Implementation Of Knowledge Management In Small And Medium Enterprises

Mobashar Rehman, Ahmad Kamil B Mahmood, Savita K Sugathan, Aamir Amin, Universiti Teknologi Petronas, Malaysia

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ABSTRACT:

This study provides an insight about KM implementation in small andmediumenterprises (SMEs). SMEs from manufacturing (including manufacturing related services) and service sector (including Information and Communication Technology) have participated in the research. Paper analyzes twelve factors which are significant for the implementation of KM in SMEs. Study also discusses the reason (benefits) due to which SMEs have implemented KM or want to put KM into practice. Beside this, reasons for not implementing KM by SMEs are also part of the study. Personally administered questionnaire method was the survey instrument. Top management provided the response (feedback). Depending on the feedback provided by respondents, CSFs were prioritized base on the significant each CSF has for the implementation of KM. Reasons for implementing and not implementing KM were also prioritized.

Keywords: *Knowledge management, Critical success factors, Small and medium enterprises, Pakistan, Malaysia*

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1. Introduction

Just like any other organizational resource, knowledge also requires management because it's a form of intangible asset for any organization. Knowledge can be categorized as explicit knowledge (stored in database as codified) and implicit knowledge (not stored in any database except in the mind). Management of knowledge is known as 'Knowledge Management' (KM). KM includes creation, adoption, storage and dissemination of knowledge. KM is also defined as 'information in action' (O'Dell & Grayson, 1998) and 'practices and policies' (Neef, 1999). KM has its own significance for both large and Small and Medium Enterprises (SMEs). Growth of a firm and the implementation of KM are correlated to each other. Higher the growth of the firm, higher the implementation of KM will be (Salojarvi et al, 2005). Improved financial performance and innovation of a firm also has a positive connection with the implementation of KM (Wong, 2005).

Beside its established importance for both large and SMEs, one can see that SMEs still lack in the implementation of KM. There are various reasons for this. Those reasons include less financial and non-financial resources, less top management promise, no KM related organizational infrastructure (Chief Knowledge Officer or Chief Information Officer) and misunderstanding about KM benefits and its implementation etc. Less work has been done about implementation of KM in SMEs due to the misunderstanding that KM can be similarly implemented in SMEs as it can be implemented in large organizations. This concept is erroneous. As was suggested by (Desouza & Awazu, 2006), it is incorrect that there is no difference in implementation of KM in large and SMEs and the only difference is scale of organization.

SMEs play a fundamental role in the growth of economy of any country. Hence those programs should be implemented which can help SMEs in better performing their operations and improving financial results. One of these programs is the implementation of KM as SMEs benefit from its implementation (Wong & Espinwall, 2005).

Objective of this study was to help SMEs in implementing KM. This study focused on those factors which are important for the implementation of KM in SMEs. Study also produced a prioritized list of Critical Success Factors (CSFs), based on their significance for implementing KM. Beside this, reasons for not implementing KM in SMEs and benefits which SMEs are getting and can get by implementing KM were also analyzed.

2. Literature Review

Definition for SMEs varies from country to country. Still there are three basic criteria for the classification of SMEs on which almost all countries and organizations agree. Those include number of employees, annual sales turnover and total assets. Some countries use one of these criteria, some use two and even some uses all three to categorize SMEs. Focus of this study was Malaysian and Pakistan based SMEs therefore; Malaysian SMEs are categorized into micro, small and medium enterprises on the basis of number of employees and annual sales turnover. These SMEs are operating in agriculture (including agro-based), manufacturing (including manufacturing related services) and service (includes ICT) sector.

Table I (categorization of SMEs depending on number of employees) and table II (categorization of SMEs depending on annual sales turnover) provides a summary of how Malaysian SMEs are categorized.

Table I: Categorization Of Malaysian SMEs Based On Number Of Employees

	Primary Agriculture	Manufacturing (including Agro-based) & MRS*	Service Sector (including ICT**)
Micro	Less than 5	Less than 5	Less than 5
Small	Between 5-19	Between 5-50	Between 5-19
Medium	Between 20-50	Between 51-150	Between 20-50

Table II: Categorization Of Malaysian SMEs Based On Annual Sales Turnover: In RM '000

	Primary Agriculture	Manufacturing (including Agro-based) & MRS*	Service Sector (including ICT**)
Micro	Less than 200	Less than 250	Less than 200
Small	More than 200 & Less than 1,000	More than 250 & Less than 10,000	More than 200 & Less than 1,000
Medium	Between 1,000 & 5,000	Between 10,000 & 25,000	Between 1,000 & 5,000

*MRS: Manufacturing-Related Services **ICT: Information and Communication Technology
Source: http://www.smeinfo.com.my

Pakistan based SMEs are categorized into small and medium levels and does not include micro level as is the case with Malaysian SMEs. Pakistan based SMEs are operating in

manufacturing, service and trade sectors. Criteria used by government of Pakistan to categorize SMEs are number of employees, total assets and annual sales turnover.

Table III provides a summary of categorization, criteria for categorizing and the sectors in which SMEs of Pakistan are operating.

Table III: Categorization Of Pakistan Based SMEs

Size	Sector	Employees	Total Assets (Rs. Million) Excluding Land & Building	Annual Sales (Rs. Million)
Small	Manufacturing	Less or equal to 50	Less or equal to30	Less or equal to 100
	Service	Less or equal to 50	Less or equal to 20	Less or equal to 100
	Trade	Less or equal to 20	Less or equal to 20	Less or equal to 100
Medium	Manufacturing	Between 51-250	Between 30 - 100	Between 100 - 300
	Service	Between 51-250	Between 20 - 50	Between 100 - 300
	Trade	Between 21-50	Between 20 - 50	Between 100 - 300

For the implementation of KM in SMEs, there are certain factors or areas which are vital for its implementation. These factors are known as CSFs. They are also known as Key Success Factors (KSFs) or Key Result Areas (KRAs) (business dictionary). In general, areas, matters or actions which are useful in the successful implementation of a plan, process, project or business are known as CSFs. When it comes to the implementation of KM, those 'activities and practices' which are helpful in the implementation of KM are known as CSFs (Wong, 2005).

Importance of KM was by no means questioned because it's an established reality now. Infact, it was mentioned in a study that measuring of KM is considered to be difficult but at the same time it is a key area for the success of an organization (Shepard, 2000). KM is not only essential for large organizations but has almost same significance for SMEs. One of the reasons for the success of SMEs is managing their knowledge (Brush, 1992).

As discussed above, implementation of KM lack in SMEs and one of the most important reason is not having enough financial resource (OECD, 2002); (Jun & Cai, 2003). Another reason for not implementing KM is that most SMEs are family owned businesses. This attribute of SME is an important obstruction in the process of knowledge sharing which is an important component of KM implementation. Owners of the SMEs do not share their knowledge with the employees having fear that when employee will leave, he/she will also take the shared knowledge with him/her. Moment at which that employee will join another organization, that knowledge will be transferred to the organization which is being joined and in this way their competitor will benefit. Higher employee turnover in SMEs also supports this phenomenon. This is the reason why SME owners believe knowledge sharing as a threat to their business.

2.1. Comparison Among CSFs Analyzed In This Study And By Other Authors

Top management support: Without the commitment and support from top management in an organization, not only KM but even any other course of action can not be followed or implemented. Hence, top management plays a major role in the implementation of KM. This factor was considered as CSF by different authors. Like management leadership and support

(Wong, 2005), knowledge leadership (Skryme & Amidon, 1997), senior management support (Davenport et al, 1998), leadership (Holsapple & Joshi, 2000); (Hasanali, 2002); (APQC, 1999) and senior leadership support (Liebowitz, 1999).

Financial resources: Financial resources are mandatory to implement KM. If organizations lack financial resources then implementation of KM will be almost impossible. Different authors combined financial and non-financial resources under 'resources'. All resources are essential but financial resources are more important because all other resources are dependent on financial resources. Hence this study will analyze separately 'financial' and 'non-financial' resources. 'Resources' was suggested as CSF by (Wong, 2005); (Holsapple & Joshi, 2000).

Knowledge friendly culture: Culture plays a vital role in any organization. In an organizational culture where people are afraid of sharing their knowledge should first be changed. Different studies emphasized on the importance of culture. Culture itself consists of many components and here we are discussing about CSFs for the implementation of KM, therefore emphasis should be on 'knowledge friendly culture'. Culture was suggested as a CSF by many authors like culture by (Wong, 2005); (Hasanali, 2002); (APQC, 1999), supportive culture (Liebowitz, 1999), knowledge friendly culture (Davenport et al, 1998) and *k*nowledge creating and sharing culture (Skryme & Amidon, 1997).

Technological infrastructure: Without suitable Information Technology (IT) tools, KM can not be implemented because IT is a foremost enabler for KM implementation. Different authors have analyzed the significance of IT as key KM enabler and considered it as a very important CSF for KM implementation. Like IT by (Wong, 2005), technological infrastructure (Skryme & Amidon, 1997); (Davenport et al, 1998), knowledge Ontologies and repositories (Liebowitz, 1999), IT infrastructure (Hasanali, 2002) and technology (APQC, 1999).

Communication between all levels of management: Communication should not only be restricted among peers (colleagues) but all levels of management (top, middle and lower) should communicate with each other. Communication can be considered as emerging CSF for KM implementation because communication helps to spread the importance of KM through word of mouth. Therefore, KM related seminars and informal talks should be allowed at regular interval. This will help in building a knowledge sharing supportive culture.

Human Resource Development: Human Resource Development (HRD) involves training and education, thus another important factor for the implementation as KM implementation requires proper training and education to employees. Training and education is not only important to low level employees but is required for top management as well. If top management does not know anything about KM and its benefits then how they will pursue its implementation. As a result, training and education is treated as a CSF for the implementation of KM. This factor was suggested as CSF by (Wong, 2005) as 'training and education'.

Strategy for KM: Strategy should be developed about the implementation of KM. Without proper strategy, any plan will fail. This factor was suggested by many authors with different names like strategy and purpose (Wong, 2005), strong link to business imperative, vision and architecture (Skryme & Amidon, 1997), clear purpose and language (Davenport et al, 1998), KM strategy (Liebowitz, 1999) and strategy (APQC, 1999).

Systematic KM processes and activities: All processes and activities should be systematic. Process and activities should be coupled with KM. Without proper linkage between 'process and activities' and KM, there will be no use of implementing KM. Factor was suggested as CSF by many authors like process and activities (Wong, 2005), systematic organization

knowledge processes (Skryme & Amidon, 1997), multiple channels for knowledge transfer (Davenport et al, 1998) and control and co-ordination (Holsapple & Joshi, 2000).

Hiring and retention of knowledgeable people: Knowledgeable people who also know the importance of sharing knowledge are important for KM implementation. At the end of the day, it is upon employees who know how to get benefit from implementation of KM? This factor was also suggested by (Wong, 2005), as 'Human Resource Management' (HRM). HRM is not only limited to hiring and retaining of employees. Infact, it involves activities like human resource planning, industrial relations, setting safety and health standards etc. Some of these are not important to implementation of KM, therefore; scope of this factor was limited to only 'hiring and retention of employees' in this study. This also has an impact on the culture of an organization. As culture is dependent on humans so such people should be hired who are knowledgeable and like to share their knowledge. This will help in the promotion of knowledge sharing culture.

Rewards to encourage KM practices: To encourage knowledge creation and sharing behavior, rewards are important (both intrinsic and extrinsic). This factor was suggested as CSF by authors as motivational aids by (Wong, 2005), change in motivational process (Davenport et al, 1998) and incentives to encourage knowledge sharing (Liebowitz, 1999).

Core values of business: Until and unless KM is not emphasized in the vision and mission statements of the business, top management might not pursue KM implementation. As reason for the existence of an organization lies in the vision and mission statements. Top management always keeps an eye on pursuing the vision and mission statements of the business. Hence core values can be considered as a new CSF for the implementation of KM.

Organizational infrastructure: Many organizations especially large ones have KM infrastructure in the form of KM department, Chief Knowledge Officer (CKO) or Chief Information Officer (CIO). Such infrastructure is important for the implementation of KM. This factor was also previously discussed by authors as CSF. Like organizational infrastructure (Wong, 2005); (Davenport et al, 1998), CKO or equivalent and KM infrastructure (Liebowitz, 1999) and structure, roles and responsibilities (Hasanali, 2002).

3. Methodology

Study was conducted in the Perak state of Malaysia and Islamabad, Pakistan. For the complete results, 100 SMEs were approached. 50 SMEs were contacted for data collection from each country. 65 companies responded out of which data from five companies was incomplete. Therefore 60 companies were included in the study (30 from Perak and Islamabad each). Out of those 30 SMEs, 15 were from service sector and 15 from manufacturing sector. Simple random technique was used for selecting SMEs (because of generalization of results). SMEs which were contacted include hotels, marketing companies, ICT based companies, distributors, stationary manufacturers, plastic products and pipe manufacturers. Personally administered questionnaire method was used as survey instrument because data was collected from small geographical area. Questionnaire was intended for the top management of SMEs. Questions were measured on the basis of 6-likert scale. Reason for selecting 6-likert scale was that in odd likert scaling (5-likert scale) if the respondents do not want to answer a particular question then he/she will select central value which means 'neither agree nor disagree'. This type of feedback is not helpful in the analysis. To avoid this problem, 6-likert scale was used as measurement technique (Gotzamani & Tsiotras, 2001).

Respondents were asked to rank all twelve factors from 1-12. One as most important and twelve was least important. Weighted average method was used to rank the factors. Value of R and R-square from linear regression was also used to cross check the results of weighted average method. Linear regression was used to see that whether there exists any relationship between dependent and independent variable or not? Value of R and R-square in this test can be used here as a criteria for measuring significance of each factor. Higher the relationship or association between two variables (dependent and independent), greater will be the significance of independent variable. All CSFs were treated as independent variables and 'implementation' of KM was used as dependent variable.

Respondents were also asked to provide feedback on choosing the reason(s) for not implementing KM. Benefits from implementation of KM were asked as well from respondents. These factors were prioritized on the basis of frequency. Frequency means, the number of respondents chose that option.

4. Results And Discussion

Feedback provided by the SMEs showed that the top most benefit which SMEs are getting from implementation of KM is time saving. 21 companies said that KM is helpful in saving time (i.e., frequency = 21). A better learning opportunity (frequency = 18) was another important reason for SMEs to implement KM. More office automation (frequency = 17), improvement in product(s) or service(s) (frequency = 17), better and quick communication with customers (frequency = 15), good financial results due to less operative costs (frequency = 15), innovation (product and process) (frequency = 14), better management of daily processes and activities (frequency = 12), helpful in decision making (frequency = 10) are the other reasons for implementing KM by SMEs. Table IV, provides a prioritized list of these benefits (according to the significance each benefit has) and the number of SMEs selected that option (frequency).

Table IV: Benefits For The Implementation Of KM

Frequency	Benefits
21	Time saving
18	Better learning opportunities
17	Office automation
17	Improved products or services
15	Improved responsiveness to customers
15	Better financial results
14	Improved innovation
12	Better management of processes & activities
10	Improved decision making

There are various reasons that why SMEs are reluctant to implement KM. Table V, provides a list of various reasons which SMEs consider as the hindrances in implementing KM. These reasons are prioritized on the basis of significance they have. For instance, highest ranked reason by SMEs for not implementing KM is that most of the SME owners don't know what KM is? (frequency = 25). i.e., top management lacks the understanding of KM. Then another important reason is the lack of financial and non-financial resources (frequency = 23), as SMEs lack resources so it's hard for them to implement KM. Other reasons are less awareness about the benefits of KM (frequency = 23); top management is oriented more towards earning profit rather than implementing KM as it will initially reduce their profit margin (frequency = 21) plus maintaining KM in an organization is also a costly process. SMEs lack time and

knowledgeable employees (frequency = 16) which also makes harder for SMEs to implement KM. These were the various reasons due to which SMEs are not implementing KM.

Table V: Reasons For Not Implementing KM

Frequency	Reasons
25	Don't know what KM is
23	Less financial and non financial resource
23	Don't know about the benefits of KM
21	Less commitment from top management
16	Lack of time and human resource
11	Lack of knowledge oriented people
9	Other

4.1 Significance Of CSFs

Table VI, gives a list of CSFs according to the significance each factor has for implementing KM in SMEs (service and manufacturing sector). Average score shows that how high every factor was ranked from 1-12. Lower the average score is, higher the significance will be. Because at the time of feedback, respondents were told that significance will decrease as they move from 1 to 12.

Support from top management is enormously important for the implementation of KM, hence making it as one of the most important CSF. Results also showed that top management support is the highest ranked CSF with weighted average score of 2.07. Knowledge sharing can be done if culture of the organization allows and it is an important criterion for the implementation of KM, thus a CSF for implementing KM with weighted average score of 3.33. Financial resources is another important CSF as nothing can be implemented without financial resources thus securing position among top 3 CSFs with average score of 3.63. Other important CSFs include technological infrastructure (weighted average 5.73), also the key enabler of KM implementation. Communication between all levels of management (weighted average 6.33). This factor was introduced by the author of the study as emerging CSF and it proves its importance as a CSF because SMEs consider it among top 5 CSFs. Next is HRD, (weighted average 6.73), another important CSF because HRD creates awareness among all levels of employees about the importance of KM through training and education. Hiring and retention of knowledgeable employees (weighted average 7.63). Employees make up the culture of an organization therefore considered as important CSF in implementing KM. Strategy for KM (weighted average 8.57). Rewards to encourage KM practices (weighted average 8.73); this factor should be a little bit higher in the priority list because rewards (intrinsic and extrinsic) are important to encourage knowledge sharing culture in the organization. Reason for its low priority is that SMEs are lacking the knowledge infrastructure. Other factors like systematic KM processes and activities (weighted average 8.93), core values of business (weighted average 8.97) and organizational infrastructure (weighted average 10.37) are also considered as CSFs beside their lower priority. Organizational structure was considered as least important factor while implementing KM and the reason might be that SMEs lack KM related infrastructure. These are the persons who know the importance of measuring KM, what are the needs of implementing KM and how KM can be implemented? As SMEs lack in this field therefore top management rated it as the least important CSF. Its priority may vary when CKO or CIO are asked to provide the feedback about the significance of 'organizational infrastructure'.

Table VI: Significance Of CSFs For SMEs

Significance of CSFs for SMEs in Malaysia & Pakistan		
Priority	**CSF Name**	**Average Score**
1	Top Management Support	2.07
2	Knowledge Friendly Culture	3.33
3	Financial Resources	3.63
4	Technological Infrastructure	5.73
5	Communication Between All Levels	6.33
6	HRD	6.73
7	Hiring and Retention of Knowledgeable People	7.63
8	Strategy for KM	8.57
9	Rewards to Encourage KM Practices	8.73
10	Systematic KM Processes and Activities	8.93
11	Core Values of Business	8.97
12	Organizational Infrastructure	10.37

5. Conclusion

Study analyzed the significance of twelve CSFs which are involved in the implementation of KM. Factors discussed were Top Management Support, Knowledge Friendly Culture, Financial Resources, Technological Infrastructure, Communication between all Levels of Management, HRD, Hiring and Retention of Knowledgeable People, Strategy for KM, Rewards to Encourage KM Practices, Systematic KM Processes and Activities, Core Values of Business and Organizational Infrastructure. Prioritized list was produced on the basis of role played by each CSF in the implementation of KM in SMEs. Beside the significance of these CSFs, study emphasized on those benefits due to which SMEs have implemented KM or want to implement KM. Study also focused on those reasons because of which SMEs are not implementing KM.

Due to time constraint, initially, only 100 SMEs were selected for data collection. For future work, generalization of study can be enhanced by increasing number of SMEs. Potential future work can also involve finding the relationship between CSFs and financial performance of an organization.

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About the Authors:

Mobashar Rehman is a student of MSc (IT) from Universiti Teknologi PETRONAS (UTP), Malaysia. He has done MBA (Finance) with distinction and BS (CS)-Hons. He has been involved in academic activities from last one year; Tel: +6 0196911930; Email: mubashir_rehman@yahoo.com

Dr. Ahmad Kamil B Mahmood is the Head of Department for CIS in Universiti Teknologi PETRONAS (UTP), Bandar Seri Iskandar, Tronoh, Perak, Malaysia; Email: kamilmh@petronas.com.my

Savita K. Sugathan is lecturer in Department of CIS in Universiti Teknologi PETRONAS (UTP), Malaysia; Email: savitasugathan@petronas.com.my

Aamir Amin is a student of MSc (IT) in Universiti Teknologi Petronas (UTP), Malaysia. He is involved in academic activities from last one year. He has done bachelors in business administration (IT) with the distinction of bronze medal; Tel: +6 0196939690; Email: aamir-amin@hotmail.com