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Knowledge management practices and innovation performance: a literature review

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Abstract: ***Purpose****- This article sought to ascertain the role of knowledge management practices in innovation performance of firms. The article reviewed the literature relating to knowledge management and innovation in order to see the extent to which they link the two.*
Design/methodology*- The methodology used was literature review.*
Findings*- The study shows that there is overwhelming support that five out of six knowledge management practices lead to innovation, namely: leadership, policies & strategies, training and mentoring, reward system, and communication.*
Originality/value*- The study provides insights on the most important knowledge management practices that management need to cultivate in order to foster innovation.*
Keywords *Knowledge management practices, Innovation*
Paper Type *Conceptual paper*

I. Introduction

In a volatile environment, firm's competitive advantages rely on its capability to effectively and constantly deliver innovative products to its customers (Lin, Che, Ting, 2011). The global business environment has been changing as the speed of innovation increases by the day coupled with evolving technologies and short product life cycles (Lin, Che, Ting, 2011; Plessis 2007). This calls for organizations to be able to integrate internal and external information from various stakeholders to enhance knowledge application and product innovation (Lin, Che, Ting, 2011). As Hamel and Prahlad(2002) argued, any firm that hopes to take leadership in this kind of environment will have to collaborate with and learn from their stakeholders (customers, suppliers, and technology providers) whenever they are located. The authors continued to point out that one of the phase to be witnessed in future competition would be intellectual leadership where firms will be interested in gaining the industry foresight by deeply probing into industry drivers, this is pointing toward knowledge and innovation. This future can be said to be already with us. Increasingly managers are becoming aware that knowledge resources are important to the survival of their organizations (Carneiro, 2000). As a result of this awareness management is taking into account the value of creativity, which enables the transformation of one type of information to the other. Organization success depends on its employee knowledge, experience, creativity activity, and qualification (Hana, 2013) and Hamel and Prahlad (2002), added the capacity of the organization to unlearn, just as it is important for firm to learn or gather new knowledge so as to be able to do things differently it is also important for them to be able to identify when it is time to unlearn genes that are defective. Knowledge, as Hana (2013) concluded is very significant in the innovation process since it act as a necessary input.

II. Knowledge, Knowledge Management, and Innovation

Nonaka (1994) argued that the concept of knowledge is a multifaceted and with multilayered meanings. Hawryszkiewycz (2010), in support of Nonaka pointed out that knowledge is abstract in reality and hard to pinpoint at. However, Hawryszkiewycz (2010), argues that knowledge is more on knowing how to interpret information and providing new insight to solve problem at hand. Knowledge can be moved, stored and valued, others argues that it give people the feelings and thoughts that they can use to develop new ideas (Hawryszkiewycz, 2010). The ever increasing importance of knowledge in modern society calls for a change in our thinking regarding innovation (Nonaka, 1994).

There is no shortage of definition of KM (Gloet and Terziovski, 2004). For example, Hislop (2009) defines KM as an umbrella term that captures any deliberate efforts to manage the knowledge of the employees which can be attained via various methods either directly such as use of particular information communication technologies (ICT) or indirectly through management of social processes and structuring of firms in a particular ways. The weakness of this definition is that it point to internal source of knowledge only. More comprehensive definitions and the one that will guide this study were offered by Plessis (2007) and Gloet and Terziovski (2004). Plessis (2007), defines KM as a planned structure approach to managing creation, sharing, harvesting and leveraging of knowledge as an organizational asset to enhance a company's ability, speed and effectiveness in delivering products or services for the benefit of clients in line with its business strategy (p 22).

Gloet and Terziovski (2004) describe knowledge management as the formalization of and access to experience, knowledge, and expertise that create new capabilities, enable superior performance, encourage innovation, and enhance customer value. These two definitions clearly point out the place of knowledge in innovation thus the researcher's choice to use them in this study.

Plessi (2007, p21) defined innovation "as the process where knowledge is acquired, shared, and assimilated targeted to create new knowledge, which embodies products and services". A more expansive definition was offered by Carneiro (2000), who noted that innovative efforts encompasses the search for and the discovery, experimentation, and development of new technologies, new products and/or services, new processes, and new firm structures. This definition is broad as it not only talk about product and or services and processes alone but take a wider view to include technologies and organizational structures. Innovation encompasses both radical and incremental innovation. Incremental innovations present themselves as extension or modification of existing products or services (Plessi, 2007). They do not represent significant departure from what the business has been doing in the past and build on competencies and know-how currently in place. On the other hand, radical innovation involves a significant departure from existing practices, products and/or market. Radical innovation Plessi (2007) argued is competence-destroying and often making existing skills and knowledge redundant. However, the author noted that companies that facilitate both radical and incremental innovation are more successful than organizations that focus on one.

Organizations that are in constant contact with dynamic environment must not only endeavor to process information efficiently but more importantly create and utilize information and knowledge if they are to be competitive (Nonaka, 1994). Plessis (207) pointed out that organizations must ensure that their strategies are innovative to build and maintain competitive advantage. However, the author caution that innovation is becoming complex by the day due to changing customer needs, stiff competition, rapid technological advancement and the amount of knowledge available to organizations. Carneiro (2000) was of the view that innovative efforts are the right consequence of the investment in knowledge and knowledge workers. This is to say that for an organization to experience innovation they must be willing to invest in knowledge management. Alegre, Sengupta and Lapiedra (2011), suggested that since innovation consist of the successful exploitation of new ideas it is therefore associated with the creation and use of knowledge.

Innovation is highly dependent on knowledge availability, hence the complexity and dynamics introduced by the explosion of knowledge must be managed if successful innovation is to be realized (Plessis, 2007). Carneiro (2000) agreeing with this view indicates that innovation highway depends on the knowledge innovation. Today, the idea of innovation is widely accepted, however it is still unclear how knowledge management practices relates to innovation. Researchers in the past have looked at the two quite independently and very few literature exist that try to link the two (Gloet & Terziovski, 2004; Plessis, 2007; Lin, Che & Ting, 2012; Hana, 2013). In filling this gap, this paper will examine how knowledge management practices influence innovation performance.

III. Innovation Performance

Innovation performance relates to the total innovation produced by an organization, in terms of the generation and commercialization of ideas for new products, new services, new or improved manufacturing or service delivery processes, and in term of underlying processes (Goffin and Mitchell, 2005). The authors cautioned that innovation is context dependent; its exact nature depends on the organization in question. A fundamental approach used in measuring innovation performance is input-output model, where all management processes in organization are viewed as having inputs and outputs. Inputs here refer to the time, investment, people and information technology that go into converting an idea into a product or service that can be sold to customers. Hence applying the input-output model call upon recognition of three measures; input, process and output measures. Input measures such as the revenue invested in research and development, focus on this measure has been criticized by its inability to measure how a firm is turning its R&D capacity into commercial success (Goffin and Mitchell, 2005). Process measures gauge the efficiency of the innovation process within an organization such as the time it takes to commercialize an innovation. Finally, the output measure relates directly to the commercial impact of innovation (Goffin and Mitchell, 2005). Output measures would include aspects such as revenue generated by the new product, cost saving resulting from the innovation.

Tin (2005) identified various common innovation measures that leading firms were using, some fit within what Goffin and Mitchell (2005) identified above. Darling of most firms as identified by Tin (2005) is revenue or profit growth from new products, this seem to be captured within the output measure. Patent submission was the second measure that is common among firms, this is increasingly becoming a popular approach but one that is misused by businesses as they focus more on the legal side than the business upside. Patent submission critics argue that as a true output measure focus should on the commercialized patents and not just on the mere submission. Another measure proposed by Tin (2005) is idea submission and flow that are captured through idea management system within the firm. This measure can point into the volume and quality

of submission within the firm, however, it is more internally focused. Other measures include; gains in market share, time-to-market and conversion rate of patents into products.

IV. Knowledge Management Practices and Innovation performance

In assessing KM practices and how they influence innovation performance, this study will focus on twenty three (23) practices that were identified by Earl (2001) in a knowledge management research carried out in Canada and have been used by several researchers afterwards. The 23 practices have been grouped to six headings: Policies and strategies; Leadership; Incentives; Knowledge Capture and Acquisition; Training and Mentoring; and Communications. These practices do not work independently but they influence one another. The next section will focus on the six practices reviewing the literature regarding the same.

4.1 Leadership

Earl (2001), found that the most important KM practices ranked to be leadership. Respondents felt that the responsibility for their knowledge management is in the hands of their managers and executives. These findings are supported to some extent by Denti and Hemlin (2012), who agree that there exist a relationship between leaders and innovation. The researchers noted that the relationship appeared strengthened in organizations that had a supportive culture for innovation and where the structures are de-formalized and de-centralized. The argument in support for this is that in such organizations both the parties (leaders and employees) are freer to engage in creative work. Visionary leadership, people and structures, and values are important factors that determine whether the organization will realize benefits from innovation (Hana, 2013). Denti and Hemlin (2012) noted that supportive and non-controlling leadership that include others in decision making can promote innovative behavior among employees. Barsh, Capozzi, and Davidson (2008), pointed out that while senior executives cite innovation as an important driver of growth, few of them lead and manage it. The three ask the question 'how can something be a top priority if it isn't an integrated part of a company's core processes and of the leadership's strategic agenda?'

4.2 Knowledge capture and acquisition

The second KM practice is knowledge capture and acquisition. This is the first steps in the process of developing knowledge and entails the broader activity of accepting knowledge from the external environment and transforming it into a representation that can be used within a firm (Liao, Wu, Hu and Tsuei, 2009). The external sources referred to here are industrial associations, competitors, clients, and supplier (Earl, 2001). Improved use of existing knowledge and more effective acquisition of new knowledge is also part of acquisition. Knowledge capture and acquisition ability is what most researcher label as absorptive capacity (Tallman, Jenkins, Henry, and Pinch, 2004; Liao et al., 2009; Yonadori and Cui, 2011). Liao et.al., (2009) concluded that knowledge acquisition has a positive relationship with innovation capability but argued that knowledge acquisition is indirectly influenced by innovation capability. Lin, Che, and Ting (2012), found that a higher degree of market knowledge and customer knowledge stimulate better product innovation performance. However, the same research found that market orientation itself is not sufficient to guarantee success. In addition, competitors' orientation constrained firms' product innovation vision by increasing imitative learning and introduction of me-too products while reducing the odds of new-to-the-world products (Lin, Che, and Ting, 2012). Hana (2013) results contradict the widely held assumption about the importance of knowledge dissemination practices for innovation by finding no formal or informal relationship between knowledge dissemination practice and innovation.

4.3 Training and Mentoring

The third KM practice, that Earl (2001) surveyed was training and mentoring. This practice indicates how firms, develop, transfer and retain the knowledge of their workers. This practice is geared toward improving worker skills and knowledge. Following the ontological dimension, at a fundamental level, knowledge is created by individuals therefore, organizations must provide a context for such individuals to create knowledge (Nonaka, 1994). One way to create this context is to train and mentor employees. According to Earl (2001), it was more prominent in large firms and encompasses practices like encouraging workers to continue their education by reimbursement of tuition fee, knowledge transfer from experienced workers and offering off-site training to workers in a bid to keep skills current. Gloet and Terziovski (2004) found that there exist a significant and positive relationship between elements of human resource/ humanist approaches to KM and innovation performance. Hana (2013), is of the idea that individual training plays an important role in contributing to internal learning and the generation of new ideas within the business. Experienced workers should transfer their knowledge to new or less experienced workers and provide informal training related to knowledge management. This transfer is important since not all workplace skills can be codified and

disseminated through documentation (Earl, 2001). This orientation makes a strong case for the role of human resource in knowledge management.

4.4 Policies and strategies

The fourth KM practice is policies and strategies. According to Earl (2001) this encompasses several aspects: written KM policy or strategy; values system or culture intended to promote knowledge sharing; policies or programs intended to improve worker retention; and use of partnerships or strategic alliances to acquire knowledge. Aranda and Fernandez (2002) concluded knowledge management policies to be the main drivers of service innovation. The two advocated for more flexible and versatile KM policies to foster robust innovation efforts. Martins and Terblanche (2003) noted that organizational culture is instrumental to organization innovation. The two argued that organizational culture affects the extent to which creative solutions are encouraged, supported and implemented. An organizational culture that support creativity is likely to encourage innovative solutions, and regards creativity as desirable and favours innovators as models to be emulated (Martins and Terblanche, 2003).

Hana (2013) emphasized the importance of business cooperation as a route for the transmission of the knowledge and experience in the production network. Internal environment of the firm need to present innovative culture that is characterized by transience of organizational structures, utilization of specialists and temporary teams, mobile offices, all that allow for speedy and flexible changes responding to new opportunities, which increases the innovative potential of a firm (Hana, 2013). The author also found that all innovations (Incremental and radical) required flexible and opportunistic organizations. Corporate culture can be a stumbling block and must be addressed if innovators are to be nurtured. Innovators require appropriate degree of autonomy and flexibility, all of which will come from the policies adopted by a firm. Companies such as Google, McDonald, and Reuters present examples of companies that have succeeded in creating the right structure and environment for innovation. Entrepreneurial culture with it proactive characteristics can enhance informational search that can result to innovation (Lin, Che and Ting, 2011).

4.5 Incentives

The fifth KM practice that Earl (2001) used is incentives, which basically capture the extent to which knowledge sharing was rewarded with both monetary or/and non-monetary incentives. Innovators require acknowledgement for technical contribution, power, or independence as much as money (Roffe, 1999).Yanadori and Cui (2013) argued that the design of employee compensation systems is an important strategic decision that is likely to influence the success of a firm's effort to enhance innovation. The more powerful the idea and the greater its potential impact on the organization the greater the risk and the more personal it becomes hence the individual behind it should be rewarded handsomely (Koulopoulos, 2009). Yanadori and Cui (2013) found that, in the context of research and development, large pay differentials among employees create disincentives that preclude innovation. Pay mix or pay administration and stock-based compensation influence innovation (Yanadori and Cui, 2013). In support of these findings, Zhou, Zhang and Sanchez (2011) identified base-salary increases and long-term incentives plans such as stock options as having the most significant and positive effects on innovation. This was supported by Peter (2009), who found that innovation success and performance is highest under a group incentive scheme that rewards long-term joint success. Andriopoulos (2001) noted that ongoing research in the area of creativity shows that there are two type of motivation, extrinsic and intrinsic, the latter being more important for creativity. Zhou, Zhang, and Sanchez (2011) and Andriopoulos (2001), concluded that tangible extrinsic and intrinsic rewards are necessary to encourage the innovative behavior of employees. Amabile (1996) as cited by Roffe (1999), argued that intrinsic motivation enhances creativity, but extrinsic motivation can hamper it. This was supported by Hislop (2009), who noted that in the area of reward there isn't a consensus at all on the best way forward, whether to link reward to innovation or even whether the reward should be individual or group-based.

4.6 Communication

The sixth KM practice is communication. This involve whether workers shared knowledge: by regularly updating databases of good work practices, lessons learned or listings of experts; by preparing written documentation such as lessons learned, training manuals, good work practices, article for publication etc. (organizational memory); in collaborative work by project teams that are physically separated. The aim of creating an effective system of communication according to Roffe (1999) is to ensure that a systematic channel catches and examines as many ideas as possible. Zdunczyk and Blenkinsopp (2007) noted a learning organization is the one where there is a safe environment of trust, understanding, acceptance, and dialogue where everyone's ideas are given equal consideration. These sentiments were supported by Roffe (1999), who argued that organizational structures that discourage the communication of ideas and flexibility impede innovation. Such organization must be supportive of experimentation and seniors are open to ideas.

Where there is good communication, employees will be able to access information in a timely manner hence enhancing innovative effort. This was supported by Andriopoulos (2001) who suggested that employees will be most creative where there is perpetual constructive feedback. Roffe (1999) posit that communication and collaboration are important factors in stimulating ideas since it is the only way individuals, groups, and organizations can learn from each other. By means of internal communication people are enabled to become more involved in all parts of the organization and makes innovations useful to everyone. Smaller firms are more flexible in this knowledge management practice, and this is drawing the attention of their larger counterparts (Roffe, 1999). Martins and Terblanche (2003) pointed out that where the organizational culture supports open and transparent communication based on trust, it is likely to enhance creativity and innovation.

V. Conclusion

Based on this article, it is evident that knowledge management practices play a significant role in innovation. Based on the review of the literature the following conclusions can be drawn. First, leadership and policies and strategies mirror the internal environment and can promote or hinder innovation. Therefore they need to present innovative culture and room that allow speedy and flexible changes which increases the innovative potential of a firm. A centralized style of leadership seems to be a catalyst of innovation. Secondly, the importance of training and mentoring cannot be overemphasized in providing a context for individual to create knowledge. For individuals and group to continually be innovative they need to be supported through deliberate organizational systems and structures in their effort to learn and acquire new knowledge. Thirdly, above training and mentoring, firms must come up with reward systems that are tied to the innovation performance by individuals and groups. Lastly, communication facilitate innovation through seamless flow of information and idea, provision of prompt feedback and trust and as such should be cultivated and enhance if innovation performance is to improved.

VI. Suggestions for Further Research

The area for further research emanating from this study should include; how innovation influence knowledge acquisition, most research assume causal relationship between knowledge acquisition and innovation, but as pointed out there is need to see whether the relationship is also reverse. Further research could be carried out to clarify the relationship between knowledge capture and acquisition and innovation since the review of the literature by this study seem to point to a mixed feedings. Finally, regarding reward and innovation, more research could be carried out to identify which reward type (intrinsic or extrinsic) tend to influence innovation more.

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