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Evaluation of Knowledge Management in the Software Sector- A Case Study

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Abstract. For an organization to sustain the competitive edge in the current knowledge economy, effective knowledge utilization and knowledge contribution may help towards attaining business objectives. The present case study aimed to evaluate the existing knowledge management initiatives of two software companies. About 150 questionnaires were sent through web survey. The questionnaire contained items related to knowledge quality, system quality, benefits and extent of use of Knowledge Management system. The results indicated that knowledge shared in the organizations was of high quality, accurate and updated regularly. Most of the employees agreed that the Knowledge Management system implemented in the two organizations was user friendly, allowed for overall knowledge development and increased innovation in the procedures employed at the workplace.

Keywords: Knowledge Management, Knowledge Management System, Software, Survey

1. Introduction

For an organization to be innovative as well as to sustain the competitive edge in the current knowledge economy there is a need to effectively utilize the most valuable strategic organizational asset, knowledge. Knowledge involves integrating information with experience, reflection and context. For instance, knowledge can be a collection of best practices in a specific profession [Skyrme and Amidon, 2003]. Knowledge is a powerful resource that enables organizations and employees to achieve faster learning and develop better decision-making [Nonaka and Takeuchi, 1995].

Knowledge Management System (KMS) refers to an IT based system for managing knowledge in organizations for supporting creation, capture, storage and dissemination of information. The idea of a KMS is to enable employees to have ready access to the organization's documented base of facts, sources of information, and solutions [Maier, 2002].

Organizations can achieve enormous direct and indirect benefits from knowledge management system (KMS) deployment [Crano and Brewer, 2002]. Knowledge utilization and knowledge contribution (sharing) are two major knowledge management processes. While the breadth and depth of a knowledge management system (KMS) depends on the magnitude of knowledge contributed to the system, benefits of KMS are actually recognized from utilizing knowledge from the KMS.

Software companies in particular face an enormous challenge compounded by the need to align the rapidly evolving technologies with the business objectives. KMS software is currently being used in a few software companies. 'Kshop' by Infosys was first launched in 1999. Through Kshop, knowledge generated in each project across the global operations of Infosys was captured [Kochikar, 2001]. 'Lotus notes' by IBM, which was launched by IBM in 1995, is being sold and used by IBM in each department across its global software group. 'Microsoft enterprise search' is commercial KMS software launched by Microsoft.

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2. Objectives

The objective of the present study was to carry out a survey on the existing knowledge management initiatives of two software companies and to assess the knowledge management directives of these companies. The justification for this project is highlighted by the fact that the Indian software industry is rated very high in terms of human resource as a tangible strategic asset. Analysis of the data collected will provide insight into the effective utilization of knowledge management initiatives by all strata of knowledge workers.

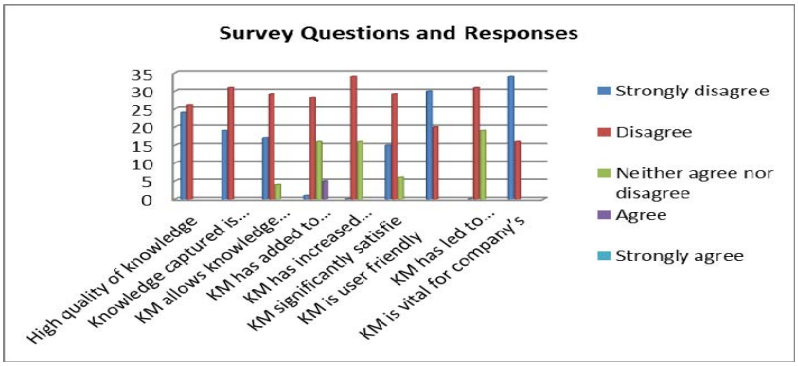
3. Methodology

The data was conducted by web survey. Two major software companies were selected for the purpose. A sample size of 25 was determined for each company. The confidence level was chosen to be 95% and population of each company was assumed to be 10,000. About 150 questionnaires were sent and the response rate was 33%. Questions were framed to be uniformly understood by all respondents belonging to different strata in the organization. During the initial trial run, the questionnaires were reviewed for problems with bias and it was confirmed that no particular question caused any problem of understanding. Simple language was used throughout the questionnaire and all possible ambiguity was eliminated.

The questionnaire used was found to be reliable and had a proven 'content and criterion related' validity, as it is derived from a standard instrument used earlier in different organizations. However, some changes were incorporated to make it suitable for the software sector. The content validity was checked again by consultation with experts in the software field. 'Item validation' was carried out through 'Factor Analysis', the purpose of which was to determine the internal structure of the set of given number of items. Principal Component Analysis (PCA) method with varimax rotation using Kaiser variation was used to generate factors.

4. Results and Discussion

Analysis was carried out for 10 parameters chosen from the survey according to their relevance in deriving appropriate conclusions for the project using SPSS software. The following scales were used to measure the response of each respondent. The respondents were evaluated based on their familiarity with Knowledge Management as Introductory, Intermediate and Advanced users represented respectively as 1, 2 and 3. For all the other 9 parameters, the Likert 5 - point scale was used for evaluation with 1 for Strongly disagree, 2 for Disagree, 3 for Neither agree nor disagree, 4 for Agree and 5 for Strongly agree. [Graph1]



Graph 1: Survey questions and responses for 9 selected parameters

During analysis, 'Familiarity with KM' was assumed as an independent parameter and the rest of the parameters were assumed to be dependent on this parameter. Table 1 shows the mean values of all the parameters.

Table 1: Mean values of data

Parameter	N	Mean	Std. Deviation	Std. Error Mean
High quality of knowledge	50	4.52	.505	.071
Knowledge captured is accurate	50	4.38	.490	.069
KM allows knowledge development	50	4.26	.600	.085
KM has added to responsibilities	50	3.50	.707	.100
KM has increased innovation in procedures	50	3.68	.471	.067
KM significantly satisfies search for knowledge	50	4.18	.629	.089
KM is user friendly	50	4.60	.495	.070
KM has led to improvement in market share	50	3.62	.490	.069
KM is vital for company's success	50	4.68	.471	.067

5. Analysis of Survey questions

For the question on "Level of experience and familiarity with KM", out of the total number of responses taken into account i.e. 50, 15 respondents chose Introductory, 23 respondents chose intermediate and 12 respondents chose advanced. The majority 46% of the respondents chose Intermediate level.

Parameter 1: 'High quality of knowledge' had a mean value of 4.47 and standard deviation of 0.516 for level 1 of familiarity. This implies that on an average respondents having introductory level of familiarity chose a value between strongly agree and agree options. For intermediate level of familiarity the mean value reduces to 4.43 and for advanced level of familiarity the mean value is 4.75. Thus the highest mean value is for advanced users. Since 4 stands for agree and 5 stands for strongly agree; only the total mean value is relevant which is 4.52 with a standard deviation of 0.505. This value tells us that 100 % of respondents agree or strongly agree with the statement. The findings are in accordance to De Lone and McLean (1992) who indicated that KMS success depends on information quality and system quality.

Parameter 2: 'Knowledge captured is accurate' had a mean value of 4.27 for level 1 of familiarity. The mean value reduced to 4.17 for level 2 of familiarity and was very high, 4.92 for level 3 of familiarity. This implies that respondents having advanced level of familiarity strongly agree that knowledge captured is accurate. The total mean value for all respondents is 4.38, which is less than the mean value for Parameter 1.

Parameter 3: 'KM allows knowledge development' had a mean value of 3.93 for level 1 of familiarity. The mean value increased as level of familiarity increased. It is 4.30 for level 2 and 4.58 for level 3. This implies that respondents having high level of familiarity agree to the statement that KM allows knowledge development and respondents having low level of familiarity are not aware or are not certain. The total mean value was 4.26 with a standard deviation of 0.6. Management support is an important factor towards knowledge contribution as reported by Al Busaidi et al in 2007. Goswami et al in 2008 observed that respondents unanimously agreed that sharing of knowledge leads to enrichment of knowledge base.

Parameter 4: 'KM has added to responsibilities' had a mean value of 3.33 for level 1 which increases to 3.78 for level 2 and reduces to 3.17 for level 3. This implies that respondents having high level of familiarity do not feel KM is a burden as much as the respondents having low level of familiarity. The total mean value is 3.50 with a standard deviation of 0.707. Hence, it may be assumed that the employees were not displeased about the KMS implemented in the organization.

Parameter 5: This parameter helps determine the extent of KMS being used as well as the success of the KMS. 'KM has increased innovation in procedures' had a mean value of 3.27 for level 1 of familiarity which increased to 3.78 for level 2 and 4.0 for level 3. This implied that respondents having high level of familiarity agreed to the statement whereas respondents having low level of familiarity were uncertain. Further, the standard deviation for respondents having level 3 of familiarity is 0 which implies that all the respondents in this level chose the same value that is 'agree'. The total mean value for all the respondents was 3.68. According to Liu in 2003, the main benefit of knowledge utilization for individuals is individual learning, which is indicated by an individual's productivity, i.e., decision making and innovation.

Parameter 6: 'KM significantly satisfies search for knowledge' had a mean value of 3.73 for level 1 which increased to 4.26 for level 2 and 4.58 for level 3, the total mean value for all the respondents being 4.18. This implied that higher the familiarity, higher number of respondents agree with the statement. This indicates that if the employees are satisfied with the efficiency and effectiveness of the system, they will be willing to use it.

Parameter 7: 'KM is user friendly' has a mean value of 4.33 for level 1 which increased to 4.70 for level 2 and 4.75 for level 3. The total value of mean was 4.60. Almost all the respondents agree that KMS of their company is good in terms of its operational characteristics. As the level of familiarity increases respondents find it easier to use, which is a natural concept with any software. Chandran D and Raman K in 2009 in a study in Malaysian business firms noted that 60% of the employees face difficulties in accessing relevant knowledge due to lack of skills in using various technologies and tools. The good response obtained in the present study may be due to the study having been carried out in a highly skilled environment such as software companies.

Parameter 8: 'KM has led to improvement in market share' had a mean value of 3.20 for level 1 which increased to 3.78 for level 2 and 3.83 for level 3. The total mean value for this parameter was 3.62, which was the lowest among all the parameters analyzed. These values imply that most of the respondents are either not aware of the impact of KM on market share or are uncertain. These results are similar to a study on ICICI bank knowledge management initiatives by Goswami et al in 2008, where the majority believed that a company's knowledge base would yield dividends but were not sure about every employee's contribution to profitability of the company.

Parameter 9: 'KM is vital for a company's success' had a mean value of 4.53 which increased to 4.70 for level 2 and 4.83 for level 3 arriving at a total mean value of 4.68 with a standard deviation of 0.471. The values imply that most of the respondents agree with the statement and feel KM may contribute considerably towards steering of the company to its goals.

Knowledge that was shared in the organizations was opined to be of high quality, readily applicable and accurate. It was also well structured and updated regularly. The KM implemented in the two organizations allowed for overall knowledge development. It has been understood to have contributed to positive and tangible results in the projects handled by employees and also to have increased innovation in the procedures in employee jobs. The employees regarded their companies as knowledge-based organisations that do recognise the importance of knowledge, knowledge sharing and knowledge creation. The implementation of KM by the top management in these companies is efficient and adequate resources are provided for the functioning of KM in the organizations. The majority of the respondents see knowledge management as a major strategic imperative that supports organisations in a competitive environment. Further, the study indicates that the software organisations were definitely aware of the issues identified in order to implement knowledge management successfully in their organisations.

6. Conclusion

The following observations may be made from the study.

- 52% of respondents agree that a high quality of knowledge exists in the organization.
- Around 62% agree that knowledge captured in the organization is accurate.
- 58% agree that the organization allows knowledge development.
- 56% of respondents are of the opinion that the implementation of knowledge management system has added to their responsibilities.
- 68% claim that knowledge management has allowed for innovation in procedures being followed in the organizations.
- 58% believe that the company's knowledge management system satisfies individuals' search for knowledge.
- 60% claim that the knowledge management system is user friendly.
- 62% claim there has been improvement in the market share following implementation of knowledge management system.

- 68% of respondents feel that knowledge management is vital for their company's success.

The present study sought to evaluate the existing KM initiatives of two software companies. Though the two organisations involved in the study cannot be regarded as representative of all software organisations in the sector, it is clear that a strong awareness exists of the importance of knowledge management in software sector organisations. The results indicated a significant relationship among the 9 constructs of the questionnaire related to KM. The present research thus contributes partially to the issues of determining and evaluating knowledge management success.

7. References

[1] Skyrme DJ, Amidon DM. The Knowledge Agenda. In: James D Cortada, John A Woods (Eds.): *The Knowledge Management Yearbook*. Butterworth: Heinemann, 2003, pp. 108 – 125.

[2] Nonaka, I. and Takeuchi, H. *The Knowledge-creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York, 1995.

[3] Maier, R.: *Knowledge Management Systems: Information and communication technologies for knowledge management*. Springer, Berlin, 2002.

[4] Crano W and Brewer M.: *Principles and Methods of Social Research*. Lawrence Erlbaum Associates Publishers, Mahwah NJ, 2002.

[5] Kochikar VP. "Creating the KM Infrastructure at Infosys: The Technology Challenge"; *Management Review*, 2001, Vol **13**, No.4, pp 104 -110.

[6] De Lone W and Mc Lean E.: Information Systems Success: The quest for dependent variable. *Information Systems Research* 1992; **3**(1): 60-95.

[7] Al Busaidi, KA, Olfman L, Ryan T and Leroy G. 'Revealing the antecedents and benefits of KMS use: An exploratory study in a Petroleum Company in Oman,' The Electronic Proceeding of the 9th International Conference on Decision support systems, Jan 2-4, 2007, Kolkata, India.

[8] Goswami C. Knowledge Management in India: A Case Study of an Indian Bank. *The Journal of Nepalese Business Studies* 2008; Vol. *V*, No. 1, pp 37 – 49.

[9] Liu, S. C.: A Study of Factors that Facilitate Use of Knowledge Management Systems and the Impact of Use on Individual Learning. PhD Dissertation: Claremont Graduate University, Claremont, CA, 2003.

[10] Chandran D and Raman K. Awareness and Problems in Implementing Knowledge Management Systems in Medium Sized Business Organizations in Malaysia, *J Soc Sci* 2009; 19(2): 155 – 161.