Conceptual Framework of Knowledge Growth for Enhancing Organizational Knowledge Capital

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ABSTRACT

This paper proposes a conceptual framework that details the main component features for modeling of knowledge growth. It contributes important insights to future studies in the field of knowledge management to design a theoretical and operational model of knowledge growth in enhancing organizations' knowledge capital. The paper is a contribution to the body of knowledge as it helps enhance the management and delivery practices of organizations tantamount to helping the organizations prepare themselves for eventualities in the future.

Keywords: conceptual framework, knowledge management, knowledge growth, knowledge capital.

I INTRODUCTION

Knowledge is an important asset in every learning organization Serrat (2009). In order to develop organizational effectiveness, learning must continue to take place for it enables knowledge to grow. Serrat observes that both individuals and groups are the units of knowledge creation and production. He adds that while knowledge is created in the minds of individuals, knowledge growth and development thrives in a rich web of social contacts among individuals, groups and organization.

Generally, most organizations experience the pressure of global competition. It is also important to note that the significant technological developments that are taking place have a different sort of impact on organizations. Moreover, customer demands require that organizations are able to create and deliver value in the form of products and services (Carlucci & Lerro, 2010). The ability to enhance performance results requires the possession of the right knowledge. In other words, knowledge must constantly evolve to meet organizational challenges.

Knowledge is identified as one of the factors that maintain organizational survival in today's highly competitive environment. As such, for any organization to maintain its competitive advantage, it must be able to retain, enhance and exploit its knowledge base to add value to its products or services consistently while increasing its general productivity. Moreover, the ever-increasing need to create, capture, share and protect tacit knowledge for continued product or service innovation is one of the top priorities to generate more revenue (Alstete, 2007). For this to happen, corporate managers must be able to establish, supervise, and protect their organizational knowledge advantage (Awad & Ghaziri, 2004). As Alstete (2007) puts it, it has become extremely important for organizations to know just how much they know.

Due to these phenomena, some frameworks have been suggested for mapping and estimating the levels of knowledge in organizations. One such model was suggested by Bohn (1994) who proposed an eight stage model, which can be employed to illustrate how organizational learning leads to knowledge changes over time.

It was purported that the stage of knowledge growth that has been achieved by an organization determines how a certain process could be computerized and directed in relation to other components of knowledge management designed to generate effective results (Tiwana, 2002). It also enhances the management and delivery practices of organizations, which is tantamount to helping these organizations to better prepare themselves in the future. Consequently, this paper proposes to model the growth of organizational knowledge and its relation with the knowledge capital in organizations. In doing so, it identifies and assesses the component features for modeling knowledge growth.

There seems to be ample opportunities to study the unique issue related to knowledge growth. For example, it would be interesting to examine how employees in an organization seek to capitalize on new ideas and insights for specific purposes. However, of utmost importance is the need to model a knowledge growth process with more detailed component features and evaluate their effect on knowledge capital of organizations. The paper seeks to investigate whether knowledge growth is a natural process that is bound to happen anyway, and whether it is an unintentional process or whether knowledge growth is a proactive or reactive process. The following discussion centers upon the various facets of knowledge growth.

II FACETS OF KNOWLEDGE GROWTH

A. Related Work in Knowledge Growth

While research in knowledge management continues, very few have been found to study the significance and importance of knowledge growth in organizations. One such study clearly presented an assessment of eight stages of knowledge growth in organizations (Bohn, 1994; Tiwana, 2002). However, there is little empirical

evidence to suggest that many other knowledge growth studies have been carried out in other organizations.

The term knowledge growth is rarely employed in the KM literature, and when it gets used, it seems to denote the concept of organizational learning. Even Bohn (1994) described his eight-stage model (knowledge growth model) as a framework that highlights "… how knowledge increases through organizational learning, and /or usage of technology….." etc.

The available literature suggests that knowledge growth is associated with evolutionary theories which imply continuous learning by organizations (Barron, 2003). In this context, evolution implies change or growth governed by three distinct mechanisms; variation, selection and retention.

According to the variation mechanism, there must be a process by which certain ideas are introduced within an organization. These variations might include new technologies, new services or products or the adoption of best practices. Secondly, the selection mechanism ensures that there is a process to distinguish between beneficial ideas and useless ones to reduce the risk of failure. Finally, the idea must have some way of spreading from the original unit to other units within an organization. This is the process of retention (Barron, 2003).

Miller (1983) described and related the notion of knowledge growth to innovation. He explained that in entrepreneurial exercises, knowledge plays a very essential role, and that this knowledge can only come about through some sort of innovation. He added that before innovation itself takes place, four factors play an important part: an environment that must yield changes, information (or idea) generation, the ability to innovate, and appropriate management decision methods for innovative projects.

Lindelöf and Löfsten (2006) argued that generally the literature on entrepreneurship – a field related to constant knowledge growth and innovation – was very much tied to technological development and innovation. They explained that most of the new technology based firms (NTBFs) act in a dynamic environment of competition. Such an environment was usually characterized by three predominant components including; innovativeness, risk taking and pro-activeness. They added that the three variables relate to the behavior of firms as deduced from the individual and collective activities of their staff. It is these activities which dominate the variation phase – as a first step in the process of knowledge growth.

B. Knowledge Growth Elicitation and Knowledge Capital

Knowledge growth elicitation is designed to capture the component features of a knowledge growth process from users, customers and other stakeholders. Knowledge growth elicitation could involve interviews, questionnaires, meetings, field observations, workshops, brainstorming, and role playing, among other things (Burnett, Illingworth, & Webster, 2004). However, for the purpose of this paper, the elicitation process is based on the proposed conceptual framework for the purpose of enhancing the knowledge capital of organizations.

Knowledge capital could be visualized to be human capital. The available literature suggests that the characteristics of human capital comprise education, experience and skills at an individual level. As for an entity, human capital can be summed up as the collective employees 'knowledge and skills' (Hitt et al., 2007). However, for an organization, human capital (tacit) alone would only be a fraction of the total knowledge that exist in the entire organization.

Khan, MacIntosh and McMaster (2011) presented a comprehensive picture of knowledge capital by describing its components for a typical organization indicating that they included human capital, structural capital, and social capital. According to Khan and colleagues, human capital represented individual capabilities, skills, knowledge as well as experience of employees, and structural capital referred to the structures of the organization supporting employees in their efforts towards achieving optimum intellectual performance. Databases, organizational charts, manuals, processes, and routines were tools for carrying out tasks in the best possible way. Social capital was described as an asset innate to the social relations and networks built between or around individuals, which existed in terms of both internal and external dimensions. According to Dzinkowski (2000), customer loyalty is an example of external social capital. Tsai and Ghoshal (1998) indicated that employees interacted and learned from each other through an internal social capital.

C. Process of Knowledge Growth

Zollo and Winter (2002) study the evolution of dynamic capabilities within an organization and developed a model called a "knowledge evolution cycle." The term evolution here implies growth or change.

The model proposes that organizational knowledge evolves, grows, develops or progresses through four sequential stages chained in a life cycle. First of all, the variation stage involves individuals or groups generating a set of ideas about how to approach old challenges in a new way. This happens on the basis of a combination of external stimuli (e.g., competitors' initiatives) and internal stimuli (e.g., information generated from performance monitoring). Secondly, these ideas, which are in raw form, are then subjected to internal selection processes or mechanisms to evaluate their potential usefulness to the process or other organizational purposes. The third stage of the cycle refers to the diffusion (dissemination, distribution or circulation) of the newly evaluated ideas to the relevant parties within the firm. The diffusion process requires spatial replication. Finally, at the retention stage, the ideas are preserved and maintained through the application and repetition of the routines within the context of the new ideas (See Figure 1 below).

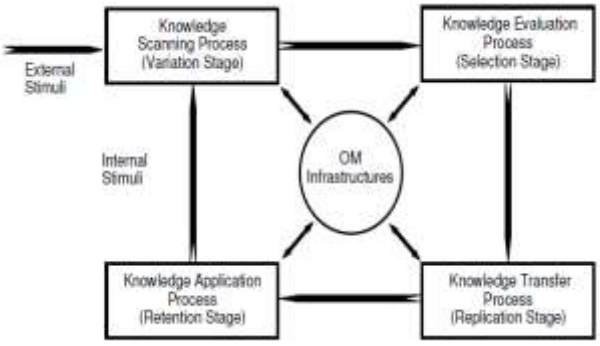

Figure 1: Theoretical Foundation (Adapted from Singh (2008))

The replication and repetition stages tend to make knowledge evolve toward a more tacit form as it becomes highly embedded in the behavior and culture of the organization. It is important to note here that knowledge growth is a process. Therefore considering knowledge growth stages alone, does not explore the detailed component features which can affect knowledge capital.

According to Gold, Malhotra and Segars (2001), knowledge growth is a process as well as an effort to improve knowledge capital. He describes entrepreneurial organizations as firms whose knowledge growth stems from a system that is highly flexible and responsive to environmental changes. He adds that such firms are usually willing to experience technological, financial and marketing risks in their growth process.

Dettwiler and Bröchner (2003) described a Swedish survey where it was revealed that security and protection of intellectual property and ideas had a very significant impact on the process of knowledge growth particularly in the high growth firms. Since the generation of new ideas in highly entrepreneurial firms involved technological and financial risks, it was fair enough that the knowledge generated from this process must be guarded at all costs to avoid further losses particularly in highly competitive environments that are characterized by dynamism and hostility.

Fong (2005) described knowledge creation and growth by highlighting five processes in cross disciplinary teams from the construction sector. The first one involves crossing of boundaries and interaction between team members. This is considered as the platform on which other processes are based. The second process involves knowledge sharing. This mainly focuses on differences of ideas that can be transferred rather than the similarities. Therefore, the variation phase of a knowledge growth process benefits from such differences. In relation to this scenario, Kalling and Styhre (2003) seemed to suggest that knowledge growth in an enterprise can lead to cost reduction and improved productivity.

Fong (2005) further described the third process as knowledge generation (creation) which was enabled through interaction and communication particularly through social networks. The fourth process was described as knowledge integration. This was basically expressed as "marrying" the different perspectives and ideas. Lastly, the fifth process was believed to entail collective project learning. In this process, failures were considered to be of value in the project as they were taken as objects for increased learning.

Aldrich and Ruef (2006) explained that knowledge growth processes sometimes require continuous changes of team members or groups that were spontaneously created and dissolved. They described a scenario of starting up a firm which can sometimes be similar to a project. They explained that in a firm, you have founders (owners) and the employed staff. The two groups usually assemble a team to find a market segment that they would wish to conquer and dominate. In order for them to gain competitive advantage, they must create and develop some specific knowledge. They explained that in an entrepreneurial venture, knowledge growth can be encouraged and fueled from; previous work experience, advice from experts and imitation and copying.

Fleming and Sorensen (2001) explained that the process of knowledge growth and innovation is a combination of complimentary internal and external components of knowledge. Internally, individuals or groups of employees exchange ideas to come up with new ways of solving a problem or creating a product or service. On the external front, individual employees or teams exchange their ideas with external teams or study and observe competitors, draw some cues and compare the differences in their knowledge of approach to handling similar problems.

Leiponen (2005) undertook a study where some factors related to knowledge generation and growth were examined in service firms. The main factors that were considered in the study were; internal co-operation, vertical and horizontal information sharing, technology adoption, incremental learning and scientific knowledge. Among the findings, there was evidence to support collective application of knowledge as being more conducive to innovation and knowledge growth as compared to individually based knowledge. On the other hand, the quantitative survey results showed that the firm's competitiveness as perceived by the manager depends on many other factors. They included internal co-operation, external sourcing of information from customers and competitors, technology adoption, learning on the job and external sourcing of information from Universities.

Hisnanick (2002) commented that ongoing research was the source of knowledge growth. However, he added that in this process sharing information and knowledge creation were important. He argued that at some point it is hard to differentiate between these two in an organization. It is important to point out that the process of knowledge creation and its transfer is a delicate and intricate affair. However both are important and complimentary to each other. As the evolutionary theory suggests, new ideas need to be circulated or disseminated to potential beneficiaries.

Nonaka and Nishiguchi (2001) presented an edited version of Knowledge Emergence where they

incorporated immense efforts of respected researchers to analyze valuable ideas in the field of knowledge creation. They organized the research work into four unique but interrelated sections. In the first place, they presented the idea of knowledge creation via the use of social relationships, and sharing within the social units. This explained that the success of the notion of "care" among individuals in the knowledge creation process depended on vibrant social networks. For instance, in "high care" organizations, employees tend to assist each other, sharing knowledge and experience as well as collective values. They added that the notion of "care" facilitates organizational knowledge development by nurturing trust as one of the most essential attributes among individuals, and social units in an organization.

Other factors discussed in relation to knowledge creation and organization knowledge development were; technology and cooperation, transnational knowledge creation and interfirm relations.

III PRELIMINARY FINDINGS

A. 3.1 The Process of Knowledge Growth

According to the proposed model, knowledge growth results as new ideas (through access to external knowledge and internal knowledge growth by way of research and idea generation among other things) are captured, validated through internal processes, modified, stored and measured in an organization. An organization evaluates the usefulness of this knowledge and disseminates it to the concerned organizational members. As Weitzman (1998) pointed out, new ideas arise out of existing ideas in some kind of cumulative interactive process through research exercises.

The information stored in the memory will be evaluated, modified and retrieved for the enhancement of the knowledge capital of an organization. This is a result of innovative activities as well as knowledge sharing and creation in the external environment changes (as seen in Figure 2 below).

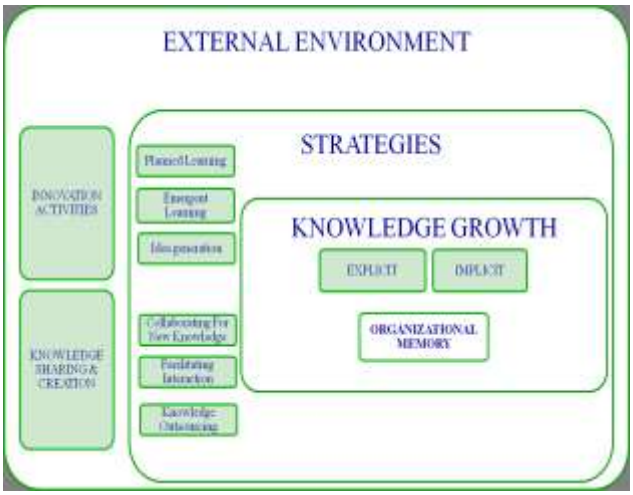

Figure 2: Process of Knowledge Growth

The environmental changes bring about planned learning, emergent learning, idea generation, collaboration for new knowledge, facilitation of interaction and knowledge outsourcing that in turn cause knowledge to evolve and develop. In a learning organization, there will be abundant opportunities for knowledge to be developed and shared with others through interpersonal contacts and access to documentation coupled with the changes taking place in the external environment. As knowledge evolves, it becomes imperative that it is preserved in repositories in order to realize the growth in new knowledge.

According to Serrat (2009), an organization's main repositories of knowledge exist in the form of the design and delivery of its products and services plus the strategies, systems, procedures it has developed to guide its decision making process. He cited feedback as the dynamic process of presenting and disseminating information to improve performance. Feedback mechanisms were identified as key elements of learning as its source of knowledge in organizations is data and information that emerge from monitoring systems, analysis, conclusions and recommendations arising from self and independent evaluations. Finally, he remarked that a learning organization should recognize the importance of a resilient organizational memory (OM). Here, a learning organization ensures that individuals and teams use a range of ways at surfacing their tacit knowledge and make it available to others through targeted documentation and collaborative working practices.

Singh (2008) extended the discussion on knowledge evolution theory. He argued that among other issues, knowledge growth in an organization was also related to organizational memory (OM). Huber, Davenport and King (1998) defined OM "as the set of repositories of knowledge that the organization has acquired and retained." According to Kingston and Macintosh (2000), OM could be regarded as the sum of all knowledge assets possessed by an organization. When an organization acquires new knowledge and adds it to its existing set of knowledge repositories, it achieves knowledge growth if this new combination of knowledge makes it possible to make new decisions or perform new complete tasks (Turner & Makhija, 2006).

It was further argued that for knowledge growth to occur in an organization, new knowledge must be retained (for the application process). Hence Olivera (2000) pointed out the importance of conceptualizing OM in terms of "retention facilities" which have proved useful for identifying general categories of organizational knowledge retention devices and memory processes.

Walsh and Ungson (1991) suggested that OM infrastructures (which they referred to as "storage bins or retention facilities") were made up of five knowledge retention mechanisms. First, are individuals who usually store knowledge "in their memories, beliefs, values and assumptions". Secondly, roles act as storage of the organizations' expectations of organizational members within the organization. The third is logic - which stores procedures and operational rules to perform tasks. The fourth is artifacts. These store knowledge in things such as the physical layout, facilities and database of the

organization. Lastly, culture stores knowledge in language shared frameworks, symbols and stories.

The useful knowledge is then retained in OM and as knowledge evolves, it is enabled by and embedded in OM. However, the capacity to process new ideas depends on the resources devoted to the task and the usefulness of such resources. This relates to the validating techniques by internal processes. The validated information is modified as new knowledge which contributes to knowledge growth from its initial stage.

B. The Conceptual Framework of Knowledge Growth

The proposed conceptual framework that constitutes initial knowledge that is validated, modified and stored presents the idea that new knowledge results from combining existing ideas in order to create new ones in the context of knowledge growth. The framework illustrates that the initial stage of knowledge is actually part and parcel of knowledge growth itself as an organization is involved in the process of continuous learning. Thus, knowledge growth commences at *t1* and ends at *t2* where *t* represents time. As an organization continues to learn, *t2* becomes *t1* (initial knowledge) and the cycle continues (see Figure 3 below).

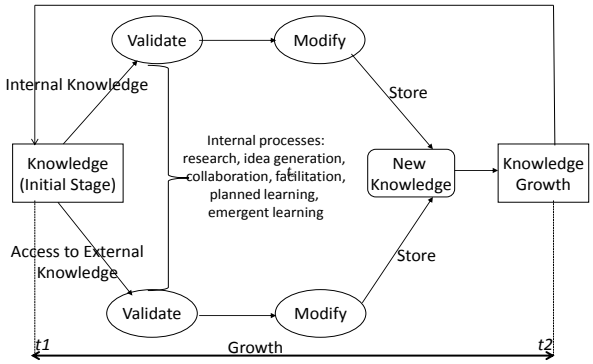

Figure 3: Conceptual Framework of Knowledge Growth

It is argued that knowledge growth is a result of observed sets of organizational learning processes (Pawlowsky, 2001) and the retention of the newly acquired knowledge in OM (Huber et al. 1998). This was further reinforced by an earlier study by (Cyert & March, 1963) who explained organizational learning as a process of taking knowledge into the firm, distributing knowledge inside the organization, the condensing of input knowledge and the output of knowledge orders to suppliers, delivery to customers, advertising, and petitions for patents and in many other ways.

Hedberg (1981) regarded organizational learning (OL) as consisting of four processes: perception of environmental stimuli, selection of stimuli, interpretation of stimuli, and reaction. Huber (1991) also talked about four processes of OL. These include knowledge acquisition, distribution, interpretation, and memorization. Pawlowsky (2001) described organizational learning in terms of four processes: the identification of information to create new knowledge, the exchange of and diffusion of knowledge, the integration of knowledge into existing knowledge, and the transformation of the new knowledge into action and application. Meanwhile, Lundberg (1989) and (Nonaka, 1994) present a similar view of organizational learning.

Another widely accepted model related to knowledge evolution (growth) theory is provided by Nonaka (1994). Nonaka suggested that organizations learn through the iterative processes of socialization, externalization, combination, and internalization. Socialization brings together tacit knowledge through shared experiences. Externalization articulates tacit knowledge as explicit knowledge. Combination connects discrete elements of explicit knowledge into a set of explicit knowledge. Finally, internalization embodies explicit knowledge as tacit knowledge.

Generally, growth models have been used extensively in both organizational research and information technology management research (Gottschalk & Vijay, 2004). Such models are employed to describe a wide variety of phenomenal events, the most common one being an organizational life cycle (King & Teo, 1997). Hence knowledge as an organizational asset is also presumed to go through certain stages of growth before it earns trust of individuals in order to get applied in the process of achieving organizational objectives.

IV DISCUSSION

In understanding and analyzing knowledge growth, people may summaries, write reviews, comment, collect more data through research, write journal/conference paper, or decide the recipients of a particular knowledge. They may share such knowledge with other people who might need and appreciate such knowledge.

This sharing and publishing of information is tantamount to enhancing the knowledge capital of organizations. It is therefore expected that knowledge growth elicitation can help identify intellectual assets of value to an organization. As Valencei (2003) pointed out, the problem for organizations is not having insufficient information or knowledge but that they are not aware of what they have most of the times.

The preliminary results show that a learning organization should recognize the importance of an organizational memory, which acts as a storage of the organizations' expectations of its members, procedures and rules to perform tasks, organizational artifacts and culture in terms of shared symbols and stories. According to Serrat (2009), in order to develop organizational effectiveness, learning must continue to take place as it enables organizations to grow, progress, and advance.

Interconnectivity is also important for a learning organization in identifying ideas that may add value to knowledge which can be used to produce products and services for the betterment of the organization at large. Thus, interconnectivity is an avenue through which knowledge could be developed and shared with others

through informal and formal interactions. Individuals and groups are part and parcel of knowledge creation process. As Serrat (2009) observed, while knowledge is created in the minds of individuals, in such organizations, knowledge growth and development thrives in a rich web of social contacts among individuals, groups and organization. Therefore, interpersonal contacts and access to documentation represent a platform of interconnectivity for developing and shared knowledge with others.

To realize the potential of the developed knowledge and guide an organization's decision-making process, it is imperative that the new knowledge is validated, modified, stored and evaluated. According to Serrat (2009), an organization could institute feedback mechanisms as a source of learning through the data that emerge from monitoring systems, analysis, conclusions and recommendations via self and independent evaluations. Here, a learning organization ensures that individuals and teams use a range of ways at surfacing their tacit knowledge and make it available to others through targeted documentation and collaborative working practices. Thus, through the feedback mechanism, knowledge growth occurs in the organization as new knowledge is retained, validated and modified to enhance its knowledge capital.

To realize knowledge growth, it is important that there is an organizational memory in an organization. According to Walsh and Ungson (1991)'s framework, an organizational memory plays an essential role in the knowledge evolution (growth, development) process. This framework has been used by other researchers in their research studies. For instance, Argote (1999) used it to identify the means by which organizations accumulate production knowledge. Furthermore, Hargadon and Sutton (1997) used the framework to study and analyze innovation in a product development organization.

Thus, the significance of this work is reinforced by the argument that as organizations learn, their new knowledge is retained in OM and as knowledge evolves (develops/grows) it is enabled by and embedded in OM.

V CONCLUSION AND FURTHER WORK

A review of the previous studies on the topic suggests that knowledge is an important source of growth in organizations that results into greater economic and social development. The preliminary results indicate that elicitation of knowledge growth can help evaluate and extract personal tacit knowledge by putting it in a proper order so that others can access it and use it.

Based on the proposed conceptual framework, for further research on knowledge growth, the researchers intend to develop a Knowledge Capture Instrument (KCI) to collect knowledge from knowledge workers with a view to modeling such knowledge for the purposes of enhancing the knowledge capital of organizations.

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