KNOWLEDGE MANAGEMENT STRATEGIES AS INTERMEDIARY VARIABLES BETWEEN IT-BUSINESS STRATEGIC ALIGNMENT AND FIRM PERFORMANCE

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Abstract

Since the relationship between knowledge management and IT-business strategic alignment should be investigated further, highlighting the importance of knowledge (both tacit and explicit) in the formation and implementation of IT strategy; this research aims to review and discuss the links between data, information, and knowledge; how researchers classify knowledge; the ways that firms could manage their knowledge and systems; the difficulties and challenges that firms might face when implementing knowledge management systems, and the ways in which managers should resolve such challenges; and empirical research on the linkage between knowledge management strategies and firm performance. Consequently, further research is needed to validate the ways researchers measure the associations among IT-business strategic alignment, knowledge management, and firm performance in both developed and developing countries and across different industries.

Keywords: IT-Business Strategic Alignment, Knowledge Management, Firm Performance

Introduction

The mixed results of the linkage between IT-business strategic alignment and firm performance call for more research into intermediary variables that translate the benefits of strategic alignment into increased firm performance (see Tanriverdi, 2005; Tanriverdi and Venkatraman, 2005; Celuch et al., 2007; Chan and Reich, 2007; Masa'deh and Shannak, 2012; Coltman et al., 2013; Masa'deh, Maqableh, and Karajeh, 2014; Tarhini et al., 2014). Murray (1998) emphasized that KM is a strategy that utilizes a firm's intellectual assets and the talents of its members to produce new products, values, and to enhance competitiveness. Some scholars (e.g. Alavi and Leidner, 2001; Shannak et al., 2010; Masa'deh and Shannak, 2012; Shannak et al., 2012; Shannak, Masa'deh, and Alkour, 2012; Kannan et al., 2013; Tarhini et al., 2013) emphasize the need for large firms to integrate their IT with their KM strategies and processes in order to survive in their highly competitive business environments. Moreover, others (e.g. Pollalis, 2003; Masa'deh et al. 2013) argue that strategic alignment can produce positive impacts for firms, if they view IT as a strategic component rather than as a support tool for the firm's operations. Therefore, some researchers emphasize that KM capability could be a vital mediator between IT and firm performance (Barua et al., 1995; Devaraj and Kohli, 2000; Tanriverdi, 2005; Chan and Reich, 2007; Masa'deh and Shannak, 2012; Coltman et al., 2013).

The hierarchical construct, from data to information to knowledge, is well known in the IT field. While data is seen as text in a database, knowledge is considered as a renewable and re-usable asset, which is valuable to a firm, and is enhanced with an employee's experience. While information can be seen in a firm's records and databases, knowledge is in a person's mind. In addition, the role of IT in applying knowledge varies from providing access to sources of knowledge, and gathering, storing, and transferring knowledge, to supporting the development of individual and organizational competencies. Moreover, Nonaka (1994) distinguished two types of knowledge: explicit and tacit knowledge. Since explicit knowledge tends to be considered as everything that can be documented, archived, or codified, it can be contained within artefacts like paper or technology. Therefore, it could be shared (e.g. books can be passed on, databases can be consulted). Tacit knowledge is more difficult to qualify, and is retained by people in their mind sets. Hence, it is the product of their minds' experiences and learning. Nevertheless, in some cases it could be shared (e.g. by the use of email, chat rooms, or instant messaging as individuals tend to use such technologies informally), however, it is mostly shared in the course of story-

telling and in conversations (Coakes, 2004). Nonetheless, explicit knowledge and tacit knowledge complete each other, and both are important elements of knowledge management approaches in firms (Beijerse, 1999; Alwis and Hartmann, 2008).

Nonaka (1994) and Nonaka et al. (2000) assumed that knowledge is created in a firm by conversion between tacit and explicit knowledge, and in turn proposed four different modes of knowledge conversion: socialization, externalization, combination, and internalization. In addition, tacit social knowledge could occur in firms at both the individual and group levels. While knowledge about language, individual identity, and work practice are considered as individual tacit knowledge; group tacit knowledge could be expressed in terms of work practice, identity practice, and membership practice. Moreover, Zack (1999) focused on knowledge strategy and its alignment to business strategy by classifying knowledge into three levels: core, advanced, and innovative; and then performing gap analysis, which involves strategic gap and knowledge gap. In addition, firms need to manage their knowledge resources more efficiently to enhance performance and to attain a competitive advantage. Furthermore, the goal of KM, in part, is to capture the tacit knowledge required by a business process. Therefore, KM enables a firm to position its tacit knowledge for responding quickly to customers, creating new markets, developing new products, and dominating emerging technologies. Another goal of KM is to capture the explicit knowledge required by firms. This is by applying technical and socio-technical organizational knowledge management systems (OKMS). Consequently, scholars emphasize the need for firms to integrate their IT with their KM strategies, processes, and practices to achieve competitive advantages and greater financial performance.

This research consists of four sections with regard to knowledge management strategies. Firstly, section 2.1 begins by elaborating the differences between data, information, and knowledge categorizations. This is to distinguish and highlight the role of IT in each field. Section 2.2 discusses the ways in which researchers classify knowledge. This is to consider its relation to the area of knowledge management. Section 2.3 shows how knowledge is managed in firms. Since IT managers lack a clear vision of how to improve organizational performance, section 3 addresses the link between knowledge management strategies and firm performance. Section 4 concludes the research's observations.

Intermediary Factor: Knowledge Management Strategy

Managers and academics have recently become more conscious of the need for improved management of organizational knowledge. This section will investigate the literature within the concept of knowledge management.

This is by viewing the definitions of knowledge, knowledge categories, and how firms get benefits from managing their knowledge.

The View of Data, Information, and Knowledge

Some researchers (e.g. Fahey and Prusak, 1998) argued that if knowledge is not a term that is different from data or information, then what is new regarding knowledge management? Vance (1997) defined data as a raw numbers and facts, whereas information is processed data, and knowledge is considered to be authenticated information. In addition, Davenport (1997) stated that data is not endowed with any meaning, while information is made when data is taken by someone and given some kind of meaning. Also, when somebody gives the information a particular meaning and interpretation, then knowledge is being made. Furthermore, the hierarchical view (from data to information to knowledge) is considered in the IT field. While data is seen a text in a database (Davenport, 1997), Ginsburg and Kambil (1999) considered knowledge as a renewable and re-usable asset, which is valuable to a firm, and is enhanced with a firm's employee experience. Moreover, Alavi and Leidner (2001) argued that information is translated into knowledge once it is processed in the minds of individuals, and knowledge become information when it is articulated and presented to others in the form of text, graphics, spoken, and written words. As a result, while information can be seen in a firm's records and databases, knowledge is in a person's mind. An earlier study conducted by Godbout (1999) distinguished the links between data, information, and knowledge. They argued that the difference related to each stem from two things, the purpose and the context (see figure 1).

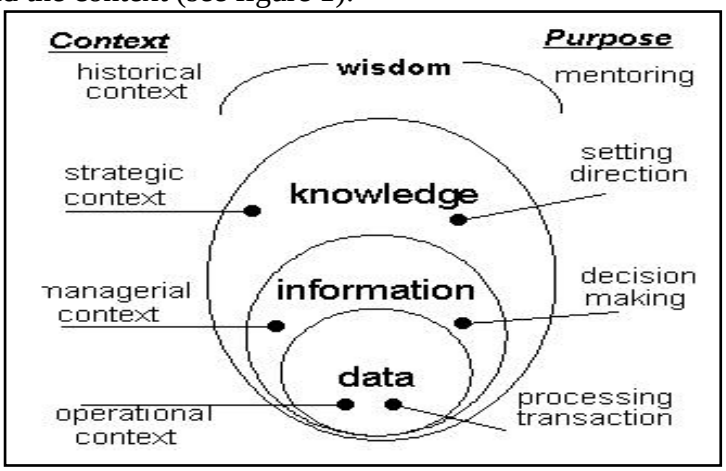

Figure 1: The Hierarchy of Meanings (Godbout, 1999)

While purpose relates to the cause that gave birth to the object, the context gives its relative value to the user. Godbout (1999) argued that data

consist of recordings of transactions and events that will be used for exchange between humans or even with machines. Hence, data do not carry meaning except if an individual understands the context in which the data were gathered. Information includes data, and also all the information a person comes in contact with as a member of a social organization. It comes in a variety of forms such as writings, statements, statistics, diagrams or charts. Also, information becomes individual knowledge when it is accepted and retained by an individual. Equally, organizational knowledge exists when it is accepted by an agreement of a group of persons. However, common knowledge does not need to be shared by all members to exist; for example, if it is accepted among a group of informed people, then this can be considered a sufficient condition.

Moreover, some researchers considered knowledge from several perspectives. For instance, Alavi and Leidner (2001) proposed five perceptions of knowledge:

1. Knowledge as a state of knowing and understanding.
2. Knowledge as an object to be stored and manipulated.
3. Knowledge as a process of knowing and acting.
4. Knowledge as a condition of having access to information.
5. Knowledge as a capability to influence future action.

The first type of knowledge could be achieved by enabling individuals to expand their personal knowledge, and to apply it to the firm's needs. Therefore, the role of IT is vital in providing access to sources of knowledge. The second perspective argues that knowledge can be viewed as a thing to be stored and manipulated. This could be made by taking the IT role in account of gathering, storing, and transferring knowledge. Thirdly, the process perspective focuses on applying expertise. The role of IT here is to provide links among sources of knowledge, to create depth of knowledge flows. Fourthly, according to this view, organizational knowledge must be organized to facilitate access to and retrieval of content. Therefore, IT should offer valuable search and retrieval methods to locate the required information. The final perspective argues that the capacity to use information, learning and experience will result in an ability to interpret information and to find out what information is necessary in decision making. Hence, IT should support the development of individual and organizational competencies.

To sum up, while data consist of recordings of transactions and events that will be used for exchange between humans, or even with machines, information includes data, and also all of the information a person comes in contact with as a member of a social organization. This comes in a variety of forms, such as writings, statements, statistics, diagrams or charts. Furthermore, knowledge exists in a firm when it is accepted by an agreement of a group of persons (i.e. knowledge is in a person's mind). Also, the role of

IT in applying knowledge is vital for firms. This is by providing access to sources of knowledge; gathering, storing, and transferring knowledge; providing links among sources of knowledge to create depth of knowledge flows; offering valuable search and retrieval methods to locate the required information; and supporting the development of personal and organizational competencies.

Categories of Knowledge

Two dimensions of knowledge in firms have been identified, explicit and tacit (Nonaka, 1994; Nonaka et al., 2000). According to Nonaka (1994), explicit or codified knowledge refers to knowledge that is transmittable in formal and systematic language, whereas tacit knowledge refers to knowledge that is hard to formalize, since it is linked to a personal quality. Nonaka et al. (2000) assert that explicit knowledge can be expressed in formal and systematic language, and shared in the form of data, scientific formulae, specifications, manuals and such like. It can be processed, transmitted and stored relatively easily. In contrast, tacit knowledge is highly personal and is hard to formalize. Subjective insights, institutions, and hunches fall into this category of knowledge.

Furthermore, Nonaka (1994) and Nonaka et al. (2000) assumed that knowledge is created in a firm by conversion between tacit and explicit knowledge, and in turn proposed four different modes of knowledge conversion (see figure 2):

1. Socialization: from tacit knowledge to tacit knowledge (e.g. exchanging experience while drinking coffee).

2. Externalization: from tacit knowledge to explicit knowledge (e.g. capturing personal knowledge in transmittable form such as emailing a colleague).

3. Combination: from explicit knowledge to explicit knowledge (e.g. adding new knowledge in a firm's database).

4. Internalization: from explicit knowledge to tacit knowledge (e.g. implementing knowledge acquired in training course).

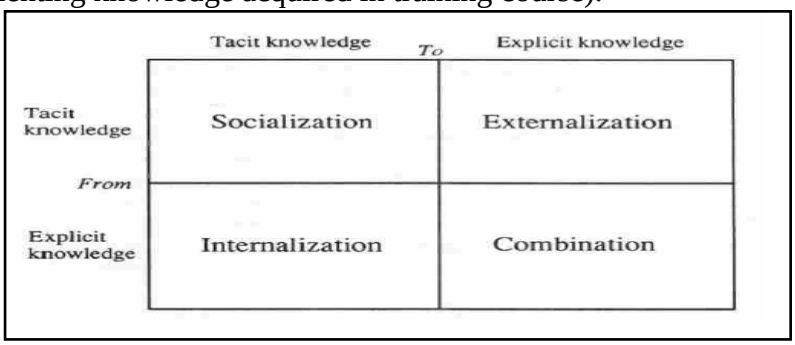

Figure 2: Modes of Knowledge Conversion (Nonaka, 1994)

Nonaka et al. (2000, p.9-10) elaborated the four modes of knowledge conversion as follows: Socialization is the process of converting new tacit knowledge through shared experiences. Since tacit knowledge is difficult to formalize and often time- and space-specific, tacit knowledge can be acquired only through shared experience, such as spending time together or living in the same environment. Socialization typically occurs in a traditional apprenticeship, where apprentices learn the tacit knowledge needed in their craft through hands-on experience, rather than from written manuals or textbooks. Socialization may also occur in informal social meetings outside of the workplace, where tacit knowledge such as world views, mental models and mutual trust can be created and shared. Socialization also occurs beyond organizational boundaries. Firms often acquire and take advantage of the tacit knowledge embedded in customers or suppliers by interacting with them.

Externalization is the process of articulating tacit knowledge into explicit knowledge. When tacit knowledge is made explicit, knowledge is crystallized, thus allowing it to be shared by others, and it becomes the basis of new knowledge. Concept creation in new product development is an example of this conversion process. Another example is a quality control circle, which allows employees to make improvements on the manufacturing process by articulating the tacit knowledge accumulated on the shop floor over years on the job. The successful conversion of tacit knowledge into explicit knowledge depends on the sequential use of metaphor, analogy and model.

Combination is the process of converting explicit knowledge into more complex and systematic sets of explicit knowledge. Explicit knowledge is collected from inside or outside the organization and then combined, edited, or processed to form new knowledge. The new explicit knowledge is then disseminated among the members of the organization. Creative use of computerized communication networks and large-scale databases can facilitate this mode of knowledge conversion. When the comptroller of a company collects information from throughout the organization and puts it together in a context to make a financial report, that report is new knowledge in the sense that it synthesizes knowledge from many different sources in one context. The combination mode of knowledge conversion can also include the “breakdown” of concepts. Breaking down a concept such as a corporate vision into operationalised business or product concepts also creates systemic explicit knowledge.

Internalization is the process of embodying explicit knowledge into tacit knowledge. Through internalization, explicit knowledge is shared throughout an organization and converted into tacit knowledge by individuals. Internalization is closely related to “learning by doing”. Explicit knowledge, such as the product concepts or the manufacturing procedures,

has to be actualized through action and practice. For example, training programs can help trainees to understand an organization and themselves. By reading documents or manuals about their jobs and the organization, and by reflecting upon them, trainees can internalize the explicit knowledge written in such documents to enrich their tacit knowledge base. Explicit knowledge can also be embodied through simulations or experiments that trigger learning by doing. When knowledge is internalized to become part of individuals' tacit knowledge bases in the form of shared mental models or technical know-how, it becomes a valuable asset. This tacit knowledge accumulated at the individual level can then set off a new spiral of knowledge creation when it is shared with others through socialization.

According to Nonaka et al. (1994), the following list summarizes the factors that characterize the four knowledge conversion modes. Factors that constitute the knowledge-conversion process are:

1. Socialization: from tacit to tacit

(a) Tacit knowledge accumulation: managers gather information from sales and production sites, share experiences with suppliers and customers and engage in dialogue with competitors.

(b) Extra-firm social information collection (wandering outside): managers engage in bodily experience through management by wandering about, and get ideas for corporate strategy from daily social life, interaction with external experts and informal meetings with competitors outside the firm.

(c) Intra-firm social information collection (wandering inside): managers find new strategies and market opportunities by wandering inside the firm.

(d) Transfer of tacit knowledge: managers create a work environment that allows peers to understand craftsmanship and expertise through practice and demonstrations by a master.

2. Externalization: from tacit to explicit

(a) Managers facilitate creative and essential dialogue, the use of "abductive thinking", the use of metaphors in dialogue for concept creation, and the involvement of the industrial designers in project teams.

3. Combination: from explicit to explicit

(a) Acquisition and integration: managers are engaged in planning strategies and operations, assembling internal and external data by using published literature, computer simulation, and forecasting.

(b) Synthesis and processing: managers build and create manuals, documents, and databases on products and services and build up material by gathering management figures or technical information from all over the company.

(c) Dissemination: managers engage in the planning and implementation of presentations to transmit newly-created concepts.

4. Internalization: from explicit to tacit

(a) Personal experience; real-world knowledge acquisition: managers engage in "enactive liaising" activities with functional departments through cross-functional development teams and overlapping product development. They search for and share new values and thoughts, and share and try to understand management visions and values through communications with fellow members of the organization.

(b) Simulation and experimentation; virtual-world knowledge acquisition: managers engage in facilitating prototyping and benchmarking, and facilitate a challenging spirit within the organization. Managers form teams as a model and conduct experiments and share results with the entire department.

Moreover, Hansen et al. (1999) introduced the concepts of the codification and personalization of knowledge management strategies, which can be referred to as explicit and tacit knowledge strategies. An example of explicit knowledge management strategy (i.e. codification) is the interaction between people and documents. This is by developing an electronic document system which codifies, stores, disseminates, and allows re-use of knowledge. An example of a tactic knowledge management strategy (i.e. personalization) is the interaction between people together. This is by developing networks for linking people in which tacit knowledge can be shared.

Furthermore, some researchers (e.g. Linde, 2001) used tacit knowledge, in the field of knowledge management, to describe any form of non-quantifiable knowledge, mostly the knowledge about social interactions, social practices, and generally how a group or an institution gets things done. An early study conducted by Linde (2001) tested if tacit knowledge can be considered in the knowledge management area because of its difficulties to represent as propositions and rules. The author proposed various classifications of "taxonomy" of types of tacit knowledge, with particular regard to the tacit social knowledge perspective. The taxonomy distinguishes between two types of social knowledge: knowledge about social groups held by an individual; and knowledge held by the group itself (see figure 3).

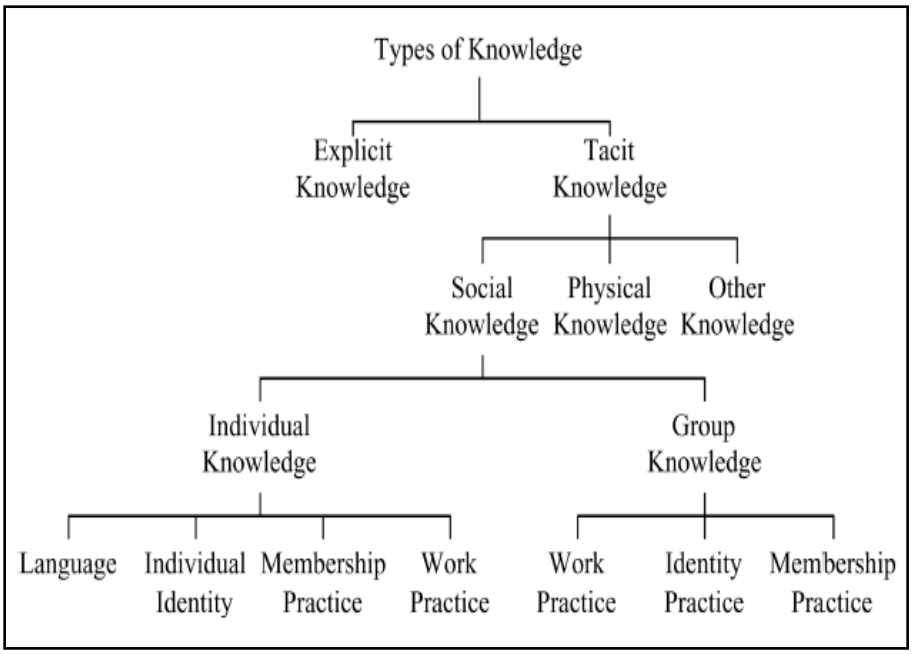

Figure 3: Types of Knowledge (Linde, 2001)

According to Linde (2001, p. 161) "of individual tacit knowledge, language is perhaps the most tacit form of tacit knowledge: one knows how to speak, but cannot articulate how one does it, or the rules which govern language use. Part of the knowledge of language includes knowledge of discourse forms: how and when to tell a story. Knowledge about identity, which one is and what one's history has been, is a very important part of an individual's tacit knowledge. Linde (1993) describes the ways in which people use narrative to construct these identities. Knowledge about one's identity as a group member, and the practice of acting as a member of the groups one belongs to is also easily expressed in narrative. Knowledge about work practice, how one does one's job is also tacit, and can, under certain circumstances be conveyed by narrative".

The second type of social knowledge is knowledge which is held by the group or institution itself. Linde (2001, p. 161-162) stated "some social knowledge is explicit knowledge, for example, the knowledge expressed in forms, formal procedures, file cabinets, and databases. However, in addition to procedures, there is also tacit knowledge which manifests as work practices, as well as the knowledge about how and when to use these knowledge resources. This kind of knowledge is held by an institution as a whole rather than by the individuals who comprise it. Other types of group tacit social knowledge include the ways that teams and groups work together, how decisions are made, how communications flow. Knowledge about the identity of an institution and the proper ways to be a member are very easily

conveyed to new members by narrative, although it is almost impossible to represent such knowledge explicitly". Therefore, based on the above discussion, tacit social knowledge could occur in firms at the individual and/or group levels.

Moreover, some scholars (e.g. Zack, 1999) focused on knowledge strategy and its alignment to business strategy. Zack (1999) classified knowledge into three levels: core, advanced, and innovative. Core knowledge referred to the minimum level of knowledge required by a firm to start competition with others. Advanced knowledge related to the level of knowledge that guarantees a firm to be competitively viable. Innovative knowledge referred to the knowledge that enables a firm to lead its competitors and industry. However, knowledge is dynamic in nature (i.e. what is innovative knowledge today will be the core knowledge of tomorrow); hence, defining a competitive position is essential and needs continuous learning and knowledge acquisition.

Zack (1999) furthermore proposed a strategic knowledge framework (see figure 4), which could be used to identify where a firm stands regarding its desired strategic knowledge (i.e. to assess its internal knowledge gap), and its competitors (i.e. to assess its external knowledge gap); and to plot the future trajectory of its knowledge.

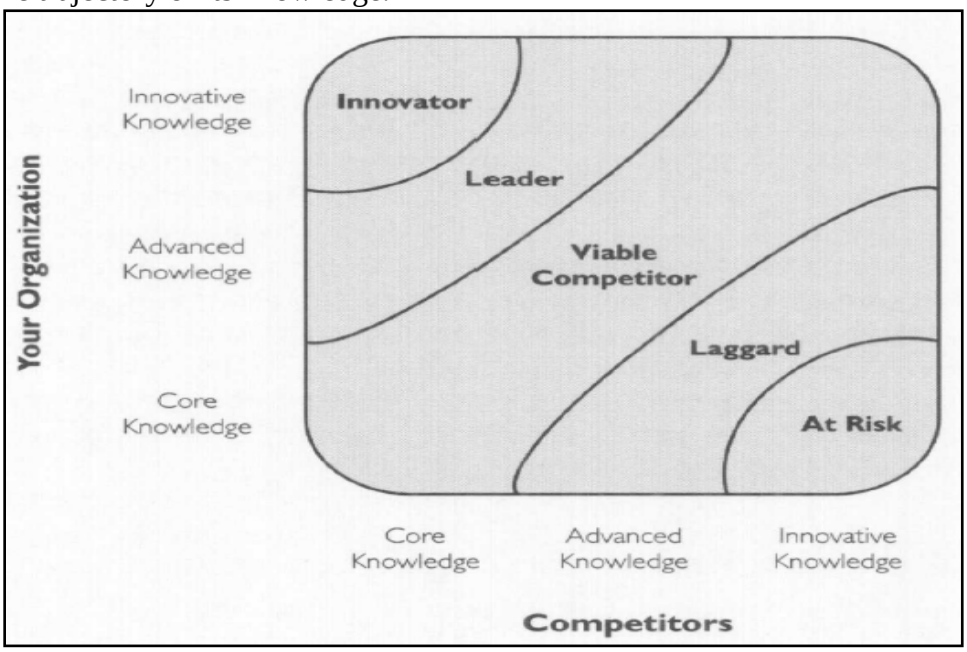

Figure 4: Strategic Knowledge Framework (Zack, 1999)

Once a firm knows its competitive position, then it can conduct a gap analysis, which investigates the strategic gap and the knowledge gap (see figure 5).

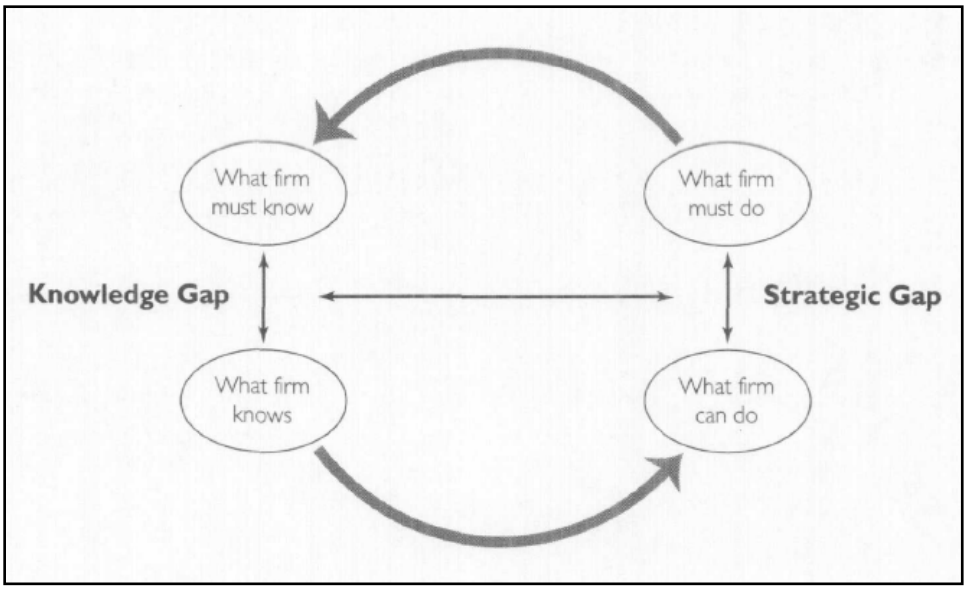

Figure 5: Gap Analysis (Zack, 1999)

Strategic gap represents the gap between what a firm must do to compete (e.g. a firm's business opportunities and threats) and what it can do (e.g. a firm's business strengths and weaknesses). After that, the strategy elaborates the way in which a firm balances its "cans" and "musts" to develop its strategic position. On the other hand, the knowledge gap represents the gap between what a firm must know to execute its strategy (e.g. a firm's knowledge opportunities and threats), and what it does know (e.g. a firm's knowledge resources and capabilities). Once a firm determines its knowledge gap, then it can decide which knowledge should be developed or obtained.

In addition, if a firm stands at a lower level of knowledge than required to implement its strategy or secure its position, it demands a high level of knowledge processing to fill its internal knowledge gap. Also, if a firm's competitors operate at higher level of knowledge than it, a high level of knowledge processing is needed to close the external knowledge gap. Furthermore, it is important to say that the knowledge gap is derived from the strategic gap, and is also aligned with it. In other words, aligning strategy with knowledge is an essential issue for a firm's knowledge strategy. Also, such alignment could assure that knowledge management activities are driven by and are supportive of the firm's competitive strategy.

In summary, Nonaka (1994) distinguished two types of knowledge. Whereas explicit knowledge refers to knowledge that is transmittable in formal and systematic language, tacit knowledge refers to knowledge that is hard to formalize, since it is linked to a personal quality. Nonaka (1994) and

Nonaka et al. (2000) assumed that knowledge is created in a firm by a conversion between tacit and explicit knowledge, and in turn proposed four different modes of knowledge conversion: socialization, externalization, combination, and internalization. Socialization is the process of converting new tacit knowledge through shared experiences. Externalization is the process of articulating tacit knowledge into explicit knowledge. Combination is the process of converting explicit knowledge into more complex and systematic sets of explicit knowledge. Internalization is the process of embodying explicit knowledge into tacit knowledge. Tacit social knowledge could occur in firms at the individual and group levels. While knowledge about language, individual identity, membership work, and work practice are considered to be individual tacit knowledge; group tacit knowledge could be expressed in terms of work practice, identity practice, and membership practice. Zack (1999) focused on knowledge strategy and its alignment to business strategy by classifying knowledge into three levels: core, advanced, and innovative; and then performing gap analysis, which employs the strategic gap and knowledge gap models.

Managing Knowledge in Firms

Knowledge is what a knower knows and there is no knowledge without someone knowing it (Fahey and Prusak, 1998; Altamony et al., 2012). Zack (1999) emphasized that firms consider knowledge to be their most valuable and strategic resource, and confirmed that the more a firm knows about its customers, products, technologies, markets, and their linkages, the better it will perform. Therefore, since knowledge is involved in most activities in firms, it has become a primary factor in their success. In addition, firms need to manage their knowledge resources more efficiently to enhance performance and produce the biggest payoffs (Blake, 1998), and to obtain a competitive advantage (Meso and Smith, 2000; Masa'deh and Kuk, 2009; Masa'deh, 2012; Masa'deh, 2013).

Several researchers in the KM field emphasize the importance of knowledge. For instance, Prusak (1999) in Myers (1996) offered numerous reasons to explain such values. First of all, firms are under huge pressure to stay ahead of competitors because of increased adaptability and process speed, as a result of the globalization of the economy. Also, there is increasing awareness of the value of specialized knowledge, as embodied in organizational processes and routines, in coping with the pressure of economic globalization. In addition, people are now better able to work with and learn from each other as a result of falling cost of networked computing. Alavi and Leidner (2001) argued that a recent survey of European firms by KPMG Peat Marwick (1998b) found that almost half of the companies reported having suffered a significant setback from losing key staff, with

43% experiencing impaired client or supplier relations, and 13% facing a loss of income because of the departure of a single employee. In another survey, the majority of organizations believed that much of the knowledge they needed existed inside the organization, but identifying its existence, finding it, and leveraging it remained problematic (Cranfield University, 1998). Such problems maintaining, locating, and applying knowledge have led to systematic attempts to manage knowledge. Also, according to a recent industry survey, 90 percent of the 811 largest firms in North America and Europe were aware of knowledge management, and most had some activity relating to it underway in the period of 1999-2000 (Harris and Kathy, 1999).

On the other hand, there is no single definition of KM, but generally speaking the idea relates to unlocking and leveraging the knowledge of individuals so that this knowledge becomes available as an organizational resource that is not dependent on those same individuals (Gottschalk, 2000). According to Lehaney et al. (2004, p. 3), knowledge management refers to the systematic organization, planning, scheduling, monitoring, and deployment of people, processes, technology, and environment to facilitate the creation, retention, sharing, identification, acquisition, utilization, and measurement of information and new ideas, in order to achieve strategic aims.

KM is also increasingly becoming an integral business function for lots of firms, as they recognize that competitiveness depends upon the effective management of intellectual resources (Zack, 1999; Grover and Davenport, 2001). By applying such resources, KM can demonstrate a number of benefits for firms (Kalpana and Premkumar, 2008). They emphasized that the goal of KM, in part, is to capture the tacit knowledge required by a business process, and to encourage knowledge workers to share and communicate knowledge with peers. Subsequently, it is easier to determine which processes are more or less effective than others. Therefore, KM enables a firm to utilize it for responding quickly to customers, creating new markets, developing new products, and mastering emerging technologies. In addition, the goal of KM, in part, is to capture the explicit knowledge required by firms. This is by applying organizational knowledge management systems (OKMS), which are considered to be information systems developed to boost the effectiveness of the organization's knowledge management. This includes technical OKMS perception and socio-technical OKMS perception (Meso and Smith, 2000).

Meso and Smith (2000) argued that technical OKMS could be considered an advanced assembly of software, and its associated hardware infrastructure, for supporting knowledge work and/or organizational learning through the free access to, and increased sharing of knowledge. Furthermore, Hibbard (1997) and Chaffey (1998) emphasized that OKMS are employing

one technology or a combination of ten key technologies: groupware, messaging, web browsers, document management, search and retrieval, data mining, visualization, push technology, group decision support, and intelligent agents. Groupware and web browser technologies are the most prominent. While groupware software packages are advanced decision support systems developed to enhance collaborative group work, between geographically dispersed professionals, web-based technologies entail employing a web browser to access knowledge resources on the internet or on intranets that link geographically dispersed professionals.

From the socio-technical perspective, OKMS are seen as being complex combinations of technology infrastructure, organizational infrastructure, people, and corporate culture. First of all, technology infrastructure is constituted by the hardware, software, middle-ware, and protocols that allow for the electronic exchange of knowledge. Secondly, organizational infrastructure refers to both roles and organizational teams, whose members have skills to serve as resources for individual projects. Also, the organizational infrastructure defines the organization's management style; how the employees of the firm are organized into formal and informal teams of departments; how these teams interact formally and informally; and the role and goals of each team, and how these relate to the overall corporate strategy (Davenport and Prusak, 1998). Also, Chan (2002), in 'why haven't we mastered alignment? The importance of the informal organization structure', conducted a case study, researching eight top-performing firms in Canada and the USA to examine the links between strategic and structural alignments with firm performance. While strategic alignment focused on the fit between the activities of the IS functions of the firms, structural alignment related to the structural fit level of the firm's IS formal (i.e. centralization) and informal (i.e. decentralization) decision-making. The study found that the informal structure was more important to IS alignment influenced firm performance than formal organization structure. Thirdly, the heart of the OKMS is the people. This component includes all of the organization's stakeholders - employees, owners, customers, suppliers, regulators, and legislators. Employees are the most significant participants, hence they are considered as the key source of the intellectual capital acquired and managed by the OKMS. Fourthly, culture refers to the shared beliefs, norms, ethics, and practices in an organization. A knowledge-friendly culture is one in which the employees value learning highly, and reveal a positive orientation towards knowledge.

Skyrme and Amindo (1997) reported several challenges a firm could face when implementing knowledge management systems. These include lack of senior management commitment, lack of ownership, lack of rewards and recognition, and focuses on individuals rather than teamwork. Rastogi

(2000, p. 43) identified further difficulties when implementing a KM system, such as:

(a) Motivating employees to search, accept, and adopt best industry practices.

(b) Developing metrics toward appraising the effectiveness of a KM program, and measuring its results.

(c) Motivating employees to share knowledge.

(d) Making knowledge useable, i.e., storing it in any easy way to understand and access, and enabling the employees to relate it to their work.

(e) Identifying suitable people for staffing and implementing the KM program.

(f) Changing people's perceptions and behavior.

(g) Identifying and representing the organization's existing knowledge.

(h) Changing bureaucratic culture and organization structure.

On the other hand, in order to resolve the above problems and difficulties, Rastogi (2000, p. 44) suggested several actions a firm should undertake, such as:

(a) Creating and stressing continuous learning opportunities for employees.

(b) Providing opportunities for people to engage in dialogue and inquiry.

(c) Encouraging and rewarding collaboration and team learning in a sustained manner.

(d) Establishing systems to capture and share learning.

(e) Involving people in developing and sharing a collective vision.

(f) Identifying and developing leaders who model and support learning at the individual, team, and organizational levels.

(g) Developing shared understanding, first at local levels, since that is the focus of learning, (and use of knowledge resides largely at local levels), and then gradually moving toward the level of a company as a whole.

(h) Providing individuals frequent occasions for discussing, debating, and clarifying for themselves what constitutes knowledge in their areas of work.

Davenport and Prusak (1998) studied 31 projects in 24 firms. Eighteen projects were considered to be successful, five were determined failures, and eight were too new to be rated. The study found eight factors that were common in successful KM projects. These factors include linkages to economic performance or industry value, a solid technical and organizational infrastructure, a flexible knowledge structure, a knowledge-friendly culture, clearly-communicated KM systems purposes and goals,

motivational incentives for KM users, multiple channels for knowledge transfer, and senior management support.

To sum up, researchers focused on the reasons and importance of managing a firm's knowledge. Firms are under immense pressure to stay ahead of competitors because of increased adaptability and process speed, as a result of the globalization of the economy. Also, there is an increasing awareness of the value of specialized knowledge, as embedded in organizational processes and routines, in coping with the pressure of economic globalization. In addition, people are now better able to work with and learn from each other as a result of the falling cost of networked computing. Furthermore, in a survey conducted at Cranfield University (1998), the majority of firms believed that much of the knowledge they needed existed inside the organization, but identifying its existence, finding it, and leveraging it remained problematic. Therefore, managing knowledge in firms is essential.

A main goal of KM is to capture the tacit knowledge required by a business process, and to encourage knowledge workers to share and communicate knowledge with peers. Therefore, KM enables a firm to position itself for responding quickly to customers, creating new markets, developing new products, and dominating emerging technologies. In addition, another goal of KM is to capture the explicit knowledge required by firms. This is by applying organizational knowledge management systems, which are considered as information systems that are developed to boost the effectiveness of the organization's knowledge management. This includes technical OKMS perception and socio-technical OKMS perception. Technical OKMS could be considered as an advanced assembly of software, and its associated hardware infrastructure for supporting knowledge work. OKMS employs one technology or a combination of ten key technologies: groupware, messaging, web browsers, document management, search and retrieval, data mining, visualization, push technology, group decision support, and intelligent agents. Socio-technical OKMS are seen as being complex combinations of technology infrastructure, organizational infrastructure, people, and corporate culture. Moreover, a firm could face several difficulties when apply knowledge management systems, including a lack of senior management commitment; lack of making knowledge useable; lack of motivating employees to search, accept, and adopt best industry practices; lack of motivating employees to share knowledge; and lack of rewards and recognition. However, in order to resolve such difficulties, firms should follow several processes and imperatives. These include: senior management support and developing leaders who model and support learning at the individual, team, and organizational levels; establishing systems to capture and share learning; and motivational incentives for KM users.

Knowledge Management and Firm Performance

Some scholars emphasize the need for large firms to integrate their IT with their KM strategies and processes in order to survive in their highly competitive business environments (Alavi and Leidner, 2001; Masa'deh, Gharaibeh, Maqableh, and Karajeh, 2013). Moreover, others argue that strategic alignment can produce positive impacts for firms if they view IT as a strategic component, rather than a support tool for the firm's operations (Pollalis, 2003). For example, Meso and Smith (2000) argued that knowledge management could be considered as the creation of sustainable competitive advantage via continued organizational learning. This is by arguing that new knowledge is created from the process of organizational learning (explicit and tacit knowledge), and it in turn generates continuous innovation (see figure 6).

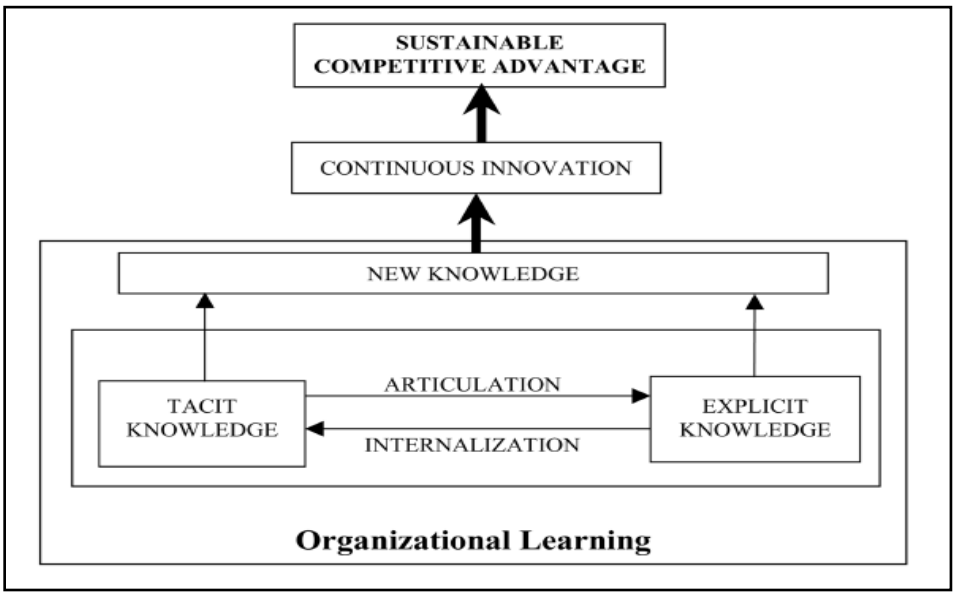

Figure 6: Knowledge and Competitive Advantages (Meso and Smith, 2000)

Darroch's (2005) research was one of the first empirical studies to test the role of KM in firms. Mail surveys of 443 CEO's in large New Zealand firms were used to examine the link between KM, innovation, and firm performance. KM was measured by looking at three main constructs: knowledge acquisition, knowledge dissemination, and responsiveness to knowledge. Seven factors characterized knowledge acquisition: valuing employees' attitudes and opinions and encouraging employees to up-skill; having a well-developed financial reporting system; being market-focused by actively obtaining customer and industry information; being sensitive to information about changes in the marketplace; employing and retaining a large number of people trained in science, engineering, or maths; working in

partnership with international customers; and getting information from market surveys. Knowledge dissemination was achieved by two factors: readily disseminating market information around the organization; and using technology such as teleconferencing and videoconferencing to facilitate communication. Moreover, responsiveness to knowledge was measured by five factors: responding to knowledge about customers, competitors, and strategies; being flexible with readily-changeable products; using innovation to create new products for the firm; improvements to existing product lines; and cost reduction of existing products. In addition, innovation was measured by asking firms the extent to which they add new products to the world and to the firm, how they add to existing product lines, how they improve or revise to existing product lines, how they achieve cost reductions on existing products, and how they reposition existing products. Firm performance was evaluated by accounting measures like profits, and non-accounting measures such as market share and sales growth. Darroch's study found firms with KM capability that used resources much more efficiently, and in more innovative ways, were achieving higher returns than others.

Also, some researchers argued that a firm that adopts KM practices can produce a sustainable competitive advantage and obtain superior firm performance. For instance, an empirical study was conducted by McKeen et al. (2006) to test the impact of KM on organizational performance. They defined KM practices as observable organizational activities that are related to knowledge management. They focused on the extent of KM practices and the relationship with the outcomes, instead of the detailed technological or structural procedures that enhance KM. The researchers identified four dimensions of KM practices that are related to performance: the ability to locate and share existing knowledge; the ability to experiment and create new knowledge; a culture that encourages knowledge creation and sharing; and a regard for the strategic value of knowledge and learning. Based on 90 Canadian, US, and Australian firms, representing ten different industry sectors, they found that KM practices correlate directly with several intermediate measures of organizational performance, such as customer intimacy (formed by merging customer satisfaction and customer retention); product leadership (formed by merging innovation and rate of new product development); and operational excellence, which in turn is directly related to firm performance indicators like ROA, ROE, and profitability. Thus, they encouraged practitioners to concentrate on specific intermediate endings and the timing of KM initiative launches. They concluded, however, that further research is needed to validate their results.

In summary, scholars emphasize the need for firms to integrate their IT with their KM strategies, processes, and practices, to achieve competitive advantages and to enhance firm performance. While Darroch (2005) found a

direct link between KM capability (i.e. in terms of knowledge acquisition, knowledge dissemination, and responsiveness to knowledge) and firm performance (i.e. in terms of accounting measures like profits, and non-accounting measures such as market share and sales growth), McKeen et al. (2006) found that KM practices correlate directly with several intermediate measures of firm performance (i.e. customer intimacy, product leadership, and operational excellence), which in turn directly related to firm performance (i.e. ROA, ROE, and profitability).

Conclusion

Since managers are always searching for new ways to improve performance, the elusive link between strategic alignment and firm performance calls for further research into intermediate variables which strategic alignment may affect firm performance; researchers suggested that both explicit and tacit knowledge management (KM) strategies could enhance accounting and market firm performance. Therefore, this research has showed the links between data, information, and knowledge. While data is seen as text in a database, information is translated to knowledge once it is processed in the mind of individuals. Also, knowledge management methods, in general, can be categorized as explicit knowledge and tacit knowledge. Explicit knowledge is considered to be everything that can be documented, codified, and then shared (e.g. books can be passed on, databases can be consulted). In fact, many writers would argue that explicit knowledge is not knowledge at all, but rather information or data (Coakes, 2004). Tacit knowledge is the product of people minds' experiences, which could be shared by the use of email, chat rooms, or instant messaging, as individuals tend to use such technologies informally.

Furthermore, since both explicit knowledge and tacit knowledge complete each other, and are significant elements of knowledge management approaches in firms, this research has discussed further theoretical studies into the ways in which firms could manage their knowledge and systems in terms of technical organizational knowledge management systems and socio-technical organizational knowledge management systems. The research also reviewed some of the difficulties and challenges that firms might face when implementing knowledge management systems, such as a lack of senior management commitment, lack of ownership, lack of rewards and recognition, and focus on individuals rather than teamwork; and the ways in which managers should attempt to resolve such challenges. In addition, since firms need to manage their knowledge resources more efficiently, to enhance performance and attain competitive advantage, this research has presented some empirical research on the linkages between knowledge management strategies and firm performance.

Moreover, recent researchers (e.g. Kearns and Lederer, 2001; Chan et al., 2006; Chan and Reich, 2007) have continuously called for more research into the factors that affect IT-business alignment and the coupling process (e.g. knowledge management strategy) between alignment and enhanced firm performance. Thus, further research is needed to validate the ways researchers measure firm performance (e.g. objective as opposed to subjective measures; and accounting as opposed to market-based metrics), and provide a detailed review of how MIS researchers measured firm performance with relation to IT and IT-business strategic alignment.

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