

An Empirical Study of Knowledge Management Processes in Small and Medium Enterprises

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ABSTRACT

The competitiveness of small and medium enterprises depends on the quality of knowledge they apply to their business processes. Knowledge management processes are part of the organization business processes. These processes are essential or the precondition for effective knowledge management. Knowledge management processes comprised of knowledge acquisition, conversion, application, and protection. These processes require turning personal knowledge into corporate knowledge that can be widely shared throughout an organization and appropriately applied. It is a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action to improve organizational performance. There are very limited empirical studies on knowledge management processes in small and medium enterprises particularly in Malaysia. In order to reduce the research gap, this study examines how small and medium enterprises apply knowledge management processes in their daily business activities and analyze the relationship between knowledge management processes and organizational performance. With an effective knowledge management processes, small and medium enterprises should be able to come up with innovative products and services to ensure their competitiveness and sustainability of performance.

1. Introduction

Today's economy is characterized by a rapid rate of change, globalization and knowledge-based products. The survival and performance of an organization is influenced by its ability and speed in developing knowledge-based competences. Keen competitiveness

in the global economy underscores the importance of knowledge management as a basis of competition. In knowledge-based economy, where generation and exploitation of knowledge play a vital role in the process of wealth creation, competitive advantage is accrued from unique knowledge and the ability to learn faster than one's competitor [1, 2]. The ability to manage an organization's knowledge ultimately results in a smarter and more capable organization thus enabling it to manage its assets cheaper, better or more effective than the competitors [3]. Besides that, knowledge management has the ability to protect intellectual assets from being lost [4-7]. By implementing knowledge management processes as part of their daily business activities, small and medium enterprises (SMEs) can confidently compete and sustain in competitive markets.

There are very limited empirical studies on knowledge management processes in SMEs particularly in Malaysia. In order to reduce the research gap, this study proposes to examine the impact of knowledge management processes on organizational performance. With an effective knowledge management processes, SMEs should be able to come up with new products and services to ensure that they are ahead of competition and at the same time improve their performance.

2. Knowledge Management in Small and Medium Enterprises

Most discussions on knowledge management and its related issues have focused on large organization, with little attention being paid to the small business sector [8]. This was due to large organizations generally having more knowledge assets to be managed. Large organizations also have many business units at

different locations, thus they need to have knowledge management systems to facilitate the sharing and transfer of knowledge. Generally, knowledge management studies conducted in small organizations have been focusing on case studies where the objectives were to examine their perception towards knowledge management and their practices and developments in the area.

McAdam and Reid [8] compared the perception of knowledge management between large organizations and SMEs. Their results showed that SMEs suffered from certain limitations. They tend to take a more mechanistic view and have limited vocabulary of knowledge; are less systematic in their approaches for embodying and sharing of knowledge; and their perceived benefits of knowledge management were targeted towards the market rather than towards the improvement of internal efficiency. In another study in Australia and Singapore, Lim and Klobas [9] concluded that there were noticeable differences in the value placed by small and large organizations on systematic knowledge management practices, especially in the adoption of computer based knowledge storage systems. They suggested that the greatest need for small businesses was to build an effective knowledge repository system. Matlay [10] found that only a minority of UK SMEs manage knowledge operate in proactive and strategic manner to enhance their competitive advantage.

Lim and Klobas [9] and Wong and Aspinwal [11] noted that small businesses generally lack a proper understanding of knowledge management and they have been slow in adopting formal and systematic KM knowledge management practices. As reported by Wong and Aspinwal [11], SMEs were just beginning to understand how knowledge management might assist them. This finding was supported by the studies of Niza Adila and Woods [12] on Malaysian SMEs. They found that the degree of knowledge management awareness among Malaysian SMEs is at a low level and thus suggested a knowledge management framework for local SMEs which focused on utilizing existing resources, encouraging a knowledge sharing culture and using free and low cost computer programmed software.

SMEs might be able to enhance their performance and competitive advantage by having a more conscious and systematic approach to knowledge management [13, 14]. As Knight [15] and Webb [16] pointed out, knowledge management promises SMEs the same benefits experienced by many larger organizations such as better communications, improved customer knowledge, faster response times, greater efficiency in

processes and procedures and reduced risks from the loss of critical knowledge. SMEs with a comprehensive and strategic approach to knowledge and intangible assets are found to be growing faster than those with a less balanced approach [13].

3. Knowledge Management Processes

An organization needs to generate new knowledge on a continuous basis, facilitate its sharing within the organization and apply knowledge to gain competitive advantage. Knowledge management processes assist an organization in acquiring, storing, and utilizing knowledge to support problem solving, dynamic learning, strategic planning, and decision-making [17].

Academics and practitioners are recognizing that knowledge management processes are becoming prerequisites for success in organizations [18-21]. Some authors suggest that an organization's ability to generate knowledge is vital [21-23]. They divide knowledge management processes into several components that are acquire, collaborate, integrate, experiment [24]; create, transfer, assemble, integrate, and exploit [25]; create, transfer, and use [26]; acquisition, conversion, application and protection [27].

4. Knowledge Management Processes in Small and Medium Enterprises

In order for SMEs to improve their competitive advantage, an organization should have knowledge management processes that can enable it to acquire new knowledge for it to apply, share and preserve vital knowledge. However, most SMEs tend to have severe limitations when it comes to such processes.

Knowledge Acquisition

Knowledge acquisition deals with the processes of creating, generating, developing, building and constructing knowledge internally. These terms refer to the process of deriving new and useful insights and ideas. SMEs have an option to acquire knowledge from external sources such as by hiring or employing individuals with the required knowledge or by purchasing knowledge assets such as patents, research documents or other intelligence [11]. Small organizations can also acquire external knowledge through other means such as by searching [28, 29], adopting it from other sources [30] or obtaining it from knowledge driven organizations. Small organization appears to be in an advantageous position in terms of acquiring customers' knowledge. Managers and employees of SMEs tend to have close and direct contact with customers and some may know them socially and personally [31]. Thus, a stronger knowledge channel can be developed which will

improve their ability to capture customers' knowledge. A close proximity to customers will enable a more direct and faster knowledge flow. It will also enable them to obtain information such as competitors' actions and behavior, market trends and other developments [11].

Knowledge Conversion

This stage of knowledge management process deals with organizing and applying knowledge that has been created or acquired in ways that make it formalized and accessible. In the context of SMEs, knowledge tends to be passed on without any associated records or documentation due to their informal communication culture. Documentation of key knowledge is rare and it is normally not properly stored in a readily retrievable system for future use due to less formal working systems and procedures. Majority of SMEs feel that it is not feasible to establish a formal system for codifying, organizing and storing knowledge since they are always busy with their daily routines [11]. In addition, SMEs have less resources and capacity to maintain a knowledge repository as compared to large organizations. They are compounded with limited budget. Therefore, most knowledge is kept in the heads of the owner-managers or a smaller proportion may reside in the heads of other employees. Thus, there is an inherent danger that knowledge will be lost if key employees leave the organization due to the absence of the repository systems. According to Wong and Aspinwall [11], the only strength that SMEs have for this process is that there is less knowledge asset in the organization, which make the process of organizing and storing easier. Further, due to fewer employees and that most of these employees know each other very well, they have better idea of the level of expertise and know-how of their colleagues, and they know whom to consult if they need certain information. Hence, Wong and Aspinwall [11] suggested that it is easier for SMEs to organize tacit knowledge through profiling employees or setting up corporate listing of employees who are knowledgeable in a particular area as compared to organizing explicit knowledge.

Knowledge Application

This phase refers to the processes of sharing, transferring, disseminating and distributing knowledge once it has been organized and stored. Knowledge that is kept solely in an individual's domain is of little value to an organization. As stated by Bhatt [32], applying and sharing knowledge means making it "more active and relevant for the organization in creating values". Communication is likely to be faster

in SMEs due to their flat structure and low level of bureaucracy. Employees in SMEs are often in close contact with each other and two-way communication is the norm. This invariably offers a strong foundation for building knowledge network with each other. Therefore, SMEs have a great advantage in this knowledge management process since their environment is likely to be conducive for transferring and disseminating knowledge. SMEs also share knowledge with large organizations and other knowledge driven organizations. With the rapid expansion of high technology, they are able to share design and production knowledge electronically and hold virtual discussions to explore new opportunities and build new capabilities. As stated by Sparrow [33], the adoption of knowledge technology in SMEs was led by clients, especially large customers and suppliers.

Knowledge Protection

It is necessary for SMEs to protect their knowledge within an organization from illegal or inappropriate use. Protection is vital if the knowledge are to be used to generate or preserve a competitive advantage [34]. Protection mechanism can be built into the technology infrastructure, but other forms of protection should also be considered that govern the behavior and conduct of employees [34, 35]. However, since it is costly for SMEs to protect its knowledge, the costs and benefits of protection must be weighed very carefully.

5. Organization Performance

An organizational performance can be improved by locating and sharing useful knowledge [36]. The potential for knowledge management to create competitive advantage is positively linked to organizational performance [37]. The overall performance of an organization depends on the extent to which managers/owners can mobilize all of knowledge resources held by individuals and teams and turn these resources into value creating activities [38]. Knowledge management active organizations were found to perform better than others while other studies showed that knowledge management practices increase the knowing-doing gap [39]. There are also other potential impacts of knowledge management, not just on the overall organization performance, for example Darroch and McNoughton [40] concluded in their study that knowledge management correlated positively with the incremental innovation and there is a relationship between knowledge management and survival and sustainable growth in the small business industry [10, 41, 42].

Most of the organization performances were measured based on respondents' perspective. They were asked to

rate their organization in comparison to their competitors on each measure of performance. Choi and Lee [43] measured organization performance from financial and non-financial perspectives. The measures were developed and validated by Deshpande et.al [44] and Drew [45]. It consisted of output items such as overall success, market share, growth rate, profitability, innovativeness and business size compared to key competitors. Besides using comparative performance measure, Darroch [40] also used internally reflective performance measure, for example “we are more profitable than we were five years ago” [43, 44, 46]. Marques and Simon [47] suggested an instrument to measure the effect of knowledge management practices on organization performance. The measures consist of capital profitability, growth, operational and financial efficiency, stakeholder satisfaction and competitive position.

6. Methodology

The objective of this study is to examine the impact of knowledge management processes on organization performance. The population frame for this study is the list of SMEs from Malaysia Development Corporation (MDeC). Specifically, the respondents are SME Multimedia Super Corridor (MSC) status organizations that are considered as knowledge intensive organizations. Unit of analysis will be the organizations where each SME will be taken as a sample. Cross-sectional method of study will be used whereby data will be collected at a single point in time. Self-administered questionnaires were used as an approach to collect data. Since this is a pilot study, 50 questionnaires were distributed and 28 were returned completely. All the samples chosen for pilot test were from the same population in the actual survey (Malhotra and Birks, 1999).

An independent variable is knowledge management processes that comprises of knowledge acquisition, conversion, application and protection are adapted from Gold et al. [27], O’Dell and Grayson [48], Holsapple and Singh [49] and Becerra-Fernandez et al. [50]. On the other hand, organization performance as dependent variable consists of growth, profitability, innovativeness, customer satisfaction and overall business performance are adapted from Ramanujam and Venkatraman [51], Venkatraman [52], Deshpande et al. [44], Drew [45], Choi and Lee [43], and Hudson et al. [53]. A list of variables was given to the respondents and they were asked to indicate their level of agreement based on Likert-scale, with the

representation of level of agreement; ‘1’ indicates ‘strongly disagree’ to ‘7’ indicates ‘strongly agree’.

7. Results and Discussion

Respondents Profiles

Respondents profiles are based on business region, business cluster, type of ownership, current position of service, education level, number of employees, number of years in operation and number of years awarded MSC status organization as shown in Table 1.

Table 1: Respondents Profile

Profile Characteristics	Percentage
Business Region	
• Cyberjaya	11
• Technology Park Malaysia	4
• KL City Centre	4
• UPM-MTDC	7
• KL Tower	0
• KL Sentral	75
Business Cluster	
• Creative multimedia	20
• Mobility, embedded software and hardware	8
• Software application	36
• SSO	16
• Support services	12
• Internet-based businesses	8
Type of ownership	
• Local	41
• Multinational	52
• Joint-venture	7
• Franchise	0
Current position of service	
• Top management	29
• Middle management	71
Education level	
• Postgraduate degree	21
• Degree	68
• Diploma	7
• STPM/SPM	4
• Others	0
Number of years in operation	
• Less than 3 years	25
• 3 – 5 years	32
• 6 – 10 years	25
• 11 – 15 years	11
• More than 15 years	7
Number of years awarded MSC status company	
• Less than 3 years	43
• 3 – 5 years	29
• 6 – 10 years	25
• 11 – 15 years	0
• More than 15 years	4

Most of respondents are located in Kuala Lumpur Sentral (75%) where majority of them offer software application services (36%). The sample consists of 52% multinational, 41% local and 7% joint-venture organizations. Looking at the key informant's current position and education level, majority of them are in the middle level management and are having Degree level (68%). Most of organizations in this study were in business for 3 to 5 years and was awarded MSC status organization for the last 3 years.

Reliability Test

Reliability test is an assessment of the degree of consistency between multiple measurements of a variable. The Cronbach alpha coefficient was used to estimate the internal consistency and reliability of a measures [54, 55]. A generally agreed lower limit of the Cronbach's alpha coefficient is 0.7., and Table 2 presents all the alpha coefficients that were above the required level of 0.7 as suggested by Nunnally [54].

Table 2: Reliability Analysis

Factors	Number of Items	Cronbach's Alpha
Knowledge acquisition	7	0.911
Knowledge conversion	7	0.919
Knowledge application	7	0.931
Knowledge protection	6	0.893
Organization performance	5	0.954

Regression

Table 3 presents an analysis using multiple regression that is used to examine the relationship between knowledge management processes and organization performance. The results shows highly positive relationship between knowledge management processes and organization performance ($r = 0.867$). Seventy five percent of variation in organization performance was explained by knowledge management processes in this analysis.

Further the model was tested using stepwise regression analysis. Results in Table 4 presents that among the knowledge management processes, knowledge acquisition is the main contributor to organization performance, where the model excludes all other processes in the analysis. Table 5 and 6 presents the beta coefficient for knowledge acquisition and the excluded variables in the analysis. It is expected that

the other three knowledge management processes were excluded in the analysis due to small sample size.

8. Conclusions

The analysis shows that knowledge management processes have a significant relationship with organization performance where knowledge acquisition is the main process that contributes to the organization performance. As discussed earlier, knowledge acquisition consists of accumulating, creating, acquiring, generating, capturing and collaborating activities that were used by SMEs in acquiring new knowledge. Due to their small size, SMEs has an opportunity to gain direct and faster knowledge from their customers which enable them to sustain in the market. Besides that, they will also have an advantage of obtaining information on competitors' actions and behavior, market trends and other developments. By having instant information, indirectly SMEs can compete in the market by offering up to-date services or products. From one of the studies, it shows that knowledge acquisition affects organization performance but this relationship is mediated by responsiveness to knowledge [40]. In contrast to a study carried out in Turkey, knowledge conversion and application are the most important predictors of knowledge management processes, followed by knowledge acquisition, while knowledge codification has the less impact on knowledge management processes [56]. However, all these knowledge management processes contribute to the performance of knowledge management practices. In conclusion, small businesses should not be seen as less important and less influential than large ones. They have their own roles to play in the economy, as do large organizations. Both are important to the economic growth of a nation and they actually complement each other in the business chain. Therefore, not only large organizations need to improve themselves through knowledge management in achieving business excellence; so should the small ones. Knowledge management should be considered just as important for them as it is for large organizations. Having systematic knowledge management processes has proven necessary in order to overcome knowledge loss. This study may assist SMEs in the further development of their knowledge management processes in order to improve their performance.

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Table 3: Model 1 Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin - Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.867	.752	.709	.65561	.752	17.462	4	23	.000	1.457

Predictors: (Constant), acquisition, conversion, application and protection

Dependent Variable: organization performance

Table 4: Model 2 Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
2	.857(a)	.734	.723	.63944	.734	71.603	1	26	.000	1.650

a Predictors: (Constant), acquisition

b Dependent Variable: organization performance

Table 5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
2	(Constant)	-.543	.766		-.709	.485
	acquisition	1.126	.133	.857	8.462	.000

Table 6: Model 2 Summary Excluded Variables

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
		Tolerance	Tolerance	Tolerance	Tolerance	Tolerance
2	conversion	.019(a)	.095	.925	.019	.279
	application	.232(a)	1.137	.266	.222	.244
	protection	.020(a)	.172	.865	.034	.791

a Predictors in the Model: (Constant), acquisition

b Dependent Variable: organization performance