

## Designing Meaningful KM Processes to Improve Organizational Learning

Vittal S. Anantatmula\*

*"NASA is searching for the original tapes of the Apollo 11 spacewalk on July 21, 1969," said Ed Campion, a spokesman for NASA's Goddard Space Flight Center in Greenbelt, Maryland, a Washington suburb.*

Source: <http://www.cosmosmagazine.com/node/561>

15 August 2006

### ABSTRACT

*There is an urgent need to develop and implement meaningful knowledge management processes for capturing tacit knowledge of individuals leaving the organizations due to attrition or otherwise. Developing, sharing, retaining, and leveraging knowledge are integral to knowledge management processes. Leveraging knowledge is manifested in learning and thus, knowledge management and organizational learning are intricately related. Knowledge management processes are often invisible and integral to more obvious and significant business processes that are employed to deliver products and services. However, the underlying knowledge management processes are critical to capture and utilizing them to improve effectiveness and efficiency of organizational performance. Using literature review findings and two independent research studies, knowledge management processes at four levels - organization process, knowledge flow process, learning flow process, and management and leadership process are presented in this paper. All these processes must be integrated and employed together.*

*Further, it is important to recognize the dynamic nature of these processes to meet changing organizational needs. The paper begins with an introduction to underline the necessity and importance of formalized KM processes in organizations. Next, review of the literature focuses on research studies dealing with knowledge management processes in order to be familiar with the current understanding of the subject. Finally, recommendations to integrate all these knowledge management processes are discussed for better organizational performance.*

**PAPER TYPE:** Conceptual Paper

**KEY WORDS:** *Knowledge Management, Organizational Learning, Tacit Knowledge, Knowledge Management Processes*

## **INTRODUCTION**

According to the Bureau of Labor Statistics, by 2010, baby boomer (those born between 1946 and 1964) population of more than 76 million will hand down their jobs to younger counterparts (Gen Xers), who are only 43 million (**Kaye & Cohen 2008**). If you consider the total number of baby boomers exiting the workforce in the next decade, the gap in numbers is staggering. Needless to say, this will affect not only the federal government agencies but private sector as well. Additionally, a wealth of knowledge will go out the door if knowledge management processes are not in place to capture their tacit knowledge.

However, such processes are not common in many organizations. A recent survey of 2,046 senior human resources and training and development executives indicated that 4% of organizations reported having a formal knowledge-transfer process

and another 23% reported having an informal process (**Laff, 2008**). Organizations will miss an important opportunity of not capturing the knowledge of outgoing and retiring employees when knowledge management processes are not in place. It is an important problem that demands immediate attention and is the focus of this study.

Bearing in mind that knowledge is a justified true belief (**Nonaka & Takeuchi 1995**), knowledge can be derived from thinking, and it is a *combination of information, experience and insight*. Deriving knowledge from information requires human judgment, and is based on context and experience. Ironically, knowledge will remain dormant, and not very useful, until it is reflected in action (**Rad & Anantatmula 2005**).

Data and information are seen as inputs to knowledge. Data is generally referred to numerical facts collected together. Therefore, data are the facts, which are organized to generate information; when used by someone to solve a problem, information in turn becomes personal knowledge (**Ellis, 2003**).

The difference between information and knowledge based on how each is obtained presents an interesting perspective; information is obtained by deduction and knowledge by induction (**Fernandes, 2000**). Agreeing with this perspective, **Berztiss (2001)** is of the view that uncertainty grows as we progress from data to information to knowledge and suggests that there is no uncertainty in data, some uncertainty in information, and more uncertainty in knowledge. Organizations must consider this aspect while developing knowledge management processes.

As a resource, knowledge increases its value with the use. Recognizing this important aspect, we define knowledge management (KM) as an important strategic initiative to utilize information technology and tools, business processes, best practices,

and culture to develop and share knowledge within an organization, and to connect those who possess knowledge with those who do not. Therefore, developing, sharing, and retaining knowledge are part of the KM repertoire. Ultimately, leveraging this knowledge for the benefit of the organization is critical for KM success. Leveraging knowledge is often manifested in learning at individual and organizational levels. Improving existing processes and implementing new processes often serve as visible evidences of organizational learning.

### **K. M. PROCESS**

Process can be defined as a group of systematic related actions directed to meet a specified result or end. Process is usually designed to improve efficiency while meeting the specified result or end. Therefore, processes can be changed and revised as and when needed to improve efficiency and effectiveness.

Organizational business processes are essentially obvious and prominent as they are the means to deliver products and services. Often, knowledge management processes are integrated with business processes to help individual and organizational learning, and provide a platform for training new people. However, the underlying knowledge management processes are not so obvious.

Akin to business processes that are expected to produce services and products, knowledge management processes are expected to create, share, and deploy knowledge within the organization and sometimes, with external partners. As such, knowledge management processes in a knowledge enterprise are meant to support knowledge creation and flow of knowledge between people, among business processes and operations, organizational units, and strategic partners external to the organization. One of the



important goals of a knowledge management process is to convert tacit knowledge into organizational explicit knowledge and make it available in the right format and context to facilitate learning at individual and organizational levels.

Organizations, in need of capturing knowledge, often resort to technology solutions, because they represent tangible and immediate solutions, without realizing that KM is a multi-dependent discipline integrating business strategy with process, organizational community and culture, learning expertise and technology (Silver, 2000). One must remember that technology plays a limited role and it is not a panacea for resolving all knowledge management issues.

#### **K. M. PROCESS: SIGNIFICANCE**

Knowledge creation and more specifically, knowledge transfer can happen only when more than one person is involved. With respect to knowledge creation, knowledge management deals with two activities:

- ✦ *Preserving and using existing knowledge, and*
- ✦ *Creating new knowledge for effective use*

Existing knowledge includes both tacit and explicit knowledge. Creating new knowledge involves a great deal of formal and informal interaction of people with the processes and among people within the organization, which underlines the importance of developing formal and informal knowledge management processes. One form of sharing knowledge is documenting the personal knowledge in some form or other; it becomes explicit knowledge, an intellectual asset that can be shared among people within the organization. Obviously, the exchange of information among organizational employees is a vital component of the knowledge management process. Technology plays an important supporting role

in making this exchange possible, specifically in virtual teams and across geographical boundaries (**Cabrera & Cabrera, 2002**).

Retention of knowledge is often possible by documenting the existing knowledge and updating it and by transforming tacit knowledge into explicit knowledge in easily retrievable and organized systems and processes by using knowledge management technology tools.

Knowledge management technology tools are thus useful in both sharing knowledge and retaining it. As a consequence, technology tools are integral to knowledge management processes.

It is obvious that knowledge management implementation is similar to implementing a new business process and a new technology. To develop it, organizations will have to design processes that foster innovative environment for knowledge workers to participate actively. Further, in order to encourage the creativity and imagination, creative approaches need to be adopted in developing them (**Li, Gao & Kameoka, 2004**).

## REVIEW OF LITERATURE

One should be cognizant of factors such as fuzziness, inconsistency, vagueness, and context dependency over and above uncertainty associated with knowledge itself (**Bertsis, 2001**) and exercise prudence in developing knowledge management processes. In addition to knowledge itself presenting challenges in designing a knowledge management process, factors integral to the organization influence the effectiveness of knowledge management process. To create a successful KM process, knowledge flow need not be tied to organization structure and should not be hierarchical. Culture of learning, collaborating, and sharing knowledge is critical. Time could be a major constraint unless individuals participating in KM realize the benefit of participation.

Organizational context factors such as climate, management style, structure, and reward system influence knowledge management processes (Hsu, 2006). For instance, information systems will help reduce the complexity in accessing the information. Likewise, data mining and knowledge mapping help organizations classify and codify knowledge. Organizational climate elements such as structure, culture, and top management support are important for effective use of knowledge.

Studies show that concepts such as systems engineering, systems perspective, and innovation can be employed to develop process models. In one of the early studies examining the importance of knowledge management process, Prece et. al (2001) recommended two knowledge engineering processes in order to improve knowledge capture and usage. First, knowledge acquisition process should capture structured knowledge systematically. Secondly, knowledge representation technologies that are far richer than conventional databases can be used to store the knowledge, preserving important relationships. Knowledge engineering process is outlined in five steps:

- *Scope of the knowledge management system using requirement analysis*
- *Conceptual model (ontology) using the scope, creating a glossary of terminology or concepts for the application domain and define interrelationships between the terms of and constraints on their usage*
- *Knowledge base construction using the conceptual model and populating the knowledge base with instances of domain knowledge often in the form of rules, facts, cases, or constraints*
- *Operationalization of the knowledge base using automated reasoning mechanisms and validation of competence against*

*the requirements or scope*

- *Refinement is necessary due to continuous evolving of system as knowledge changes*

From a systems perspective, knowledge process elements consist of input, purpose, method, chaos, output, and feedback (**Beck & Schornack 2005**). *Inputs* include status and assumptions at individual and organization levels. A sense of *purpose* defines intentions and objectives an organization desires to accomplish, both internal and external audience to which the knowledge management process is designed to address. *Method* consists of technical tools for internal communication, collaboration, knowledge management, and process redesign and human processes including philosophy, epistemology, psychology, and culture. *Outputs* include objective, and observable knowledge.

In the context of innovation of projects, **Tranfield et. al (2002)**, using empirical data, developed KM process model comprising of eight generic routines: search, capture, articulate, contextualize, apply, evaluate, support, and re-innovate.

**Bertsis (2001)** suggested that before developing knowledge management process, organizations must have a clear understanding of how knowledge will be used, and recommended requirement analysis for this purpose. Next step should focus on process efficiency to ensure that the knowledge management process adds value. Further, **Bertsis (2001)** argued that identifying requirements will lead us to design and approach to defining the knowledge management system will depend on the following:

- *What are the sources of knowledge?*
- *Who will use the knowledge and under what conditions?*
- *What are the effects of unreliability of knowledge?*

Citing reasons such as finding knowledge may be difficult and

expressing it in a form not easily understood by prospective users, **Bertsis (2001)** recommended useful case based reasoning techniques and an educational component to convince users of the benefits. Bertsis findings and approach to knowledge management processes suggest the importance of integrating them with business processes.

Evolution of innovation indicates its transition from technology push (1950s and 60s), market pull (1960s and 70s), coupling model of innovation (1970s and 80s) and integrated innovation process (1980s and early 90s) to knowledge-driven (**Huang, 2006**). Huang argues that knowledge management plays an important role in innovation. Consequently, its processes play a significant role in promoting innovation.

**Zack (1999)**, after capturing practices and the understanding of many organizations, recommended a five-step knowledge management process of acquisition, refinement, storage and retrieval, distribution, and presentation. *Acquisition* can be from either internal or external sources. Including only relevant and useful knowledge, labeling, indexing, sorting, abstracting, and standardizing the acquired knowledge are integral to the *Refinement* process. *Storage and retrieval* is an important process to bridge creation of repository. *Distributing* knowledge is a process of making the knowledge repository easily accessible. *Presentation* process is involved with developing capabilities and flexible approach to arranging, selecting, and integrating knowledge content.

Citing **Weggman's (1997)** findings, **Van Zolingen, Streumer and Stoker (2001)** suggests that knowledge management should be seen as a value chain driven by organization's vision and strategy with the value chain consisting of determining the need, identifying available knowledge, developing, applying, and evaluating

knowledge.

Knowledge management maturity model provides a comprehensive approach to develop a KM system including KM processes. **Hung and Chou (2005)** recommend three levels to the model; maturity levels, KM processes, and enabling infrastructures. Hung and Chou recommended knowledge creation, storage, sharing, and application as the important KM process elements, which are commonly found in many other studies as well (**Alavi & Leidner 2001; Gold et. al 2001, Silver 2000, Han & Zhong 2006**).

**Table 1 Knowledge Management Process**

<i>Knowledge Processes</i>	<i>Dimensions</i>
Creation	- Socialization - Externalization - Combination - Internalization
Organization	- Storage - Retrieval - Maintenance - Protection
Transfer	- Acquisition - Diffusion - Absorption
Application	- Integration - Leverage

*Source Han and Zhong, 2006*

**Table 1** represents knowledge management processes that are commonly found in the literature. As can be seen in **Table 1**, research studies have used the **Takeuchi and Nonaka (1995)** model of that uses socialization, externalization, combination, and internationalization. These processes can be integrated with business

processes to get better results. Further, integration of creation, organization, transfer, and application is essential in every knowledge management process.

Supporting the idea of capturing knowledge in a business process, **Mou, Zhang and Cao (2004)**, using their research findings suggest that context-based KM proved to be effective. Process-oriented KM strategy is the desired way to implement knowledge management as it offers several benefits (**Maier & Remus 2001**). First and foremost, knowledge that contributes to value creating activities can successfully be linked to the business process and knowledge is more targeted. Further, process-oriented knowledge strategy results in developing context-relevant knowledge for process that can be put to use routinely. Together, these two benefits would logically lead to improvements in managing knowledge. Process related knowledge improves operational efficiency.

### **INTEGRATING OUTCOMES WITH THE KM PROCESS**

The measurement is crucial to understanding of how knowledge management systems should be developed and implemented (**Jennex & Olfman, 2004**). Jennex and Olfman cite another research study (**Turban and Aronson, 2001**) to support their notion. They argue that measurement is helpful: *(1) to provide a basis for valuation; (2) to stimulate management's focus on what is important; and (3) to justify investments*. Therefore, one must keep these factors in mind while designing knowledge management processes.

Measures can also assist in evaluating the initial investment decisions and to develop benchmarks for future comparison (**Kankanhalli and Tan, 2004**). Further, the measurement of



knowledge management will be helpful to: *a) identify knowledge management content and knowledge management process; b) direct and assess all the activities in knowledge management, which are implemented by enterprises; and c) provide valuable references for further empirical studies (Han & Zhong, 2006).*

Using research study that examined the relation between knowledge management processes as defined by Nonaka, and knowledge management effectiveness, **Becerra-Fenrandez and Sabherwal (2001)** concluded that managers should try to understand the characteristics of their tasks, and then, based on task domain and orientation, identify and develop the knowledge management processes that are most appropriate.

Our research has shown that knowledge management leads to improved communication, and enhanced collaboration. Further, enhanced collaboration leverages employee skills in the context of decision-making to influence productivity and quality (**Anantatmula, 2005**). Knowledge management processes, therefore, should be designed to improve decision-making and productivity internally, and customer satisfaction externally. Further, better decision-making is closely associated with innovation and must incorporate in the design and development of knowledge management processes.

## **DESIGN OF KNOWLEDGE MANAGEMENT PROCESS**

Literature review findings presented different perspectives and processes of knowledge management. However, certain common themes emerge from the discussion in the previous section. Many research studies commented on the importance of integrating

knowledge management processes with business processes. The literature review has revealed that creation, storage, sharing, and application are common to many knowledge management process models.

It is common knowledge that business processes are outcomes of knowledge creation and processes are where knowledge is developed, stored, shared with all those who need, utilized, and created again for future use. These processes form the core of knowledge in organizations and contain majority of the organizational explicit knowledge. Consequently, process-oriented KM strategy is expected to offer several benefits.

Knowledge flow takes place at different levels and in different forms using different media. Therefore, an approach that knowledge management process can be developed at different levels with different purposes is desirable. In the following section, knowledge management processes are developed based on how knowledge is organized, how knowledge flows, how it is managed, and finally, how learning takes place.

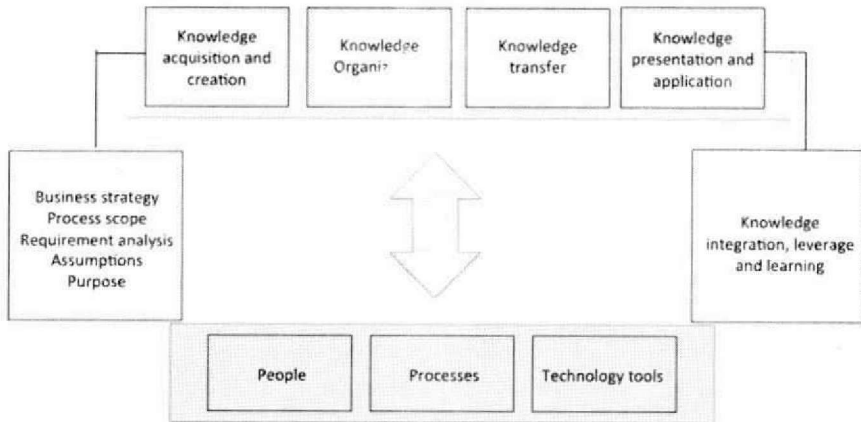
#### ➤ ***Knowledge Management Process Organization Level***

Integrating the literature review findings, knowledge management process is developed based on how knowledge is organized and managed in organizations (**Figure 1**).

As shown in the **figure 1**, knowledge management process has four sub-processes namely, 1) *knowledge acquisition and creation*, 2) *knowledge organization*, 3) *knowledge storage, retrieval and transfer*, and 4) *knowledge presentation and application*. The first sub-process of knowledge acquisition focuses on acquiring existing

knowledge within the organization and creating new knowledge.

**Figure 1 KM Process Organization Model**



Creation of knowledge follows the tacit-explicit-tacit knowledge process outlined by **Nonaka and Takeuchi (1995)**. The second sub-process of knowledge organization consists of codification of relevant and useful knowledge, labeling, indexing, sorting, abstracting, and standardizing the acquired knowledge storage for easy retrieval and use. The key aspect of third sub-process knowledge transfer is to make knowledge available and accessible to everyone in the organization in the right context, right format, and right content for use. The fourth sub-process of knowledge presentation and application deals with arranging the knowledge content in the desired format for easy integration and application. People, processes, and technology tools influence and in turn, are influenced by all the four sub-processes.

While developing this process at organization level, knowledge engineering processes recommended by **Preece et. al**

(2001) can be used, which are outlined as follows:

- *Define scope of KM using requirement analysis*
- *Create a glossary of terminology or concepts*
- *Populate the knowledge base in the form of rules, facts, cases, or constraints*
- *Operationalize using automated reasoning mechanisms*
- *Refine as and when necessary*

Likewise, while identifying the requirements, it is preferable to follow the approach suggested by **Bertzsis (2001)**:

- *What are the sources of knowledge?*
- *Who will use the knowledge and under what conditions?*
- *What are the effects of unreliability of knowledge?*

As can be seen in the **figure 1**, business strategy and the scope of the knowledge management process determine set boundaries for all the four sub-processes. Business or organization strategy should influence the purpose of the process. Requirement analysis is an outcome of the knowledge needs and is bound by the process scope. Ultimately, the knowledge management process outlined in the figure should facilitate leveraging the knowledge to improve decision-making and productivity internally, and customer satisfaction externally.

➤ ***Knowledge Management Process Knowledge flow Level***

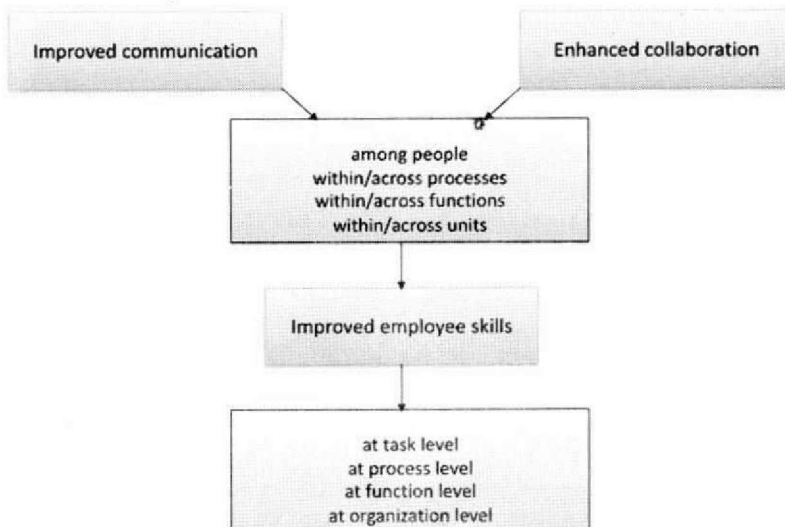
Using internal success factors of knowledge management as outlined by **Silver (2000)**, one can define the functional success of knowledge management process shown in the **figure 1** when:

- *Everyone in the organization knows where to find the*

### Knowledge

- *Individuals can use the knowledge in the right context*
- *All knowledge is available, accessible, and anytime independent of user's location*
- *All knowledge is relevant, current, and directed*

However, is it adequate to make right knowledge available, accessible in the desired format, content, and context? Such knowledge management processes and the resultant knowledge must translate to knowledge management outcomes such as improved communication, and enhanced collaboration; together they lead to improving employee skills thereby leading to higher productivity and better decision making (**Anantatmula 2005**). **Figure 2** illustrates the knowledge flow among people when desired outcomes of improved communication, enhanced collaboration, and improved employee skills are accomplished.



Source Anantatmula 2005

Research findings have shown that knowledge management, when implemented effectively, would lead to improved communication, and enhanced collaboration among the employees. This communication and collaboration should take place at various levels to improve employee skills (Anantatmula 2005).

Information exchange, one of the goals of KM process, promotes collective knowledge, an important competitive advantage. For this to happen, organizations make people aware of the impact that their engagement in information exchanges can have on the performance of others. Another intervention is to foster cooperation by enhancing employees' sense of group identity and personal responsibility (Cabrera & Cabrera 2002).

Figure 2 proposes information exchange among people within and across business processes, within and across functional departments and divisions to facilitate knowledge sharing and learning from each other. Further, this process will facilitate measurement of knowledge sharing among people, within and across processes, within and across functions and divisional units and improved employee skills at task, process, function, and organization levels.

To implement both the knowledge management processes (Figures 1 and 2) successfully, it is necessary to deploy right technology tools. The importance of technology in sharing and retaining knowledge was discussed earlier. From the perspective technology tools, knowledge management systems are broadly categorized into the following (Maier & Remus 2001):

- *Knowledge management repositories (database management systems)*
- *Knowledge discovery and mapping (text mining techniques)*

- *Knowledge transfer (electronic yellow pages)*
- *Meta search systems*
- *Collaboration (expert modeling and decision making)*
- *Visualization and navigation systems (between knowledge elements and holders of knowledge)*

Business entities can adopt some or all of these technology tools depending on the scope of the process as defined in the organization model (**Figure 1**). Organizations must recognize that availability of technology and tools alone will not produce desired results. Rather, they should be used in the context of knowledge management processes that are tailor-made to fulfill the needs of the organization. Often, organizations build knowledge management processes around technology tools that are in place but the right approach should be to define the knowledge management processes first as suggested in the process model outlined in **figure 1**.

Ultimately, leveraging knowledge becomes a reality when the new knowledge is translated into action. For instance, an improved employee skill is considered an important outcome of KM as shown in **figure 2**. In reality, improved employee skills is an outcome of employee learning, which underlines the intricate relation between knowledge management outcomes and learning at individual and organizational levels. Our next knowledge management process will focus on this issue.

#### ➤ ***Knowledge Management Process Learning Level***

The underlying concept of knowledge creation and leverage is learning. A well-defined knowledge management process, which focuses on learning is necessary for acquiring existing knowledge and creating new knowledge and promote learning at individual and organizational levels.

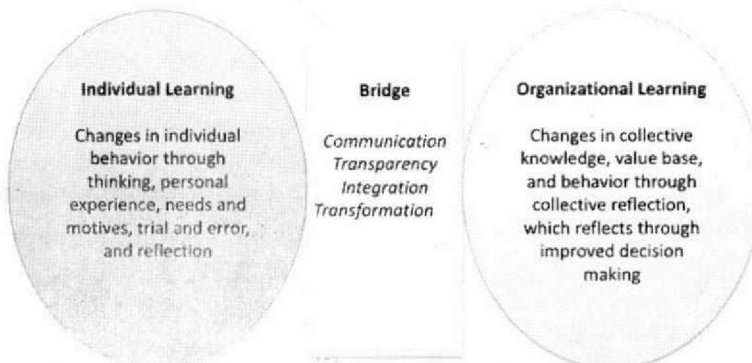
Individual learning leads to organizational learning and is



characterized by thinking, personal experience, needs and motives, interests and values, level of difficulty of the task at hand, and manifestation of behavioral changes (**Figure 3**). Conversely, collective thinking and creation of shared frame of reference characterize organizational learning and it is defined as a process by which the organization's knowledge and value-base is changed, thus leading to improved problem-solving, which in turn leads to increased capacity for action (**Probst & Buchel, 1997**).

Individual learning is largely associated with tacit knowledge whereas organizational learning is reflected as explicit knowledge. Employees tend to develop optimum processes while performing tasks within the rules of the organization. Subsequently, organizations gain knowledge by documenting these processes, and by using these documents as reference material for sharing it within the organization. Through replicating these processes, organizations acquire additional knowledge, which becomes independent of individuals who developed the original processes. This cycle of learning continues to promote learning at individual and organizational levels.

**Figure 3 K.M Process Learning model**



*Source Probst & Buchel 1997*

It is of critical importance that organizations promote effective communication, openness, and transparency to integrate learning associated with individuals with the explicit knowledge of the organization. Openness and transparency in communication would result in establishing trust and non-threatening work environment for sharing knowledge. Trust and non-threatening work environment encourages people to willingly collaborate with each other using both the formal and informal structures.

Value of collaborative work and informal network in organization is well recognized. Various empirical studies in the last four decades have demonstrated that social ties are of crucial importance, not only for the generation of ideas, but also for a large number of knowledge-related activities (**Fliaster & Spiess 2008**). Specifically, social ties in organizations can help to identify or reformulate problems, validate ideas and a course of action, offer critical perspective, discover opportunities, and allow problems to be better divided up through the division of labor (**Fliaster & Spiess 2008**). The learning model shown in the **figure 3** must be employed with due recognition to and integration of social and informal networks within the organization.

➤ ***Knowledge Management Process Leadership and Management Levels***

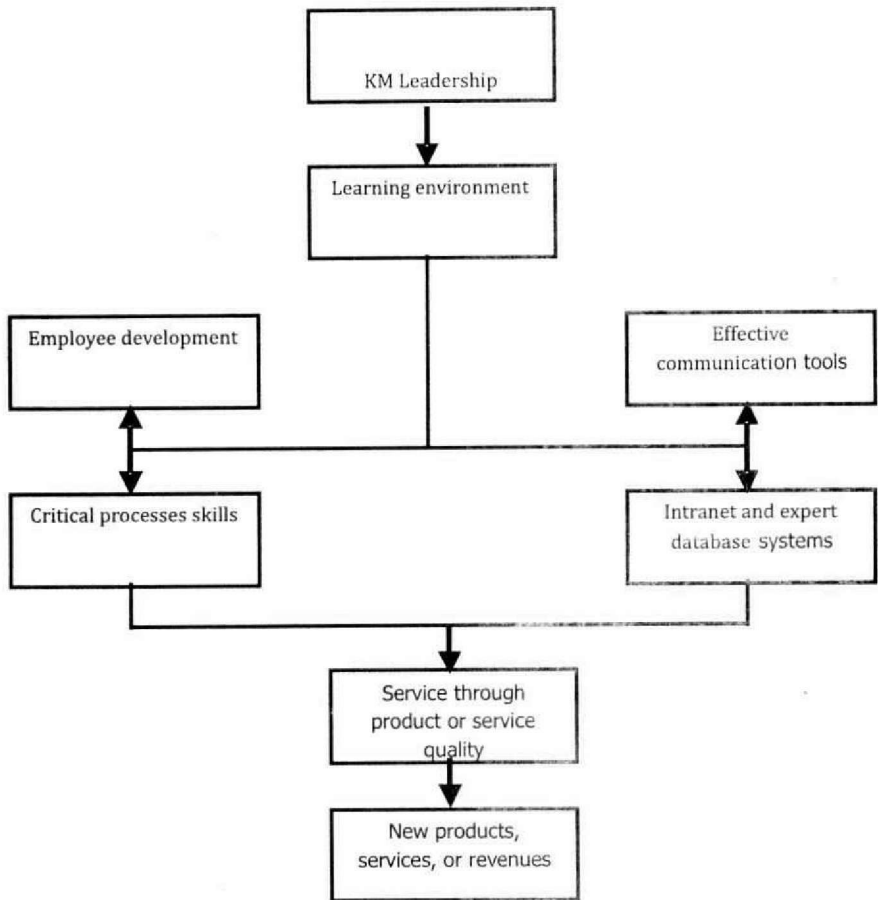
In the previous section, the importance of gaining trust of employees to facilitate knowledge transfer between individuals and the organization was discussed. Creating conducive work climate of openness, transparency, and establishing trust are some of the responsibilities of the KM leadership (**Figure 4**).

Leadership is responsible for creating a learning environment that is conducive for employee development and effective communication. Employee development in terms of improving their skills in business processes is considered an important outcome of knowledge management.

Effective knowledge management processes are in place for a good learning environment thereby encouraging continuous transformation of individual knowledge to organizational knowledge and vice versa. Further, to promote individual learning, an employee's performance should be linked to business goals. Finally, a learning environment should challenge employees to perform better due to tougher standards set by the management. Needless to say, top management support is required to establish learning environment and knowledge sharing culture. It is important to recognize that *people are motivated by challenges and opportunities to further their career goals.*

Once employees know you have their best interests in mind, they can be a wealth of creativity, talent, and motivation (Kaye & Cohen 2008). *As such, people are always interested in accomplishing personal and professional goals and managers must understand the personal aspirations of employees and link them to organizational goals. Leadership plays an important role in motivating and guiding people to grow as professionals and accomplishing organizational goals at the same time.*

**Figure 4 K.M Process Leadership and Management Model**



Source Anantatmula, 2007

The underlying concepts for improving critical process skills are collaboration and sharing best practices among all the employees. **Nonaka and Takeuchi's (1995)** notions of internalization and externalization underline the importance of both collaboration and sharing practices. Internalization processes help convert explicit knowledge into tacit knowledge. Externalization processes involve the expression of tacit knowledge and its translation into comprehensible forms that others can understand. Effective collaboration symbolizes internalization. From time to time such collaborations result in commonly accepted practices. Such practices exemplify the formation of tacit knowledge. Sharing of preferred practices is an example of externalization. The recipient of such knowledge has to understand how and which of the preferred practices can add value in their context. Therefore, a preferred practice, which is often explicit knowledge in the domain it emanated from, often becomes tacit knowledge when someone attempts to use it in his or her context.

Knowledge management leadership is responsible for creating a good learning environment that promotes employee development and deploys right technology tools to improve communication with an aim to align individual goals with the organizational goals of quality services and products.

## CONCLUSION

Knowledge management results in gaining new knowledge. As a consequence, it is often associated with change, which habitually faces resistance. This resistance is manifested in reluctance to modify actions at individual level, and adjusting working culture at the

organization level. From this perspective, leadership assumes importance and is a determinant of success as it provides vision and ability to cope with change.

The challenge faced by knowledge management professionals is how to leverage knowledge. From a management perspective, it is important to utilize knowledge management processes to improve communication and collaboration for enhancing employee skills with a focus on improving productivity. From a leadership perspective, it is critical to make knowledge management investments that are aimed to bring changes in work culture such as innovation, transparency, and openness both at individual and organizational levels in order to meet customer needs. One aim to confront and resolve these challenges is by suggesting the defined knowledge management processes that meet both internal and external goals. These processes work together at different levels and no single process is adequate to meet the challenges organizations face today. Further, these processes imply that it is critical to keep them dynamic and responsive to changing needs of knowledge in the organization.

## REFERENCES

- Alavi, M., & Leidner, D.E. (2001). Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly*, 25(1), 107-136.
- Anantamula, V. (2005, April-June). Outcomes of Knowledge Management Initiatives. *International Journal of Knowledge Management*, 1(2), 50-67.
- Anantamula, V., & Kanungo, S. (2006). Structuring the Underlying Relations among the Knowledge Management Outcomes. *Journal*

- of Knowledge Management*, 10(4), 25-42.
- Anantatmula, V. (2007). Linking KM Effectiveness Attributes to Organizational Performance. *The VINE: Journal of Information and Knowledge Management Systems*, 37(2), 133-149.
- Becerra-Fernandez, I., & Sabherwal, R. (2001). Organizational Knowledge Management: A Contingency perspective. *Journal of Management Information Systems*, 18(1), 23-55.
- Beck, C.E., & Schornack, G. (2005). A System Model for Knowledge Management: A Rhetorical Heuristic Process. *HICSS38, IEEE Computer Society*, 0-7695-2268-8/05, 1-10.
- Bertzsis, A.T. (2001). Dimensions of the Knowledge Management Process. *IEEE Computer Society*, 1529-4188/01, 432-441.
- Cabrera, A., & Cabrera, E. F. (2002). Knowledge-sharing Dilemmas. *Organization Studies*, 23(5), 687-710.
- Ellis, K. (2003, November). K-span: Building a bridge between learning and knowledge management. *Training*, 40(10), 46.
- Fernandes, A. A. (2000). Combining inductive and deductive inference in knowledge management tasks. In Eleventh International Workshop on Database and Expert Systems Applications, pp. 1109-1114, *IEEE Computer Society Press*, 2000.
- Fliaster, A., & Spiess, J. (2008, January). Knowledge Mobilization through Social Ties: The Cost-Benefit Analysis. *Schmalenbach Business Review*, V. 60, pp. 99-117.
- Gold, A.H., Malhotra, A., & Segars, A. H. (2001). Knowledge Management: An Organizational Capabilities Perspective. *Journal of Management Information Systems*, 18(1), 185-214.
- Han, W., & Zhong, Q. (2006). Development of an Instrument to Measure Knowledge Management Processes, *International Conference on Management Science and Engineering, ICMSE '06*. 1262-1268.
- Hsu, L. (2006, Summer). The impact of industrial characteristics and organizational climate on KMS and BIP Taiwan Bioscience



- industry. *Journal of Computer Information Systems*, 2006, 8-17.
- Huang, W. (2006). Acquiring Innovative Knowledge via Effective Process Management. 2006 IEEE International Conference on Management of Innovation and Technology. *IEEE Computer Society*, 1-4244-0148-8/06, 384-388.
- Hung, Y. & Chou, S.T. (2005). On Constructing a Knowledge Management Pyramid Model. *IEEE Computer Society*, 0-7803-9093-8/05, 1-6.
- Jennex, M.E., & Olfman, L. (2004). Accessing knowledge management success/effectiveness models. *Proceedings of the 37th Hawaii International Conference on System Sciences*, HICSS37, IEEE Computer Society.
- Kankanhalli, A., & Tan, B.C.Y. (2004). A review of metrics for knowledge management systems and knowledge management initiatives. *Proceedings of the 37th Hawaii International Conference on System Sciences*, HICSS37, IEEE Computer Society.
- Kay, B., & Cohen, J. (2008, April). Safeguarding the Intellectual Capital of Baby Boomers. *Training and Development*, pp. 30-33.
- Laff, M. (2008, January). Knowledge Walks Out the Door. *Training and Development*, V. 20.
- Li, M., Cioabă, F., & Kameoka, A. (2004). Enhancing Creativity and Imagination in Process Management- Combinative Use of Systems Methods and Knowledge Management Tools. *International Engineering Management Conference 2004*, *IEEE Computer Society*, 0-7803-8519-5/04, 505-509.
- Maier, R., & Remus, U. (2001). Towards a Framework for Knowledge Management Strategies: Process Orientation as a Strategic Starting Point. *HICSS34*, *IEEE Computer Society*, 0-7695-0981-9/01, 1-10.
- Mou, Y., Zhang, S., & Cao, J. (2004). Providing Knowledge Support In Business Process: A Context Based Approach. 2004 IEEE International Conference on Systems, Man, and Cybernetics. *IEEE*

- Computer Society*, 0-7803-8566-7/04, 2143-2149.
- Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company*. New York: Oxford University Press.
- Preece, A., Flet, A., Sleeman, D., Curry, D., Meany, N., & Perry, P. (2001). Better Knowledge Management through Knowledge Engineering. *IEEE Intelligent Systems*, 1094-7167/01, January-February, 36-43.
- Probst, G., & Buchel, B. (1997). *Organization Learning*. London, UK: Prentice Hall.
- Rad, P.F., & Anantatmula, V. (2005). *Project Planning Techniques*. Vienna, VA: Management Concepts.
- Silver, C. (2000, November/December). Where Technology and Knowledge Meet. *Journal of Business Strategy*, pp. 28-33.
- Tranfield, D., Young, M., Parrington, D., Bessant, J. & Sapsed, J. (2003). Knowledge Management Routines for Innovation Projects: Developing a Hierarchical Process Model. *International Journal of Innovation Management*, 7(1), 27-49.
- Turban, E. and Aronson, J.E. (2001). *Decision Support Systems and Intelligent Systems (6<sup>th</sup> ed.)* Prentice-Hall: Englewood Cliffs, NJ.
- van Zolingen S.J., Streumer, J.N., & Stoker, M. (2001). Problems in knowledge management: a case study in a knowledge-intensive Company. *International Journal of Training and Development*, 5(3), 168-184.
- Zack, M. H. (1999, Summer). Managing Codified Knowledge. *Sloan Management Review*, 1999.