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Requirements and Functional Analysis of Knowledge Management Tools: A Review

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Abstract

Organizations encounter a huge number of challenges and they have to overcome these challenges with escalating dynamics and complexity. Many organizations are now looking to knowledge management (KM) to address these challenges. Knowledge Management strategy must do more than just outline high level goals such as become a knowledge-enabled organization in the form of decentralization. Decentralization is creating a nourishing environment for creativity and it is the main strategic prerequisites for an organization and it starts with the development of a knowledge management strategy to identify the key needs and issues within an organization, and provide a framework for addressing these issues. The application of information technology can offer a cutthroat interface, enhance customer service, or create a lithe fabrication atmosphere. Most of the organizations made the mistakes in the selection of the knowledge management tools, because they choose the tools what other organizations used/the supplier provide and these salutation doesn't satisfies their needs. Therefore they are miserable while using the knowledge management tool. This paper expresses an idea about knowledge management tool and their use and compares their features. This may help the organization to choose the appropriate tool according to their needs and economy.

Keywords: *functionality; knowledge management; knowledge management system; tools*

1. Introduction

Several years ago information technologies were designed MIS to support the professional workers to processing and publishing vast amounts of information. Now IT developed the system to organizations hub on providing tools to analysis the decisions and submits to the decision makers and provide updated real-time relevant information to senior and middle grade managers. This type of systems contributes to improve not only to the organization but also to the employees in various degrees to take the decision as well retrieve the information. Therefore nowadays several organizations motivated to have these systems. An emerging lines of systems intention the professional and managerial activities by concentrating on creating, gathering, organizing, and disseminating an organization's "knowledge" as opposed to "information" or "data". These systems are referred to as Knowledge Management Systems (KMS). The idea of coding and transmitting knowledge in organizations as training to the employee, organizational policies, routines, procedures, reports, and manuals have served this function for years. The existing body of work on KMS consists primarily of general and conceptual principles of KMS and case descriptions of such systems in a handful of bellwether organizations (Alavi, 1997; Henderson & Sussman, 1997).

 Traditionally, knowledge creation and transfer has taken placed through various ways such as face-to-face interactions, mentoring, job rotation, and staff development. However, as markets and organizations turn into more global and step to virtual forms, these traditional process may show to be too leisurely and less effective and in need of being supplemented by more efficient electronic methods. Knowledge will not necessarily circulate freely firm-wide just because the technology to support such circulation is available (Brown

and Duguid 1991). In the absence of an explicit strategy to create and integrate knowledge in the organization, computer systems which facilitate communication and information sharing have only a random effect at best. As a result, companies are beginning to implement information systems designed specifically to facilitate the codification, collection, integration, and dissemination of organizational knowledge (Alavi, 1997; Bartlett, 1996; Sensiper, 1997). Such systems are referred to as Knowledge Management Systems. The popular claims for the results of KMS include the ability of the organizations to be flexible and respond more quickly to changing market conditions, and the ability to be more innovative as well as improving decision making and productivity (Stata, 1997).

2. Skeleton of knowledge management systems

Knowledge management initiatives in organizations are consequently increasingly seemly eminent and firms are formulating significant IT investments in set up knowledge management systems (KMS). The prime focus of several efforts has been on budding new applications of information technology such as data warehousing and document repositories linked to search engines to support the digital capture, storage, retrieval and distribution of an organization's explicitly documented knowledge.

	Artifact	Individual
Structured	Data Warehousing	Expertise Profiles and Databases
Unstructured	Intranet and Search Engine	Discussion Forum

Figure 1: Skeleton for knowledge management system

Figure 1 evidently illustrates the tactic to build up the knowledge management system for the organizational desires. Organizational knowledge resources spotlight in horizontal dimension of the framework whether the knowledge is embodied within folks or whether it subsist as externalized knowledge artifacts and the vertical dimension deals with the scope to which the KMS imposes or necessitates a formation(Awad & Ghaziri, 2004; Raman, 2004; Mertins, Heisig , Vorbeck, 2003).

The top left cage of the KMS framework includes managing the knowledge artifacts that have an inborn structure or those where the KMS enforces a structure on the contents. Fundamentally, this domain is controlled to the organizational knowledge that is effectively codified. Normally document repositories and data warehousing systems fall into this domain and it use database management systems (DBMS) to capture and store information with predefined keywords therefore the stored information can be accessed using query language(Awad, & Ghaziri, 2004; Raman, 2004, Mertins, Heisig & Vorbeck, 2003).

The top right domain consists knowledge resides in individuals but the contents managed by the KMS are catalogued and structured employing categorizing schemes. The contents of this domain collected from employees by filling out a questionnaire to describe their level of expertise in a predefined list of skill categories. The database experts upload the every individual's information and locate the people with their specific skills and the personal information in this cage(Awad & Ghaziri, 2004; Raman, 2004, Mertins, Heisig & Vorbeck, 2003).

The bottom left part of the frame consists of systems where the knowledge is annexed in artifacts but the contents don't have apriority structures imposed on them. Instances include the KMS systems incorporat-

ing document repositories that are fully indexed on the words they contain and KMS with document advice abilities using collaborative filtering technology and the contents dynamically organized to provide employees with relevant information on the fly. Information doesn't stick to predefined structure that is search and retrieval is achieved via search engines that track down the information using full-text search. The use of collaborative filtering technology that urges information is substitute approach to positioning the relevant information to the user's query or problem without arranging the contents. Collaborative filtering records the browse and search behaviors and suggests information based on the previous similar searches performed (Awad, & .Ghaziri, 2004; Raman, 2004; Mertins, Heisig & Vorbeck, 2003).

The last bottom right cage provides instrument for the users to access others who may be able to help and where the system imposes no arrangement on the knowledge. In such case, interpersonal associates enabled by the system results in knowledge sharing and transfer. Instances of such systems include electronic discussion forums where employees may post their questions; other employees may post their replies with answers or suggestions. Threaded discussions and email distribution lists are mainstream technologies employed in this domain (Awad & Ghaziri, 2004 ; Raman, 2004; Mertins, Heisig & Vorbeck, 2003).

When user accesses data warehouse in KMS returned an extremely germane set of information as the outcomes of a query for the specific keyword and never gave any immaterial information. However, such a KMS inflicts a burden on users as salvage of relevant content frequently complicated for somebody without access to the local terminology. Intranet and Search Engine supports a free-text keyword search of the information (Awad & Ghaziri, 2004). It produces the outcome in a much larger number of information existence get back in response to the single search with numbers of irrelevant and relevant information for the given keyword. This provides negligible difficulties to access but inconvenience to the users to identify the appropriate information from the filtered content. The framework thus also highlights the implicit assumptions regarding the nature of knowledge and sources of knowledge required for problem solving that underlie different KMS (Raman, 2004; Mertins, Heisig & Vorbeck, 2003).

Likewise, in Expertise Profile and Database provides predefined systems solutions, the most important resource of knowledge from the project proposals and earlier solutions to related problems these may be reused for more efficient performance. Sustaining the reuse of such knowledge through an electronic discussion forum would probably lead to simple discussions. An information repository with an efficient indexing mechanism would be more effective for users to obtain the inputs they need without burdening other employees with requests for help (Mertins, Heisig & Vorbeck, 2003).

3. The magnitude and need of knowledge management system

Many more organizations are now engaged in KM. Many research showed that KM was taken seriously and the results of the research reported that forty five percent of the respondents had no major interest in KM, forty percent indicated only an unconscious readiness, nine percent indicated some formal leadership support for KM, and only six percent indicated they had integrated KM into their performance appraisal. Another study barely a year later indicated that fifty percent of the companies were engaged in KM, and doing so because of expected savings, other fifty percent was concerned with growth and quality of service (Hildebrand, 1999).

The importance and necessity of KM cannot be overstated. Research carried out at the National Defence University involving public and private sector participants concluded that as far as the necessity and importance of KM is concerned, not much has changed from what it was during the days of the construction of the pyramids. The necessity to develop organizations' social and structural capital, innovate, transfer knowledge across time, space and boundaries as well as satisfy customers remains in place. Conclusions can be drawn from the research that despite whether it is a new or old economy KM is essential and the underlying principle for KM is fully justified. Furthermore, due to the influence of several technologies and the globalization of world trends, KM presents a feasible substitute for firms to establish and uphold competitive advantage in turbulent economies (Neilson, 2001). A compelling cause for this the fact that unlike physical goods that are

subject to decreasing returns, knowledge appreciates and consequently yields increasing returns.

4. Implementation of knowledge management tools

In the current competitive market implementation of knowledge management tool is essential for the organizations. To achieve this victory firm has to consider the following before the execution of the KM tool.

Technological deliberations

Technology makes use of in all the processes of KM and a range of technological solutions by now obtainable in the market. Unfortunately, technology solution providers tend to add details to the benefits. In this process they erroneously present technology as the sole answer to KM (Berkman, 2001). Nowadays technology presents the least hurdles to successful KM. Technological impact is less that 35 percent of the whole KM effort (Tiwana, 2000). Given vendors' mis-presentation of technology, the dilemma is in reality of choosing a suitable technology. Effective knowledge transfer is possible, when the procedure fits the knowledge being transferred. Effective use of technology depends on how the technology hysterics the process it supports. It is best to know what has to be done before looking for a technology to support the target to KM objectives (Tiwana, 2000). Another suggestion is a technology selection map (Jarbenpaa & Beers, 1996). This map specifies the objective to locate knowledge for these knowledge bases, search and retrieval tools, and yellow pages would be considered technological enablers. If the objective is to create knowledge, then collaborative decision-making, expert decision support and data mining systems, notes databases, externalization tools, etc would be considered technological enablers. If the objective is to reuse and validate knowledge, then customer support and feedback, knowledge bases, past project records and communities of practice would be used.

Leadership deliberations

The triumph of any organization depends on leadership and the accomplishment of any leader depends on allocated responsibilities and how it carriedout. The identification of KM in organizations escort to a propagation of titles such as Chief Knowledge Officer (CKO), Knowledge Architect, Knowledge Manager, etc. all alleged with the accountability of make sure the successful of KM within the organization. Some of the CKO roles may discord with the traditional roles of the Chief Information Officer (CIO); the primary fact is that new titles/positions are being created to make the best of the organization's knowledge capital. Major distinction between the roles of the CKO and CIO, while CIOs focus much of their activity on physical computer and network assets but CKOs focus their efforts on an integrated set of activities that address organizational behaviors, processes and technologies (Neilson. R, 2001). The roles to be assigned to the CKO not limited to leadership and strategy, resources, taxonomy, education, technology, incentives and rewards, communities of practice, knowledge sharing culture, and best practices (Neilson. R, 2001).

Cultural deliberations

Cultural changes are the biggest challenges to successfully implementing the KM properly. Effectively carry out role of the CKO must understand the dynamics of the organizational culture, and how individuals relate to it. Many researchers proposed the knowledge diffusion map, in which tacit and explicit knowledge can easily be captured and shared across individual, group, inter- and intra- organizational participants (Nonaka & Takeuchi, 1995; Boynton, 1996; Newman, 1997; Leidner, 1999). Knowledge sharing from individual and organizational value perspectives where the value of the knowledge is high to the individual but low to the organization, there is a tendency for hoarding. On the other hand, if the value of the knowledge is high to both the individual and the organization, there is a tendency for selective sharing. If the value is low to both, then there is full sharing. Duty of the CKO to ensure that full, rather than selective sharing occurs when the knowledge is of high value to both the individual and organization. Unfortunately, the individual's objectives may not always align with those of the organization and vice versa (Leidner, 1999). While the CKO can achieve good results by focusing on the knowledge sharing dynamics better results will be obtained, if the CKO also

understands the knowledge creation dynamics and should understand the 4-stage knowledge creation process (Nonaka. & Takeuchi, 1995; Boynton, 1996; Newman, 1997). Creating the right culture is essential for KM success and one way to do this is through storytelling (Denning, 2000). Based on a study of successful KM efforts, identified four major classes such as Knowledge Repositories, Knowledge Access, Knowledge Environment and Managing Knowledge as an Asset (Davenport, & Prusak, 2000).

5. Knowledge management tools

Modern organizations faced with a tremendous number of opportunities to use the knowledge management system. Different organizational and technical structures are necessary to realize new possibilities through the use of information technology. Plenty of tools available to support the knowledge management system but all of them never included whole domain of the system. Most of them cover an individual domain of the aspect very few included all of the aspects in a single roof. Before selecting the knowledge management tool, organization has to think that the end user and their need. If the selection carried out in these decisive factor, knowledge management tools never fails and provide more success for the institution. The reason for the interruption of the knowledge management tools as failure to line up the knowledge management efforts with the organization's strategic objectives, establishment of repositories without addressing the necessitate to manage content, fail to realize and connect knowledge management system into individuals' day by day activities, an overemphasis on formal learning efforts as a mechanism for sharing knowledge, and concentrating the knowledge management efforts within organizational precincts. Although these are not meant to be a comprehensive list, they represent issues that can hamper the effectiveness of a knowledge management effort, costing organizations time, money, resources and perhaps, most importantly their ability to affect meaningful business results. According to the above statement the researcher provide the clear awareness to opt for knowledge management tools depend on the necessities.

KartOO products

"KartOO" is one of the famous knowledge management tool which support to the managers or the decision makers to properly take the decision according to the situation and the need. This tool helps the user/employee to post their thoughts other members and collect opinion/ idea. This can collectively produce lot of options or experiences from the other user/employee for a particular problem and can choose the most best among the lists. Advantage of this tool is to transfer of knowledge from one location to another in secure mode. Most important option of this tool includes the collaboration technology. Here every individual's valuable thoughts could be consider when the decision going to be taken for the organization's betterment. This tool supports the networking milieu. Therefore organization gain more betterment when applied in their intranet with the high speed network backbone. This helps a lot to transfer the knowledge in geographically separate locations within few seconds to the click of the relevant links and also reduce the operational cost of the organization. When the organization uses this tool, it's not necessary to have the experts in every location rather than that it can have their expertise in the location where they would like to serve and able to get their knowledge when it needs via this tool.

This tool endow with the social network analysis which helps to analysis the individual user's social activities such as the interest they have in the specific project/work, the contribution/involvement to the venture, individual and group differences in each activities of their work/project in the organization, and the relationship between the individuals and groups, which imparts the organizational achievement in every point of verdict. This type of analysis increases the reputation of the organization not only in the ventures cycle but also to the customers and medias. Another important aspect of the tool to support the economic intelligence which is supports the decision makers to gaze at their competitors and the external market of the products.

Kartoo increases the information retrieval this allows the management to make the decisions easier. It encourages the sharing and the communication level of the individuals as well the groups which improves the productivity of the organization. Management of Explicit Knowledge is good and discovers the knowledge

from this tool excellent. Expertise management, collaboration, interface, ergonomics and knowledge orderliness are great. Administration and maintenance of this tool is comparatively easy. The cost of the tool is far above the ground. It is suitable for analysis the data and provides the solutions to the company.

VisuaLinks components

"VisuaLinks" also the well-known tool in knowledge management to supports the data modeler to builds of multiple databases into single workspace. This helps the user to manage the information effectively. It supports the network miner to come across the uncovered relations between the data, able to locate the most accurate data from multiple databases in the organization by the database query concepts which helps to retrieve the data properly for the user requirements, and corrects the inconsistencies in databases. Mapping feature also existing in this tool to plots the data on geographical and provide the alerts to the users of the changes made to the respective database in the organization which confirms the authorities regarding the changes done and also forms the snapshots and data reports to the managers to takes the proper decision at the proper time regarding the issue.

This tool facilitates to find the patterns and trends in the databases and permits to connect the multiple databases. Data analysis enhanced from the help of this tool and provides the most relevant data depends on the user request for the swift decision making. It is tremendous to manage the explicit knowledge but the knowledge discovery and expertise management are moderate. Collaboration technique is trivial compare to the kartoo. Knowledge organization of this tool is reasonable and the interface design and ergonomics also in mediocre stage but the security to store and retrieved the data remarkable. It is petite complicated to handle by all the users, trained administrators can admin the tool appropriately for the yield output of the organization. Maintenance of the tool also not much easier than kartoo and the price is economical than the other tool. Visual links is mostly suitable for the data warehouse organization for their data analysis.

Table 1: Summary of comparison of both tools

Functional Criteria	KartOO	VisuaLinks
Management of Explicit Knowledge	Moderate	Good
Knowledge Discovery	Good	Moderate
Expertise Management	Good	Moderate
Collaboration	Good	Moderate
Knowledge Organization	Good	Moderate
Interface and ergonomics	Good	Moderate
Administration and maintenance	Good	Moderate
Security	Moderate	Good
Cost	High	Reasonable
Intranet Meta Search Engine	Available	Unavailable
Experts Directory	Available	Unavailable
Social Network Analysis	Available	Unavailable
Economic Intelligence	Available	Unavailable
Data Modeler	Unavailable	Available
Network Miner	Unavailable	Available
Database query	Unavailable	Available
Mapping	Available	Available
Alerts	Unavailable	Available
Reports	Available	Available

Table 1 illustrates the summary of the both tools. This quick overview helps the reader to understand the function of the tools and get the idea of how to choose the tool for the specific organizations.

6. Conclusions

Knowledge measured as a capital which has an economic value, new strategic resource for increasing efficiency, steadiness factor in wobbly and dynamic competitive environment. The strategic visions that can potentially develop the managers on their corporate knowledge and make them identify the universal objectives in order to optimize that resource. Those objectives are always structured by three key issues: capitalize, share, and create. One may notice that those objectives are, in a certain way, paradoxes and then knowledge management really challenge for the managers the most important significant change, and new visions of the organization for the global competitions. To achieve this goal firm has to consider the need of the knowledge management system, their expertise, users, technical infrastructure, and the capital for the system. The success of the knowledge management tool to satisfied the above criterion. These comparisons channels facilitate the organizations to accurately select the knowledge management tools for their requirementsand avoid the techno and economic failures.

References

Alavi, M.(1997).*KPMG Peat Marwick U.S.: One Giant Brain*, Boston, MA: Harvard Business School,.

A Thothathri Raman.(2004). *Knowledge Management a resource book*, EXCEL Books.

Berkman, E. (2001). *When Bad Things Happen to Good Ideas*, Darwin Online Magazine.

Boynton.A. (1996).*Exploring Opportunities in Knowledge ManagementHow to Get Started*, in Knowledge Management Symposium,IBM Consulting Group, Sydney.

Brown, J. S., & Duguid, P.(1991).Organizational Learning and Communities-of-Practice: Toward a Unified View of Working. *Learning, and Innovation, Organization Science*, 2 (1), 40-57.

Davenport, T., Jarbenpaa,S., & Beers,M. (1996).Improving Knowledge Work Processes.*Sloan Management Review*, Summer, 53-65.

Davenport. T.H. & Prusak,L. (2000). *Working Knowledge: How Organizations Manage What They Know* (Paperback ed.), Boston, Harvard Bus Press.

Denning S. (2000). *The Springboard: How Storytelling Ignites Action in Knowledge-Era Organizations*(Paperback ed.), Butterworth Heinemann, Boston,.

Dixon, N. (2000). *Common Knowledge: How Companies Thrive by Sharing What They Know*. Harvard Bus Press.

Elias M.Awad,& Hassan M.Ghaziri. (2004). *Knowledge Management*, Pearson Education.

Henderson, J. C., and Sussman, S. W.(1997).Creating and Exploiting Knowledge for Fast-Cycle Organizational Response: The Center for Army Lessons Learned, *Working Paper No. 96-39*, Boston, MA: Boston University.

Hildebrand, C. (1999). Making KM Pay Off.*CIO Enterprise*, 64 - 66.

Kai Mertins, Peter Heisig & Jens Vorbeck. (2003). *Knowledge Management: Concepts and Best Practices* (2 ed.).,Springer Publications.

Leidner D.E. (1999). Understanding Information Culture: Integrating Knowledge Management Systems into Organizations.*Proceeding of the Strategic Information Management: Challenges and Strategies*, Managing Information Systems, Butterworth Heinemann: Ox.

Neilson. R. (2001).,*Knowledge Management and the Role of the CKO*.NDU.

Neilson.R. (2001). *Knowledge Management: A timeless Concept?*.retrieve from http://www.ndu.edu/irmc/Publications/MilitaryEngineer.pdf.

Newman. V. (1997). Redesigning Knowledge Management to deliver competitive advantage.*Journal of Knowledge Management*.

Nonaka, I., & Takeuchi,H. (1995). *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Springer Publications,New York.

Stata.R. (1989). Organizational Learning-The Key to Management Innovation.*Sloan Management Review*, Spring, 63-74.

Sensiper.S. (1997). *AMS Knowledge Centers*, Case N9-697-068, Boston: Harvard Business School.

Tiwana, A. (2000). *The Knowledge Management Toolkit:Practical Techniques for Building a Knowledge Management System*. Prentice Hall.