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Investigation and Assessment of Critical Success Factors of Knowledge Management Implementation in Iranian Small-to-Medium Sized Enterprises

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Abstract: Based on an in-depth review and comparative study of existing studies on Critical Success Factors (CSFs) of Knowledge Management (KM) and by considering the characteristics of small to medium sized enterprises (SMEs), twelve CSFs were identified, namely management leadership and support, organizational culture, information systems, KM strategy, performance measurement, organizational infrastructure, processes and activities, rewarding and motivation, training and education, removal of resources constraints, human resources management and benchmarking which is believed to be suitable for SMEs. The importance of the proposed CSFs was theoretically discussed and justified. An instrument, which consists of all CSFs and their related elements, was developed to evaluate the appropriateness of the proposed CSFs from experts' point of view. The experts were asked to express their views and perceptions on the extent of appropriateness of the CSFs and their related elements for Iranian SMEs using a six-point Likert scale, ranging from not successful to extremely successful. This scale was then grouped into three levels-poor, satisfactory and good. The overall results from this assessment show that experts endorsed the proposed CSFs and their related elements as being at least eighty percent satisfactory for their intended purpose. The set of CSFs can act as a list of items for organizations, particularly for SMEs to address when implementing KM. This helps to ensure that essential issues and factors are covered when planning and developing KM. Also, it can provide a basis for them to evaluate their KM practices. For academics; it provides a common language for the discussion and study of factors underpinning the success of KM in SMEs.

Key words: Critical success factors, knowledge management, small to medium, sized enterprises, Iran

INTRODUCTION

Although there is recognition that knowledge is a key business asset, organizations are still in the early stages of understanding the implications of KM. KM is slowly becoming an integral business function for them (Metaxiotis *et al.*, 2005). Nowadays mature governments have understood the importance of knowledge and management of it, so the related activities are led by top levels and ranks in those countries especially in advanced and developed countries (Akhavan and Jafari, 2006). It is widely acknowledged that developing countries that fail to build capabilities enabling them to participate in the evolving global networks of knowledge creation risk falling further behind in terms of competitiveness as well as economic and social development. So, the need for a more systematic and deliberate study on CSFs for implementing KM is crucial. Organizations need to be cognizant and aware of the factors that will influence the success of a KM initiative. Ignorance and oversight of the necessary important factors will likely hinder an organization's effort to realize its full benefit (Wong,

2005). Almost all the discussions on KM and its related issues have concerned large organizations, with little attention being paid to small business sector (McAdam and Reid, 2001). As asserted by Frey (2001), although major corporations have led the way in introducing and implementing KM, it is increasingly important for small businesses to manage their collective intellect. Okunoye and Karsten (2002) stated that KM has indeed become the underlying sources for successful organizations regardless of their size and geographical locations. They account for more than half of the employment and added value in most countries (Valmohammadi, 2010a). This research attempted to answer the two research questions through an in-depth study of KM literature and collecting Iranian experts' view in the field of KM. The research questions are as follows:

- What are CSFs for implementation of KM in Iranian SMEs?
- To what extent are these CSFs suitable from Iranian experts' point of view?

Literature review: There seems to be general agreement in the literature that a combined social and technological approach is ideal (Wong and Aspinwall, 2005). So, the way forward will be paved if organizations are aware of the key factors that will make its adoption successful. On the other hand, as SMEs play a very important role in the economic growth, employment and sustainable development of countries, for instance in Iran SMEs constitute 90% of all enterprises (Valmohammadi, 2010b). Directly applying these factors into the SMEs environment may not be sufficient without an understanding of their very own and specific conditions (Wong, 2005). While large organizations may have long grasped the underlying concept of KM and have advanced knowledge on various related technologies, this is not necessarily true for SMEs. Jeffcoate *et al.* (2000) stated that SMEs have limited knowledge on technology and lack technical expertise. Similarly, Lim and Klobas (2000) pointed out that small businesses lack an understanding of KM processes. Thus, it appears that there is a greater need for SMEs to provide appropriate training associated with KM, to their employees. Another central KM issue in SMEs is the occurrence of knowledge loss, through key employees leaving the companies. SMEs are prone to this phenomenon, since individuals are constantly seeking better careers and job prospects and

higher salaries in larger organizations. Without doubt, when employees leave a company, they will take with them all the knowledge that is embedded in their mind. Retaining employees in an organization is highly dependent on effective people management strategies. In fact, people management plays a much wider role and it lies at the heart of KM (Wong, 2005).

A broad range of factors that can influence the success of KM implementation has been mentioned in the literature. Saraph *et al.* (1989) viewed CSFs as those critical areas of managerial planning and action that must be practiced in order to achieve effectiveness. Wong (2005) said, in terms of KM, they can be viewed as those activities and practices that should be addressed in order to ensure its successful implementation. These practices would either need to be nurtured if they already existed or be developed if they were still not in place. Based on the above definition, CSFs in this study are treated as those internal factors which are controllable by an organization. External factors such as environmental influences are not taken into account since organizations have little control over them when implementing KM. To answer the first question and based on the characteristics of SME scoter an in-depth review of literature was performed, leading to the identification of 12 CSFs, which is shown in Table 1 with their resources.

Table 1: List of KM success factors

No.	CSFs	Researchers
1	Management leadership and support	Skyrme and Amidon (1997), Holsapple and Joshi (2000), Davenport and Volpel (2001), Liebowitz (1999), Hasanali (2002), APQC (1999), Ribiere and Sitar (2003), Wong and Aspinwall (2005), Al-Busaidi and Olfman (2005), Chong (2006), Akhavan and Jafari (2006), Akhavan <i>et al.</i> (2006), Jafari <i>et al.</i> (2007), du Plessis (2007), Valmohammadi (2010b)
2	Organizational culture	Skyrme and Amidon (1997), Davenport <i>et al.</i> (1998), Liebowitz (1999), APQC (1999), McDermott and O'Dell (2001), Hasanali (2002), Wong and Aspinwall (2005), Al-Busaidi and Olfman (2005), Yu-Chung <i>et al.</i> (2005), Akhavan <i>et al.</i> (2006), Chong (2006), Bozbura (2007), du Plessis (2007), Valmohammadi (2010b)
3	Information technology	Skyrme and Amidon (1997), Davenport <i>et al.</i> (1998), APQC (1999), Alavi and Leidner (2001), Al-Busaidi and Olfman (2005), Yu-Chung <i>et al.</i> (2005), Wong and Aspinwall (2005), Akhavan and Jafari (2006), Chong (2006), du Plessis (2007), Valmohammadi (2010b)
4	KM strategy	Skyrme and Amidon (1997), Davenport <i>et al.</i> (1998), Liebowitz (1999), APQC (1999), Zack (1999), Wong and Aspinwall (2005), Akhavan <i>et al.</i> (2006), Bozbura (2007), du Plessis (2007), Valmohammadi (2010b)
5	Performance measurement	Davenport <i>et al.</i> (1998), APQC (1999), Holsapple and Joshi (2000), Hasanali (2002), Yu-Chung <i>et al.</i> (2005), Wong and Aspinwall (2005), Chong (2006), du Plessis (2007), Valmohammadi (2010b)
6	Organizational infrastructure	Davenport <i>et al.</i> (1998), Liebowitz (1999), Hasanali (2002), Al-Busaidi and Olfman (2005), Wong and Aspinwall (2005), Akhavan and Jafari (2006), Jafari <i>et al.</i> (2007), du Plessis (2007), Valmohammadi (2010b)
7	Processes and activities	Skyrme and Amidon (1997), Davenport <i>et al.</i> (1998), Holsapple and Joshi (2000), Bhatt (2000), Wong and Aspinwall (2005), Akhavan and Jafari (2006), Valmohammadi (2010b)
8	Rewarding and motivation	Davenport <i>et al.</i> (1998), Liebowitz (1999), Yahya and Goh (2002), Al-Busaidi and Olfman (2005), Wong and Aspinwall (2005), Akhavan and Jafari (2006), du Plessis (2007), Valmohammadi (2010b)
9	Training and education	Mentzas (2001), Yahya and Goh (2002), Wong and Aspinwall (2005), Yu-Chung <i>et al.</i> (2005), Akhavan and Jafari (2006), Chong (2006), Akhavan and Jafari (2006), Bozbura (2007), du Plessis (2007), Jafari <i>et al.</i> (2007), Valmohammadi (2010b)
10	Removal of resources constraints	Holsapple and Joshi (2000), Davenport and Volpel (2001), McDermott and O'Dell (2001), Wong and Aspinwall (2005), Chong (2006), Valmohammadi (2010b)
11	Human resources management	Brelade and Harman (2000), Yahya and Goh (2002), Wong and Aspinwall (2005), Valmohammadi (2010b)
12	Benchmarking	Drew (1997), O'Dell and Grayson (1998), Day and Wendler (1998), Moffett <i>et al.</i> (2003), Yu-Chung <i>et al.</i> (2005), Chong (2006), Akhavan and Jafari (2006), Valmohammadi (2010b)

This resulted in a survey instrument for determining the suitability of the CSFs for implementing KM in the Iranian SME sector which will be discussed later in the study

Management leadership and support: Top management plays a pivotal role which has been pointed out by various authors (Table 1). They should for example, exhibit a willingness to share and offer their knowledge freely with others in the organization, to continuously learn and to search for new knowledge and ideas. It is vital that they model their behaviors and actions through deeds, not just words. By doing so, they can further influence other employees to imitate them and increase the propensity of employees to participate in KM. Other leadership competencies that would be important include steering the change effort, conveying the importance of KM to employees, maintaining their morale and creating a culture that promotes knowledge sharing and creation. In essence, leaders establish the necessary conditions for effective KM (Holsapple and Joshi, 2000).

Organizational culture: The literature suggests that the corporate culture of the organization must be right for KM to work. In order to be able to share, people must first be able to trust. There must be an acceptance of change and willingness to adapt and assist. Culture is believed to influence the knowledge related behaviors of individuals, teams, organizational units and overall organizations because it importantly influences the determination of which knowledge it is appropriate to share, with whom and when (King, 2007). One cultural aspect which is crucial for KM is collaboration. Goh (2002) asserted that a collaborative culture is an important condition for knowledge transfer to happen between individuals and groups. This is because knowledge transfer requires individuals to come together to interact, exchange ideas and share knowledge with one another. Not only this, collaboration has been empirically shown to be a significant contributor to knowledge creation. Trust is also another fundamental aspect of a knowledge friendly culture.

Information Technology (IT): KM is interlinked with IT, as one seems to lead to the creation of the other. It's widely accepted that databases, intranets, knowledge platforms and networks are the fundamental supporting blocks of KM. They make the recording of knowledge much easier and having it in one central repository means it is much easier to search for and to use. There are also added bonuses of categorization, linking related items and ability to update. IT has been shown to increase the speed of knowledge flow and potentially lower the cost of information usage. There is a broad collection of information technologies that supports KM which can be applied and integrated into an organization's technological platform. According to Luan and Serban

(2002) they can be grouped into one or more of the following categories: business intelligence, knowledge base, collaboration, content and document management, portals, customer relationship management, data mining, workflow, search and e-learning. Given the dependence of KM on information technology, KM is still perceived as information management by many organizations. As a result, it is often associated with technological solutions such as intranets and databases (Anantamula and Kanungo, 2010). Organizations should recognize that IT is only a tool and not the ultimate solution, something that, unfortunately, most Iranian organizations do not consider (Valmohammadi, 2010b).

KM strategy: All the academic literature agrees that for a concept to be implemented into an organization there must be a strategy and commitment to implementation (Table 1). While several strategies for implementing KM have been suggested in the literature, a suitable one should be well adjusted to the situation and context of the organization in hand. In order to attach more significance to a KM strategy, it should support an imperative business issue of an organization. A successful KM strategy needs to identify a firm's key factors and leverage them to achieve business results (Massey *et al.*, 2001). It should be noted that selecting what kinds of KM strategies to use is dependent on the company's desired purposes, the limited resources and even the company's preferences.

Performance measurement: Measurement of the knowledge management program as well as the resulting efficiencies attained in processes and practices are essential (du Plessis, 2007). Because knowledge is rapidly becoming a critical asset for promoting the company's future performance, it is therefore vital that indicators and measure are developed in order to allow top management to make decision regarding KM activities (Tseng, 2008). Ahmed *et al.* (1999) argued, measuring KM is necessary in order to ensure that its envisioned objectives are being attained. Measurement enables organizations to track the progress of KM and to determine its benefits and effectiveness. Essentially, it provides a basis for organizations to evaluate, compare, control and improve upon the performance of KM (Ahmed *et al.*, 1999).

Organizational infrastructures: It is crucial for any knowledge management program to include infrastructure management-this does not only include technology, but also training and support. Best practice usability and information architecture techniques to design effective interfaces and efficient information structures are critical

to the success of knowledge management (du plessis, 2007). Despite the fact that some existing functions within an organization such as HRM and IT have already been working with knowledge issues, establishing a group of people with specific and formal responsibilities for KM is crucial. Roles within this team can either be devolved to existing positions or to new ones. While large companies may have the resources to establish a team with multiple layers of roles for KM, SMEs will need to take a smaller scale approach (Wong, 2005).

Processes and activities: Processes can be subdivided into two areas of importance, namely knowledge management processes and knowledge management roles. It is critical to understand how knowledge is captured, evaluated, cleansed, stored, provided and used and how the organization can improve these. Roles have to be created to perform the knowledge management processes (Chait, 1999). Many researchers have suggested a number of activities or processes associated with KM. For example, four main processes were discerned by Alavi and Leidner (2001): creation, storage/retrieval, transfer and application. Nonaka and Takeuchi argued that KM process is a cyclical process consisting of technology-centered strategy to manage explicit knowledge and people-centered strategy to manage tacit knowledge. KM is most frequently associated with three types of activities: generating and creating new knowledge (construction), documenting and codifying individual's knowledge (embodiment) and disseminating the knowledge through such venues as a company-wide database (deployment) (Wei *et al.*, 2009). The execution of KM processes lies at the heart of creating a successful knowledge-based enterprise.

Rewarding and motivation: Rewards and incentives create a climate of co-operation, learning and innovation. Wong (2005) stated if individuals are not motivated to practice KM, no amount of investment, infrastructure and technological intervention will make it effective. Hence, one of the important factors is to establish the right incentives, rewards or motivational aids to encourage people to share and apply knowledge. Also du Plessis (2007) argued that in many organizations a culture of knowledge hoarding, or knowledge is power prevails. The reward and incentive system for knowledge management should consist of push and pull rewards, e.g., rewarding people as part of their performance appraisals according to participation in the program (push) and incentivizing people to use the knowledge base to provide a platform for their innovative ideas, i.e., providing them and their ideas with visibility in the organization (pull).

Removal of resources constraints: It is important that senior managers of SME sector attempt to remove all organizational constraints that create barriers to successful KM implementation. They must realize that organizational constraints can affect negatively the perception and/or attitudes toward KM success. On top of all, the senior managers must allocate adequate budget for their KM initiatives to be successful. Wong (2005) argued since resources availability is a primary concern in SMEs, it has to be properly considered when implementing a KM initiative. For example, the program scope must not be too substantial for their available resources. Investment decisions in KM should be based on a sound consideration of resources and not on the belief that it is a nice to have business program. In addition, proper budgeting of resources is crucial for KM. Arguably, one of the key issues for SMEs in achieving effective KM is to deal with their resources.

Training and education: Knowledge management training and awareness workshops are essential. For example Choie (2006) pointed out to subjects such as training on the importance of knowledge sharing and other knowledge activities, training on the importance of KM to organizations, just to name a few. He also continues, Since KM involves the use of information system infrastructure to capture important information, training on how to use the repository is extremely critical. Employees 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. Horak (2001) suggested that for effective KM, skills development should occur in the following areas: communication, soft networking, peer learning, team building, collaboration and creative thinking. Likewise, Yahya and Goh (2002) showed that training related to creativity, team building, documentation skills and problem solving had a positive impact on the overall KM process.

Human resources management: People are crucial to managing knowledge, as they are the initial holders of the knowledge and without their cooperation to share it; all other efforts are in vain. People should also be encouraged to absorb information from others, as well as taught how to disseminate their information. Organizations should treat people as their priority knowledge resource and be prepared to invest training and time into building KM into people's workloads. As stated by Davenport and Volpel (2001), managing knowledge is managing people; managing people is managing knowledge. Wong (2005) believed central issue

in KM is how to retain knowledge from being lost. This is where the function of employee retention gains its significance in KM, particularly for the SME sector.

Benchmarking: Many firms have adopted benchmarking as a significant, systematic technique for measuring company's performance towards its strategic goals (O'Dell and Grayson, 1998). Once an organization has benchmarked best practices, it is easier to apply the useful knowledge around the organization (Davis, 1996). For instance, VIA Technologies, Inc. (VIA) is a leading supplier of market-leading information technology, including multimedia, logic chipsets, processors and complete platform solutions. VIA is based in Taiwan but with offices in Europe, the USA and China, they employ a workforce of over 2,000 and are seen as a model for other enterprises in the semiconductor industry. So organizations in this industry could benchmark against this corporation.

Assessment of the CSFs from Iranian experts' view: Based on the comprehensive discussion above, all the factors and their underlying issues and elements were carefully shaped into a survey instrument. This was then used to investigate the importance of the CSFs. A group of Iranian academics, consultants and practitioners who have worked and have experience in the field of KM was randomly selected to participate in the survey. As part of the survey, they were asked to assess the extent of the instrument's success in characterizing those factors crucial for implementing KM in the SME sector. Their perceptions were captured using a six-point Likert scale, ranging from not successful at all to extremely successful. This scale was then grouped into three levels-poor, satisfactory, good. Poor comprised the not successful at all and slightly successful scales; moderately successful and successful were denoted satisfactory; and very successful and extremely successful were taken as good. The survey instruments were administered to 44 experts. In total, 37 useable replies were received (84% response rate) the distribution of responses from the participants is shown in Fig. 1. Fifty four percent of the respondents rated the extent to which the proposed CSFs were successful, as satisfactory. The corresponding result for good was 27%. Hence, more than eighty percent of the respondents confirmed the proposed CSFs as being at least satisfactory for their intended purpose. The mean of the ratings revealed a value close to the successful domain. This shows that on the average, the respondents regarded the CSFs to have been successfully developed to reflect those aspects crucial for adopting KM in the SME sector.

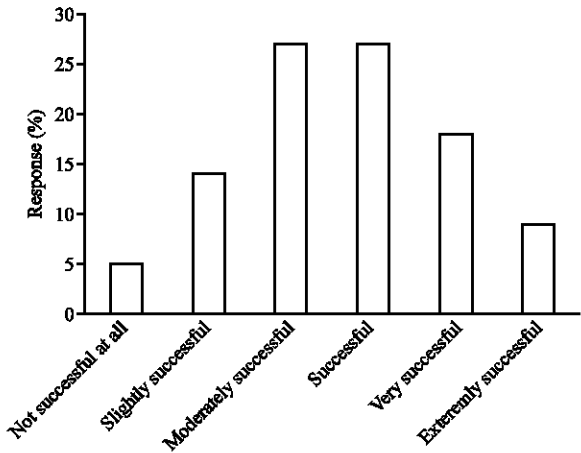


Fig. 1: Extend of suitability of CSFs from experts' view

CONCLUSION AND RECOMMENDATION

This study has proposed a set of 12 CSFs which is believed to be appropriate for SMEs. In addition, an empirical assessment was conducted to evaluate the extent of success of this proposition. On the whole, the results were supportive, thus providing a preliminary indication of the appropriateness of the proposed CSFs. The set of CSFs proposed is in itself important because it can act as a list of items for SMEs to address and deal with when accomplishing KM. This helps to ensure that essential issues and factors are covered when they are planning and developing KM. At a later stage, it can also provide a basis for them to evaluate their KM practices. For academics, it provides a common language for the discussion and study of the factors underpinning the success of KM in SMEs. In the end it is recommended to Iranian scholars and researcher, as the number of Iranian organizations which are keen to implement KM grow, through participation of these organizations necessary studies towards empirical validation of the instrument to be done.

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