KNOWLEDGE MANAGEMENT – A HR TOOL TO GET COMPETITIVE EDGE
AN EMPIRICAL STUDY IN TELECOM SECTOR

Vandna Sharma*

*K*NOW *what questions to ask to encourage sharing - "I need your advice on" will be far more effective than "tell me what you know!*
Much more than the buzzword, knowledge management has emerged as a critical competitive differentiator – a delicate balance of people, processes, and tools.

Knowledge Management provides access to experience, knowledge, and expertise that create new capabilities, enable superior performance, encourage innovation, and leverages existing knowledge assets of the organization, facilitates information and knowledge dissemination across boundaries and integrates the information and knowledge into day to day business process.

Introduction
Increasingly, ability of an organization to compete in the global village gets defined by its ability to manage its knowledge and knowledge workers. It is most apparent in knowledge-intensive industries such as software, biotechnology, consultancy and pharmaceuticals. However, knowledge management has become an important issue in all types of organisations and industries. It is being said that only those organisations that are able to create a culture for knowledge management will survive and grow.

For an organisation to have a KM system, the organisation culture is a key factor. It has to be an open environment without any strict hierarchy, needs a free communication network across the organisation and a collaborative and participatory style of operation. KM requires that the company acknowledges and identifies its knowledge base among other things as part of its critical success factors (CSF).

Knowledge Management is the process by which the organization generates wealth from its intellectual or knowledge based assets (Wendi and Ruth, 1999).

Knowledge Management is a concept in which an enterprise gathers, organizes, shares, and analyzes the knowledge of individuals and groups across the organization in ways that directly affect performance. It is about helping people communicate and share information. Knowledge Management envisions getting the right information, in the right context, to the right person, at the right time, for the right business purpose (Robert, 2000).

Literature Survey
According to Malhotra (1997), knowledge that is contained in the minds of organizational members is the greatest organizational resource. Malhotra posits, therefore, that knowledge management is not only about managing knowledge assets, but also managing the interpersonal and organizational processes

* *Asst. Professor, Galgotias College of Engineering & Technology, Greater Noida, India*

that act upon these assets. In a 1998 study, Malhotra further defines knowledge management as a synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of human beings.

Collaborative knowledge management is necessary for a company to: (i) Remain Competitive; (ii) Adapt to a rapidly changing environment; (iii) Innovative; (iv) Respond to the demand of e-business; (v) Fully capitalize and develop its people; (vi) Support effective relationships with Suppliers, Partners and Customers.

David (1997) suggests that organizational culture is relevant to firm that creates, shares and uses knowledge. He also suggests four ways in which organizational culture influences behaviors central to knowledge creation, sharing, and use. (i) Culture and particularly subcultures shape our assumptions about what knowledge is and, hence, what knowledge is worth managing. (ii) Culture mediates the relationships between individual and organization-level knowledge. (iii) Culture creates the context for social interaction that ultimately determines the value an organization derives from knowledge. (iv) Culture shapes the processes by which new organizational knowledge – with its accompanying uncertainties – is captured, legitimated, and distributed.

Weidner (2002): Knowledge Manager integrates both connect and collect for effective knowledge process, i.e. (i) reinforce natural instincts to build trust and a culture of knowledge sharing; (ii) provide appropriate technology-enhanced collaboration tools; (iii) provide intuitive repositories for accumulating mission critical knowledge (iv) enrich the technology with managerial practice and business process.

Therefore, this paper gives an empirical insight that KM implementation will require collaboration and creativity leading to organizational learning, knowledge culture building, organization development and employee satisfaction.

Hypotheses

The proposed study is based on the hypothesis that without Knowledge Management an organization is not able to get competitive edge over other organizations.

Some of the specific hypothesis are listed below:

H1a: There is a positive correlation between Knowledge Management and Collaborative approach among employees.

H1b: There is a positive correlation between Knowledge Management and Creativity, and Innovation management

H1c: There is a positive correlation between Knowledge Management and Organizational Learning.

H1d: There is a positive correlation between Knowledge Management and Organization Development.

H1e: There is a Positive correlation between Knowledge Management and Satisfaction level of employees.

Method

Sample

The study comprises Telecommunication Sector (excluding other industries). The sampling frame consists of one industry – that includes 10 Telecommunication companies. The data relates to financial year 2002-2003. The 10 Telecommunications companies were sorted out in Market Share and Sales order (from higher to lower).

The list of all the companies in this industry has been listed in the table attached as Annexure I.

Sampling Framework

I identified the four (4) companies from industry of Telecommunications. The random sample design is selected.

Total Sample Size of Study: Two companies from specified industry where the Knowledge Management is being implemented and two companies where the Knowledge Management is not being implemented as on the specified date.

Table 1

Industries	KM Implemented	KM not implemented
Telecom	1. Bharti Tele 2. Tata Teleservices	1. MTNL 2. VSNL

The research tools include MS-Excel and SPSS V.12. Data has been collected from the balance sheets of the companies and the Central of Monitoring of Indian Economy, 2003 (upto 31st March 2003).

A detailed questionnaire (Wendi and Ruth, 1999) for the respondents covering various facets of operations was prepared and circulated among the selected companies of each industry. The survey was divided in to six parts:

Part-I: Demographic data such as age, sex, and qualification, marital status & work related information such as Designation, Department, salary, years in employment, and other business related information;

Part – II: KM Audit

Part – III: Organizational Learning Survey

Part – IV: Organizational Culture Survey

Part – V: Employee Satisfaction Survey

Part – VI: Collaboration Questionnaire

Part – VII: Creativity & Innovation Questionnaire

A structured questionnaire is being used: (i) Administrative Questions- like participants name, interview location; (ii) Target Questions: - Structured (Closed) – Unstructured (Open). Respondents are required to fill in the appropriate number question from the different-point scaling technique i.e. nominal scale, single/multiple choice, multiple rating and Likert scale in the rank of 1 to 5 or 0 to 4.

A total of 80 respondents were approached that included 20 from each company selected in sample. In each company, Questionnaire is administered on knowledge workers, project managers, team members, consultants, researchers and designers etc.

Table 2

Implementing KM IT Techniques		Not Implementing KM IT Techniques	
Bharti Tele	Tata Teleservices	MTNL	VSNL
1	2	3	4
20	20	20	20

Total = 4 * 20 = 80

Pattern of Analysis and Statistical Tool Employed

The first customary step is to editing and coding the raw data into statistical software like SPSS and Microsoft Excel. The classifying data into appropriate codes like numeric and alphanumeric for conclusive analysis. We also follow the rules of missing values and don't know rules.

Hypotheses were tested using the following test

❑ *Data Reduction Technique* – Factor Analysis (Principal Component Analysis)

❑ *Descriptive statistics* – Mean Median, Mode, and Standard Deviation.

❑ *Parametric:* Z-test, F-test, t-test, and Correlation Technique.

Various statistical packages like MS-Excel and SPSS has also been used for testing the hypothesis for significance level of 95%.

Result

$\mu 1 = \mu 2, \mu 3, \mu 4, \mu 5, \mu 6$

Where, $\mu 1$ = Knowledge Management

$\mu 2$ = Organizational Learning

$\mu 3$ = OrganizationalCulture and Development

$\mu 4$ = Employee Satisfaction

$\mu 5$ = Creativity & Innovation

$\mu 6$ = Collaborative Approach

Table 3: Descriptive Statistics

	Mean	Std. Deviation	N
Knowledge Management	35.0250	9.0077	80
Organizational Learning	51.2500	5.7885	80
Organizational Culture & Development	87.2500	11.8829	80
Employee Satisfaction	154.4000	22.3576	80
Creativity & Innovation	9.7250	1.7645	80
Collaborative Approach	.365	2.0943	80

Multiple regression analysis, a form of general linear modeling, a multivariate statistical technique, used to examine the relationship between a single dependent variable, here, *Knowledge Management,* and a set of independent variables (*Organizational Learning, Organizational Culture and Development, Employee Satisfaction, Creativity and Innovation, Collaborative Approach*). Multiple regressions also provided a means of objectively assessing the degree and character of the relationship between dependent and independent variables.

In addition to assessing the importance of each variable, multiple regressions also provide the researcher means of assessing the nature of the relationships between the independent variables and the dependent variable.

Research Design of a Multiple Regression Analysis

The survey obtained *80 respondents* which provided complete response, resulting in 80 observations available for analysis from industry meant for the research study for this purpose. The first question to be answered concerning sample size is the level of relationship (R^2) that can be detected reliable with the proposed regression analysis. The proposed regression analysis is deemed sufficient to identify not only statistically significant relationship but also relationships that had managerial significance.

This analysis also ensures that the research is meeting the basic assumptions of regression analysis involves two steps:

1) Testing the individual dependent and independent variable, and

2) Testing the overall relationship after model estimation.

The three assumptions in this case to be addressed for the individual variable are linearity, constant variance, and normality.

Stepwise Estimation: Selecting the First Variable - In this analysis, Researcher used Stepwise procedure to select variables for inclusion in the regression variate. Table below displays all the correlations among the five independent variables and their correlations with the dependent variable (Knowledge Management). *Examination of the correlation matrix indicates that Employee Satisfaction is most closely correlated with the dependent variable i.e. Knowledge Management* (.86). Our first step is to build a regression equation using this best independent variable. The results are shown below:

Now, Correlation of Knowledge Management ($\mu 1$) with Organizational Learning ($\mu 2$), Organization Culture and Development ($\mu 3$), Employee Satisfaction ($\mu 4$), Creativity and Innovation ($\mu 5$), and Collaborative Approach ($\mu 6$). This would fetch more close approximation between Knowledge Management & the variable identified here under Table 4.

Table 4

	Knowledge Management	Organizational Learning	Organizational Culture & Development	Employee Satisfaction	Creativity Innovation	Collaborative Approach
Knowledge Management	1.00	0.78	0.85	0.86	0.73	0.52
Organizational Learning	0.78	1.00	0.74	0.81	0.73	0.53
Organizational Culture & Development	0.85	0.74	1.00	0.89	0.69	0.53
Employee Satisfaction	0.86	0.81	0.89	1.00	0.75	0.73
Creativity & Innovation	0.73	0.73	0.69	0.75	1.00	0.53
Collaborative Approach	0.52	0.53	0.53	0.73	0.53	1.00

Table 5: Most Summary[d]

Mode	R	R Squar	Adjuste R Squar	Std. of the Estimat	Change				
					R Chang	F	df1	df2	Sig. Chang
1	.862[a]	.744	.740	4.590	.744	226.18	1	78	0.000
2	.882[b]	.772	4.305	.034	11.67	1	77	.001	
3	.890[c]	.792	.783	4.193	0.14	5.177	1	76	.026

a. Predictors: (Constant), Employee Satisfaction

b. Predictors: (Constant), Employee Satisfaction, Organizational Culture & Development

c. Predictors: (Constant), Employee Satisfaction, Organizational Culture & Development, Organizational Learning

d. Dependent Variable: Knowledge Management

Multiple R is the correlation coefficient for the simple regression of 3 Variables and the dependent variable. It has no plus or minus sign because in multiple regression the signs of the individual variables may vary, so these coefficients reflect only the degree of association.

R square is the correlation coefficient squared, also referred to as the coefficient of determination. This value indicates the percentage of total variation of dependent variable by independent variable.

Standard Error of Estimate: It is another measure of the accuracy of our predictions. It represents an estimate of the standard deviation of the actual dependent values around the regression line that is; it is a measure of variation around the regression line.

Table 6: ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4766.277	1	4766.277	226.182	.000[a]
	Residual	1643.673	78	21.073		
	Total	6409.950	79			
2	Regression	4982.735	2	2491.367	134.412	.000[b]
	Residual	1427.215	77	18.535		
	Total	6409.950	79			
3	Regression	5073.747	3	1691.249	96.194	.000[c]
	Residual	1336.203	76	17.582		
	Total	6409.950	79			

a. Predictors: (Constant), Employee Satisfaction

b. Predictors: (Constant), Employee Satisfaction, Organizational Culture & Development

c. Predictors: (Constant), Employee Satisfaction, Organizational Culture & Development, Organizational Learning

d. Dependent Variable: Knowledge Management

High value of F clearly points out that, there is significant positive correlation with dependent variable. The ANOVA table tests the acceptability of the model from a statistical perspective. The *Regression* row displays information about the variation accounted for this model. The *Residual* row displays information about the variation that is not accounted for in this model. The regression and residual sums of squares are approximately equal, which indicates that the model explains about 79% of the variation in these variables. The significance value of the F statistic is less than 0.05, which means that the variation explained by the model is not due to chance. While the ANOVA table is a useful test of the model's ability to explain any variation in the dependent variable, it does not directly address the strength of that relationship. The model summary table reports the strength of the relationship between the model and the dependent variable. R, the multiple correlation coefficient, is the linear correlation between the observed and model-predicted values of the dependent variable. Its large value by adding all the variables (89%) indicates a strong relationship. *R Square*, the coefficient of determination, is the squared value of the multiple correlation coefficient. It shows that about 79% the variation in *time* is explained by the model. As a further measure of the strength of the model fit, compare the standard error of the estimate in the model summary table to the standard deviation of *time* reported in the descriptive statistics table.

Table 7: Coefficients[a]

| Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statiscs	
		B	Std. Error	Beta			Zero-Order	Partial	Part	Tolerance	VIF
1	(Constant)	-18.616	3.603		-5.166	.000					
	Employee Satisfaction	.347	.023	.862	15.039	.000	.862	.862	.862	1.000	1.000
2	(Constant)	-22.980	3.613		-6.361	.000					
	Employee Satisfaction	.205	.047	.510	4.379	.000	.862	.447	.235	.214	4.683
	Organizational Culture & Development	.301	.088	.398	3.417	.001	.850	.363	.184	.214	4.683
3	(Constant)	-28.677	4.319		-6.640	.000					
	Employee Satisfaction	.149	.052	.370	2.869	.005	.862	.313	.150	.165	6.060
	Organizational Culture & Development	.281	.086	.370	3.251	.002	.850	.349	.170	.211	4.735
	Organizational Learning	.316	.139	.203	2.275	.026	.777	.253	.119	.344	2.904

a. Dependent Variable: Knowledge Management

The standardized regression coefficient, or beta value, is the value calculated from standardized data. The beta value allows us to compare the effect of independent variable on dependent variable to the effect on dependent variable of other independent variable at each stage, because this value reduces the regression coefficient to a comparable unit, the number of standard deviations.

A smaller standard error implies more reliable prediction. Thus, researcher preferred to have small standard error and small confidence intervals. This standard error is also referred to as the standard error of the regression coefficient. It is an estimate of how much the regression coefficient will vary between samples of the sample size taken from the same population. As we can indicate from the respective table, the use of *3 variables* decreases the standard error.

The t value of variables in the equation, as calculated, measures the significance of the partial correlation of the variables reflected in the regression coefficient. It helps us to determine whether any variable should be dropped from the equation once a variable has been added.

 The partial correlation is a measure of the variation in dependent variable not accounted for by the variables in equation (3 variables in this equation) that can be accounted for by each of these additional variables. As we shift from model 1 to another models, the values of partial correlation increased. As it also predicts that, by getting higher number, the percentage getting lesser for unexplained variance. Much of the variance has already been explained by 3 variables.

Measure the degree and impact of multi-collinearity: Highly collinear variables can distort the results substantially or make them quite unstable and thus not generalizable. Measures are available for testing the impact of collinearity: calculating the tolerance and VIF values. A high tolerance value indicates little collinearity, and tolerance value approaching zero indicates that the variable is almost totally accounted for by other variables. The variance inflation factor is the reciprocal of the tolerance value; thus we look for small VIF values as indicative of low inter-correlation among variables.

Histogram

Dependent Variable: Knowledge Management
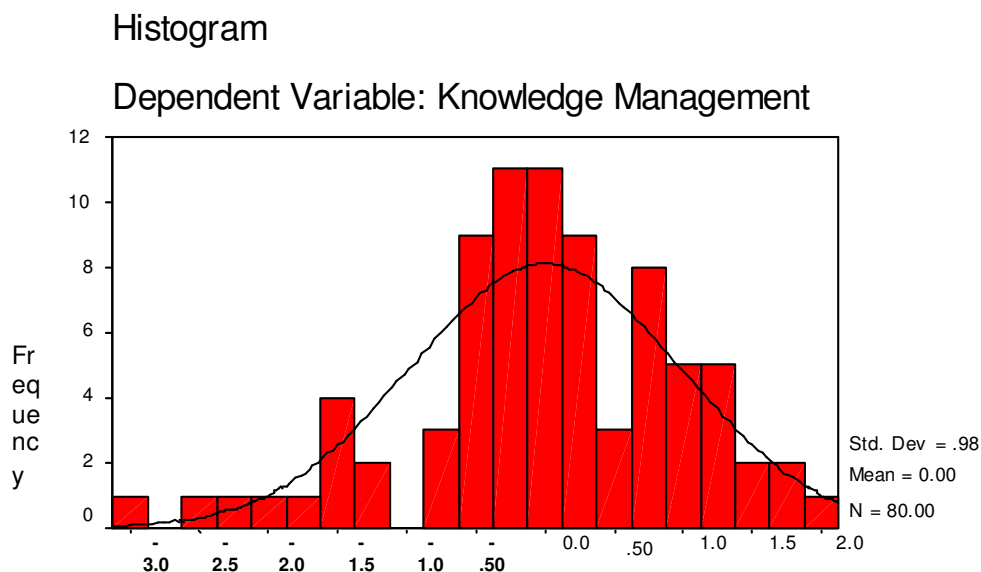
A residual is the difference between the observed and model-predicted values of the dependent variable. The residual for a given product is the observed value of the error term for that product. A histogram or P-P plot of the residuals will help to check the assumption of normality of the error term. The shape of the histogram should approximately follow the shape of the normal curve. This histogram is acceptably close to the normal curve.

Normal P-P Plot of Regression Standardized Residual

Knowledge Management
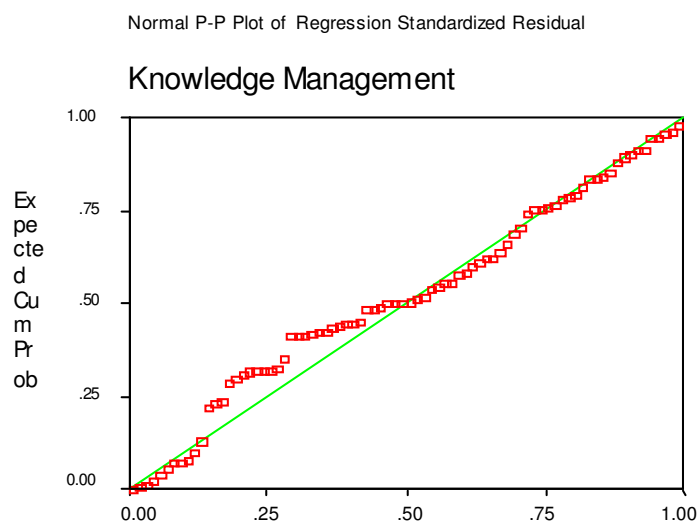
The P-P plotted residuals should follow the 45-degree line. Neither the histogram nor the P-P plot indicates that the normality assumption is violated.

A Managerial Overview of the Results

What affects Knowledge Management? In formulating a response, the researcher must consider two aspects: prediction and explanation. In terms of prediction, the regression models all achieve high levels of predictive accuracy. The amount of variance explained exceed 79 percent and the expected error rate for any prediction is approximately 3.6 (plus or minus) percent. In this type of research setting, these levels, augmented by the results supporting model validity, provide the highest level of assurance as to the quality and accuracy of the regression models as the basis for developing business strategies.

In terms of explanation, all of the models arrived at essentially the same results: three strong influences (*Employee Satisfaction*) and somewhat lesser influence (*Organization Culture and Development, and Organizational Learning*) on knowledge management. Increase in any of these 3 variables will result in corresponding increase in knowledge management.

Conclusion

Thus, it can be concluded that any effort aimed at gaining competitive edge through Knowledge management must take in to consideration collaboration, sharing, creativity, culture, learning to be appreciably successful.

References

David, Long De (1997), "Building the Knowledge-Based Organization: How Culture Drives Knowledge Behaviors", Center for Business Innovation, Ernst & Young LLP, May, p.26.

Douglas, Weidner (2002), "Using Connect and Collect to Achieve the KM Endgame", IT Pro January - February, pp.18-24.

Malhotra, Y. (1997), "Knowledge Management in Inquiring Organizations," Proceedings of 3rd Americas Conference on Information Systems (Philosophy of Information Systems Mini-track), Indianapolis, IN, August 1997, Retrieved Feb. 13, 2002 from www.brint.com/km/km.htm.

Wendi, R. Bukowitz and Ruth L Williams (1999), "The Knowledge Management FieldBook", Pearson Education Limited, London, p.2.

Robert, S. Seiner (2000), "Knowledge Management: It's Not All About the Portal," *The Data Administration Newsletter*, November.

Annexure I
List of Telephone Communication Services

Company-wise Trends in Sales

(Rs. Crore) 2002-2003

	Market Share	**Sales**
1. Bharat Sanchar Nigam	63.50	21309.86
2. Mahanagar Telephone Nigam	16.39	5499.28
3. Videsh Sanchar Nigam	13.52	4538.55
4. Bharti Infotech	3.29	1102.50
5. Tata Teleservices	0.78	261.89
6. Tata Teleservices (Maharashtra)	1.07	359.59
7. Reliance Telecom	1.06	356.41
8. Shyam Telelink	0.17	58.87
9. Bharati Tele-Ventures	0.22	72.90
10. Reliance Energy Infrastructure	-	0.74