objects and relations in a domain (Albert, Jonker, Karami and Treur 2004) as shown in figure 4.

Figur-4: relevant objects and relations in a domain



Source: Albert, Jonker, Karami and Treur 2004

6. DESIGN

Required appropriate design, which is cultivated through various related research work/projects executions (Huang and Lin 2005; Mariano et al., 2001; Joo, Knoshita, and Shirtori 2000; Maes, Guttman and Moukas 1999; Guttman Maes, Chavez, and Dreiliger 1997).

6.1 Agent Roles and Description

There will be three types of agents in the marketplace facilitator, Seller and Buyer agents (see figure 5), following proper protocol for their complete sets of interactions in the execution of electronic market (see figure 6).

i. Agents in Market Place

i) Facilitator

Activities performed by Facilitator are:

- maintainSignInInfo

Facilitator maintains information of Buyer and Seller Agents, who have signed in and are active. So Facilitator will send and receive messages from active agents only.

- maintainSignOutInfo

Facilitator keeps a check when the Buyer or Seller has signed out. After sign out it marks its status as inactive.

- listenBuyRequests

Facilitator listens for the buy requests from the buyer.

- receiveBuyRequest

As soon as the listener listens to a buy request, this method receives the buy request and stores it in its own memory. This method also automatically triggers the sendBuyerRequest method.

- sendBuyerRequest

This method checks the Buy Request. It looks for Product Specifications and Buyer’s Preferences. It sends the Buyer’s Request to only those Sellers who are active and which fulfill the buyer’s preferences.

- receiveSellerOffer

Seller sends its offers against Buyer’s Requests. These offers are received by the Facilitator.

- sendSellerOfferToBuyer

Facilitator sends the Offers to the respective buyer.

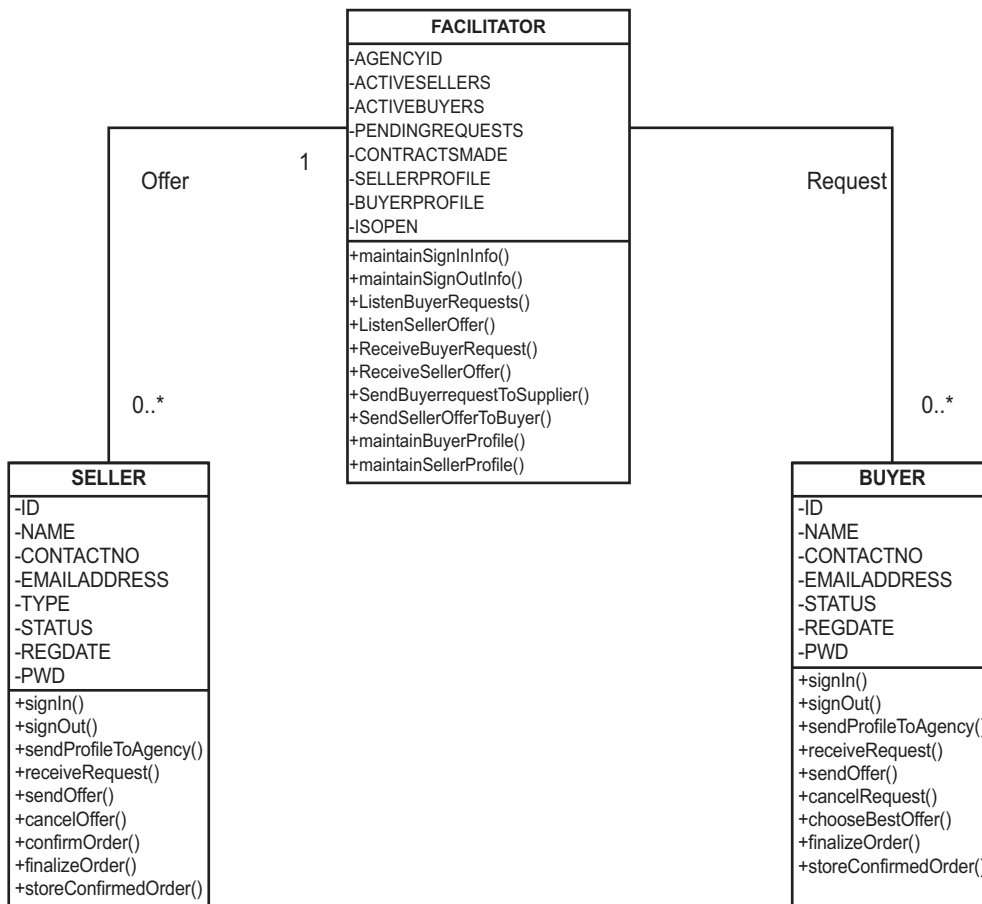
- maintainBuyerProfile

Facilitator maintains buyer profile. How many requests it had made and how many orders it had confirmed. Against this profile it assigns a rating to the buyer.

- maintainSellerProfile

Facilitator maintains seller profile. Facilitator assigns it a rating based on its past performance.

Figur-5: Types of Agents in Marketplace



Source: Generated by author

ii) Buyer

Activities performed by the Buyer are:

- `signIn`

Whenever the buyer signs in, it informs the Facilitator that it is active and it opens the communications channels.

- `signOut`

Whenever the buyer signs out, it informs the Facilitator that it is inactive and it will not be able to communicate.

- `sendProfiletoAgency`

Buyer sends its profile to Facilitator in which its basic information is kept, and this profile can be forwarded to seller if buyer agrees to it.

- `sendRequest`

Buyer sends request for a specific product. The parameters sent with the Request are quantity required, shipment time and relaxation in it(if any), price preference, and seller's rating.

- `receiveOffer`

Buyer receives offers from the sellers via Facilitator.

- `cancelRequest`

Buyer can cancel a request.

- `chooseBestOffer`

Buyer can evaluate and then choose best possible offer. Evaluation is done on the basis of preferences given by the end user.

- `finalizeOrder`

After choosing the best option, buyer confirms the order and then order is finalized. From this stage onwards buyer cannot cancel the order.

- `storeConfirmedOrder`

Buyer Agent also stores the confirmed order into its own repository for record keeping and future references.

ii) Seller

- `signIn`

Whenever the Seller signs in, it informs the Facilitator that it is active and it opens the communications channels.

- `signOut`

Whenever the Seller signs out, it informs the Facilitator that it is inactive and it will not be able to communicate.

- `sendProfiletoAgency`

Seller sends its profile to Facilitator in which its basic information is kept, and this profile can be forwarded to Buyer if seller agrees to it.

- `receiveRequest`

Seller receives request from the Buyer for a specific product via Facilitator.

- `sendOffer`

Seller sends the offer to the Buyer via Facilitator.

- `cancelOffer`

Seller can cancel an offer.

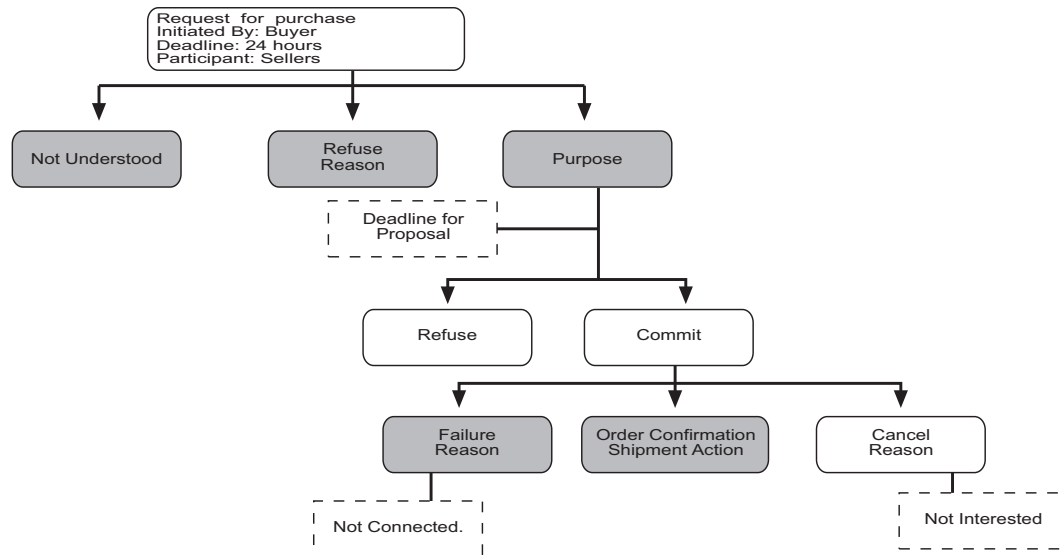
- `finalizeOrder`

Once buyer accepts Seller's offer, seller finalizes the order.

- storeConfirmedOrder

Seller Agent stores the confirmed order into its own repository for record keeping and future references.

AGENT INTERACTION PROTOCOL



Source: Generated by author

i. Underlying Protocols

- Sockets
- TCP/IP

ii. Development Tools

- JCreator (Java Editor)
- JDK 1.4
- Swing Components
- MS Access (RDBMS)
- Concept Building Tool: C#, Jack, Agent Builder (ABUG 2004)

7. CONCLUSION AND FUTURE DIRECTIONS

Just like any real-life business, software agents can work on behalf of customer by transforming provided information into knowledge. Buyer/Seller Agency is a system where users create agents to search and filter offers for the purchase and sale of goods on their behalf. In this study a simple prototype has been built to test the basic concepts and feasibility. Future work is focused on making smarter agents, which is direct able at a more natural level for users. Though this study has only just scratched the surface in terms of making a truly useful system, we are excited about this work and think it has the chance to fundamentally change the way people buy and sell goods and services in the not-too-distant future.

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Islamic Economics system In the Eyes of Maulana Maududi-An Analysis

Farooq Aziz* and Muhammad Mahmud**

ABSTRACT

Attempt has been made to investigate the Islamic Economics System from the perspectives of Maulana Maududi. He is one of the greatest thinkers that Islamic world has ever produced. He was a great scholar, and has written a large number of books, articles and booklets on different aspects of Islam. Economics has been one of the fields of his interest. It may be said that at least in the Sub-Continent, he was the person, who has established "Economics of Islam" as a separate branch of knowledge. In this context, he has highlighted the characteristics, principles and objectives of this system. On the pattern set by him, a large number of Muslim economic thinkers have followed his line of thinking. According to Maulana Maududi basic principles of Islamic economic systems are: private ownership, limits of *halal* and *haram*, economic equality, free economy and welfare role of state. Whereas this system is established to achieve the objectives of human liberty, simultaneous development of material and moral growth, establishment of justice, equal distribution of wealth, fulfillment of basic needs of people and co-ordination between different groups of society.

JEL. Classification: B11; N3.

Keywords: Islamic economic system, Principles, Objectives.

1. INTRODUCTION

No doubt Maulana Maududi was a great thinker & religious scholar. He has written a voluminous literature on different aspects of Islamic ideology. One dimension of his knowledge is economics of Islam. No doubt he is the person who has played a deciding role to shaping Islamic economy as a separate branch of knowledge (Chapra 1988:14). He has written on different aspects of Islamic economics, and it is almost impossible to review the varying dimensions of his economic thoughts in an article. This is the reason that, only one aspect of his economic views i.e. how he had seen the Islamic economic system has been selected to discuss in this article. As a matter of fact, he recognized that Islamic economic system means that basic principles and objectives, which *Shariah* has set for

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our lives in general and particularly for economic aspect. These principles and objectives are those foundation stones on which the building of Islamic economic system can be built at any time and anywhere, according to the needs and requirements of that society and time. The society that wants to adopt these principles and objectives can set up the details of the system, which are universal and independent of time and place. This is the reason that structure of the building may be different but the soul will remain same (Maududi 1977).

In the following lines a brief analysis of those principles and objectives on which Islamic economic system is based in the eyes of Maududi, and the difficulties in their application.

2. BASIC PRINCIPLES OF ISLAMIC ECONOMIC SYSTEM

According to Maududi, the basic principles of Islamic economic system are as follows:

2.1 Private Ownership

The important features of basic principles of Islamic economic system are as follows:

Western point of view accepts the absolute right of people, on their income and wealth (Spencer 1993:18). But according to him in Islam this right is not absolute. From Islamic perspective *Allah* is the owner of each and everything, which people have. *Allah* has given them right to use, and has also described the guidelines for their consumption. Now it is the duty of the people to follow that orders and use their income and wealth in accordance with those rules and regulations (Maududi 1971:306).

No doubt, in line with other Muslim thinkers, Maududi has introduced the moral divinely ordained aspect in this principle, from which western concept is completely barefoot. It also gives superiority of Muslim concept over western thinking.

But the main problem is that a big majority of the people could not understand the same. Moreover there is not any mechanism, which except a moral appeal to pressurize the people to adopt it. Due to this reason its practical application becomes a difficult task.

According to him the items which are God gifted and mankind do not have any role in their preparation, if some people want to use them on commercial basis then government has the right to impose tax on them (Maududi 1977). But he did not explain whether government has the right to stop them or not?

A person, who gets a part of natural resources and makes it fruitful with his ability, then he will be the owner of that thing (Maududi 1959:124-128.).

If a person has the ownership of some assets, in accordance with the rules of Shariah, then government does not have any right to reduce his rights of ownership or nationalize them. And if, government do the same then it is an open oppression (Maududi 1977). In this way he has almost closed the doors of nationalization of any private property.

In the same way, he is not ready to impose any restriction on earning of wealth, subject to the condition that, these earnings are from *Halal* sources.

On the same line, ownership of land is lawful up to unlimited extent and no limit can be imposed on it (Maududi 1969:105.). He completely agrees with other Muslim thinkers, who are thinking on the same line (Usmani 1990:10).

However, in some of his writings he is ready to impose some restrictions on these unlimited rights but with conditions, and the same is with the land (Maududi 1977).

Most important point is this that he is not ready to distinguish between income from human labor and income from any asset and accepts it as *halal*. For its justification; he gives the examples of heirship, endowment and gifts which are lawful. Hence, on the basis of it, income from any sources is lawful except that it is not the result of *haram* sources as mentioned in Shariah. This situation makes the institution of private ownership as sanctioned cow. Nobody can touch it, but here are lots of undefined ifs and buts.

2.2 Limits of *Halal* (lawful) and *Haram* (unlawful)

According to Maududi only those economic activities will be allowed in an Islamic economic system, which are permissible in *Shariah*, and all those transactions which are in the category of *haram*, can not be allowed.

2.3 Concept of Economic Equality

He recognizes the diversified capabilities in human beings, and due to which income of all persons will be different in nature and consequently inequality in income is created. He advised to stop this inequality because the way of Islam is different from capitalism and socialism (Maududi 1941:10). But he did not highlight any concrete mechanism, suggested by Islam, to solve this basic economic problem. Somewhere he also suggested that, Nizam-e-Zakat can solve this problem. But what will be the way to achieve it by imposing this system.

2.4 Free Economy

He admitted that an Islamic economy will be a free economy and will be based upon the forces of demand and supply forces. Price mechanism is the basic instrument for the allocation of resources and remuneration of factors of production. But again this market will not be a completely free market like *laissez-faire* economy. But in a situation in which government has a very limited role in the economy to monitor demand and supply forces, and also cannot restrict private ownership. It is almost impossible that *Shariah* rule will be able to control the forces of demand and supply.

2.5 Role of State

In an Islamic economy role of state will be to provide all the essential facilities to the public. Since it will be a welfare state, hence state will perform all those functions which are expected from such type of government. Government can also impose taxes other than *zakat* (Maududi 1962:354-355).

It is quite interesting that, on one side it is claimed that, *zakat* system is the solution of all economic

problems. On the hand it is allowed that government can impose taxes other then *zakat*. It is an open contravention (Farooq 2004:234).

3 OBJECTIVE OF ISLAMIC ECONOMIC SYSTEM

He did not describe the objectives of Islamic economic system at one particular place. But these can be derived from his different writings. Sometimes he calls them principles, sometimes elements and sometimes objectives (Khan 1983:31). These are as follows:

3.1. Human Liberty

One of the basic objectives of Islamic economic system is to safeguard the human liberty. So that, every human being will be free to take decisions about him-self. It is not an absolute freedom, but subject to the limits which are necessary for the collective welfare of society. In other words, Islam do not interfere in the personal freedom of the man, but restricts it where this freedom will become a danger for the society (Maududi 1977).

3.2. Relationship between Material and Moral Development

Another important objective of Islamic economic system is that material and moral development will be simultaneous. In the other words, on the one hand economy will grow at its optimum level, and on the other hand, this system will create good moral values in the public (Maududi 1977).

Definitely it is almost an impossible task. History provides a lot of examples, which prove the fact that with increase in wealth, rapid fall in moral level of society occurs. And ultimately societies are destroyed. In case of Islamic economic system what will be the mechanism, with which it will be possible is never discussed by him. Even all Muslim thinkers have put the same claim, but none of them has described its mechanism.

3.3. Distribution of Wealth.

With the increase in wealth, its equal distribution (up-to maximum limit) is another objective of Islamic economic system. This objective can be achieved, on one hand by developing the moral values in the society and on the other hand by effective enforcement of law. These laws will be restricted to concentration of wealth in society.

In a society, in which role of government is quite limited and full protection is given to unlimited private ownership, how this objective can be achieved? Definitely it puts a big question mark for Muslim economists.

3.4. Fulfillment of Basic Needs of Men

In a capitalist economy the basic problem is: How to increase the level of production? But in an Islamic economy, the basic objective of the society is to fulfill at least basic needs of the society. Resources allocated to achieve this objective is just opposite to western thinking (Khan 1983:31).

No doubt it is an ideal objective but practically impossible. The main problem is that measurement of needs of a man and the whole society is not possible. It is completely a relative term and changes from time to time and place to place. In such a situation when measurement of need is not possible then how resources will be allocated on this basis.

3.5. Co-ordination between Different Groups of Society

Another objective of Islamic economic system is to create co-ordination between different groups of society. Taking the first step, efforts are being made to eliminate different groups e.g. the groups which they have and which they do not have or capitalist and labor groups etc. The institutions are also being built to eliminate such types of groups. On the second step, if some groups are established, which are the ultimate result of evolution of society, then Islam offers them the way of coordination to minimize the possibilities of clash between groups of the society (Maududi 1977).

The situation is quite the same with this objective also. Question arises as what mechanism will be adopted for this purpose? Its answer is anxiously awaited.

4. CONCLUSION

Maulana Maududi as the founder of Islamic economics has sketched the principles and objectives of Islamic economic system, which are derived from *Qur'an and Hadith*. These principles and objectives themselves are questionable due to lack of continues sources. But the main question is: How to implement them? Almost all Muslim thinkers, including Maududi, have just described them but none of them paid attention on the applied form of these principles and objectives. This is the reason that Islamic economics till to date is no more a theoretical subject. It is the need of the time to think on the applied form of these principles and objectives floated by Maududi.

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Popularity of Tracking Device as an Anti-theft Measure and Impact of its sales on Sales of Auto Insurance Policies: Evidence from Karachi, Pakistan

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ABSTRACT

In this paper attempt has been made to examine the popularity of tracking devices and its impact on the sales of automobiles insurance policies. Literature review revealed that people insure their vehicles to protect them from theft as well as from other perils such as fire, SRCC, accidental losses and third party liability. The coverage is mainly obtained to prevent theft, which has the major significance. Insurance companies have been trying since a long time to curtail the cost of theft, which is the major cause for higher premium rates. To achieve the objectives of this study Non Probability Technique known as Purposive Sampling is applied, based upon questionnaire survey from a representative sample of tracker and insurance service users. This research revealed that blending the motor insurance policies, with tracker devices, have successfully attracted the major chunk of market and have gained access to a larger segment of the market, offering packaged policies with discounted premium rates and hence the loss ratio has declined with the use of these devices, which ultimately affects the premium rates. The researchers tested the relationship between tracker sales and insurance policy sales. The research revealed significant insights into the relationship.

JEL. Classification: D31; D91; G22; G34

Keywords: Tracker Devices, Auto Insurance, Sales, Theft, Third Party Liability.

1. INTRODUCTION

The automobile sector in Pakistan witnessed a sharp increase in theft of cars during the late 1980's and early 1990's. There were many factors involved in it, the political uncertainty and the Afghan war considered to be the major ones. Although Car Insurance existed long before, it gained significance during that era due to the increased in theft. People adapted this concept rapidly during that era and thanks to the industrial growth that they afforded the cost of insuring their vehicles. But then too the Pakistani auto-insurance sector never grew up to the percentages compared to the western market. Until that time the major concern was the theft of vehicle, however, as the time passed away and the traffic on roads grew other services offered by insurance companies too gained importance such as third party liability, personal accident, fire and explosion.

The material presented by the authors does not necessarily represent the viewpoint of editors and the management of the KASBIT as well as the authors' institute.

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By the end of 1990's, a new concept of Tracking Devices was introduced. An electronic device installed in a vehicle which transmits signal to the source and provides information about the measurement of vehicle to the control room of Tracking Devices Company. This concept was very effective against the theft / stealing of vehicles. With the passage of time tracker devices were made more efficient with the use of satellite technology and produced good results. If a vehicle is theft / stolen the owner intimates the control center of tracking company, which monitors and immobilizes the vehicle. Once it is tracked by the recovery teams or the police, it is activated and instantly handed over to the owner.

Tracking devices gained popularity initially amongst the elite class and had become a status symbol in the early days. Tracking devices were an effective tool against the theft, but auto-insurance remained the major player in the automobile sector, mainly due to the fact that the comprehensive policies provide full coverage. Many researchers have made research upon the options available for auto owners when installing tracker and purchasing insurance. But nobody has conducted any research in Pakistan related with Tracking Devices and the sales of automobiles **Insurance** policies.

Keeping above facts in mind this study is conducted on “**Popularity of Tacking Devices as an Anti-theft Measure and Impact of its sales on Sales of Auto Insurance Policies**”.

Problem Statement:

Tacking Devices as an Anti-theft Measure and Impact of its sales on Sales of Auto Insurance Policies is positively significant.

1.2 OBJECTIVES

In this paper mainly attempt has been made to examine the popularity of tracking devices and its impact on the sales of automobiles Insurance policies.

Specific objectives

- To identify significance of Tracking Devices as an anti theft measure.
- To identify that an association between sales of auto-insurance policies and sales of tracker devices is significant.

1.2.1 Key Research Question

To achieve these objectives, the study shall be directed towards establishing affect:

Whether tracker devices are popular as anti theft measure?

Whether there is any association between sales of auto-insurance policies and sales of Tracker Devices?

1.2.2 Hypothesis

From above main questions following hypothesis are developed and tested.

H1: Tracking devices are not popular as an anti-theft measure

H2: There is no association between sales of auto-insurance policies and sales of tracker devices

1.3 SCOPE OF THE STUDY

The coverage is mainly obtained to prevent theft which has the major significance. Insurance companies have been trying to curtail, since a long time, the cost of theft which is the major cause for higher premium rates. Tracking Devices are very successful sources for reducing the theft. The successful

blending the motor-insurance policies with tracker devices have attracted the major chunk of market and have gained access to a larger segment of the market, offering packaged policies with discounted premium rates and hence the loss ratio has declined with use of these devices, which ultimately affects the premium rates. Therefore there is a need to carry out the studies on such topics for further awareness and promotion.

In order to fill this gap an evaluation was conducted from gross root in Karachi to get complete information on “**Popularity of Tacking Devices as an Anti-theft Measure and Impact of its sales on Sales of Auto Insurance Policies: Evidence from Karachi, Pakistan**”. This type of study is first ever in its nature.

Data on tracking devices provides the awareness among auto owners, new purchasers and insurance company owners to estimate and forecast the benefits of the installing Tracking Devices and its impact on the sale of the insurance policies. It will help insurance companies and auto-tracker companies to co-operate with each other for promoting their objectives of increasing sales. It will also help insurance companies to estimate the premium rates.

1.4 LIMITATIONS AND DEFICIENCIES

This research is conducted in Karachi only and the samples selected are associated with top leading Auto-trackers and insurance companies. Since the research period was limited, therefore, extensive and in depth data collection was not possible.

As the universe of study was Karachi, therefore respondents of the suburban and rural centers were not included and that may effect the generalization of the research objective.

The respondents were selected from top Auto-tracker and insurance companies due to which responses of average or less famous companies could not be included in the research which may affect the outcome of the research conducted.

There were only a few researchers involved in the research. The shortage of human resource restricted the inclusion of respondents from other areas of Karachi district.

Data was collected in the last quarter of 2008, that may also affect the overall sales analysis of auto tracker and insurance companies as most of the Auto companies introduce their new models in the first quarter of every year and that is the time when it is possible that we can observe higher sales of auto tracker and insurance policies.

1.5 ORGANIZATION OF PAPER

Organization of the remaining paper is composed of: section 2 reviews related literature. Research Methodology is given in section 3. In section 4 hypothesis testing and analysis is given and finally section 5 concludes the study and with policy suggestions.

2. LITERATURE REVIEW

2.1 Types of Car Crime

Clarke (1991) Categorizes Car Crime into Six types:

- 1) theft from Vehicles.

- 2) theft of vehicles for so called joy-riding.
- 3) for use in the commission of other crimes (e.g ramroding or getaway cars);
- 4) for immediate transport.
- 5) for longer term transport.
- 6) as part of insurance frauds.

The Manchester study (Smyth 1990) formed part of a joint police probation car crime campaign. The findings were that 52% of the sample of offenders said they would be put off by an alarm and a further 40 % by an Auto Lock. The major reasons that can be quoted for taking cars were excitement (58%), financial gain (47%) and liking driving 47%).

2.2 Adverse Effect on Highway Safety

Khazoom (2000:24) pointed out that a carefree attitude among drivers who are insured under the compulsory insurance program results into increased accidents at Highways. The insured driver carelessly as he is covered for all types of losses and would not bear the risk that is associated with rash driving. Compulsory insurance laws does not reduce rash driving attitude.

2.3 Administrative and Enforcement Costs for Insurers and State

Khazoom (2000:22) found how the insurers have to incur some administrative cost, when they issue new policy. For instance survey costs, cost of preparing new policy, snaps etc. However, if the new policy holder cancels the insurance policy before the expiry of the policy, the insurer must refund the unearned premium. Similarly, the insurance company will have to bear the costs again, when the policyholder fails to pay the premium balance.

In the developed countries, the concept of compulsory insurance is practiced more strictly. The laws regulating compulsory insurance requires the insurer to notify the authorities whenever the policyholders terminates their coverage, fail to renew their insurance policies or could not pay the premium balance on an existing policy. This notification also adds expenses at the insurance companies end. Then to implement the law—tracking down the insured and penalizing him by the regulating agencies involves costs.

2.3 The Negligence Theory

Butler (2006:1), when talking about the negligent driver theory of the vehicle accident system, it maintains financial liability for negligently causing an accident and allows an incentive for the drivers to be non-negligent. There were some concerns that allowing insurance against this liability would eliminate the incentive for non-negligent driving. By increasing insurance premiums for drivers, who are found negligently driving, the insurance companies at some extent have resolved problem.

2.4 Tracking Devices to Cut Car Insurance Rates

Donohue (2008:1) explains the Pay-as-you-drive concept by saying that it would reduce the insurance company's bill by tracking the insured's driving habits. The insurance companies will equip cars of their clients with tracking devices that will constantly track motorists' driving habits to determine how much the insured persons should be charged. The devices will track the cars' odometers and it will inform the insurers about the mileages of the vehicle. It would provide the insurers with extensive data on accelerating, hitting brakes and at what time the insured person normally travels. The best drivers will receive a discount on their insurance premium and the drivers, who instantly race up and apply intensive brakes, would have to face surcharges. The drivers are careful when they know that their

driving is monitored, as well as the incentives for less mileage consumption will keep them off the road, except for that their driving is essential usage of vehicle. The idea is that the program must help in curbing the traffic on roads as the drivers would be avoiding long derive.

2.5 Purchase Patterns

Power and Associates (2008) reports three key factors to determine over all satisfaction for buyers of new auto insurance policy. These factors are mentioned as below:

Distribution Channel for auto-insurance	(50%)
Price for auto-insurance	(29%)
Policy Offerings for auto-insurance	(21%)

2.6 A System to Eliminate Extra-allocation of Resources – Pay at the Pump Auto Insurance

Khazoom (2000:2) wrote that how under the Pay-at-the-pump Auto insurance system, the extra resources allocated will be eliminated by saving the lump-sum insurance premium? The insurance companies form a pool and charge a particular premium calculated for every customer, regardless of the fact that some of them are careful drivers and some of them indulge in rash driving, racing etc. Therefore, the insurance bill remains the same for every motorist approaching an insurance company. But the Pay-at-the-Pump Insurance concept provides a unique concept which is required to charge customers according to their driving habits. A motorist driving extra mileage will be charged more in comparison to a motorist driving lesser miles. Thus, it would eliminate the subsidy that some motorists are giving unintentionally to others. The insurance companies may also reap some benefits and sometimes lose under this system. A Brookings institution's study found that if the total number of drivers would pay the insurance on the basis of the driven miles, the overall driving would be dropped by 8 percent. Under PAY-AT-THE-PUMP fuel and insurance are inputs with Zero rate of substitution in the production of driving services. Both are equally the lifeblood of driving. If this system is implemented Insured car owners will no longer pay an additional premium for uninsured motorists, as they do presently in countries that have mandatory insurance laws.

2.3 Emergence of Co-branding / Vertical Integration

It is observed, over the years, after the launch of tracking devices that they have significantly impacted the auto-mobile industry, as well as the auto insurance industry. However, there is no such evidence that they have put a negative impact on insurance sales. Instead tracking companies has just provided a substitute for a different segment. This is evident from the fact that many tracker companies have aligned their resources with insurance companies to either give their product offerings as a bundle or have vertically integrated to form their insurance companies as well (www.cplc.org.pk and CTrack; www.trakker.com.pk).

The bundling of product offerings has reaped many benefits for the auto-insurance industry. For example the major benefit that is perceived from the tracking companies is the control on theft that they have exercised. It is reported that the recovery rate of vehicles fitted with tracking devices is a marvelous 98.5%. This has helped in lowering the overall cost that the automobile industry has to bear. For those vehicles who were offered a bundle product i.e a tracking device with an insurance policy on some overall discount from the insurance company have helped insurance companies to estimate that there will not be a claim on these vehicles with respect to theft / snatching. As the tracker systems are efficient enough to recover a vehicle after it is stolen or theft (CTrack; www.trakker.com.pk) .

2.9 Discounts Offered

Insurance companies offer substantial discounts to insured vehicles having installed tracker devices in them. Since the overall cost of theft is rising day by day, this may be seen as a subsidy, but the insurance companies found it highly attractive. It is a burden on the insurance industry as well as on the economy itself. This concept helps in reducing it.

2.10 Vehicle Category 800-1000 cc

In Pakistan, the vehicle category from 800 cc to 1000 cc poses a greater risk than the vehicles pertaining to higher category. They are more exposed to theft and have stolen risk because of the demand for fuel efficient and smaller cars in Pakistan. Then it is easy to jack these vehicles due to the low quality locks and anti-theft systems provided by the company. In fact a recent study showed that it takes less than a minute for a car thief offender to steal a Mehran (800 cc). Upon that study DAWN NEWS conducted a further investigation and held a demonstration from a car jacker. It took just 20 seconds to open the lock of the MEHRAN car. The Theft figures from CPLC & some insurance companies confirm these figures. According to the figures MEHRAN (800 cc) has highest rate of being stolen or theft, seconded by DAIHATSU CUORE (800 cc) and ranks SUZUKI CULTUS (800 cc) as the third most stolen vehicle (www.cplc).

2.11 Hardship for low Wealth Uninsured Motorist

Khazoom (2000:24) wrote that the mandatory insurance laws increase the hardships of the low wealth motorist. One has to pay a larger share of budget for automobile insurance, thus restricting their access to food and other necessities. In Pakistan, there is an absence of strong action from the government agencies to enforce the compulsory insurance law which results in ignorance of motorists to purchase insurance.

2.12 Effect of Consumer Financing on Auto Insurance

Statistics from Provincial Excise and Taxation Departments of Pakistan pertaining to the number of vehicles registered in all the four provinces are taken from 1998-2007 and according to these statistics 1,058,969 (One million fifty eight thousand nine hundred and sixty nine) vehicle were registered. Motor cars / Jeeps were also registered in Pakistan in the year 1998, excluding commercial vehicles and 2 wheelers. If we include commercial vehicles, motorcycles, trucks, buses, rickshaws, etc this figure becomes 4,303,296 (Four Million Three Hundred and Three thousand Two hundred Ninety six for the year 1998. Now if we look at the figures for the year 2006 for Motor cars (private vehicles) only, it is 1,344,657 an approximately 27% increase. Similarly overall figures for all vehicles registered in Pakistan for 2006 stood at 5,287,152 an approximately 23% increase. It is evident from the figures that use of the automobile rose rapidly in the country. Speedy increase in the numbers of vehicles resulted in a heavy traffic load on the roads and also made opportunity for insurance companies and tracker devices to have access to a bigger market and increase their sales. The sales of automobile rose rapidly due to the consumer financing at lower interest rates and the government policy to promulgate consumer financing in the country.

2.13 Vehicle Theft and its Recovery

Insurance Association of Pakistan (IAP) publishes the records of vehicles theft in a year as well as the vehicles recovered. For the years from 2000 to 2006 it is observed that the highest recovery of theft vehicles was in 2000 when a record 10% (137 out of 1137) vehicles were recovered after they were stolen / theft. The worst record is of 2006 when a mere 89 vehicles were recovered out of 3,663 stolen

/ theft vehicles. These records are only for the insured vehicles which were stolen / theft. These do not include vehicles which were not insured and vehicles installed with a tracker device. Theft is a major problem for the insurance companies and the major loss contributor. The recovery rate of theft / stolen vehicles is very low and most of the vehicles that are recovered are not in their original condition. Either the engine OR chassis is trapped, CNG kit taken out, cassette players / CD players stolen etc resulting in a refusal from the owner to accept the vehicle back. Thus insurance companies have to pay for the claim. This had a significant impact on the premium rates. Although not all car models were posed to the same risk of being jacked up but the excess in premium was always applied across the board. For example the 800 – 1000cc automobile category includes vehicles with theft / stolen rates 5 to 7 times greater than many less attractive models for car – jackers. For instance as stated above a Suzuki model of 800cc is stolen 3 times more than another vehicle of same horse power of Toyota motors. Although its sales is much higher than Toyota Make but theft ratio is still higher because of cheap parts, easy breakage of locks etc. But the owners pay the premium at a flat rate multiplied by the value of the car which should not be done. As some are charged more for the greater risk that the other carries. However, alliances with tracker companies by the insurance companies have helped solve this problem. Tracker companies have intelligent Geographical positioning systems to instantly locate a car. Although it is said that car jackers are still able to jack vehicles equipped with tracker devices yet the recovery rate of vehicles equipped with these devices is remarkably high i.e 98.5% approx. The insurance companies are able to align with these companies and offer the insurance policy along with the tracker devices and offering around 20 to 30 % discount on insurance premiums. At present these devices are mandatory for the attractive models for car jackers such as Suzuki Mehran and Toyota Corolla 2.0D. However these discounts can be enhanced through a carefully monitored study (www MNS/Ak/A10-Summary 2000 to 2006).

2.14 Family Involvement in Car Crime

Light, Nee and Ingham (1993) a home office study group during their survey / sampling from England and Wales, identified that young car hackers often influenced by others in the family, usually a brother or cousin. Either they took cars or had done so in the past. Sometimes it happens that the family knew about it but could not take any action against it. Some times the family did not know about the offender, specially, when he is relatively young and the family is not involved in the crime.

2.15 Boredom and Excitement

Offenders usually get into the crime of a young age. Although the search for fun and excitement is, of course, characteristics of young people's statistics showed that the major problem was boredom for those without money and jobs. Taking cars was seen as a relief by many.

2.16 Passion for Cars

Researches show that for many young offenders 'interest in cars' is linked with their becoming offenders. Their current interest seemed closer to criminal activity but when they get into car crime their keen interest in cars from an early age was the motivating factor.

Vehicle Insurance provides coverage against the following:

- i. The Insured
- ii. The insured vehicle &
- iii. The third party.

It provides coverage for damages occurring to an insured, his vehicle and any liability arising from

third party damage. Coverage for a vehicle may include a Total Loss, Theft, or a partial damage resulting from an accident.

In order to understand, why there is a need to study the impact of tracker companies on auto-insurance policies is important, the answer is because many myths address and various issues that insurance companies are facing such as rising cost of theft. Tracker devices were introduced initially as an effective tool to control the theft problem for the automobile industry and offered some other value added services. With the passage of time tracker devices were modified to offer many added features like online tracking solution offered to customer, track record of vehicle driven, the way it is being driven and assistance for recovery of vehicle. Tracker companies were initially perceived as the competitors to the insurance industry, however, as the market and preferences were shaped, new products emerged with the alliance of the insurance companies and tracker companies.

Some characteristics distinguish insurance companies from tracking companies. Insurance companies deal with a theft claim by requesting to fulfill certain documentary requirements e.g. lodging an FIR with the police, after which the claim is settled. The client is paid a certain amount of money, according to the insurance policy, after deducting some amount known as deductibles. The claim amount is paid after a certain period till then both the client and the insurance company waits for recovery of the vehicle. In case the vehicle is recovered, before the claim's settlement³ it is usually handed over to the client or the company retains it if the client does not agree to take the vehicle back. In some countries, the client is provided with a backup vehicle for the period until his claim is paid. However, this is not the practice in Pakistan. The client suffers for a month or more if there is any discrepancy in documents or any delay from the insurance company. He has to visit the police station to lodge an FIR, make copies of all the necessary documents, submit them with the insurance company and then wait for his claim to be settled.

Looking at tracking companies for the same problem i.e. Theft ,we came to know that the average recovery time for tracker companies to recover the vehicle, after its stolen or theft is a few hours only. The benefit for the client is instant recovery, hassle free possession and almost zero possibility of missing accessories i.e CNG KIT, CD Players / Cassette players etc.

Now there are a certain elements that are covered under a vehicle insurance policy such as accidental coverage, insured hospitalization third party liabilities and stolen parts.

Whereas a tracker company specializes in the recovery of the same vehicle that the owner lost, provides real time tracking of a vehicle and fleet management etc. Both provide products /services that have their own advantages/disadvantages. For example, the major concern for the insurance companies was the rising cost of theft / stolen vehicles. The recovery rate of stolen / theft vehicle that are not equipped with any device is less than 10%, not even 10 vehicles are recovered out of 100 (www.insurance-research.com).

3. METHODOLOGY

To achieve the results for objectives, scope and hypothesis of this study data was collected. For the collection of data, there are two types of references and resources, primary and secondary.

3.1 Primary Source

This study is mainly dependant on primary data. In order to collect primary data of trackers and insurance service users, methods of inquires can be Case study, statistical method and sample survey method. In this study Non Probability Technique known as purposive Sampling Survey is applied, based upon structural questionnaire.

3.1.1 The Sample

The primary data for this study was compiled through questionnaire filled in on a one-to-one basis by respondents from a representative sample of 50 from tracker and 50 from insurance service users in Karachi district during the last quarter of 2008. The list of respondents was taken from a representative of CTrack and insurance companies.

As Karachi is metropolitan city, and due to time and budget constrains and human resources, it was very difficult to reach every individual, who was using trackers and auto-insurance policy. While selecting the respondents randomly survey was conducted from areas of typical nature, in order to get complete information about the whole district.

In this connection it is worth mentioning here that in order to collect the data on the prescribed closed ended questionnaire, it was compelling need to stay and build up reputation with respondents. In order to get the questionnaire filled, in meetings with respondent was difficult. Therefore co-operation of reputed personalities of the areas was sought. Job was also difficult in the sense that respondents hesitated to cooperate with strangers due to privacy and law and order situation in Karachi.

Purpose of personally collecting and getting the questionnaire filled in, was because it required explanation. The questionnaire was in English, therefore content of the questionnaire were translated for respondents in Urdu, at the spot, and their answers were recorded. Thus it was possible to collect the questionnaire then and there.

3.2 Secondary Data Collection

The Secondary Data was collected from Insurance Association of Pakistan, Citizens Police Liaison Committee, Adamjee Insurance Company Limited, EFU General Insurance Limited, published research articles and also electronic sources were sought.

3.3 Data Analysis Techniques

The collected data were tabulated and analyzed for the defined purpose. Developed hypothesis were assessed by utilizing PHSTATS and excel package. Z-Test and Chi Square test were used for analysis. For the anti-theft measure we applied the Z-Test, Chi-Square was applied for goodness of fit test.

4. DATA ANALYSIS, RESULTS AND DISCUSSIONS

Collected data, from the respondents with the help of questionnaires “the samples” were used in the following hypotheses:

Hypotheses

H1: Tracking devices are not popular as an anti-theft measure

H2: There is no association between sales of auto-insurance policies and sales of tracker devices

4.1 HYPOTHESIS ANALYSIS

4.1.1 Testing Popularity of Tracking Devices as an Antitheft Measure

Step 1: Statement of Hypothesis-1

H_{1o}: Tracking devices are not popular as an anti-theft measure ($\mu_0 = 2.5$)

H_{1A}: Tracking devices are popular as an anti theft measure ($\mu_A < 2.5$)

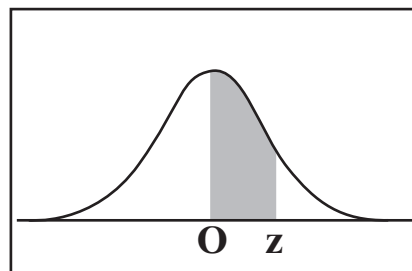
Step 2: Significance level: $\alpha = 0.05$

Step 3: Test Statistic:
$$Z = \frac{\bar{x}_1 - \mu_0}{\frac{\sigma}{\sqrt{n}}}$$

Step 4: Calculation

Z Test for Population Mean	
	antitheft measure
Number of Observations	50
Population Std. Deviation	0.760000
Sample Mean	1.900000
$\mu_0 = 2.5$	$\mu_A < 2.5$)
Z	-5.582422
P[Z ≤ Z*]	0.000000
Z Critical ? = 0.05	-1.644854

Step 5: Critical Region: Reject Ho if $Z < -Z_{0.05} = -1.645$



Step 6: Conclusion

Since p- value is less than 0.05 thus H_A is accepted

The study concludes that Tracking devices are popular as an antitheft measure. This means that Null hypothesis is rejected and Alternate Hypothesis is accepted.

4.1.2 Testing association between sales of auto-insurance policies and sales of tracker devices.

Step 1: Statement of Hypothesis-2

H_{2O} : There is no association between sales of auto-insurance policies and sales of tracker devices.

H_{2A} : There is an association between sales of auto-insurance policies and sales of tracker devices.

Step 2: Significance level: $\alpha = 0.05$

Step 3: Test Statistic:

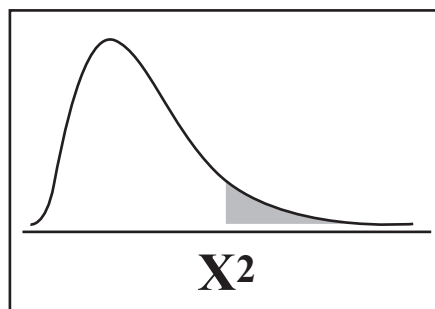
$$\chi^2 = \sum \sum \frac{(o_{ij} - e_{ij})^2}{e_{ij}}$$

Step 4: Calculation

Calculation of the Chi-Square Test	
DESCRIPTION	VALUE
χ^2*	4.386817
p-value	0.884161
Critical value	16.918978
α	0.05
df	9

Step 5: Critical Region

Reject H_0 if $\chi^2* > \chi^2_{(0.05, 9)} = 16.918978$



Step 6: Conclusion

Do not reject H_0 .

There is no association between sales of auto-insurance policies and sales of tracker devices.

5. CONCLUSION

The Purpose of this study was to see the opportunity and the possible alliances of insurance companies with the tracker companies, in order to avoid theft, increase recoveries, provide peace of mind to the customer and cut down losses. To explore the relationship of the tracker sales and the impact on auto insurance policies. Tracker devices are the best available anti-theft measure nowadays along with the value added services.

However, there is no association between the sales of tracker devices and the sales of insurance policies as evident from the Tested Hypothesis. The limitation of this article restricts from exploring further categories of the vehicles as well as assessing the many other factors which have less impact on the insurance policy sales. Tracking devices are new in the market and are expensive, auto-insurance products are old and the insurance companies itself have their legacies. The study reveals:

- There is a fair competition in the market.
- Tracker and Insurance companies cannot indulge in cut throat competitions due to difference in services.
- Tracker devices have increased the sales of auto-insurance policies in general when co-branding.
- A very small segment of market has shifted solely to tracker companies from insurance companies. This segment is conscious of status symbol as evident from the questionnaire result.

Out of 50 respondents 35 (70%) agree that the insurance companies offer lower rates to customers having installed tracker devices. Out of 50 respondents 8 said that they offer lower rates whereas 7 out of 50 were of the opinion that higher rates are charged.

It is concluded that more research in the product development area for the alliances of insurance companies and tracker devices can result into a vast range of possibilities for the Pakistani consumers just as the Pay-at-the-Pump auto insurance concept has done in some western countries. For consumers, who are willing to purchase auto insurance and tracker devices, a single solution is available now.

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www.insurance-research.com

www.iap.net.pk Insurance Association of Pakistan,

www.cplc.org.pk Citizens Police Liaison Committee. (CTrack)

www.trakker.com.pk

www.nj.com/news/ledger/topstories/index.ssf/2008/07/tracking_devices_to_cut_car_in.html

**A Book Review-Africa: Continent of Economic Opportunity
Ravinder Rena***

The 512-page David Fick's "Africa: Continent of Economic Opportunity" is based on his belief that the second largest continent has immense potential that only waits to be tapped, and his confidence in her citizens' creativity, resilience and industry. Important task of the book is not a money-making venture: the author has donated his entire royalties to charity Doctors without borders. Further, the cover illustration of the book is derived from the artwork "Africa Connections",

David Fick spend considerable amount of time and invested resources in collecting valuable information from Africa's 50 countries via research by means of the Internet and e-mail correspondence, corresponding with entrepreneurs in all the 53 countries and asking for their corrections and improvements to their rough draft text. The effort that poured in the form of this book is highly commendable. Besides, the book provides a bibliography of speeches by international opinion leaders, writers and reports by credible international bodies and the Media.

David seems to support better ideas on how to create economic environments and opportunities for skilled, innovative, and passionate entrepreneurs in Africa to successfully implement their ideas, achieve their dreams, and bring benefits to their communities. He further points out that Africa needs millions of jobs. He believes jobs on the other hand, would raise the incomes, lower poverty, and create tax base necessary to finance critical work in combating HIV/AIDS, malaria and tuberculosis. He therefore, suggested that the African decision makers and their international partners must stick to their pledge to keep their jobs very much at the centre: jobs for 35 million Africans who are unemployed and better-paying work for the 140 million Africans who earn less than US\$ 1 a day.

The author analyses the socio-economic profile of the different countries in Africa from East to West and South to North. The book also lists the views and ideas of different political leaders and businessmen in the African Continent. It is an effort to know the authors' opinion regarding the socio-economic and conditions in the Black continent. Certainly, books like this can help the researchers, academia, and other interested readers policy makers, practicing and potential entrepreneurs etc., in Africa who like to know the reasons behind the problems and prospects of different African states.

The Book encompass issues ranging from contested approaches to regional integration to the need for a new conceptualization of African development initiatives, the role of regional economic communities as building blocks of regionalism, and the formation of regional innovation systems for economics development of Africa. Indeed, David summarizes the philosophies of the economists, educators and political readers who are interested in developing Africa to its full potential for the benefit of Africans

The material presented by the author does not necessarily represent the viewpoint of editors and the management of the Indus Institute of higher education as well as the authors' institute

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and the world.

The unique features of the book: it highlights the successful entrepreneurs and their ongoing enterprises in Africa. Each story captures the spirit behind the successes and also highlights how they are not only creating countless job opportunities in 53 African countries but also bringing immeasurable improvement to the quality of life among African communities

Fick discusses in the book how to create awareness on the obstacles and successes of entrepreneurship in Africa. For example, he has highlighted the success story of people from Eritrea to South Africa and their communities that are successful in developing Africa.

He identifies that Africa needs substantial resources for growth. In order to meet the MDGs, the continent should reach at least a 7 percent growth rate to achieve them by 2015.

The author suggested that the economic policies in Africa should regulate the international environment in the private sector. The author reiterated that the African should craft their own solutions their won problems, thus, they need intellectual freedom to expose problems and permit an open and free debate of possible solutions.

Fick says African economy largely depends on informal and traditional sectors. Therefore, these two sectors have to be developed instead of developing modern sector. He points out that the trade can realize its full potential only if rich countries alike take action to redistribute opportunities in favour of the poor. The US and EU are not implementing the policies at their home that they insist African countries must take. David highlighted that “to empower the people in Africa, do not give them fish, rather teach them how to fish.” Rich Western nations should open their markets to developing countries and give them grants instead of loans.

Fick observed that in 2001, the US imported duty free goods worth of US \$ 8.2 billion under African Growth and Opportunity Act (AGOA). The US is sub-Saharan Africa’s single largest single market, purchasing 27 per cent of the regions’ export in 2000. In addition, US exports to sub-Saharan Africa reached record levels in 2001, growing to nearly US \$ 7 billion, a 17.5 per cent increase from 2000.

Finally, David concluded that “Africans wherever they are should get back home with diversified experience and expertise to help out their motherland. African Diaspora can play a very important role in Africa’s empowerment and improvement. African unity must be broadened to include the African Diaspora. The ultimate goal of economic integration must be to benefit and improve the lives of Africans by creating new avenues of trade and creating an African bloc in terms of economic negotiations on the world markets. The United States and European Union are driven by economic reasons upon which no individual African country can make a significant impact- but an African union can make enough impact to cause the citizens of the US and EU to take Africa seriously. A successful AU will empower all of Africa, not merely the strong countries. Africa’s abundant resources would then benefit the health, education, and wellbeing of all Africans.”

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