

# Critical Success Factors to Knowledge Management Implementation: A Holistic Approach

Chong Siong Choy

Faculty of Business and Law

Multimedia University, Jalan Ayer Keroh Lama, 75450 Melaka  
Tel : 06-2523606, Fax : 06-2318869, E-mail : scchong@mmu.edu.my

## ABSTRACT

*The objective of this paper is to propose a comprehensive set of critical success factors (CSFs) that would enable successful knowledge management (KM) implementation in organisations. Building upon the work of Chong and Choi (2005), various models of KM CSFs proposed by researchers and practitioners were comprehensively reviewed. Based on the results of a myriad of relevant research, this paper concludes that successful deployment of a KM programme depends on eleven CSFs. The identification of these factors has important implications on organisations in this knowledge-based economy (k-economy) where success is dependent on knowledge and how it is managed.*

## Keywords

*Knowledge management; Critical success factors; Knowledge management framework; Knowledge management implementation*

## 1.0 INTRODUCTION

Knowledge management (KM) is getting significant attention in both the academic and business world. This is evident from the drastic increase of publications related to KM (von Krogh, Nonaka & Aben, 2001). This claim is further supported by international conference organisers who acknowledged that KM was a top theme for business and management in 2002 (Chourides, Longbottom & Murphy, 2003). Further, KPMG (1999) reported in 2000 that KM has been practiced by 80 percent of the biggest companies in the world. In Malaysia, a study by Chong (2006) indicates that 58.5 percent of the Malaysian IT companies have made significant investments in KM while 21 percent of the organisations plan to invest in KM within a year. Another study by Chong and Yeow (2005) on Malaysian telecommunication companies also indicates that 59 percent of the 289 middle managers surveyed view their businesses as knowledge intensive.

Such an overwhelming response given to KM is not surprising, as the landscape of business have changed drastically since the mid-1990s. The increasing globalisation of business, the shift from production-based to a knowledge-based economy (k-economy), the growth of information communications technology (ICT), the strive to become learning organisations and the emergence of knowledge workers (k-workers) (Chong & Choi, 2005) imply that an organisation's ability to effectively create, retain, communicate, use and manage its knowledge is critical for organisational success (Marquardt, 1996).

As a result, organisations are compelled to effectively managing their knowledge base or risk losing the competitive advantage. Further evidence were provided by Cohen and Prusak (1996) and Davenport (1998) where organisations such as BP Amoco, Microsoft, Chevron Corporation, Dow Chemical, Texas Instruments and Xerox are highly successful because of a well-designed KM programme in place. Further, it has been reported that companies that already practiced KM top the *Fortune 500* list and smaller companies top the *Inc. 100 Companies to Watch* list (Chong & Choi, 2005).

However, recent survey evidences have suggested that, while knowledge has been acknowledged as source of competitive advantage, it has not been managed well in organisations. A study by Takeuchi (1998) on a poll of executives from 80 large companies in the U.S. found that only a few executives felt that they manage their knowledge well. Choi (2000) in his study on the U.S. industry found that there are significant gaps between perceived importance and implementation of the critical success factors (CSFs). Similar results were found in Chong and Yeow (2005) and Chong's (2006) studies on Malaysian telecommunication and IT companies, respectively.

These findings suggest that organisations are still unsure of the activities of KM, and what are the critical factors that enable successful KM implementation in organisations. As Malhorta (1998) opines, the current

KM solutions are still ad hoc, constrained by basic rigid and limited views of knowledge and lack the necessary zeal and dynamics to meet the knowledge requirements of organisations in today's competitive environment. This has led Gubbins (2003) to conclude that the biggest problem with KM is lack of focus where there are lots of grand visions proposed but has little practicality. Another reason would be that the academic development of KM which has not stabilised and filtered into the industry (Levette & Guenov, 2000). Moreover, there is no universal consensus on the terminology of KM to date!

In order to fill this gap, this paper reviews the CSFs that are important to implementing a KM programme in organisations by building upon the work of Chong and Choi (2005). Chong and his co-researcher state that successful deployment of a KM programme depends on eleven critical enablers such as employee training, employee involvement, teamwork, employee empowerment, top management leadership and commitment, organisational constraints, information system infrastructure, performance measurement, egalitarian culture, benchmarking, and knowledge structure. These critical factors will provide a greater understanding to the researchers and practitioners of the enablers of a successful KM programme.

Before the paper goes on to discuss the CSFs, it is important to review the definitions of KM. This is because it is difficult to see how these CSFs fit into an organisation's KM initiatives without prior understanding of what is KM. Then, the CSFs proposed by various researchers and practitioners are reviewed. Recommendations are presented at the end of the paper.

## 2.0 DEFINITION OF KM

KM is a broad subject which encompasses a wide range of disciplines that include, but not limited to, cognitive science, communications, individual and organisational behaviour, psychology, finance, human resource management, strategic planning, systems thinking, process reengineering, systems engineering, computer technologies and software and library sciences (Stankosky & Baldanza, 2001). The multi-disciplinary nature of KM have posed challenges in the attempts to define what is KM. Different perspectives or schools of KM can yield different dimensions and meaning (Salleh & Goh, 2002), thus lead to different definitions of KM. As a result, the proposed CSFs are fragmented and diversified.

Wiig (1993) defines KM as a systematic, explicit and deliberate building, renewal and application of knowledge to maximise an enterprise's knowledge-related effectiveness and returns from its knowledge

assets. Specifically, KM deals with two activities: (1) maintaining and applying existing knowledge; and (2) creating new knowledge. The existing knowledge consists of both tacit and explicit knowledge, while new knowledge is created through the interaction among people in the organisation. The implicit purpose of KM is to empower knowledgeable individuals with intellectual tasks and authority, thereby challenging them to obtain the desired behaviour for success (Wiig, 2000).

According to Martin (2000), KM is related to the wider discipline of management in the context of overlapping and synergistic relationships in such activities as learning and innovation, benchmarking and practices, strategy, culture and performance measurement. Salleh and Goh (2002) define KM as 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 organisations.

Wigg (1993) defines KM from the approach of its primary activities (the management of knowledge in terms of creation, gathering, organisation, store, diffusion, usage and exploitation of knowledge). However, for these KM activities to be appropriately carried out, enablers are needed to support the primary activities. These enablers, termed as CSFs or secondary KM activities [as being partially mention by Wigg (2000) and Salleh and Goh (2002)], will ensure the success of KM implementation. Quinn, Anderson and Finkelstein (1996) assert that the analysis of CSFs provide an important meaning to KM through the identification of processes that are critical to KM implementation. The next section discusses the definition of CSF and the critical factors leading to successful KM implementation.

## 3.0 KM CRITICAL SUCCESS FACTORS

CSFs can be viewed as those activities and practices that should be addressed in order to ensure successful implementation of KM (Wong, 2005). Wong further adds that these practices would either need to be nurtured if they are already in existence or developed if they are still not in place. The set of CSFs should be treated as internal environmental factors that can be controlled by the organisation, not the external environmental forces as organisations would have little control over them when implementing KM.

Since the late 1990s, many researchers have attempted to develop a comprehensive list of CSFs for KM implementation. However, the list differs because of the

multidisciplinary nature of KM. In this study, Chong and Choi's (2005) model was studied along with the CSFs proposed by other researchers. Three observations are noted. First, the proposed CSFs are fragmented and diversified. Secondly, many studies on CSFs are narrowly scoped. In other words, none of the frameworks proposed earlier provide a generalised frame for defining the fundamental attributes of KM and their interrelationships due to the different background and interests of KM researchers (Chong & Choi, 2005). Thirdly and most importantly, among the studies conducted, the most comprehensive list of CSFs have been proposed by Chong and Choi (2005). They have provided a unifying theory of what constitutes successful KM implementation in organisations with regards to the CSFs proposed.

As a result, eleven CSFs to successful KM implementation have been identified and is presented in Table 1. The works of previous researchers on the CSFs have also been presented. The next section discusses the CSFs and suggestions are made on how on how organisations could better organise their KM efforts.

Table 1: Critical Success Factors of KM

Factor	Researchers
Employee training	Choi, 2000; Chong & Choi, 2005; Mondy et al., 2002; Garavan et al., 2000; Hung et al., 2005; Hwang, 2003; Moffett et al., 2003; Salleh & Goh, 2002.
Employee involvement	Bhatt, 2000; Binney, 2001; Choi, 2000; Chong & Choi, 2005; Hall, 2001; Hung et al., 2005; Moffett et al., 2003; Ryan & Prybutok, 2001.
Teamwork	Choi, 2000; Chong & Choi, 2005; Civi, 2000; Geraint, 1998; Greengard, 1998; Haas, 2002; Mohrman et al., 1995; Phillips, 1994; Ryan & Prybutok, 2001.
Employee empowerment	Anahotu, 1998; Bhatt, 2002; Choi, 2000; Chong & Choi, 2005; Martinez, 1998; Senge, 1991; Verespej, 1999; Moffett et al., 2003.
Top management leadership and commitment	Abell & Oxbrow, 1999; Choi, 2000; Chong & Choi, 2005; Civi, 2000; Davenport et al., 1998; Kalling, 2003; Moffett et al., 2003; Pemberton et al., 2002; Ryan & Prybutok, 2001; Salleh & Goh, 2002.
Removal of organisational constraints	Bonaventura, 1997; Choi, 2000; Chong & Choi, 2005; Clarke & Rollo, 2001; Demarest, 1997; McCune, 1999; McDermott & Dell, 2001.
Information systems infrastructure	Bhatt, 2001; Bontis et al., 2000; Choi, 2000; Chong & Choi, 2005; Davenport et al., 1998; Kotorov & Hsu, 2001; McCampbell et al., 1999; Moffett et al., 2003; Ryan & Prybutok, 2001.
Knowledge-based performance	Choi, 2000; Chong & Choi, 2005; Bassi & Van Buren, 1999; Beijerse,

measurement	2000; Carneiro, 2001; Gooijer, 2000; Martinez, 1998; Moffett et al., 2003; Pearson, 1999.
Knowledge-friendly culture	Choi, 2000; Chong & Choi, 2005; Greengard, 1998; Gupta et al., 2000; Jager, 1999; McDermott & Dell, 2001; Ribiere, 2001; Ryan & Prybutok, 2001; Skyrme & Amidon, 1997; Wild et al., 2002.
Benchmarking top KM companies	Choi, 2000; Chong & Choi, 2005; Davis, 1996; Day & Wendler, 1998; O'Dell & Grayson, 1998.
Knowledge structure	Choi, 2000; Chong & Choi, 2005; Davenport & Klahr, 1998; Greco, 1999; Hsieh et al., 2002; Ulrich, 1998; Wenger & Snyder, 2000.

## 4.0 DISCUSSION AND IMPLICATIONS

### 4.1 Employee training

Training is an important enabler to KM implementation because it not only provides employees and managers an avenue to fulfil their responsibilities, but also creates effective work behaviours to support KM principles. There are two important aspects of training. First, employees have to be sent to attend training programmes related to KM, such as the importance of knowledge sharing, importance of KM to organisations and so on. In addition, they have to be trained on how to best utilise the KM system. Specifically, they need to be trained in terms of writing, editing and formatting skills in order for them to store items to a knowledge repository, as information has to be presented in a standardised fashion (Bennett & Gabriel, 1999).

Second, training on issues related to organisational 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 organisation (Salleh & Goh, 2002). Above all, learning organisations must see training as strategic investment rather than budgeted cost (Mondy et al., 2002). One of the vital roles of human resource department in building a learning organisation is to teach the change of mindset required to implement KM through assisting employees in creating and using knowledge (Garavan et al., 2000). Education must be provided to employees to help them recognise what knowledge is valuable, and therefore merits sharing (Greco, 1999).

### 4.2 Employee involvement

Employee involvement describes how employees can contribute effectively to meeting the organisation's objectives. It refers to the degree that employees share information, knowledge, rewards and power throughout the organisation (McMahon & Lawler, 1995).

To create a high involvement organisation, recognition must be given to how employees convert their tacit knowledge of the work process into continuous process innovation and improvement (Crause O'Brien, 1995). Employees share their expertise when they are required to collaborate with others. To do this, one strategy is to allow employees to involve in their own job design and evaluation. Another strategy would be to provide an environment where k-workers of various disciplines can come together and create new knowledge (Binney, 2001). Through such efforts, organisational-wide complex problems can be resolved through as a result of co-ordination of diverse sets of employees' activities (Bhatt, 2000).

#### **4.3 Teamworking**

Many researchers have recognised teamwork as one of the CSFs for successful KM implementation. This is true because team are the units that actually carry out the work in many knowledge-intensive organisations (Mohrman et al., 1995).

To achieve this, organisational leaders must act as catalysts in building team-oriented organisations (Nonaka, 1994). Effective dialogue within a KM team is essential if knowledge is to be embodied and disseminated (Demarest, 1997) because valuable knowledge is built from each member's ideas and strengths (Nadkarni, 1995). According to Greengard (1998) and Nonaka (1994), one of the organisation's most important tasks is to organise self-organising and cross-functional teams so that k-workers can come together to create new knowledge and present them in an easily accessible format. As such, organisations must create an environment of trust and meaningful relationships within the team in which technology alone cannot facilitate such a relationship (Geraint, 1998).

#### **4.4 Employee empowerment**

Empowered employees are given autonomy – the freedom, independence and discretion – over their work activities, which have high levels of task significance – important to themselves and others. When employees are empowered, they will have a sense of ownership in the overall aim of the organisation's KM efforts and thus allows effective creation and sharing of knowledge.

Through empowerment, employers can value their employees' expertise and thus help them to communicate their knowledge by creating ways to capture, organise and share knowledge (Martinez, 1998). Empowered employees, on the other hand, will take extra responsibilities to solve organisational problems by learning new skills in their jobs (Anahotu, 1998), making

them more competent and therefore contribute to the performance of the organisation (Bowen & Lawler, 1992). Another aspect of empowerment is on how employees deal with customers. A significant amount of decision making authority must be given to employees when dealing with organisational customers.

#### **4.5 Top management leadership and commitment**

Many researchers have insisted that top management leadership and commitment are the most critical factor for successful KM initiatives. It has been reported that more than 40 percent of Fortune 1000 companies have chief knowledge officers (Roberts, 1996).

Top management must understand that they have the greatest ability to enable KM implementation in their organisations. Organisational leaders must show commitment by charting the necessary direction of its KM activities by including KM as part of organisational vision and mission as well as developing a knowledge-friendly culture. Top management must demonstrate their support to a KM programme by showing good examples by involving themselves in the knowledge sharing activities. Senior managers must buttress the development of programmes and policies to make it real (Greengard, 1998; Gun & Valikangas, 1998). Top management must play a key role throughout the entire KM project, including maintaining employees' morale during the difficult change period (Salleh & Goh, 2002).

#### **4.6 Information systems infrastructure**

Many researchers have supported the notion that effective and efficient implementation of KM is unthinkable without information systems infrastructure, which provides an edge in harvesting knowledge.

While information systems infrastructure is critical to the success of KM implementation, organisations must recognise the role of information systems as enablers to KM. Successful deployment of KM requires an organisation to think in terms of applications and how people use applications; not systems and software (King, 1996). Thus, the system should be friendly enough so that it can be used productively. It is not the technology itself that induces knowledge sharing, but rather a separate motivation to share knowledge (Hendriks, 1999).

Secondly, KPMG's (1999) report that only 16 percent of the 423 organisations in Europe and US surveyed mentioned that they had a system specifically configured to KM. It indicates that many organisations view KM system as costly, a reason why many managers are reluctant to develop one. An organisation can make full

use by integrating the current technologies they have (Tiwana, 2000). This is the best approach as an organisation can fit its KM system to its requirement. There is no silver bullet in KM systems, and therefore, buying an entire system from the vendors may not be a good solution.

#### **4.7 Performance measurement**

Performance measurement is related to the key areas of the organisation, such as expansion, innovation and productivity, which is critical to the development of prosperity of an organisation (Carneiro, 2001) and as such, it has been identified as a critical enabler of KM implementation. Since KM deals with intangible assets of an organisation, non-financial indicators are necessary to be developed to measure and capture the impact of KM (Bukowitz & Williams, 2000; Carneiro, 2001).

As such, organisations must find the right system of measuring its stock of intellectual capital (brain of its employees, their know-how, knowledge processes and customer knowledge) and capture the soft assets in their balance sheet (Edvinsson & Malone, 1997) together with key measures of financial performance to evaluate effectiveness (Van Buren, 1999). Kaplan and Norton have proposed the use of balance scorecard technique to guide organisations on how their tangible and intangible assets can be captured and measured.

#### **4.8 Egalitarian (knowledge-friendly) culture**

Many researchers have insisted that a knowledge-friendly culture must be present or nurtured in order to achieve KM implementation success. Since KM is considered radical innovation in organisations, it is regarded as intervention to the organisation's culture (Gooijer, 2000). Culture has been identified as the biggest challenge to KM implementation (Chase, 1997; Forbes, 1997; Koudsi, 2000).

In order to create a knowledge-friendly culture, an organisation must consider the cultural environment of a company before implementing KM (Larson, 1999) as KM is people-based, not technological (Chong & Choi, 2005). A culture of confidence and trust is required to encourage the application and development of knowledge within an organisation (Scarborough et al., 1999). Top management in this case plays an important role to sell the idea that "knowledge sharing is power". KM must be included as part of an organisation's vision and mission. Senior managers must educate its employees so that they could see how they benefit from KM implementation. Trust is the crux here. The human resource department should take the responsibility for teaching the change in mindset required to implement KM by offering news,

updates and training (Salleh & Goh, 2002). Long-term rewards such as promotion and advancement opportunities must be provided to employees who openly share their knowledge.

#### **4.9 Knowledge structure**

Knowledge structure has been identified as one of the critical enablers of KM implementation. 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). Organisations must be able to recognise the value brought about by the knowledge of its customers and suppliers as important sources of their product and service innovation, thus contributing to their performance.

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 organisational work groups in order to implement KM successfully (Choi, 2000). For the work groups, organisations must support the creation of communities of practice in order to promote knowledge in a particular area in order to provide solutions to organisational problems as well as offering insights on new or innovative products and services (Bukowitz & Williams, 2000). The establishment of extranets that link an organisation with its customers and suppliers are also an important point to consider so that knowledge can be generated and shared between them. The customers' use of Beta version of products and involving suppliers in designing products should be the focus of such a link. Above all, organisations must take note of the issue of respect and trust for each other's knowledge. Interpersonal interaction and social relationships are more important than the technology itself in order for knowledge to be effectively generated and shared (Lang, 2001).

#### **4.10 Benchmarking**

Benchmarking, as defined by Camp (1989), is the systematic or ongoing process of searching for industrywide best practices that lead to superior performance. It has been identified to play a critical role in successful KM implementation. O'Dell (1996) provides evidence where many large firms have adopted benchmarking as a significant, systematic technique for measuring the companies' performance toward its strategic goals.

Organisations must be aware that once it has benchmarked best practices, it is easier to develop knowledge strategy (capture, share and management of

organisational knowledge) and apply the useful knowledge around the organisation (Davis, 1996; Day & Wendler, 1998). Benchmarking is not limited just to process improvement or reuse, but it extends far beyond and promote the growth and acceptance of a learning culture throughout the organisation.

An organisation 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 (O'Dell, 1996). By referring to the knowledge within the organisation, companies do not have to solve the same problems repeatedly, and thus time and money can be saved (O'Dell & Grayson, 1998). Similarly, employees must be encouraged to search for information within the KM system first before they attempt to look for information outside the organisation. For companies which plan to benchmark knowledge processes from outside, a knowledge map must be identified first.

However, it is worth remembering that benchmark will only provide a short-term competitive advantage to the benchmarking organisation. Thus, it should be treated as a guideline for the organisation to search for improvements or breakthroughs, through the innovative and creative capacity of the organisational members (Chong & Choi, 2005).

#### 4.11 Removal of organisational constraints

The last CSF identified is the removal of organisational constraints. Organisations must understand that successful KM implementation may not be achievable if organisations cannot eliminate constraints that is present in an organisation. Organisational constraints such as rigid regulations, hierarchical bureaucracy, close culture, lack of incentives to be creative, lack of funding to KM initiatives, top management's unwillingness to support KM efforts, improper use of information technology infrastructure may hinder the effort of effectively exploiting the knowledge of an organisation.

Organisations must therefore strive to eliminate all the constraints mentioned above that impede KM implementation success. Many organisations cited lack of funding in implementing a KM programme, particularly in terms of information technology (IT) investment, the difficulty in hiring a chief knowledge officer (CKO) and top management's commitment towards KM (Chong & Choi, 2005). Top management in this case must allocate sufficient funding for KM implementation. A knowledge-friendly culture must be built and integrated around the knowledge processes. Knowledge sharing must be made mandatory from top to bottom and across the organisational structure. IT

investments can be minimised by building the KM system upon the technology that the organisation already owns. An organisation may assign one of its senior officials to assume the position of CKO if it cannot afford to hire one. Employees from different departments can be assigned to perform knowledge activities so as to sell the idea of KM to their respective departments. By doing this, the success of an organisation's KM effort is assured.

## 5.0 CONCLUSION

Knowledge in the minds of enterprise members is the most valuable organisational resource which cannot be left unmanaged (Liebowitz, 1999). Companies, regardless of small and medium or large, whether established or new, must not underestimate the power of KM. To become learning organisations, it is essential that organisations continuously update their organisational knowledge and create new ones in order for them to survive and grow. To do this, the presence of the proposed CSFs in supporting the organisation's knowledge-intensive processes are especially critical. Equal attention and emphasis must be given to all the CSFs if an organisation wants to compete in the marketplace successfully and to achieve business growth.

It is hoped that the factors proposed in this study would provide organisations with better perspective of how their knowledge activities can be effectively managed in order to maximise their knowledge-related effectiveness and returns from knowledge assets. 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 KM implementation in organisations. With effective management of knowledge, organisations will be able to reap benefits and become successful in today's competitive environment.

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