

## **Role of Knowledge Management to Bring Innovation: An Integrated Approach**

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### **Abstract**

**Purpose:** The basic objective of the study is to reconcile the literature on knowledge management and innovation in organizations. The study seeks to examine and elaborate the linkage between knowledge management process and innovation process to dig out the important relationships and flows of activities.

**Design/Methodology/Approach:** The study is induced using qualitative methodology. The relationships postulated and the propositions made are based on the reconciliation of secondary data on the study variables. Theoretical relationships are enriched by the conclusions drawn from keen literature review.

**Findings:** By studying several empirical and conceptual studies, we find that different components of Knowledge Management as Knowledge activities, Knowledge

types, transformation of knowledge and technology have a significant positive effect in bringing innovation through transformation of knowledge into knowledge assets in organizations.

**Originality / Value:** This article enlightens the ways through which innovation can be brought in organizations. The innovative aspect of this study is that all knowledge management activities are incorporated simultaneously to examine their impact on innovation. Moreover this article will be important for decision makers, researchers and practitioners.

**Keywords:** Knowledge Management, Knowledge assets, Innovation

**Paper type:** Theoretical/Conceptual

## **1. Introduction**

Importance of knowledge can be seen every where whether that is a society or a corporate world. Because knowledge enlightens the human mind, shape up the behaviors, mold the attitude of the humans. So to make society a more civilized every one agrees that, to gain the knowledge is the foremost activity or obligation, that is to performed or fulfill whilst its importance also recognized for corporate world as well.

Prusak and Davenport (1998) defined knowledge is derived outcome of framed experiences, values, contextual information, and experts insight that provide a framework for evaluating and incorporating new experiences and information.

### **1.1. Knowledge Management**

KM is an organizational process that aims to create centralize knowledge source within the organization that acquire, assimilate, distribute, integrate, share, retrieve and reuse the internal and external, explicit and tacit to bring innovation in the organization in the form of the product, people and organizational process. First Polyani (1962) identified the duality of the knowledge. He divided knowledge into two types.

- 1) Tacit knowledge
- 2) Explicit knowledge

#### **1.1.1. Tacit Knowledge**

Polyani (1962) defined tacit knowledge as the abilities, expertise and conceptual thinking. Further, he argued that tacit knowledge is not only attributed to the, what is know but it is also attributed to the knower as well. Because sometimes knower's knowledge level is soaring but he could not explain in efficient way or sometimes knower does not have adequate sources to disseminate his knowledge to the person who actually needs this. Tacit knowledge is very difficult to acquire because it is embedded in the form of capabilities, skills and ideas which individuals carry in their minds. Tacit knowledge can only be seen through the application that is why tacit knowledge is difficult to capture, exploit and diffuse among the organizational members.

#### **1.1.2. Explicit Knowledge**

Polyani (1962) said that explicit knowledge can be disseminated and shared in the form of hard data, well defined procedures, and standardized principles. Nonaka, takeuchi (1995) defined explicit knowledge as "Knowledge of Rationality". Explicit knowledge is easy to capture, manage, share and disseminate to the people.

## **1.2. Innovation**

There are several definitions of innovation. Herkma (2003) stated that foremost and basic purpose of innovation is to produce new knowledge which can develop and find out the doable solutions for society. Innovation is a practice and process which capture, acquire, manage and diffuse knowledge with aim to create new knowledge which will support to produce and deliver distinctive and idiosyncratic kind of products and services. (Gloat and Terziovski, 2004).

Plessis (2007) delineated innovation as a formation of new knowledge which helps the new business returns, which has purpose to make organization internal business process and structure more sophisticated that produce the market acceptable products and services.

We can define Innovation as “Activities and processes of creation and implementation of new knowledge in order to produce distinctive products, services and processes to meet the customers needs and preferences in different ways as well as to make process, structure and technology more sophisticated that can bring prosperity among individuals, groups and into the entire society.

## **1.3. Importance of Innovation**

The basic objective of innovation is to create value for the business. In today’s competitive era innovation is a soul to the business because through innovation organizations produce unique products and services. Innovation is also important because of the rapid change in taste and preferences of the customer of emerging and developed markets. That is why according to a research 75 percent CEO’s of fastest growing organizations claim that their strongest weapon to compete in market is their innovative products and processes. The organizations which are not much capable to produce innovative products and services will be wiped out from the industry by the competitors because innovation works as a fuel for the organization to grow in any type of environment.

## **1.4. Scope of Innovation**

Innovation might be radical or incremental. A radical innovation is a product, service and process with entirely unique or significant improvements in existing features which improve the cost and performance (Leifer et.al 2007). Radical innovation is highly risky for the business because radical innovated products are more difficult to commercialize. But on the other hand, radical innovation in product, service or process is crucial for the business because it involves the development and application of new technology. Important aspect of radical innovation is that to what extent new technology is more sophisticated and advance as compared to current technology (Govindarajan and Kopal:2004, Christenson and Overdorf:2000).

Leifer et.al. (2007) presented the idea of different hubs to bring radical innovation. Among those hubs, one important hub is of idea generators. Idea generators are responsible for generating distinctive ideas and there are people who exploit these distinctive ideas, idea hunters, who actually exploit and execute these ideas. Idea gatherers basically are receivers of the ideas. They have skills, expertise, judgment and motivation to respond these unique ideas. The combination of generators, hunters, and gatherers play important role to bring radical innovation in large organization. There are two causes that firms strive to bring radical innovation. First, these radical innovations create barriers for the potential competitors and ruin the market share of existing industry players (Christenson, 1997, Christenson and Bower, 1996). Second, competitors are much capable to develop or produce radical innovated products (Christenson, 1997, Christenson and Bower, 1996, Christenson and Overdorf, 2000, Leifer et. al., 2000, Gopalkrishnan et. al., 2006).

Plessis (2007) explained that incremental innovation is basically a modification in a product which also called line extension or market pull innovation. Incremental innovation does not need to significantly diversify from current business. That is why this type of innovation enhances the skills and competencies of the organizational employees. Incremental innovation is decisive for the

organization because it helps the organization to increase their market share to be remaining in industry for a long time (Banbury and Mitchell, 1995).

### **1.5. Relationship between KM and Innovation**

Messa and Testa (2004) stated that organizations must develop the receptors that gain or absorb the external knowledge and this activity is strongly correlated to the innovation capability. Further, they said that through the benchmarking, organizations can acquire explicit and tacit knowledge from external sources. These external sources of knowledge can be integrated with the organizational internal explicit and tacit knowledge and if knowledge gap prevails that can be filled through the new knowledge acquisition which will be helpful to bring innovation. Ju et.al., (2006) argued that in order to get competitive advantage organizations should continuously learn from outside sources. Through the proper knowledge distribution and sharing, organizations can bring the innovation. So, organizations must develop such channels within the organizations through which employees share their knowledge with one another. Plessis (2007) stated that innovation depends upon knowledge. So, to bring innovation, organizations must identify knowledge capability, and richness.

Parlby and Taylor (2000) asserted that the foremost purpose of knowledge management is to bring innovation. Plessis (2007) stated that organizations can develop the collaborations across the organizational boundaries to bring the innovation and to get the sustainable competitive advantage. This collaboration helps the organization to approach the new knowledge that can be helpful to fill the knowledge gap within the organization. This collaboration ultimately brings the innovation into the organization and this collaboration can reduce the risk and cost to bring innovation.

Organizations that rapidly capture and implement new knowledge across the organization can be able to foster innovation as compared to those organizations that don't focus on this aspect (Cavusgil et.al. 2003). Furthermore, they argued that first and most important aspect of the innovation is to, increase the innovation capability to identify and capture the tacit knowledge of the organization. Tacit knowledge can be acquired from outside the organization like customers, suppliers and bankers etc. This acquisition of tacit knowledge plays significant role to foster the process of innovation. Tacit knowledge becomes more important in those particular industries where explicit knowledge is scarce. Through knowledge management, organization can identify their tacit knowledge which they usually do not know before. Knowledge management also helps the organization to articulate tacit knowledge in the form of explicit knowledge and this is a strong base to bring innovation (Plessis: 2007). Knowledge management integrates different types of tacit and explicit knowledge. Through integration, organizations can discover what type of tacit and explicit knowledge subsists in the organization. Furthermore, knowledge activities like knowledge gathering, managing, sharing, learning, reuse and retrieval play important role in bringing innovation. Through knowledge management activities, organizations find out the distance of knowledge from inside and outside the organizations. Organizations manage this knowledge in the form of data base, so that, they can ensure the availability of right type knowledge to the right person at the right time.

**Figure 1.1:**

Different Models of Knowledge Management and Innovation Harnessing Knowledge for Innovation (Goh; 2005) A Contingency Model for Knowledge Management Capability and Innovation (Ju, Li and Lee;2006) Research Innovation and Knowledge Management (Diem Ho;2007) Macro Process of Knowledge Management for Continuous Innovation (Xu, et.al; 2009)
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### **1.6. Significance of the Study**

Today, the business world is becoming more and more competitive and demand for innovative products is mammoth. Knowledge places an integral role to be productive and innovative in market

place. But, unfortunately, organizations don't recognize and take advantage of expertise and skills of the people in the form of knowledge which they possess. Organizations should identify the skills, expertise, creativity and motivation of the people. Knowledge management focuses on this neglected area because in this competitive era organizations compete not only on the basis of efficiency and effectiveness but its success also depends upon how particular organizations identify, gather, manage, integrate, share and disseminate relevant knowledge to their human capital to bring innovation.

### **1.7. Major Objectives of the Study**

The focus of the study is to find out the role of different factors of knowledge management to bring innovation.

Sub objectives include:

- To find out the impact of knowledge management activities to enhance the knowledge assets of the organizations.
- To explore the factors underlying the success of knowledge transformation.
- To investigate the role of knowledge transformation process to bring innovation.
- To find out the determinants of innovation those affect the knowledge transformation process.

## **2. Literature Review**

Shankar et.al, (2003) explored that knowledge management creates long term competitive advantage. JU, Li and Lee (2006) developed a strategic contingency model to identify interrelationships among knowledge characteristics, knowledge management strategy, knowledge integration, organizational learning, knowledge management capability and innovation. They explored that knowledge characteristics with higher modularity and explosiveness could enhance organizational learning and knowledge integration. Furthermore, they found that levels of organizational learning, knowledge integration and knowledge management capability have significant impact on firm's innovation.

Drucker (1994) stated that in knowledge economies, knowledge is the primary factor of economic development and conventional factors of production like land, labor and capital have not abolished but these factors have become secondary. In contingent era, the organizations that utilize their knowledge in efficient way will be the industry winners through offering the most innovative products. Neilson (2006) integrated the knowledge management with dynamic capabilities approach by demonstrating that dynamic capabilities could be seen as composed of concrete and well known knowledge management activities.

Majchrzak, Cooper and Neece (2004) developed an approach to reuse the knowledge for innovation by making better understanding of knowledge reuse process when innovation is expected. They pointed out the problems and approach, including decide to search for other's ideas to reuse, search and evaluate other's ideas to reuse and developed ideas to find out the performance gap which could fill by the using other's knowledge.

Goh (2005) developed an integrated management framework to harness knowledge for innovation. He explained why innovation management not be viewed as mutually independent from knowledge management. Also, he explained the role of knowledge creation and the value of knowledge capital in support of the knowledge to bring innovation. He said that, to bring innovation organizations should support knowledge centered principles in order to make efficient role of knowledge creation for innovation.

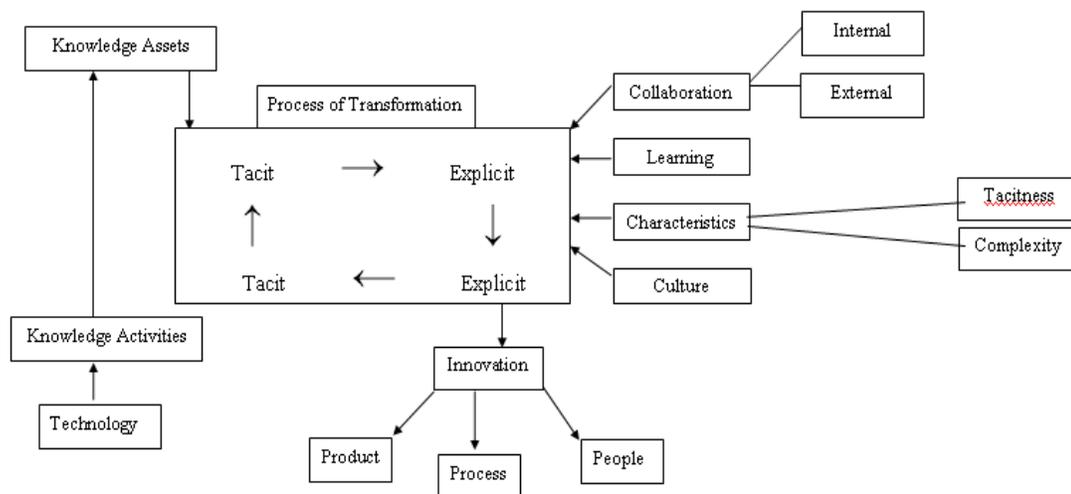
Leifer, O'Connor and Rice (2001) searched out the role and importance of different hubs to bring radical innovation in mature firms. They proposed different ways to manage radical innovation projects. Malhotra (2005) incorporated knowledge management technologies in business processes of organizations. He provided pragmatic understanding about how to integrate knowledge management strategy, technologies and business processes to get better performances. Rrambaru, Saenz and Rivera

(2006) investigated how to accelerate the process of innovation through knowledge creation. They measured the explicit emphasis given by different manufacturing organizations to bring innovation. They also analyzed the extent to which management adoption of middle-up-down model to harness the effective knowledge creation process. They also explained the importance of knowledge vision and articulation of the vision by means of concepts and images. Plesis (2007) examined the role of knowledge management to bring innovation. She found the factors that are important for knowledge management system for bringing innovation. She also tailored the value proposition by using personal experiences and literature available on knowledge management and innovation. She found that world's economic growth has been changed due to rapid innovation and new technological shift, short product life cycle and increasing rate of new product development.

Massa and Testa (2004) explained the relationship between benchmarking and innovation through knowledge management. They found that organizations can get the explicit and tacit knowledge from outside the organization through benchmarking. To bring innovation, organizations have to integrate the explicit and tacit knowledge which is captured and acquired from inside and outside the organization.

### 3. Conceptual Framework and Model Explanation

Figure 1.1:



The basic aim of this research is to explore integrated approach about knowledge management and other factors which play important role to bring innovation in any industry which was lacking before. There are several components involved in this model like KM activities, Knowledge transformation, technology and culture and more importantly organizational knowledge assets which comprises of two things 1) Human capital 2) Data Warehouses. All organizations have both type of knowledge Tacit and Explicit. Explicit knowledge is easy to disseminate and share to the people whereas tacit knowledge is very difficult to share, integrate and disseminate to the people (Haldin, Herigard, 2000). The one tool to increase knowledge and enhance the innovation process is open communication within the organization because, open communication and flexible structures urge people to create new ideas and share their tacit knowledge.

#### 3.1. ICT Factors

As far as relationship of IT and KM is concerned, there are two schools of thought about it. MecDermott, O'Dell (2001) and Habbard, Carilo (1998) stated that KM could be successful without

IT. It can be used when it is necessary. On the other hand, Duffy (2000) and Lang (2001) argued that IT has become much more important because of globalization. It is true that technology alone can not play any role to capture, manage and exploit the knowledge which exists inside and outside the organizations. Rather, it is combination of technology and human capital that leverage the KM activities (Mecdermott: 1999). Today, IT supports the most important tasks of KM. ICT identifies and gathers the knowledge through different tools like web portals, internet and intranet etc. Not only this, knowledge gathering modernize IT tools but also help organization to diffuse the explicit and tacit knowledge.

ICT plays important role in organizational communication. Baker et.al., (1997) explored that technology is a tool to support the communication. There must be a proper communication structure through which people can share the knowledge and ideas. One of the major sources to gain the new knowledge is internet (Terrett, 1998).

Mohammad, Stonkosky and Murray (2000) stated that the real face up to for IT experts to revolutionize the objectives to select, develop and implement the better technology that could serve the KM in efficient and effective way.

### **3.2. Knowledge Management Activities:**

Neilson (2006) made the connection between different knowledge management activities like knowledge creation, acquisition, capturing, assembling, sharing, integration, leverage and exploitation. He further divided these eight KM activities into three dynamic capabilities like knowledge development, knowledge (re)combination and knowledge use. These eight KM Activities contain all important activities that start from the acquiring the new knowledge and end to the exploitation of new knowledge. Through these activities, organizations find out the new knowledge within the organizations as well as from outside the organization that enhances the knowledge capability of the organizations. These knowledge management activities enrich the organizational knowledge assets. This consistent acquisition of new knowledge makes more sophisticated organization process and routines. And, by the application and use of this new knowledge, innovation can be brought into the organization.

### **3.3. Knowledge Assets**

Organizational knowledge assets are the soul of innovation as knowledge assets increase the knowledge capability of the organization and knowledge capability leads to innovation. Knowledge assets include two factors: Human Capital and Knowledge Repositories.

#### **3.3.1. Human Capital**

Most important factor of the organizational knowledge is human capital. Knowledge and competencies of the workers have become the vital component of developed economies. (Drucker; 1993). Human capital is the most sustainable, inimitable source of competitive advantage. Human capital consists of competencies, skills, knowledge and information possessing by the workers of the organization. (Namasiviyam, Denizci; 2006). Megregor et.al., (2006) defined human capital as the size and quality of broader labor markets, but also as the sum of individual competencies in organizations. Human capital creates the ideas that are the strongest base of innovation. Role of human capital is not only limited to the idea generation rather its role is also important during distinctive idea execution to deliver the innovative products and services to the customers. Megretta (1999) avowed that customer value creation depends upon idea and information. Organizations must know the type and level of the organizational human capital. In highly dynamic and competitive environment, collective knowledge and expertise of employees must be utilized in effective and efficient way so that they could create optimum economic benefits. It is not only important to discover competent human capital in the organization but organization must create the environment to utilize the competent human capital. If

organizations have such type of supportive culture and environment, such type of human capital will produce more economic value (Gold & Campbell; 2002).

### **3.3.2. Knowledge Repositories**

Organizational knowledge repositories consist of large databases, data warehouses, internet, intranet etc. Knowledge repositories having complete database of skills, expertise and knowledge of organizational employees due to knowledge repositories it becomes easy to access information and knowledge of the organization. Through knowledge repositories, we can accomplish important task which is managing the explicit knowledge of the organization. This explicit knowledge can be diffused to the person or area where it needed.

## **3.4. Knowledge Transformation Success and Innovation**

In this paper we explore and discuss several factors that contribute in bringing innovation but these factors can not bring innovation itself rather organizations have to make the knowledge transformation/conversion process successful so that these factors may become effectively bring innovation. Cumming and Teng (2003) identified several factors that play important role to transfer knowledge among individuals, groups and in entire organizations. They divided these key factors that make knowledge transfer successful into four broad contextual domains like knowledge context, relational context, recipient context and activity context.

### **3.4.1. Knowledge Embeddedness**

Knowledge use to be entrenched in individuals, tools, processes and in related activities and networks of the organizations (Argote and Ingram, 2000). There is way to transfer knowledge from one place or department to another place or department is to transfer knowledge individuals. The benefit of this is organization can transfer both type of knowledge tacit and explicit at the same time (Allen, 1977; Berry and Broadbent 1984, 87; Starbuck 1992). Whenever there is difference of knowledge and expertise between knowledge recipient and knowledge sender, the knowledge recipient fails to learn (Moreland, et.al.; 1996). Knowledge can be rooted in organizational activities and practices (Levitt & March; 1998, Szulanski; 1996). Finally, knowledge can also be embedded in multiple elements and sub networks (Cumming & Teng; 2003). As Teece (2000) found that it would be difficult to transfer knowledge within the organization without mobility of experts with recognized patterns of working mutually. Knowledge embeddedness is negatively and significantly affecting knowledge transfer success (Cumming & Teng; 2003).

### **3.4.2. Knowledge Articulability**

Knowledge articulability is an important factor that affects the knowledge transfer success. Knowledge articulability is, to what extent knowledge is written down, verbalized and articulated (Bressman; 1999). Polyani (1966) stated that people less explain than whatever they know since individuals have tacit knowledge which is unarticulated, intuitive and can only be observed through application. Articulated knowledge can easily be captured, stored and shared with other employees because it can easily be understood and observed as there is less ambiguity in articulated knowledge. Knowledge tacitness is significantly and positively correlated with ambiguity (Simionon; 1999). Transfer of knowledge success is depends upon how much knowledge is tacit and explicit. If knowledge is more explicit and articulated the chances of transfer success will be more. Ambiguous and less articulated knowledge is difficult to share and poor articulated knowledge is difficult to diffuse among the organizational employees as well (Hakanson and Nobel, 1998). There is a negative and significant relationship between knowledge articulability and knowledge transfer success. Theoretical background does not support the findings of the (Cumming and teng, 2003) because they did work on R&D projects which were considered more technical and having more tacit knowledge as compare to explicit

knowledge. So, that is why, the findings of (Cumming and Teng, 2001) were not similar to previous studies.

### **3.4.3. Organizational Distance**

The base of organizational distance is the mean through which the source and receiver shares the knowledge. Organizations can get knowledge form within the organization as well as outside the organization. Knowledge transfer within the organization is easier as compared to outside the organization. Knowledge is easy to transfer from selected parties (Cumming and Teng; 2003). Like franchises (Darr et.al.; 1995), chains (Baum and Ingram; 1998), networks (Uzzi; 1996) can transfer knowledge more effectively and efficiently. Cumming and Teng (2003) found that transfer success will decrease with the increase in organizational distance between source and recipient of knowledge.

### **3.4.4. Knowledge Distance**

Knowledge distance is to what extent source and recipient having same kind of knowledge. It is found that for organizational learning knowledge gap between source and recipient should not be too much (Haml; 1991). The reason behind this is, if knowledge gap is greater the learning steps will also be more and knowledge transfer will be much complex, difficult and time taking. As Haml (1991) said if the knowledge and expertise gap among source and recipient is much, transfer of knowledge and learning will almost be impossible. To minimize these gaps, there must be some adjustments in knowledge and other factors in order to make knowledge transfer successful. Cumming and Teng (2003) explored that there is significant and negative relationship between knowledge distance and success of knowledge transfer.

### **3.4.5. Physical Distance**

Physical distance is the difficulty, type and expense to get face to face communication and for knowledge transfer. Athanassiou and Nigh (2000) explored that face to face interactions are better as compared to all other modes to deliver strategically important matters. Cumming and Teng (2003) found that physical distance negatively affects success of knowledge transfer.

### **3.4.6. Project Priority**

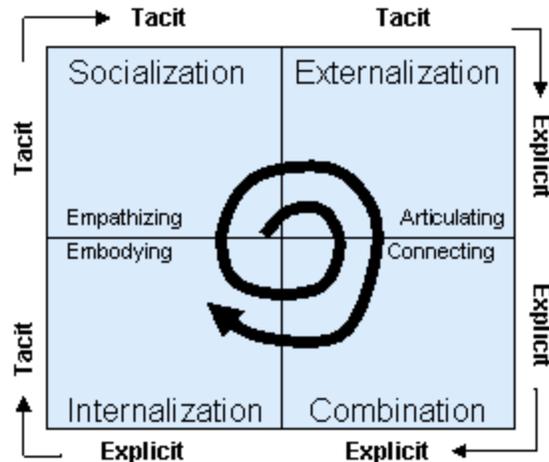
Different projects take different degrees of attention, resources and time. When recipient gives too much priority to the project, he will be much motivated to get new information and knowledge transfer success with rapidity and with much more intensity. Researchers identified different variables to make knowledge transfer successful as motivation and learning intent of the recipient of knowledge. These factors play vital role in knowledge transfer success. (Baughn et.al.; 1997, Haml; 1991, Szulanski; 1996). According to Cumming and Teng (2003), people will support the transfer of knowledge in highly prioritized projects than less ones.

### **3.4.7. Learning Culture**

Learning culture is also an important factor for success of knowledge transfer. Knowledge transfer has two aspects; first is knowledge velocity and second is knowledge vesocity. Knowledge velocity is the speed of knowledge transfer and knowledge vesocity is richness of knowledge transfer (Davenport and Prusak; 1998). When there is learning routines in organizations, every employee starts to get new knowledge by interacting other people and also by approaching other means like books, journal etc.

## Determinants of Knowledge Transformation Process

### The SECI model (Nonaka and Takeuchi)



Modes of knowledge transformation as by Nonaka et.al, (1994) are:

1. Socialization (Tacit to Tacit)
  - Wandering inside
  - Wandering outside
  - Tacit knowledge transfer
  - Tacit knowledge accumulation
2. Externalization (Tacit to Explicit)
  - Dialogue
  - Metaphor
3. Combination (Explicit to Explicit)
  - Collecting data and acquisition
  - Disseminating data and information
  - Editing and synthesizing data and information
4. Internalization (Explicit to Tacit)
  - Personal experience
  - Simulation

Organization's top management must focus on this knowledge transformation process because this knowledge transformation process is the important source of diffusion of knowledge among individuals, groups and in entire organization from top level to the bottom level in hierarchy of the organization. This knowledge transformation process creates the leverage within the organizations regarding knowledge sharing, creation, dissemination and integration of the knowledge within the organization. Important tools for knowledge transformation might be mentoring, coaching formal and informal meeting and seminars and it also includes learning by doing. Through these different activities, erudite persons share their knowledge and expertise with others which can boost the level of knowledge in persons lacking knowledge as well as it urges people to gain new knowledge and ideas to produce something distinctive as compare to competitors which is the soul of innovation and competitive advantage. The biggest achievement for any organization is when her employees start to think in different ways, when they are fervor, devoted and motivated to push their organization to the height of success and excellence. The knowledge transformation process is affected by many factors as well.

### **3.5. Determinants of Innovation:**

#### **3.5.1. Knowledge Transformation, Collaboration & Integration and Innovation**

Knowledge collaboration is very important for bringing innovation. Collaboration might be internal or external. Through internal collaboration, organizations come to know about diverse knowledge which exists in the organization in the form of tacit and explicit knowledge. Through strong internal collaboration with the employees, organizations come to know what, where and how much knowledge exists in the organization. This internal collaboration can foster the innovation because when organizations collaborate and integrate with the internal employees this can lead the organization towards the generation of pool of expertise and creativity which are essentials for bringing innovation in the organization. As far as the role of external collaboration to bring innovation is concerned, external organizations play important role to bring innovation like customers (Baker and Sinkula; 2005, Gassman et.al; 2006) and competitors (Hamel et. al.; 1989). Nowadays, to bring innovation, crucial is to make linkages with external organizations to get the knowledge and capabilities which are necessary for innovation (Chesbrough; 2003, Powell, et.al; 1996). To bring innovation, linking with external organization and partners is a core process. Chesbrough (2003) argued that if any firm wants to innovate successfully in a highly complex environment, the innovation process must be supported by the open and flexible structure. Organizations must integrate with external knowledge and capabilities. This integration and collaboration allows the organization to get more innovative ideas which is sole of innovation.

#### **3.5.2. Organizational Learning and Innovation**

To compete in highly dynamic environment each and every organization must focus continuous learning because customer's needs and preferences are rapidly changing and to meet those requirements organization must seek and learn the new ways. These new ways and methods can only be come into the organization through learning. Organizational learning enhances the organization knowledge capability and knowledge assets. Consequently organizational learning strengthens the knowledge transformation process because when employees learn they have to share their experiences and knowledge with others who really need current knowledge to fill the knowledge gap. Wijnhoven(2001) states that organizational learning urges the people to enhance the organizational knowledge base. Organizational learning enhances the interaction among the employees so that knowledge sharing, integration and dissemination achieved. Drucker (1993) explained that organizational learning will boost the quality and quantity of the information and accumulation of knowledge in a dynamic environment. Organizational learning will enhance the ability to create new knowledge and its application.

#### **3.5.3. Knowledge Transformation and Knowledge Characteristics**

Knowledge characteristics also affect the knowledge transformation and innovation. There are two types of knowledge characteristics: Knowledge Tacitness and Knowledge Complexity. The most important characteristic of the knowledge is knowledge tacitness which is human expertise, capabilities and competencies which exist in human mind. To pace up the innovation process, organizations must focus onto the transformation of tacit knowledge into the explicit knowledge because tacit knowledge is difficult to share, capture and disseminate. It can only be observed through application. So, to get benefit and competitive advantage from tacit knowledge, organizations must transform tacit knowledge through mentoring, coaching, formal and informal meetings and seminars so that tacit knowledge can be diffused to the other members of the organization as well. Other characteristic of knowledge is complexity. Knowledge complexity can be a hurdle in knowledge transformation process and so to bring innovation. Complex knowledge is difficult to share with others and this factor can slow down the pace of knowledge transformation and innovation process. Meetu and Perez-cano (2004) believe that knowledge complexity will slowdown the knowledge transformation and it is more difficult to apply in organizations and convert in other type of knowledge. Knowledge complexity will increase

the cost of acquiring and exploitation of the knowledge and it will affect the learning efficiency of the organization because individuals can not have easy access to such knowledge (McEvily and Chakarvarthy; 2002).

#### **3.5.4. Organizational Culture and Innovation**

Culture is one of the most important factors to implement the knowledge management system. Delong and Fahey (2002) stated that knowledge management faces the difficulties from corporate culture to be implemented that's why normally organization do not get maximum benefit from knowledge management. In a study of 453 firms, more than half of them indicated organizational culture was biggest hurdle to implement the KM system in the organizations (Rsuggles; 1998). In order to implement the knowledge management system effectively, organizations must create the thirst for knowledge and achievement among the individuals of the organization. So, to implement the knowledge management, organizations need to build the knowledge culture within the organization in which new knowledge acquisition and sharing will be the integral part of the organization strategy and culture. Gold et.al, (2001) stated that encouraging and supportive culture will help to build the knowledge management system in the organizations.

## **4. Conclusion**

In this paper, we develop an integrated model which includes several factors that plays vital role to bring innovation. ICT factors help the organization to find out and manage the organizational knowledge which increases the organizational knowledge assets and capabilities. Knowledge success factors are vital in diffusing knowledge from individuals to the entire organization which strengthens the organizational knowledge culture. In order to pace up the innovation process, organizations must implement the innovation determinants which are actually the cause of innovation.

## **References**

- [1] Allen, T. J., (1977), "Managing the flow of technology: Technology Transfer and dissemination of technological information within R&D organization", *MIT Press, Cambridge, M.A.*
- [2] Athanassiou, N. and Nigh, D. (2000), "Internationalization, Tacit Knowledge and Top Management Teams of MNCs", *Journal of International Business Studies*, Vol.31 No.3, pp.471-487.
- [3] Baker, W.E. and Sinkila, J.M. (2005), "Market Orientation and the New Product Paradox", *Journal of Product Innovation Management*, Vol.22 No.6, pp.483-502.
- [4] Baum, J.A.C. and Ingram, P. (1998), "Survival-Enhancing learning in the Manhattan Hotel Industry", *Journal of Management Sciences*, Vol. 44, pp. 996-1016.
- [5] Berry, D.C. and Boardbent, D.E., (1984), "The Relationship between Task Performance and associate verbalized knowledge", *The Quarterly Journal of experimental psychology*, Vol.36 A, pp.209-231.
- [6] Bressman, H. and Dirkinshaw, J.M. (1999), "Knowledge transfer in International acquisition", *Journal of Internal Business Studies*, Vol. 30 No. 3, pp 439-462.
- [7] Cavusgil, S.T, Calantone, R.J and Zhou, Y. (2003), "Tacit Knowledge Transfer and Firm Innovation Capability", *Journal of Business and Industrial Marketing*, Vol.18 No.1, pp.6-21.
- [8] Chesbough, H. (2003), "Open Innovation: The Imperative for Creating and Profiting from Technology", *Harvard Business School Press*, Boston
- [9] Cumming, J.L. and Teng, B.S. (2003), "Transferring R&D Knowledge: They Key factors affecting knowledge transfer success", *Journal of Engineering and Technology Management*, Vol.20, pp.39-68.

- [10] Darr, E. and Argot, L. D. (1995), "The acquisition, transfer and depreciation of knowledge in service organization: Productivity in franchises", *Journal of Management Sciences* Vol. 41, pp. 1750-1762.
- [11] Davenport, T.H. and Prusik, L. (1998), "Working Knowledge, How Organizations Manage What They Know", *Harrard Business Process, Boston, MA*.
- [12] Delong, D.W. and Fahey, L. (2000), "Diagnosing Cultural Barriers to Knowledge Management", *Academy of Management Executive*, Vol.14 No.4, pp.113-127.
- [13] Drucker, P. (1994), "The Theory of Business", *Harvard Business Review*, Sep, Oct, pp.95-104.
- [14] Drucker, P.F. (1993), "Post Capitalist Society", *Butterworth Heinemann*, Oxford.
- [15] Gassman, O., Sandmeier, P. and Wecht, C.H. (2006), "Extreme Customer Innovation in the Front End Learning from a New Software Paradigm", *International Journal of Technology Management*, Vol.33 No.1, pp.46-66.
- [16] Gloet, M. and Terziovski M. (2004), "Exploring the Relationship between Knowledge Management Practices and Innovation Performances", *Journal of Manufacturing Technology Management*, Vol. 15 No. 5, pp.402-409.
- [17] Goh, A.L.S. (2005), "Harnessing Knowledge for Innovation: An Integrated Management Framework", *Journal of Knowledge Management*, Vol. 9 No. 4, pp 6-18.
- [18] Gold, A.H., Malhotra, A. and Segars, A.H. (2001), "Knowledge Management: An Original Capability Perspective", *Journal of Management Information System*, Vol.18 No.1, pp.185-214.
- [19] Hamel, G. (1991), "Competition for Competence and Inter-partner Learning within International Strategic Alliances", *Strategic Management Journal*, Vol.12, pp.83-103.
- [20] Hamel, G., Doz, Y.L. and Parahald, C.K. (1989), "Collaborate with your Competitors and Win", *Harvard Business Review*, Vol.67 No.1, pp.133-139.
- [21] Harkama, S. (2003), "A complex perspective on Learning within Innovation Projects", *The Learning Organization*, Vol. 10 No.6 pp. 340-346.
- [22] Ju, T.L., Li, C.Y. and Lee, T.S. (2006), "A Contingency Model for Knowledge Management Capability and Innovation", *Industrial Management and Data System* Vol.106 No.6, pp.855-877.
- [23] Leifer, R. and O'Connor, G.C and Rice, M. (2001), "Implementing Radical Innovation in Mature Firms: The Role Hubs", *The Academy Of Management Executive*, Vol.15 No.3, pp.102-113.
- [24] Majchrzak, A., Cooper, L.P. and Neece., O.E. (2004), "Knowledge Reuse for Innovation", *Journal of Knowledge Management Sciences*, Vol. 55 No. 2, pp 174-188.
- [25] Malhotra, Y. (2005), "Integrated Knowledge Management Technologies in Organizational Business Process: Getting Realtime Enterprise to Deliver Real Business Performance", *Journal of Knowledge Management*, Vol. 9 No. 1, pp 7-28.
- [26] Mcevely, S.K. and Chakarvarthy, B. (2002), "The Persistence of Knowledge Based Advantage: An Empirical Test for Product Performance and Technological Knowledge", *Strategic Management Journal*, Vol.23, pp.285-305.
- [27] Mecerdmott, R. and O'Dell, C. (2001), "Overcoming Cultural barriers to sharing knowledge", *Journal of Knowledge Management*, Vol.5 No. 1, pp 76-85.
- [28] Medermott, R. (1999), "Why Information Technology inspire but cannot deliver Knowledge Management", *California Management Review*, Vol. 41 No. 4, pp 103-117.
- [29] Messa, S. and Testa, S. (2004), "Innovation or Imitation? Benchmarking: A Knowledge Management Process to Innovate Services", *Benchmarking: An International Journal*, Vol. 11 No. 6, pp 610-620.
- [30] Mohammed, M., Stankosky, M. and Murrey, A. (2006), "Knowledge Management and Information Technology: Can they work in perfect harmony", *Journal of Knowledge Management*, Vol. 10 No. 3, pp 103-116.

- [31] Nielson, A.P. (2006), "Understanding dynamic capabilities through knowledge management", *Journal of Knowledge Management*, Vol. 10 No. 4, pp 59-71.
- [32] Nietu, M. and Perezcan, O.C. (2004), "The Influence of Knowledge Attributes on Innovation Protection Mechanism", *Knowledge and Process Management*, Vol.11 No.2, pp.117-126.
- [33] Nonaka, I. and Takeuchi, H. (1995), "The Knowledge-Creating Company", *Oxford University Press, Oxford*.
- [34] Parlby, D. and Taylor, R. (2000), "The Power of Knowledge: A Business Guide to Knowledge Management", available at [www.kpmgconsulting.com/index.html](http://www.kpmgconsulting.com/index.html).
- [35] Plessis, M.D. (2007), "The Role Of Knowledge Management in Innovation", *Journal of Knowledge Management*, Vol. 11 No 4, pp (20-29).
- [36] Polyani, M. (1962), "Personal Knowledge: Towards a Post Critical Philosophy", *University Of Chicago Press, Chicago, IL*.
- [37] Powell, W.W., Kopat, K.W. and Smithdoerr, L. (1996), "Inter-Organizational Collaboration and the Locus of Innovation: Networks of Learning in Bio-Technology", *Administrative Science Quarterly*, Vol.41 No.1, pp.116-145.
- [38] Ruggles, R. (1998), "The State of the Notion: Knowledge Management in Practice", *California Management Review*, Vol.40 No.3, pp.80-89.
- [39] Simonin, B.L. (1999), "Transfer of Marketing Know How in International Strategic Alliances: An Empirical Investigation of the role of antecedents of knowledge ambiguity", *Journal of International Business Studies*, Vol. 30, pp. 463-490.
- [40] Starbuck, W.H. (1992), "Learning by Knowledge intensive firms", *Journal of Management Studies*, Vol.29, pp.713-738.
- [41] Szulanski, G. (1996), "Exploring Interstickness: Impediments to the transfer of best practices within firm", *Strategic Management Journal*, Vol.17 summer special issue pp.27-43.
- [42] Uzzi, B. (1996), "Sources and Consequences for the Economics Performance of Organizations", *American Sociological Review*, Vol.61, pp. 674-698.
- [43] Wijnhoven, F. (2001), "Acquiring Organizational Learning, Norms: A Contingency Approach for Understanding Deutero Learning", *Management Learning*, Vol.32 No.2, pp.181-200.