Critical factors in the successful implementation of knowledge management

ABSTRACT:

The globalization of business, the shift from production-based to a knowledge-based economy, the growth of information communications technology (ICT), the strive to become learning organizations and the emergence of the needs for knowledge workers have made knowledge management practice a must today across all types and levels of firms (Chong, 2005). However, because the concept is so new, there exist different views among practitioners and even researchers on how a knowledge management program can be designed and implemented in organizations. This paper posits that knowledge management consists of critical enablers such as employee training, employee involvement, teamwork, employee empowerment, top management leadership and commitment, organizational constraints, information system infrastructure, performance measurement, egalitarian culture, benchmarking, and knowledge structure that are critical to the success of a knowledge-based organisation. These critical factors will provide a greater understanding to the researchers and practitioners of the enablers of a successful knowledge management program.

Introduction

Society has recognized the value of knowledge for centuries. Intellectual reflection on knowledge has been pursued for as long as records of human activities are available. It has been studied by philosophers and has been practiced for centuries (Chaw et al., 2003). For hundred of years, owners of family members have passed off their commercial wisdom to their children, master craftsmen have painstakingly taught their trades to apprentices and workers have exchanged ideas and know-how on the job (Hansen et al, 1999). However, the terminology of knowledge management was not widely used until the middle of the nineties (Chaw et al., 2003).

In the nineties, the characteristics of the business environment have changed. The increasing globalization of business, leaner organizations, products and service convergence and vast development of technology (Davenport & Prusak, 1998) implied that the issues of more efficient and effective operation of an organization’s knowledge assets have become more important than ever before. Drucker (1999) fittingly warned us years ago that those who wait until this challenge indeed becomes a “hot” issue are likely to fall behind, perhaps never to recover. As Drucker (1995) has predicted, knowledge has become the key economic resource and the dominant source of competitive advantage today.

This is evident that few big businesses that already practiced knowledge management are the ones that top the Fortune 500 list and the few small ones top the Inc. 100 Hot Companies to Watch List. According to a survey by Covin et al. (1997), top executives of both Canadian Financial Post 300 firms and US Fortune 500 firms view knowledge resource as critical for organizational success. Moreover, most executives (87 percent) define their organization's business as knowledge-intensive according to a survey by Ernst & Young (Ruggles, 1998). However, it is only recently that companies have finally realized the importance of managing their organizational knowledge for competitive advantage, hence, searching for knowledge management best practices all over.

The main objective of this paper is to identify the best practices that would make knowledge management program works in an organization. To accomplish this, various knowledge management models presented by various researchers and practitioners are reviewed. This paper posits that successful deployment of knowledge management program depends on eleven critical enablers such as employee training, employee involvement, teamwork, employee empowerment, top management leadership and commitment, organizational constraints, information system infrastructure, performance measurement, egalitarian culture, benchmarking, and knowledge structure. The paper proceeds to discuss the definitions of knowledge management. How the key success factors emerged from the literature is then explored. The propositions of how the presence of these key success factors influence the successful implementation of knowledge management in organizations are then discussed. Recommendations are presented at the end of the paper.

Defining Knowledge Management: No Consensus On Universal Agreeable Definition

Knowledge management is a broad subject with many facets ranging from databases to patents, from the Intranet to the mentor, from coldly technical to warmly personal concepts. The idea of managing knowledge is recent, but the language used to describe it is still in its infancy (Shaw, 1999). The processes and terminology associated with knowledge management often sounds abstract. However, it is concrete, practical and profoundly important (Leonard-Barton, 1995).

Based on the review of the literatures presented by many academics and practitioners, it can be concluded that there is not yet a common consensus on the definition and concept of knowledge management (Earl, 1999) despite a great deal of interest on the subject. Defining knowledge management is especially difficult, as different perspectives or schools of knowledge management can yield different dimensions and meaning (Salleh & Goh, 2002). For example, management information systems researchers and practitioners tend to define knowledge management as an object that can be recognized and controlled in computer-based information systems. Management researchers, on the other hand, address knowledge as processed based on individual and organizational competencies such as skills and know-how (Davenport & Prusak, 1998; Nonaka & Takeuchi, 1995; Sveiby, 1997; Winter, 1998). Thus, different
However, in the simplest term, knowledge management means exactly that: management of knowledge. It can be extended to management of organizational knowledge for creating business value and generating a competitive advantage. It consists of the processes required to effectively manage knowledge. It is a systematic, explicit and deliberate building, renewal and application of knowledge to maximize a firm’s knowledge-related effectiveness and returns from its knowledge assets (Wiig, 1997). Knowledge management is essential for enterprises to determine where they are going and for organizational survival in the long run, given that knowledge creation is the core competency of any organizations (Leonard-Barton, 1995). It is a key requirement to future successful enterprises and is rapidly being recognized by firms to be of major strategic importance (Dyer, 2000).

This paper adopts Salleh and Goh’s (2002) definition of knowledge management where it is a process of leveraging knowledge as means of achieving innovation in process and products/services, effective decision-making, and organisational adaptation to the market for creating business value and generating a competitive advantage to organizations. If the above statement is true, then it is extremely important that an efficient knowledge-intensive process must be established to meet the demands of improved enterprise performance (Quinn et al., 1996). It is this area that provides the setting for the paper to discuss the various critical factors to successful knowledge management implementation.

**Knowledge Management Success Factors**

Digman (1999) asserts that the critical success factors is useful for structuring environmental analysis because there is an important link between environmental analysis and critical success factors leading to organizational success. The analyses of these factors provide an important meaning to knowledge management through the identification of core processes that are critical to successful knowledge management implementation, as elucidated by Quinn et al. (1996). Thus, a knowledge management program needs to identify critical performance indicators of success factors to gauge its performance (Choi, 2000).

In achieving this, various knowledge management models have been reviewed so that a unified framework of knowledge management can be developed. From the analyses of the models, it was found that several studies have proposed several key variables for successful implementation of knowledge management. For example, Davenport et al. (1998) have identified eight knowledge management success factors such as (1) technology infrastructure; (2) organizational infrastructure; (3) balance of flexibility, evolution and ease-of-accessibility to knowledge; (4) shared knowledge; (5) knowledge-friendly culture; (6) motivated workers who develop, share and use knowledge; (7) means of knowledge transfer using various information technology infrastructure; and (8) senior management support and commitment. Ryan and Prybutok (2001) propose five success factors such as (1) an open organizational culture; (2) senior management leadership and commitment; (3) employee involvement; (4) teamwork and (5) information systems infrastructure. Perhaps the most comprehensive list of success factors has been presented by Moffett et al. (2003). Ten key components to successful knowledge management were identified: (1) a friendly organizational culture; (2) senior management leadership and commitment; (3) employee involvement; (4) employee training; (5) trustworthy teamwork; (6) employee empowerment; (7) information systems infrastructure; (8) performance measurement; (9) benchmarking and (10) knowledge structure.

However, except for Moffett et al., 2003), none of the frameworks can provide a complete and generalized frame for knowledge management by defining fundamental attributes of knowledge management and their interrelationships. Many studies are narrowly scoped although they identified some critical success factors (Choi, 2000, Chong, 2005). For example, a considerable number of research have yet to initiate the removal of organizational constraints as one of the important factors in ensuring successful knowledge management implementation. In other words, the proposed success factors are fragmented and diversified, depending on the researchers’ background and interests.

In addition, little attempt has been made to integrate all the success factors proposed by the knowledge management researchers. As such, there is an absence of unifying theories on what critical factors that influence knowledge management implementation success. In line with the trend toward examining fully integrated models of knowledge management success factors, a set of variables taken solely from one perspective might explain only a small proportion of how well the success factors contribute to the successful knowledge management implementation in organizations.

The following section discusses the propositions between the critical success factors and their influences on successful knowledge management implementation that have garnered impressive empirical or theoretical support.

**The Link Between Key Success Factors And Knowledge Management Implementation – A Theoretical Context**

Numerous studies have pointed out on the importance of employee training to knowledge management implementation success (Carneiro, 2001; Choi, 2000; Mondy et al., 2002; Garavan et al., 2000; Greco, 1999; Hung et al., 2005; Hwang, 2003; Moffett et al., 2003; Salleh & Goh, 2002; Sunoo, 1998). Salleh and Goh (2002) insist that if a company wants to become a truly knowledge-based organization, it must start with quality training. This is true because in virtually every market, customers are demanding high quality, lower costs and faster cycle times. To meet these requirements, firms must continually improve their overall organizational performance. Rapid advances and technology and improved processes have been important factors helping businesses meet this challenge. However, the most important competitive advantage to any firm is its workforce – one that must remain competent through continuous training and development efforts. Training provides employees and managers the skills and information to fulfill their responsibilities. Improved performance is a strategic goal for organizations in order to achieve the bottom line purpose through training and development. For the same reason, a number of organizations have become or are striving to become learning organizations. This is because one of the reasons for the failure in effective work behaviors would be insufficient training to support knowledge management.
The importance of training capabilities for any organization is well recognized, especially for those agents concerned with preserving intellectual capital (Carneiro, 2001). Garavan et al. (2000) see the daily task of human resource development in building of a learning organization as (1) assisting employees in creating and using knowledge; (2) establishing appropriate networks; and (3) engaging in double-loop learning. Greco (1999) claims that one of the key elements of successful knowledge management is education to help employees recognize what knowledge is valuable, and therefore merits sharing. Unless people in organizations possess the learning capability to use knowledge creatively, a well-developed knowledge management system cannot be directed at sustaining profitability (Hwang, 2003).

In addition, it is not surprising that one of the most recent and popular training tools for knowledge management is a corporate university – educational organizations established and run by companies to provide total education to their workforce. It was found that approximately 40 percent of Fortune 500 companies have implemented such programs (Sunoo, 1998). Since then, there have been more corporate universities being established all over the globe to support organizational learning efforts. Thus, timely and appropriate employee training is one of the key success factors for knowledge management implementation. As a result, it is posited that

**Proposition 1 – Employee training is critical to successful knowledge management implementation**

Employee involvement in making organizational decisions is a well-researched area. It describes how employees can contribute effectively to meeting the organization’s objectives. It refers to the degree that employees share information, knowledge, rewards and power throughout the organization (McMahon & Lawler, 1995).

Researchers such as Kaufman (1992), Silos (1999), Wilson and Asay (1999), Bhatt (2000), Choi (2000), Hall (2001), Binney (2001), Ryan and Prybutok (2001), Hung et al. (2005) and Moffett et al. (2003) found that employee involvement is one of the critical factors for knowledge management implementation success. Corporate leaders are realizing that employee knowledge is a critical resource for competitive advantage, so they are encouraging employees to share this knowledge (Choi, 2000). According to Lawler (1992), creating a high involvement organization involves making choice about organizational design that creates a world in which individuals know more, do more and contribute more. A recognition of the importance of employee tacit knowledge is based on the assumption that successful performance improvement may not only depend on how work is organized, and the skill of the worker, but on the willingness of employees to convert tacit knowledge of the work process into continuous process improvement and innovation (Crauise O’Brien, 1995).

Employee involvement is an array of techniques aimed at sharing information, knowledge, rewards and authority (Steinecke, 1993). It is thus the right way to gather knowledge from various levels of management and essential for an organization to survive. According to Hall (2001), knowledge creates knowledge when it is shared. Problems faced by organizations can be resolved through knowledge management where employee involvement and commitment is emphasized. According to Binney (2001), the focus of business and knowledge management application is on providing an environment in which knowledge workers of various disciplines can come together and create new knowledge. By agreeing on common presumptions and analytical frameworks, employee can co-ordinate diverse sets of activities and solve organizational-wide complex problems (Bhatt, 2000).

Employee involvement has been a focal point of other management fields as well. It has been viewed as one of the most effective problem-solving and process improvement principles of total quality management (Silos, 1999). Since both fields share common perspectives on employee involvement, quality professionals are in a unique position to assist knowledge management implementation (Wilson & Asay, 1999). Employee involvement is important in successful knowledge management implementation because since employees must share the nature of knowledge creation and sharing, many knowledge management activities are unthinkable without employee involvement (Choi, 2000). Thus, the following proposition ensues

**Proposition 2 – Employee involvement is critical to successful knowledge management implementation**

Teams are groups of two or more people who interact and influence each other; are mutually accountable for achieving common objectives, and perceive themselves as a social entity within an organization (Cohen & Bailey, 1997). Companies around the globe are discovering that teams potentially make more creative and informed decisions and coordinate work without the need for close supervision. As such, teams are replacing individuals as the basic building blocks of organizations (Choi, 2000).

Many researchers have recognized teamwork as one of the critical factors for successful knowledge management implementation (Choi, 2000; Civi, 2000; Geraint, 1998; Greengard, 1998; Haas, 2002; Mohrman et al., 1995; Nadkarni, 1995; Phillips, 1994; Ryan & Prybutok, 2001). According to Demarest (1997), effective dialogue within a knowledge management team is essential if knowledge is to be embodied and disseminated.

Teams are the units that actually carry out the work in many knowledge-intensive organizations (Mohrman et al., 1995). They are the ones that must access and apply distributed knowledge effectively (Haas, 2002). By creating teams, it allows organizations to apply diverse skills and experiences towards its processes and problem-solving (Choi, 2000). After all, the focus of business and knowledge management application is on providing an environment in which knowledge workers of various disciplines can come together and create new knowledge (Binney, 2001).
Nadkarni (1995) suggests that members of an organization must work together and build on each other's ideas and strengths. Phillips (1994) believes this can be developed by creating trusting and meaningful relationships within the team. This is because organizations with team-oriented employees who trust one another are more successful at sharing knowledge than those who are merely technologically superior (Geraint, 1998). Thus, fostering a spirit of teamwork based on trust is an essential factor for the successful implementation of knowledge management in organisations. It is hereby anticipated that

**Proposition 3 – Open and trustworthy spirit of teamwork is critical to successful knowledge management implementation**

Empowerment refers to a feeling of control and self-efficacy that emerges when people are given power in a previously powerless situation. It means eliminating the bureaucratic controls and creating a sense of freedom so that people can commit all their talents and energies to accomplish their shared goals (Pickering & Matson, 1992). Empowered employees are given autonomy – the freedom, independence and discretion – over their work activities. They are assigned work that has high levels of task significance – important to themselves and others. Empowered employees also have control over performance feedback that guides their work and also a feeling of self-efficacy; that is, they believe that they are capable of successfully completing the task.

Many researchers (Anahotu, 1998; Bhatt, 2002; Choi, 2000; Martinez, 1998; Senge, 1991; Verespej, 1999; Moffett et al., 2003) have regarded employee empowerment as one of the critical factors for knowledge management implementation success. Verespej (1999) claims that the real advantages of knowledge management implementation could not be realized without truly empowering the employees. Without the appropriate knowledge and skills, it is almost impossible for employees to perform their jobs effectively (Lawler, 1992). If employees are to feel empowered, they need knowledge that will enable them to comprehend and contribute to the performance of the organization (Bowen & Lawler, 1992). This is because when individuals are empowered, they begin to take extra responsibilities to solve organizational problems by learning new skills in their jobs (Anahotu, 1998), which will eventually lead to them being more competent.

Effective creation and sharing of knowledge will fail if employees do not have a sense of ownership in the overall aim of the organisational knowledge management system. After all, most organisational knowledge comes from the expertise, learning and experience of their employees (Choi, 2000). Through empowerment, employers can value their employees’ expertise and help them communicate their knowledge by creating ways to capture, organize and share knowledge (Martinez, 1998). Thus, it can be concluded that empowerment is recognized as one of the critical implementation factors to the success of knowledge management. As a result, it is postulated that

**Proposition 4 – Employee empowerment is critical to successful knowledge management implementation**

Many researchers (Abell & Oxbrow, 1999; Civi, 2000; Chard, 1997; Davenport et al., 1998; Dutta, 1997; Greengard, 1998; Guns & Valikangas, 1998; Hansen et al., 1999; Kalling, 2003; Moffett et al., 2003; Pemberton et al., 2002; Roberts, 1996; Ryan & Prybutok, 2001; Salleh & Goh, 2002) have insisted that top management leadership and commitment are the most critical factors for a successful knowledge management project, particularly in knowledge creating and culture sharing activities.

Top management are increasingly recognizing that the knowledge inherent in an organization is an extremely valuable asset, and that it is no longer sufficient to leave it unmanged and underleveraged (Chard, 1997). The effective management of knowledge is increasingly seen as an important basis for competitive advantage (Dutta, 1997). In fact, poor leadership quality has been identified as a threat to successful implementation of knowledge management (Choi, 2000). It has been reported that over 40 percent of Fortune 1000 companies have chief knowledge officers (Roberts, 1996).

Leadership commitment to the knowledge management process is essential (Kalling, 2003). Leadership is responsible for creating the knowledge vision of the organization, communicating that vision, and building a culture that regards knowledge as a vital company resource (Pemberton, et al., 2002). It is therefore important that senior management recognizes its importance and buttresses the development of programs and policies to make it real (Greengard, 1998; Guns & Valikangas, 1998). Without the support of top-level managers, the success of knowledge management activities is cumbersome (Civi, 2000). Only strong leadership could provide the necessary direction, where an enterprise will need to implement and effectively deploy a knowledge management strategy (Hansen et al., 1999). To realize the potential of knowledge management, enterprise leadership must provide the proper environment to motivate its workers to enable the creation, organization and sharing of knowledge (Abell & Oxbrow, 1999).

Top management plays a key role not only in implementing knowledge management but also during the whole project (Goh and Salleh, 2002) assert that the leadership skills are essential to the middle level manager, as they are the one who leads the change in lower levels. They also need to maintain employees' morale during the difficult change period. Thus, for successful knowledge management implementation, the visible leadership and commitment of top management must be sustained throughout a knowledge management effort. It is thereby posited that

**Proposition 5 – Visible top management leadership and commitment is critical to successful knowledge management implementation**

Many researchers (Bhatt, 2001; Bontis et al., 2000; Choi, 2000; Covin et al., 1997; Davenport et al., 1998; Despress & Chauvel, 1999; Ghilardi & Mellor, 1997; Kotorov & Hsu, 2001; McCampbell et al., 1999; Moffett et al., 2003; Ryan & Prybutok, 2001; Savary, 1999) have supported the notion that effective and efficient knowledge management is unthinkable without information systems. A majority of business managers believe in the powers of computers and communication technologies that lead to knowledge management implementation success in organizations. According to a survey by Covin et al. (1997), top executives of both Canadian Financial Post 300 firms and US Fortune 500 firms view information technology as one of the most critical success factors for knowledge management success. Further, a survey conducted by “InformationWeek” reveals that respondents consider knowledge management strategic to their
Savary (1999) insists that an effective information systems infrastructure is necessary for the organization to implement the knowledge management process. Information technology can provide an edge in harvesting knowledge (Bhatt, 2001). According to Bontis et al. (2000), structural capital includes the databases, organizational charts, process manuals, strategies and routines and anything whose value to the company is higher than its material value. As a matter of fact, Davenport et al. (1998) point out two most critical factors for the successful knowledge management project, one is the establishment of a broad information systems infrastructure based on desktop computing and communications. The second is the utilization of the network technology infrastructure such as the Internet, Lotus Notes and global communications systems for effective transfer of knowledge. Despres and Chauvel (1999) report that knowledge bases and Intranets are the most popular ways of implementing knowledge management. Ghilardi and Mellor (1997) also argue that the two critical components in a successful knowledge management system are the process and information systems. They also recommend that information resource-center staff should play a critical role in both these areas.

Information systems have provided knowledge management with capabilities that were not possible before (Boudreau & Couillard, 1999). It has helped an organization to manage and leverage its knowledge systematically and actively (Storck & Hill, 2000). Without information technology and computers, knowledge cannot be stored. As storage forms an important part of knowledge management activities, the inefficiency of this part will disable knowledge management. As a result, it is thereby posited that

**Proposition 6 – Information systems infrastructure is critical to successful knowledge management implementation**

Bavon (1995) defines performance measurement as the collection of information about effectiveness and productivity of individuals, groups and larger organizational units. Performance measurement is related to the key areas of the organization, such as expansion, innovation and productivity, which is critical to the development of prosperity of an organization (Carneiro, 2001).

Many researchers have found a positive relationship between performance measurement and successful knowledge management implementation. (Bassi & Van Buren, 1999; Beijerse, 2000; Bukowitz & Williams, 2000; Bukowitz & Petrats, 1997; Carneiro, 2001; Edvinsson & Malone, 1997; Gooijer, 2000; Martinez, 1998; Moffett et al., 2003; Pearson, 1999). According to Ellis (1997), traditional management and measurement techniques that focus only on financial performance can be misleading and counter productive in a development environment. As such, the new theory of the organization must be expanded to capture the impact of knowledge on organizational performance (Bukowitz & Williams, 2000). Besides financial performance, Carneiro (2001) suggests that organizations can measure some of its intangible assets and use non-financial ratios or indicators for measuring management efficiency. According to Bassi and Van Buren (1999), the intellectual assets of a firm include not only the employees' know-how, but also its business processes and customer knowledge as well.

Pearson (1999) insists that effective knowledge delivery can be achieved by finding the right system of measurements, as well as better ways of building and delivering the right information to the right people at the right time. One of the recent developments of intellectual capital measurement model by the American Society of Training and Development Working Group reveals two perspectives. One is a core set of measures to enumerate the intellectual capital stocks that are common to most organizations. Most of the solutions geared towards profit making in commercial firms; measuring intellectual capital and the intangible assets on the company balance sheet is an example (Edvinsson & Malone, 1997). The second set of key measures of financial performance is to evaluate effectiveness (Van Buren, 1999).

Creating a new theory of the organization that explicitly includes intangibles has been a central focus for knowledge management practitioners (Bukowitz & Williams, 2000). Regardless of the type of knowledge (tacit or explicit), its contribution must be measurable not only by traditional financial measures but also by other performance measurements. Knowledge must be measured because the intellectual capital of an organisation includes the brain of its employees, their know-how, the processes and customer knowledge that they create (Choi, 2000). Thus, it is clearly necessary to include performance measurement system as a key factor for the successful knowledge management implementation. It is hereby anticipated that

**Proposition 7 – Performance measurement is critical to successful knowledge management implementation**

Culture is a set of beliefs, which provides an identity for the organization, which in turn defines how the organization runs day to day. The set of beliefs includes organizational purpose, criteria of performance, the location of authority, legitimate base of power, decision-making orientation, leadership style, compliance, evaluation and motivation (Schermershorn et al., 1991).

There is a general agreement that a knowledge-friendly culture must be present or nurtured in order for knowledge management implementation success (Chase, 1997; Choi, 2000; De Long et al., 1996; Galagan, 1997; Greengard, 1998; Gupta et al., 2000; Jager, 1999; McDermott & Dell, 2001; Ribiere, 2001; Ryan & Prybutok, 2001; Skyrm & Amidon, 1997; Wah, 1999; Wild et al., 2002). According to Ribiere (2001), after having primarily focused efforts on information technology, practitioners are now realizing the importance of the “soft” aspects of knowledge management initiatives. Culture practices reflect how the organizations view and facilitate both learning and innovation, including how it encourages employees to build the organizational knowledge base in ways that enhance values for the customers (Jager, 1999). A recent study conducted by the American Productivity and Quality Center shows that 40 companies are known to have corporate culture that supports knowledge sharing (McDermott & Dell, 2001).

Organizational culture as a concept is considered to be a key element of managing organizational change and renewal (Pettigrew, 1990). Thus, since knowledge management is a radical innovation or changes the operations of an organization, it is regarded as an
intervention to the organization’s culture (Gooijer, 2000). It has been identified that the biggest challenge in knowledge management is not a technical one but a cultural one (Forbes, 1997; Koudsi, 2000). An international survey of the approaches adapted to knowledge management in 500 companies reveals that 80 percent of respondents cited “existing organizational culture” as a major barrier to the implementation of knowledge-based system (Chase, 1997). Similarly, another survey on 430 firms finds that a majority of respondents recognized that their internal cultures represent a major barrier to effective knowledge transfer, and that employees’ behavior would have to alter (Skyrme & Amidon, 1997).

To create a knowledge friendly culture, it is important to consider the cultural environment of a company before implementing knowledge management (Larson, 1999). An open culture built around integrating individual skills and experiences into organizational knowledge will be more successful (Gupta et al., 2000). As Buckman (1999) points out, creating and sharing knowledge are intangible activities that cannot be forced. A culture of confidence and trust is required to encourage the application and development of knowledge within an organization (Scarborough et al., 1999). As such, it is anticipated that

**Proposition 8 – Knowledge-friendly culture is critical to successful knowledge management implementation**

Camp (1989) aptly describes benchmarking as the systematic or ongoing process of searching for industry-wide best practices that lead to superior performance. In plain English, this simply means emulating the ways things are done best, anywhere within or outside the firm, industry or sector and measuring organizational performance against that of a leading organization. Benchmarking determines how the leading organization achieves those performance levels and uses the information as a basis for the organization’s targets, strategies and implementation (Karolof & Ostblom, 1993).

Benchmarking is a very well known management tool. It has played an important role in implementing knowledge management and to gain competitive advantage (Choi, 2000; Davis, 1996; Day & Wendler, 1998; O’Dell & Grayson, 1998). Many large firms have adopted benchmarking as a significant, systematic technique for measuring the companies’ performance toward its strategic goals (O’Dell, 1996). Since managing knowledge work effectively is becoming a necessity for functional area heads and department managers, once an organization has benchmarked best practices, it is easier to apply the useful knowledge around the organization (Davis, 1996).

Day and Wendler’s (1998) study provides a practical implication for a wider view of knowledge management benchmarking. They insist that it is necessary to develop knowledge strategy in order to capture, share and manage organizational knowledge correctly, and one of the knowledge strategies would be benchmarking.

Benchmarking has been one of the most effective tools for developing and improving knowledge management as it is not limited just to process improvement or reuse. It extends far beyond and promotes both the growth and acceptance of a learning culture throughout the organization. Benchmarking efforts can often provide insights to an organization into areas such as overall productivity; service quality; customer satisfaction; time to market in relation to other competitors; costs, profits and margins; distribution and relationships and relationship management; which impact its competitive advantage (Choi, 2000). Thus, the following proposition ensues

**Proposition 9 – Benchmarking is critical to successful knowledge management implementation**

Knowledge creation can be based on numerous sources. Knowledge can be created individually, in groups and on an organizational level. Specifically, reliable, useful, up-to-date and timely knowledge can be captured and created by sharing knowledge with other members of work groups, suppliers and customers (Choi, 2000). Many researchers have identified knowledge structure as one of the critical factor for successful knowledge management implementation (Choi, 2000; Davenport & Klahr, 1998; Greco, 1999; Hsieh et al., 2002; Ulrich, 1998; Wenger & Snyder, 2000).

Since organizations are striving to improve their bottom line, many of them have realized the importance of customers and suppliers are their sources of product and service innovation. Many organizations have in fact brought suppliers and customers into the organization fold to share ideas for their product development and refinement decisions and to come up with new, innovative products and services. Organizations are striving to form strategic partnerships with customers so that the relationship becomes a long-term proposition (Bukowitz & Williams, 2000). Knowing the importance of customers and suppliers, there must be a well-established knowledge structure, which includes knowledge about internal and external customers, suppliers as well as organizational work groups in order to implement knowledge management successfully (Choi, 2000).

Wenger and Snyder (2000) claim that as a complement to the practice of knowledge sharing, a new organizational form, called community of practice has emerged where individuals with common professional goals and interests provide a natural focal point for organizing and promoting knowledge in a particular area (Bukowitz & Williams, 2000). These communities help to provide solutions to organizational problems, as well as to provide insight on new or innovative products and services. Davenport and Klahr (1998) argue that the management of customer support knowledge is becoming increasingly important to organizations because of rapid product changes and the growing need for service-based orientation. Thus, the establishment of a well-defined knowledge structure would be another critical factor for successful knowledge management implementation. As a result, it is posited that

**Proposition 10 – Knowledge structure is critical to successful knowledge management implementation**

The final proposition is the removal of organizational constraints. Successful knowledge management implementation may not be achievable if organizations cannot eliminate organizational constraints that present in an organization (Bonaventura, 1997; Choi, 2000; Clarke & Rollo, 2001; Demarest, 1997; McCune, 1999; McDermott & Dell, 2001). This is because organizational constraints can affect negatively the perception and/or attitudes toward knowledge management success (Choi, 2000).

Organizational constraints lead to inefficiency, ineffectiveness and powerlessness. They tend to create hierarchical bureaucracy with few
Contributors' departments are rewarded when the knowledge posed on the repository is used, and when the knowledge is able to help system for the rewards. One way is to introduce a point system where contributors, users, evaluators of the knowledge and the present if it desires a successful knowledge management program. If a short-term reward structure is used, its employees may game the sharing what the employees hold already. However, top management must bear in mind that a long-term reward structure must be vital role by offering news, updates and training (feelings when it comes to impact of knowledge management on the job security of employees. Top management in this case is because the employees cannot see the benefits when they share knowledge. In a study by management, not only to the bottom-line of the organization, but also to its employees. Many knowledge management strategies fail reduce the tendency on the employees' side to hoard knowledge. Most importantly, there must be a belief embedded inside each is power is critical to the successful deployment of a knowledge management program. The emphasis on knowledge sharing is power only top management has the ability to shape the culture of the organization, building and embedding a culture that knowledge sharing. Knowledge management seems fundamentally a cultural phenomenon. In addition, the eleven factors seem to overlap with each other. Despite different opinions and thus varying definitions of knowledge management, the shared theme of current business literature is that knowledge in the minds of enterprise members is the most valuable organizational resource (Liebowitz, 1999). The understanding of knowledge management is particularly vital to enterprises, both new and established. Knowledge and knowledge management is rapidly evolving as the starting point for action in all businesses and over the past fifteen years, this understanding has surfaced as a major focus for its role in the enterprise value process (Choi, 2000). As such, this paper has attempted to fulfill its objective by providing a comprehensive knowledge management model by integrating the work of previous researchers. Based on the findings from leading knowledge management researchers and survey evidences, this paper posits that for an organization to successfully embrace knowledge management, there are eleven key factors that must be present and practised in the knowledge-based organizations. Chong (2005) in his study among the ICT companies in Malaysia found that all the eleven factors presented above are regarded as critical factors for successful knowledge management implementation to the ICT organizations. On and above all, many researchers have agreed that knowledge management is people-based, and not technological-based. Knowledge management seems fundamentally a cultural phenomenon. In addition, the eleven factors seem to overlap with each other. In this case, top management plays an ever increasing role to ensure that a knowledge-friendly culture is built in the organization. Since only top management has the ability to shape the culture of the organization, building and embedding a culture that knowledge sharing is power is critical to the successful deployment of a knowledge management program. The emphasis on knowledge sharing is power will reduce the tendency on the employees' side to hoard knowledge. Most importantly, there must be a belief embedded inside each and every employee that sharing knowledge is the only way to survive. Another strategy would be to include knowledge management as part of organizational vision and mission. Together with the cultural perspective, the top management is responsible to educate its employees on the importance of knowledge management, not only to the bottom-line of the organization, but also to its employees. Many knowledge management strategies fail because the employees cannot see the benefits when they share knowledge. In a study by Chong (2005), the respondents have mixed feelings when it comes to impact of knowledge management on the job security of employees. Top management in this case is responsible to build the trust in its employees on how knowledge management benefits them. The human resource department should take the responsibility for teaching the change in mindset required to implement knowledge management. The department must play a vital role by offering news, updates and training (Salieh & Goh, 2002). According to Gumbley (1998), another strategy would be to build rewards in terms of future training and development in return for sharing what the employees hold already. However, top management must bear in mind that a long-term reward structure must be present if it desires a successful knowledge management program. If a short-term reward structure is used, its employees may game the system for the rewards. One way is to introduce a point system where contributors, users, evaluators of the knowledge and the contributors' departments are rewarded when the knowledge posed on the repository is used, and when the knowledge is able to help
other employees solving critical problems or making complex decisions (Bukowitz & Williams, 2000).

It is equally important too that staff need to be trained on how to best utilize the system. Specifically, they need to be trained in terms of writing, editing and formatting skills in order for them to input items to a knowledge repository, as information has to be presented in a standardized fashion (Bennett & Gabriel, 1999). Thus, the system has to be friendly enough. It is worth remembering that the information technology, like knowledge, is easily accessible, but valueless without the knowledge and skills to use it productively (Amat Taap, 2001).

In addition, training on issues related to organizational change is vital to support the transformation process in a company and its people. As such, providing training on leadership, managing change and company mission and values is equally important for a knowledge-based organization (Salleh & Goh, 2002).

In addition, organizations must realize the importance of teamwork to their knowledge management implementation success. As such, one of the most important tasks in successful knowledge management is to organize self-organizing and cross-functional teams to seize the right knowledge and present it in an easily accessible format (Greengard, 1998; Nonaka, 1994). In this case, organizational leaders must act as catalysts in building team-oriented organizations (Nonaka, 1994).

Employee involvement and empowerment are equally important factors that must not be ignored as well. Employees share their expertise when they are required to collaborate with others. One strategy is to allow employees to involve in their own job design and evaluation of their own jobs. By doing this, the employees are now more committed towards using their knowledge for the general good of the organization. Further, organizations must realize that when employees are empowered, they begin to think of the best ways of delivering best results in their jobs. This is especially true in today’s business environment where customer becomes the central focus. Many teams are now working directly with their customers to design products for them. If the teams are not empowered, they would have to seek for their superior’s approval before they could inform their customers. In such a case, time and resources are wasted. In a study by Chong (2005), the respondents cited that their employers have given limited authority to them. The employees found it time and resource wasting when they are not allowed to make meaningful decisions on behalf of their organizations and customers.

To the very best extent, the top management must eliminate whatever constraints faced by the organization when implementing a knowledge management program. Chong (2005) found in his study that many respondents cited lack of budget and incentives as barriers to successful implementation of knowledge management in their organizations. These respondents claimed that their organizations cannot afford to hire a CKO due to financial standings. In many occasions, the respondents claimed that the senior managers do not “walk their talk”. If this happens, then these organizations will never be able to implement knowledge management successfully. Perhaps these organizations should first train a few of its employees from different departments on knowledge management, and assign them to their respective departments to sell the idea of knowledge management, while a senior manager is seconded to perform the CKO’s job. In this case, the employees are assured of the top management commitment to knowledge management.

Another important factor is the information systems infrastructure. There is a misconception that it is costly to develop or buy a knowledge management system. This might be one of the reasons why many top managers were reluctant to develop a knowledge management program. Organizations must understand that there is no silver bullet in knowledge management systems, i.e. what worked in one company may not work for another. Further, organizations can make use of the technologies they currently have, rather than buying the entire system which might not suit the company, as elucidated by Tiwana (2000). A team comprises of IT personnel and other related personnel can be formed to look at what are the requirements of the company, and then look at what are the technologies available that can be combined into the system. It is worth remembering that information systems is just an enabler to knowledge management. As mentioned by King (1996), successful deployment of knowledge management requires an organization to think in terms of applications and how people use applications; not systems and software. It is not the technology itself that induces knowledge sharing, but rather a separate motivation to share knowledge (Hendriks, 1999).

The next critical factor would be benchmarking. One interesting notion by O’Dell (1996) is that an organization should start the benchmarking process from within before looking outside. This is because there are usually existing best practices within different parts of the same company. Companies waste time and money solving the same problems repeatedly that have been solved in other offices or locations of the same company (O’Dell & Grayson, 1998). This is where the knowledge management system should play its role. Employees must be encouraged to search within the system before they look for external information. A company prospers when employees are able to build knowledge on knowledge, resulted in wisdom (Drucker, 1999). However, it is worth remembering that benchmark will only provide a short-term competitive advantage to the benchmarking organization. It should be treated as a guideline for the organization to search for improvements or breakthroughs, through the innovative and creative capacity of the organizational members.

Performance measurement is another critical factor posited that would ensure successful knowledge management implementation. It is important that an organization considers its performance measurement on both its tangible and intangible assets. This is because knowledge management measures must be embedded in the overall business performance model, and not be a marginal “add-on” to the core measures (Gooijer, 2000). Chong (2005) found that almost 100 percent of the organizations surveyed in Malaysia are still using traditional performance measurement, including the performance appraisals administered on organizational employees. At the employees’ level, a comprehensive performance measurement system must be developed to capture the impact of knowledge on the individual and organizational performance. At the organizational level, perhaps one effective way to start off is to use the balanced scorecard technique, proposed by Kaplan and Norton to capture the tangible and intangible assets of a firm.

Finally, another critical factor posited to influence knowledge management implementation success is knowledge structure. According to Choi (2000), knowledge must be generated and shared with customers and suppliers. In many organizations, consumers are playing an ever-increasing role in determining the products and services of an organization that meet their needs. Similarly, many suppliers have
Knowledge management is emerging as a significant organizational and management challenge. The pressure of the emergence of the global knowledge-based economy and recognition of knowledge as key and intangible asset are making the effective management of knowledge a priority. The knowledge-based economy (k-economy) in the intelligence age is moving forward at a very rapid pace, especially with the role played by information and communications technology which acts as a catalyst to the development of knowledge. It has become a business phenomenon for the knowledge management paradigm to play a vital role in the success of an organization in the global market. Over and above participation in the k-economy, knowledge management will help shape technological and organizational innovations of an organisation for a more effective operation and thus enable an organization to better compete in the marketplace and for survival.

This paper proposes that there are eleven critical factors to a successful knowledge management implementation in organizations. It is hoped that the factors proposed in this study would help organizations to better organise their knowledge management activities. Effective knowledge management can help any organizations to leverage core knowledge as means of building corporate intelligence, achieving innovation in process and products/services, effective decision-making, and organisational adaptation to the market for creating business value and gaining competitive edge. May the propositions made above provide an opportunity to the practitioners to undergo self-check to what extent the various critical success factors have been implemented. According to Wigg (1997), such a research would help organizations to act as intelligently as possible to secure their viabilities and overall successes by realizing the best value of their knowledge assets.

Apart from that, from the academic point of view, it is also hoped that additional research will be undertaken to build upon this work, and to further develop and enhance knowledge on the factors proposed above that contribute to effective knowledge management implementation in organisations. This aids to better understanding of pre-requisite necessary to succeed in businesses, especially in today’s competitive environment. In this era of source scarcity, and the need to be more productive and efficient, knowledge management can play a more important role as a source of competitive advantage.

Conclusion

References


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