International Business Management 12 (5): 396-407, 2018
ISSN: 1993-5250

Factors Affecting Knowledge Management System and Effective Decision Making among Manufacturing SMEs in East Coast Malaysia

[1]Nurshahida Binti Mohamad Razali, [2]Abdullah Al Mamun,[1]Mohd Nazri Bin Zakaria and
[1]Noorshella Bt Che Nawi
[1]Faculty of Entrepreneurship and Business,
[2]Global Entrepreneurship Research and Innovation Centre (GERIC),
Universiti Malaysia Kelanta, Kelantan, Malaysia

Abstract: In today's competitive global business environment, SME's sustainability largely depends on their effective decision making capacity. This study examines the effect of Tacit knowledge, explicit knowledge, knowledge acquisition, knowledge dissemination and knowledge utilization on knowledge mnagement sstem (kms) and the effect of kms on effective decision-making among the manufacturing SMEs in East Coast Malaysia. This study adopts the cross-sectional design and quantitative methods and collects data from 141 randomly selected SMEs from Kelantan, Pahang and Terengganu States. Findings of this study reveal that tacit knowledge, explicit knowledge, knowledge dissemination and knowledge utilization have a significant positive effect on KMS and KMS has a significant positive effect on effective decision making among the manufacturing SMEs in East Coast Malaysia. Manufacturing SMEs in Malaysia should therefore focus on improving the knowledge management system for effective decision-making.

Key words: Knowledge management system, effective decision making, manufacturing SMEs, study adopts, cross-sectional design, knowledge dissemination

INTRODUCTION

Small and Medium Enterprises (SMEs) are a huge part of the global economy specifically in economic growth through innovation and taxes (Kongolo, 2010), the ability to create employment in developing and developed countries (Namusonge, 2014) and a factor for economic growth and poverty reduction (Katua, 2014). As such much importance is given to the development, growth, success and sustainability of SMEs. SME's competitiveness is determined by many factors where Nonaka and Takeuchi (1995) highlight the importance of knowledge in firms in order to bring innovation, new products, processes and improving the existing ones. The effective management of knowledge is the best strategy to equip a firm with competitiveness since knowledge is a strategic resource that enables firms to achieve innovation and competitiveness (Chirico, 2008).

Knowledge Management (KM) is the process of acquiring, storing, disseminating, sharing and using productive knowledge to enhance organizational performance (Kiessling *et al*., 2009). The creation of knowledge is through the conversion of tacit and explicit knowledge that is put through a series of knowledge management processes including knowledge acquisition, knowledge dissemination and knowledge utilization to complete the structure of the knowledge management system. Knowledge management system and the related activities are found to benefit small businesses. Previous studies have found that knowledge management contributes to organizational success, fewer losses, sales growth (Edvardsson, 2009) and improved customer satisfaction in terms of reputation and customer loyalty (Edvardsson, 2009; Wei *et al*., 2011). Wei *et al*. (2011) noted that knowledge management activities lead to employee development involving staff retention, increase of learning and skills, innovation, creativity and knowledge creation.

Despite the importance of knowledge management to SMEs, the spread of knowledge management among SMEs is not sufficient. This is due to the lack of technological maturity, reluctance to change, lack of financial resources and uncertainty regarding benefits of knowledge management (Edvardsson and Durst, 2013). Moreover, previous studies on knowledge management have given minimal attention to the benefits generated for

Corresponding Author: Nurshahida Binti Mohamad Razali, Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, Kelantan, Malaysia

SMEs as the focus has been more on large firms (Roxas *et al*., 2014). Furthermore, the lack of understanding on how firms create, transfer and use knowledge has decreased the utilization of knowledge to create advantages (Lin *et al*., 2012) and the difficulty in measuring knowledge management in SMEs explains the scarcity of empirical studies (Becerra-Fernandez and Sabherwal, 2014)

The contribution of SMEs to the GDP has increased from 29.4% in 2005 to 33.1% in 2013 (Anonymous, 2012) and has provided 59% of employment in Malaysia (Anonymous, 2012). Interestingly, 95.4% of manufacturers are SMEs (Anonymous, 2011) and they are the second largest contributor to the nation's GDP behind the services sector. However, SMEs in the manufacturing sector have experienced a decline in their contribution to the GDP from 8.1% in 2005 to 7.4% in 2009. The contribution improved and showed an upward trend in 2013 when it increased to 7.9% (Anonymous, 2012, 2014). It is important for manufacturing SMEs to maintain an upward trend in GDP contribution, therefore it is crucial to examine issues pertaining to the competitiveness of manufacturing SMEs. Based on the above-mentioned discussion, this study intends to examine the effects of tacit knowledge, explicit knowledge, knowledge acquisition, knowledge dissemination and knowledge utilization on knowledge Management System (KMS) and the effect of KMS on effective decision-making among the manufacturing SMEs in East Coast Malaysia.

Study context; manufacturing SMEs in Malaysia: The importance of Malaysia's continuous economic development lies in the transformation of its industrial base into increased productivity, automation, innovation and value added products. According to the Anonymous (2016), in 2014, the manufacturing sector employed 2,096,197 individuals, 98% of whom were fulltime employees. Among those employed in the manufacturing sector, 1,423,337 (69.3%) are plant and machine operators and assemblers; this group of employees received RM27.4 billion in total in the form of salaries and wages. The managers, professionals and executives group of employees received RM18.5 billion as salaries and wages while employing 187,092 people. This group of managers, professionals and executives scored the highest average salaries and wages per annum of RM98, 685. Meanwhile, 1,738,937 or 84.1% of the employees from other groups of manufacturing groups recorded average salaries and wages of RM27, 048 per annum. Apart from that, the manufacturing sector accounted for 81.5% of the total exports of Malaysia in 2016. Malaysia as a developing country relies heavily on the significant contribution of Small and Medium Enterprises (SMEs). SMEs consist of 99.2% of the total business establishment in Malaysia and they contribute 32% to the nation's GDP (Anonymous, 2014). The contribution of SMEs to the GDP has increased from 29.4% in 2005 to 33.1% in 2013 (Anonymous, 2012) and has provided 59% of employment in Malaysia (Anonymous, 2012). The SME growth in 2014 at 13.6% outpaced the overall economy expansion which increased the SMEs contribution to the GDP at 35.9%. Interestingly, 95.4% of the manufacturers are SMEs (Anonymous, 2011) which accounts for 6% of the total SMEs (37,861). They are the second largest contributor to the nation's GDP behind the services sector. 57.1% of the manufacturing SMEs are micro-sized, 36.8% are small-sized and 3.1% are medium-sized. Manufacturing SMEs are backed by petroleum, chemical, rubber and plastic products with the highest contribution of RM307 billion (30.4%) gross output in 2014. Electrical, electronic and optical manufacturing accounted for RM232.2 billion (23%). Beverages and tobacco products had the lowest gross output at RM9.7 billion (1.0%) (Anonymous, 2016).

Literature review

Factors affecting KMS: Tacit knowledge-is defined as an aspect of knowledge which is highly personal, hard to formalize and difficult to communicate (Nonaka and Takeuchi, 2004). Tacit knowledge is deeply rooted in involvement, commitment and action in a specific context. To transfer tacit knowledge, it involves the participation from key personnel and supporting systems (Pham, 2008). It is noted that tacit knowledge contains both technical and cognitive elements; the technical aspect of tacit knowledge includes strong know-how and personal skills while the cognitive aspect of tacit knowledge includes mental model, beliefs and ingrained schema (Nonaka, *et al*., 2000). This gives importance to Tacit knowledge which is unique and hard to imitate since it is context-specific, developed from experience and rooted in complex organizational routines. It is considered the most important strategic resource and the only sustainable and renewable factor for competitiveness (Nonaka and Takeuchi, 2004; Chen and Mohamed, 2010). It is noted that to have a successful knowledge management, it is important to integrate Tacit knowledge (Lammers, 2009). The spiral model suggested by Nonaka *et al*. (2000) points out that knowledge starts from individuals, turns into organizational knowledge and finally expands throughout an organization which suggests that knowledge in the tacit form is important in creating knowledge management

in organizations. Researchers believe that collective intelligence can create knowledge management (Svobodova and Koudelkova, 2011). Previous studies have shown that Tacit knowledge has high potential in leading to competitive advantage and superior performance (Zaim *et al*., 2015) and understanding the effects of tacit knowledge on knowledge management systems is crucial which leads to the following hypothesis:

- H_1: tacit knowledge has a positive effect on knowledge management system among the manufacturing SMEs in East Coast Malaysia

Explicit knowledge: Polanyi (1996) defines explicit knowledge as formal, easy to share and codify and systematic knowledge which a person can express. Explicit knowledge is the knowledge people have consciously in mental focus, in a way that can be communicated easily to others. It is noted that both explicit and tacit knowledge are important in ensuring the success of knowledge management system. Furthermore, both types of knowledge continuously interact towards the creation and application of knowledge. Individuals are regarded as essential to the success of knowledge management (Lammers, 2009), as new knowledge always starts with individuals which is transformed into organizational knowledge and spread throughout the organization (Nanoka *et al*., 2000). Empirical evidence suggests that knowledge management and its activities are facilitated by the collective intelligence gathered from the available knowledge of individuals, as it is crucial for the organization (Svobodova and Koudelkova, 2011; Boder, 2006). The above literature leads to the following hypothesis:

- H_2: explicit knowledge has a positive effect on knowledge management system among the manufacturing SMEs in East Coast Malaysia

Knowledge acquisition: It is described as the process of gaining knowledge from individual experts and putting it into a readable form. It is done through interviewing, brainstorming, observations and protocol analysis (Feliciano, 2007). It is the process of developing new tacit or explicit knowledge from individual data and information or the synthesis of prior knowledge (Hegazy and Ghorab, 2014). Knowledge acquisition is crucial in creating organizational memory (Becerra-Fernandez *et al*., 2004). A previous study by Jiang and Li (2009) found that knowledge acquisition improves performance significantly and it promotes learning. Knowledge acquisition allows employees to learn from others and this will more likely equip them with knowledge which enables them to anticipate changes, learn and manage their work as needed (Becerra-Fernandez *et al*., 2004). The process of acquiring knowledge from inside or outside of the organization is expected to influence the performance (Cho and Korte, 2014) where appropriate acquisition increases the available knowledge to the organization. This allows the formulation of the next hypothesis:

- H_3: knowledge acquisition has a positive effect on knowledge management system among the manufacturing SMEs in East Coast Malaysia

Knowledge dissemination: The process of transferring and sharing of acquired knowledge with the members of the organizations through technological and human means. This process enables the members of the organization to utilize the new knowledge to perform their job functions which includes the use of knowledge management systems (Funmilola, 2015) and as important as it is to acquire information and knowledge, it is equally important to make it accessible and retrievable easily which is the fundamental objective. The main concept is to avoid the loss of ideas, insights, contacts, relationships, experience and information when an employee leaves an organization. This highlights the importance of sharing or the dissemination of knowledge.

Previous studies found that Knowledge dissemination is a key activity in effective knowledge management (Amayah, 2013; Olatokun and Nwafor, 2012). In order to utilize the knowledge once it is created and to add value to the organization, knowledge must be shared and transferred, as it is important for knowledge management. This is the basis for the following hypothesis:

- H_4: knowledge dissemination has a positive effect on knowledge management system among the manufacturing SMEs in East Coast Malaysia

Knowledge utilization: Jiang (2015) defines Knowledge utilization as the process of integration of gained knowledge, existing knowledge and the creation of new knowledge to improve firm process or performance. The process of knowledge utilization starts from knowledge acquisition where knowledge is gathered; Knowledge dissemination is the process of sharing the acquired knowledge and the final step is the utilization of the

knowledge. The ultimate goal of the knowledge management system is the utilization of knowledge (Jiang, 2015). Utilization of knowledge is expected to improve the organizational process and ultimately the performance; As mentioned earlier, it is expected to affect an organization's knowledge management system as well. A previous study has found that knowledge utilization improves work performance among academic staff (Savolainen, 2009). Agba *et al*. (2004) found that knowledge utilization increases efficiency, quality and effectiveness. This leads to the following hypothesis:

- H_5: knowledge utilization has a positive effect on knowledge management system among the manufacturing SMEs in East Coast Malaysia

Knowledge management system and effective decision-making: Knowledge management is the planning, motivating organizing and controlling of individuals, systems and processes in an organization to improve knowledge related assets and the effective employment of knowledge (King, 2009). Knowledge management systems are the usage of organization's communications and information systems to support knowledge management processes (King, 2009). Knowledge-based view (Grant, 1996) looks at knowledge beyond the aspects of strategic management, competitive advantage, strategic choices and the traditional views of knowledge. Grant (1996) claims that it delves more into the characteristics of knowledge and the utilization of knowledge to create value within a firm. The theory explains that "Knowing how" (tacit knowledge) is revealed through application and "Knowing about the facts" (explicit knowledge) is revealed by communication. Both are transferable but the mechanism differs. Transferable knowledge must be receivable and the question is whether the person receiving the new knowledge is able to add this to the existing knowledge. The efficiency of this process is enhanced through the advances in information technology, as the process of transferring and aggregating knowledge is important in decision making within a firm. In the work of Grant (1996), it is noted that knowledge acquisition by experts and specialists leads to efficiency in knowledge production. The firm is regarded as an institution for knowledge application; This emphasizes the utilization of knowledge where managers put knowledge to use to make better decisions.

Consequently, the objective of knowledge management practices is to improve organizational performance through better decision making, improved organizational behavior and better knowledge practices (King, 2009). Omotayo (2015a, b) points out that managing knowledge leads to substantial savings in a firm and that is hard to achieve without improved decision making. Mohammed and Jalal (2011), in their research, propose that the most valuable achievement of a firm's knowledge utilization is effective decision making. Many large companies regard investing in knowledge management as a business strategy as decision makers heavily depend on it to make a reasonable decision (Addicott *et al*., 2006). Knowledge management has allowed various actors at different stages and situations to participate in the decision making process (Alberts and Hazes, 2006) and this leads to the following hypothesis:

- H_6: knowledge management system has a positive effect on effective decision-making among the manufacturing SMEs in East Coast Malaysia

As noted above, earlier studies have noted a positive effect of tacit knowledge (Lammers, 2009; Nonaka *et al*., 2000; Svobodova and Koudelkova, 2011; Zaim *et al*., 2015), explicit knowledge (Boder, 2006), knowledge acquisition (Jiang and Li, 2009; Cho and Korte, 2014), knowledge dissemination (Amayah, 2013; Olatokunk and Nwafor, 2012) and knowledge utilization (Jiang, 2015; Savolainen, 2009; Agba *et al*., 2004) on Knowledge Management System (KMS) and the effect of KMS on effective decision-making (King, 2009; Omotayo, 2015a, b; Mohammed and Jalal, 2011; Addicott *et al*., 2006; Alberts and Hazes, 2006). Therefore, this study hypothesizes that:

- H_6: knowledge management system mediates the effect of tacit knowledge, explicit knowledge, knowledge acquisition, knowledge dissemination and knowledge utilization on effective decision-making among the manufacturing SMEs in East Coast Malaysia

MATERIALS AND METHODS

Measurement scales: The constructs are measured using the 5-point likert scale ranging from 1 (strongly agree) to 5 (strongly disagree). Table 1 presents the measurement of the dependent variable (decision-making effectiveness), mediating variable (knowledge management system) and independent variables (tacit knowledge, explicit knowledge, knowledge acquisition, knowledge dissemination and knowledge utilization). According to Nonaka *et al*. (1996), there are two types of knowledge which are Tacit and explicit. For the tacit and

Table 1: Items measurement

Variables	Items	References
Tacit knowledge	My organization has a clear vision and strategic direction	Gold *et al.* (2001) and Mushraf (2002)
	My organization has excellence research and development efforts	
	The organization is making outstanding efforts in research and development	
	The organization has capacity and patents in the work	
	The organization has employees with high skeletal experiences	
Explicit knowledge	My organization has excellent knowledge about future demands	Gold *et al.* (2001) and Mushraf (2012)
	My organization has advanced knowledge about future market changes	
	My organization has excellent knowledge about existing and potential customers	
	My organization uses an effective index for customer satisfaction and loyalty	
	My organization has an effective system which supports all knowledge processes	
Knowledge acquisition	My organization acquires knowledge about our customers	Gold et al. (2001) and Mushraf (2012)
	My organization generates new knowledge from existing knowledge	
	My organization acquires knowledge about its competitive industry environment	
	My organization acquires knowledge about new products/services within our industry	
	My organization has processes for observing knowledge from individuals and other partners	
Knowledge dissemination	My organization has processes for distributing knowledge throughout the organization	Gold *et al.* (2001) and Mushraf (2012)
	My organization exchanges knowledge between individuals (employees)	
	My organization exchanges knowledge with our business partners	
	My organization integrates different sources and types of knowledge	
	In my organization, knowledge sharing, skills and competences are appreciated and rewarded	
Knowledge utilization	My organization applies knowledge learned from past experiences, success stories and mistakes	Gold *et al.* (2001) and Mushraf (2012)
	My organization uses knowledge in the development of new products and services	
	My organization uses knowledge to adjust vision, mission and strategic direction	
	My organization seeks to apply knowledge to respond to competition demands and market changes	
	My organization is able to locate and apply knowledge to achieve competitive advantage	
Knowledge system	Using information technology will decrease productivity	Wu and Wang (2006), management King and Marks (2008) and Wang and Yang (2016)
	The knowledge or information provided by information technology is available at a time suitable for its use	
	The knowledge or information provided by information technology is meaningful, understandable and practical	
	I use extensive information systems for codifying and storing knowledge	
	I share information and knowledge necessary for particular tasks	
	I use the information system (example: e-Mail, intranet, electronic bulletin boards, etc.) to share information and knowledge	
	I improve task efficiency by sharing information and knowledge	
	Information sharing system improves the decision-making	
Decision making effectiveness	Looking for information extensively is important before making a decision	Muhammad and Ridwan (2015) and Mann *et al.* (1997)
	Analyzing relevant information is important before making a decision	
	Quantitative analytic techniques are important in making a decision	
	Focusing on crucial information and ignoring irrelevant information is important in making decisions	
	The decision that I made has improved productivity	
	The decision that I made has improved profitability	
	The decision that I made has developed new products	
	The decision that I made has improved the quality of products and services	

Explicit knowledge constructs, this study adopted the measurement scale developed by Gold *et al.* (2001) and Mushraf (2012). Similarly, for knowledge acquisition, knowledge dissemination and knowledge utilization constructs, this study adopted and adapted the measurement scale from Gold *et al.* (2001) and Mushraf (2012). Next, for the knowledge management system, this study adopted the measurement scale established by Wu and Wang (2006), King and Marks (2008) and Wang and Yang (2016). It is used for this study because the perspectives of the system are similar to the present study. For the dependent variable (decision making effectiveness), the measurement scale was adopted from two different resources which represent the quality of decision and how the respondent perform the decision making in order to achieve an effective decision. According to Vroom and Yetton (1973), the decision effectiveness is related to the quality which is about objective achievement, commitment and time taken to reach the decision and to put it into practice. As such, the measurement scale adopted from Muhammad and Ridwan (2015) and Mann *et al.* (1997) is suitable for this study which is related to the quality of the decision as mentioned by Vroom and Yetton (1973).

Research paradigm: This study used a cross sectional design which is data gathered only once. As mentioned by Given (2008), quantitative research refers to the systematic empirical investigation of a specific problem using statistical, mathematical or computational

techniques. Therefore, the quantitative approach was applied in order to investigate the existing relationships.

Sample selection and data collection: The sample frame for the present study is manufacturing SMEs from three states in Malaysia (East Coast Region of Malaysia). The data was gathered from the SME corp website (public SME website) and Anonymous (2011). The population for this study is based on the manufacturing SMEs that are registered with the SME corporation Malaysia. Manufacturing SMEs were chosen as the population because it is an important sector that contributes a large amount to the total export in Malaysia (Anonymous, 2011). Malaysia is divided into 5 regions but the respondents for this study were selected from 1 region only (East Coast Region). It is because the government has developed a master plan which is to guide the development of these three states to transform into exporters of resource based and manufactured products, a vibrant trading centre and an infrastructure and logistics hub (Anonymous, 2016). As mentioned by Lord and Tangtrongjita (2014) and Zuraimi *et al.* (2012) the manufacturing sector has become one of the key economic drivers to boost the setting up of the East Coast Economic Region (ECER) Master Plan. Indeed, to support the government's goal, the development of the manufacturing sector in this region needs to be studied comprehensively. Hence, it is crucial to study these issues on the manufacturing SMEs among these states considering that many studies have only focused on the north and west regions of Malaysia (Mat Nawi, 2015).

According to the data retrieved from the SME corp website, the total establishment of manufacturing SMEs in Pahang, Kelantan and Terengganu are 1,305, 1,814 and 1,782, respectively. Referring to Krejcie and Morgan (1970), the sample size for this study is fixed at 351. The probability of sampling technique (stratified random sampling) was used in selecting the respondents in each state. Once the population was stratified, the samples of each state were 93 for Pahang, 130 for Kelantan and 128 for Terengganu. The unit of analysis for this study is the organization or company of manufacturing SMEs represented by middle managers, junior executives or operational managers. They were chosen because of their responsibility in the decision-making process.

RESULTS AND DISCUSSION

Demographic characteristics: Of the 351 respondents, only 141 (40.2 %) participated. 98 responses were received on the first distribution. Another 43 responses were received after follow-up telephone calls and e-mail reminders. This response rate is considered satisfactory since it is hard to access the head officers (Othman., 2001). From the 141 valid responses, 64.5% are female and 35.5% are male. It was recorded that only 2.8% of the respondents are under 25 years of age; 68.1% are 25-35 years old, 25.5% are 36-45 years old and 3.5% are 46-55 years old. For this survey, the majority of industry is from the food industry which is 47 (33.3%). This is followed by textile which covers 11.3, 7.8% are from oil and gas, 8.5% are from ceramic, 4.3% are from wood and 34.8% are represent for other industry. For education, 7.8% of the respondents have the Malaysian Certificate of Education (SPM), 29.8% are diploma holders and 61.7% have a Bachelor Degree and only 0.7% of the respondents hold a Master Degree which covers the least percentage of educational level. Meanwhile, it was recorded that the respondent's working experience for <5 years is 48.2%. The 36.2% of the respondents have 5-10 years experience, 12.1% have 11-15 years experience and only 3.5% have more than 16 years experience. The majority of the respondents are operational manager which covers 60.3%; 14.2% are junior executives and the rest (25.5%) are middle managers. On the other hand, from the 141 respondents, 25.5% of them are from the marketing department, 21.3% are from the human resources department, 34.8% are from the operation department, 7.1% are from the finance department and 11.3% are from other departments.

Reliability and validity: In order to achieve a robust research, having a reliable and valid item is required. The first criterion to be evaluated is typically the internal consistency reliability. Cronbach's alpha assumes that all indicators are equally reliable (Hair *et al*., 2014). For this study, the reliability of the data is shown in Table 2 based on the Cronbach's alpha, composite reliability and the Average Variance Extracted (AVE). The Cronbach's alpha for tacit knowledge, explicit knowledge, knowledge acquisition, knowledge dissemination, Knowledge utilization, knowledge management system and effective decision-making reveals a result of more than 0.7, thus, the items used are reliable. According to Hair *et al*. (2014), the reliability value of an item specifically, composite reliability values of 0.60-0.7 are acceptable. As for the Average Variance Extracted (AVE), (Hair *et al*., 2011), the value should be higher than 0.50 because if the AVE is <0.50 on average, more error remains in the items than the variance that is explained by the construct (Hair *et al*., 2014). In Table 2, the AVE values for the variables are higher than 0.50 which indicates acceptable convergent validity.

Table 2: Reliability and Validity

Variables	No. items	Cronbach's alpha	Composite reliability	AVE
Tacit knowledge	4	0.713	0.803	0.509
Explicit knowledge	4	0.712	0.824	0.547
Knowledge acquisition	5	0.767	0.842	0.519
Knowledge dissemination	4	0.728	0.830	0.552
Knowledge utilization	4	0.786	0.857	0.606
Knowledge management system	8	0.873	0.899	0.529
Effective decision-making	5	0.815	0.872	0.579

One method for assessing discriminant validity is by examining the cross loadings of the indicators (Hair *et al*., 2014). For the discriminant validity, a component is considered reliable when the value is higher than 0.7 and the construct loading must be higher than its cross loading. Table 2 shows that all the indicator loadings are higher than 0.7, except for tacit knowledge (item 2 and 3), explicit knowledge (item 1), knowledge acquisition (Item 1 and 5), knowledge dissemination (item 1 and 4), knowledge utilization (item 2), knowledge management system (item 1 and 7) and effective decision-making (item 1) which show a value lower than 0.7 but still higher than 0.5; thus, it is assumed reliable. This is because a component loading with a value of 0.5 can be acceptable if the AVE value is higher than 0.5 which is the critical value (Hair *et al*., 2014). Looking at the cross-loadings, all the indicator's loadings are higher than the entire cross-loadings, confirming discriminant validity.

Structural model: The path coefficients between tacit knowledge and knowledge management system are positive and statistically significant at the chosen 5% level of significance; thus, the hypothesis (H_1) is accepted. Similarly, the path coefficients between explicit knowledge and knowledge management system are positive and statistically significant at the chosen 5% level of significance; thus, the hypothesis (H_2) is accepted. On the contrary, the path coefficients between knowledge acquisition and knowledge management system are positive but not statistically significant at the chosen 5% level of significance; thus, the hypothesis (H_3) is rejected. The path coefficients between knowledge dissemination and knowledge management system are positive and statistically significant at the chosen 5% level of significance; thus, the hypothesis (H_4) is accepted. Likewise, the path coefficients between knowledge dissemination and knowledge management system are positive and statistically significant at the chosen 5% level of significance; thus, the hypothesis (H_5) is accepted. Finally, the path coefficients between knowledge management system and effective decision-making are positive and statistically significant at the chosen 5% level of significance; thus, the hypothesis (H_6) is accepted. In terms of effect sizes (f^2) of variables on knowledge management system; tacit knowledge, knowledge dissemination and knowledge utilization have shown a weak effect. Explicit knowledge has a moderate effect on the knowledge management system. Finally, knowledge management system has shown moderate to strong effects on effective decision-making of manufacturing smes in east coast malaysia (Table 3).

Mediating effect: The mediating effect of Knowledge management system between tacit knowledge; explicit knowledge; knowledge acquisition; knowledge dissemination, knowledge utilization and effective decision-making of manufacturing smes are measured using baron and kenny's four-step mediation approach (Baron and Kenny, 1986). The steps, requirements for next steps and the status are presented in Table 4. Testing the mediating effect of knowledge management system between tacit knowledge and effective decision-making is step one; the coefficient of tacit knowledge on effective decision-making is found to be 0.443 with a p-value of 0.000 which satisfies the requirement and allows conducting step two. Step two tests the effect of tacit knowledge on knowledge management system and shows a significant positive effect which satisfies the requirement and allows conducting step three. In step three, the coefficient of knowledge management system on effective decision-making is 0.454 with a p-value of 0.000 Which satisfies the requirement and allows conducting step four. Step four tests the effect of tacit knowledge and knowledge management system on effective decision-making. The coefficient between tacit knowledge and effective decision-making is 0.293 with a p-value of 0.000. The effect of tacit knowledge on effective decision-making is positive and statistically significant in stage one and four which indicates the partial mediation of the knowledge management system between tacit knowledge and effective decision-making of manufacturing smes in east coast malaysia.

Testing the mediating effect of knowledge management system between explicit knowledge and effective decision-making in step one, the coefficient of explicit knowledge on effective decision-making is found to be -0.305 with a p-value of 0.186 which fails to satisfy the requirement and no further testing will be done. As for the mediating effect of knowledge management system between knowledge acquisition and effective decision-making in step one, the coefficient of knowledge acquisition on effective decision-making is found to be 0.010 with a p-value of 0.467 which fails to satisfy the requirement and no further testing was done. Testing the mediating effect of knowledge management

Table 3: Outer model loadings and cross-loadings

Variables	Tacit knowledge	Explicit knowledge	Knowledge acquisition	Knowledge dissemination	Knowledge utilization	Knowledge management system	Effective decision-making
Tacit knowledge							
Item 1	0.729	0.085	0.193	0.217	0.162	0.197	0.262
Item 2	0.605	0.152	0.175	0.208	0.239	0.106	0.141
Item 3	0.622	0.086	0.286	0.202	0.204	0.183	0.320
Item 4	0.867	0.071	0.259	0.401	0.357	0.402	0.387
Explicit knowledge							
Item 1	0.109	0.506	0.278	0.292	0.222	0.248	0.088
Item 2	0.062	0.808	0.026	0.016	-0.010	0.305	-0.179
Item 3	0.080	0.812	0.129	0.158	0.249	0.345	-0.082
Item 4	0.095	0.788	0.172	0.260	0.158	0.408	0.124
Knowledge acquisition							
Item 1	0.309	-0.019	0.610	0.396	0.298	0.254	0.352
Item 2	0.260	0.023	0.791	0.571	0.622	0.391	0.499
Item 3	0.099	0.222	0.788	0.603	0.534	0.417	0.332
Item 4	0.343	0.148	0.726	0.465	0.524	0.305	0.441
Item 5	0.204	0.282	0.670	0.606	0.471	0.384	0.229
Knowledge dissemination							
Item 1	0.210	0.128	0.665	0.640	0.549	0.352	0.257
Item 2	0.271	0.091	0.489	0.779	0.623	0.490	0.419
Item 3	0.338	0.149	0.591	0.850	0.643	0.576	0.564
Item 4	0.339	0.393	0.523	0.685	0.565	0.408	0.324
Knowledge utilization							
Item 1	0.276	0.150	0.454	0.651	0.813	0.545	0.531
Item 2	0.197	0.135	0.400	0.307	0.561	0.188	0.283
Item 3	0.431	0.140	0.670	0.700	0.878	0.459	0.482
Item 4	0.193	0.227	0.635	0.713	0.822	0.474	0.375
Knowledge management system							
Item 1	0.285	0.425	0.385	0.406	0.286	0.680	0.255
Item 2	0.127	0.517	0.342	0.386	0.327	0.713	0.150
Item 3	0.398	0.254	0.380	0.521	0.464	0.714	0.490
Item 4	0.383	0.417	0.372	0.464	0.482	0.849	0.340
Item 5	0.239	0.307	0.356	0.483	0.410	0.739	0.334
Item 6	0.084	0.204	0.292	0.430	0.394	0.740	0.258
Item 7	0.093	0.269	0.299	0.329	0.304	0.619	0.222
Item 8	0.366	0.263	0.428	0.554	0.572	0.747	0.467
Effective decision-making							
Item 1	0.414	0.070	0.398	0.454	0.376	0.367	0.609
Item 2	0.331	-0.013	0.298	0.342	0.269	0.307	0.790
Item 3	0.200	-0.006	0.281	0.339	0.381	0.388	0.806
Item 4	0.304	-0.063	0.541	0.482	0.587	0.268	0.763
Item 5	0.340	-0.044	0.435	0.464	0.503	0.359	0.816

Table 4: Hypothesis testing

Variables	Beta	t-values	Sig.	R^2	f^2	Decision
Tacit knowledge• KMS	0.126	1.815	0.035		0.028	Accepted
Explicit knowledge• KMS	0.313	4.842	0.000		0.189	Accepted
Knowledge acquisition• KMS	0.010	0.083	0.467	0.514	0.000	Rejected
Knowledge dissemination• KMS	0.356	3.233	0.001		0.073	Accepted
Knowledge utilization• KMS	0.171	1.685	0.046		0.020	Accepted
KMS• effective decision-making	0.454	7.390	0.000	0.2060.260		Accepted

KMS-Knowledge Management System

system between knowledge dissemination and effective decision-making in step one, the coefficient of knowledge dissemination on effective decision-making is found to be 0.567 with a p-value of 0.000 which satisfies the requirement and allows conducting step two. Step two tests the effect of knowledge dissemination on knowledge management system and shows a significant positive effect which satisfies the requirement and allows conducting step three. In step three, the coefficient of knowledge management system on effective decision-making is 0.454 with a p-value of 0.000 which satisfies the requirement and allows conducting step four. Step four tests the effect of knowledge dissemination and knowledge management system on effective decision-making. The coefficient between knowledge dissemination and effective decision-making is 0.441 with a p-value of 0.000. The effect of knowledge dissemination on effective decision-making is positive and statistically significant in stage one and four, indicating the partial mediation of knowledge

Table 5: Mediating effect

Variables	Beta	Sig.	Requirements for next step	Decision
Mediating effect: TAKN• KMSY• EFDM				
TAKN• EFDM	0.443	0.000	Statistically significant	Satisfied
TAKN• KMSY	0.126	0.035	Statistically significant	Satisfied
KMSY• EFDM	0.454	0.000	Statistically significant	Satisfied
TAKN and KMSY • EFDM	(TAKN• EFDM)		Step 1: p<0.05	Partial
	0.293	0.000	Step 4: p<0.05	Mediation
Mediating effect: EXKN• KMSY• EFDM				
EXKN• EFDM	-0.305	0.186	Statistically significant	Not satisfied
Mediating effect: ACKN• KMSY• EFDM				
ACKN• KMSY	0.010	0.467	Statistically significant	Not satisfied
Mediating effect: DIKN• KMSY• EFDM				
DIKN• EFDM	0.567	0.000	Statistically significant	Satisfied
DIKN• KMSY	0.356	0.001	Statistically significant	Satisfied
KMSY• EFDM	0.454	0.000	Statistically significant	Satisfied
DIKN and KMSY• EFDM	(DIKN• EFDM)	0.000	Step 1: p<0.05	Partial
	0.441		Step 4: p<0.05	mediation
Mediating effect: UTKN• KMSY• EFDM				
UTKN• EFDM	0.588	0.000	Statistically significant	Satisfied
UTKN• KMSY	0.171	0.046	Statistically significant	Satisfied
KMSY• EFDM	0.454	0.000	Statistically significant	Satisfied
UTKN and KMSY• EFDM	(ENTO• EFDM)	0.000	Step 1: p<0.05	Partial
	0.464		Step 4: p<0.05	Mediation

TAKN = Tacit Knowledge; EXKN: Explicit Knowledge; ACKN: Knowledge Acquisition; DIKN: Knowledge Dissemination; UTKN: Knowledge Utilization; KMSY: Knowledge Management System; EFDM: Effective Decision-making

Management system between knowledge dissemination and effective decision-making of the manufacturing smes in east coast malaysia (Table 5).

Finally, testing the mediating effect of knowledge management system between knowledge utilization and effective decision-making in step one, the coefficient of knowledge utilization on effective decision-making is found to be 0.588 with a p-value of 0.000 which satisfies the requirement and allows conducting step two. Step two tests the effect of knowledge utilization on knowledge management system and shows a significant positive effect which satisfies the requirement and allows conducting step three. In step three, the coefficient of knowledge management system on effective decision-making is 0.454 with a p-value of 0.000 which satisfies the requirement and allows conducting step four. Step four tests the effect of knowledge utilization and knowledge management system on effective decision-making. The coefficient between knowledge utilization and effective decision-making is 0.464 with a p-value of 0.000. The effect of knowledge utilization on effective decision-making is positive and statistically significant in stage one and four, indicating a partial mediation of knowledge management system between knowledge utilization and effective decision-making of manufacturing smes in east coast malaysia.

CONCLUSION

The findings from the study disclose that tacit knowledge has a positive and significant effect on the knowledge management system of manufacturing SMEs in East Coast Malaysia (H_1). This indicates that Tacit knowledge in the form of know-how, personal skills and context specific knowledge developed from experience and routine affects the knowledge management system. Explicit knowledge is also proven to have a positive and significant effect on the knowledge management system of manufacturing SMEs in East Coast Malaysia (H_2) which indicates that formal and easy to express knowledge is important in knowledge management system. Knowledge dissemination is found to have a positive and significant effect on the knowledge management system of manufacturing SMEs in East Coast Malaysia, disclosing that the hypothesis (H_4) is also supported and in line with literature as knowledge must be shared and transferred, as it is a function of the knowledge management system.

Knowledge utilization has also exhibited a positive and significant effect on the knowledge management system of manufacturing SMEs in East Coast Malaysia (H_5) which reflects that Knowledge utilization is the ultimate goal of the knowledge management system. Despite the importance of Knowledge acquisition in the knowledge management system, the results exhibited a positive but statistically non-significant effect on the knowledge management system of manufacturing SMEs in East Coast Malaysia (H_3). This conveys that SMEs in the East Coast of Malaysia have not given importance or have not realized the potential of knowledge acquisition as the process itself is challenging. Lastly, knowledge management system is found to have a positive and statistically significant effect on knowledge management system of manufacturing SMEs in East Coast Malaysia

(H_6) translating that usage of knowledge management system in decision-making or helping in decision-making process leads to effective decision-making among SMEs.

Findings in terms of the mediating effect of the knowledge management system on the relationships between tacit knowledge, explicit knowledge, knowledge acquisition, knowledge dissemination and knowledge utilization with effective decision-making (H_7), shows that except for explicit knowledge and knowledge acquisition, knowledge management partially mediates the relationship. This conveys that knowledge management system acts as a significant mediator and is responsible for the relationship between tacit knowledge, knowledge dissemination and knowledge utilization with effective decision making among manufacturing SMEs in East Coast Malaysia.

Following the importance of SMEs and manufacturing SMEs to the economy and specifically to Malaysia, each decision taken by the firms is important. This study shows that having a knowledge management system in place is beneficial and adds value to each and every decision made (Mohammed and Jalal, 2011). It is now safe to say that the processes involved in knowledge management and the utilization of knowledge leads to a better decision-making among manufacturing SMEs. As knowledge management is regarded as a strategic resource, firms should invest in knowledge management systems to gain and add value to their firms and better decision-making. This study contributes by exhibiting the factors affecting the knowledge management system among SMEs and the effect of knowledge management system in effective decision-making.

REFERENCES

Addicott, R., M.G. Givern and E. Ferlie, 2006. Networks, organizational learning and knowledge management: NHS cancer networks. Public Money Manage., 26: 87-94.

Agba, D.M., I.M.N. Kigongo-Bukenya and J.B. Nyumba, 2004. Utilization of electronic information resources by academic staff at Makerere University. Univ. Dares Salaam Lib. J., 6: 18-29.

Alberts, D.S. and R.E. Hayes, 2006. Understanding command and control. Command Control Research Program, Washington, USA.

Amayah, T.A., 2013. Determinants of knowledge sharing in a public sector organization. J. Knowl. Manage., 17: 454-471.

Anonymous, 2011. SMEs are the backbone of the economy. SME Corporation Malaysia, Kuala Lumpur,Malaysia. http://www.smecorp.gov.my/index.php/en/policies/2015-12-21-09-09-49/sme-statistics

Anonymous, 2011. SMEs statistic. SME Corporation Malaysia, Kuala Lumpur, Malaysia.

Anonymous, 2012. SMEs census report. Department of Statistics Malaysia, Putrajaya, Malaysia.

Anonymous, 2012. Small and medium enterprise annual report. SME Corporation Malaysia, Kuala Lumpur, Malaysia.

Anonymous, 2014. Small and medium enterprise annual report. SME Corporation Malaysia, Kuala Lumpur, Malaysia.

Anonymous, 2016. Report on survey of manufacturing industries. Department of Statistics Malaysia, Putrajaya, Malaysia.

Baron, R.M. and D.A. Kenny, 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. J. Pers. Social Psychol., 51: 1173-1182.

Becerra-Fernandez, I. and R. Sabherwal, 2014. Knowledge Management: Systems and Processes. 2nd Edn., Routledge, New York, USA., ISBN:978-0-7656-3915-8, Pages: 137.

Becerra-Fernandez, I., R. Sabherwal and A. Gonzalez, 2004. Knowledge Management: Challenges, Solutions and Technologies. Pearson, London, UK., ISBN:9780131016064, Pages: 386.

Boder, A., 2006. Collective intelligence: A keystone in knowledge management. J. Knowledge Manage., 10: 81-93.

Chen, L. and S. Mohamed, 2010. The strategic importance of Tacit knowledge management activities in construction. Constr. Innovation, 10: 138-163.

Chirico, F., 2008. Knowledge accumulation in family firms: Evidence from four case studies. Intl Small Bus. J., 26: 433-462.

Cho, T. and R. Korte, 2014. Managing knowledge performance: Testing the components of a knowledge management system on organizational performance. Asia Pac. Educ. Rev., 15: 313-327.

Edvardsson, I.R. and S. Durst, 2013. The benefits of knowledge management in small and medium-sized enterprises. Procedia Social Behav. Sci., 81: 351-354.

Edvardsson, I.R., 2009. Is knowledge management losing ground? Developments among Icelandic SMEs. Knowl. Manage. Res. Prac., 7: 91-99.

Feliciano, J.L., 2007. The success criteria for implementing knowledge management systems in an organization. MSc Thesis, Pace University, New York, USA.

Given, L.M., 2008. The Sage Encyclopedia of Qualitative Research Methods. Sage, Thousand Oaks, California, USA., ISBN:9781452265896, Pages: 1072.

Gold, A.H., A. Malhotra and A.H. Segars, 2001. Knowledge management: An organizational capabilities perspective. J. Manage. Inform. Syst., 18: 185-214.

Grant, R.M., 1996. Toward a knowledge-based theory of the firm. Strategic Manage. J., 17: 109-122.

Hair, J.F., C.M. Ringle and M. Sarstedt, 2011. PLS-SEM: Indeed a silver bullet. J. Market. Theory Pract., 19: 139-152.

Hair, J.F., G.T.M. Hult, C.M. Ringle and M. Sarstedt, 2014. A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage Publication, Thousand Oaks, CA., USA., ISBN-13:9781452217444, Pages: 328.

Hegazy, F.M. and K.E. Ghorab, 2014. The influence of knowledge management on organizational business processes' and employees' benefits. Intl. J. Bus. Soc. Sci., 5: 148-172.

Jiang, P., 2015. Knowledge transfer in firms under the promotion of dynamic capability research. Mod. Economy, 6: 965-970.

Jiang, X. and Y. Li, 2009. An empirical investigation of knowledge management and innovative performance: The case of alliances. Res. Policy, 38: 358-368.

Katua, N.T., 2014. The role of SMEs in employment creation and economic growth in selected countries. Intl. J. Educ. Res., 2: 461-472.

Kiessling, T.S., R.G. Richey, J. Meng and M. Dabic, 2009. Exploring knowledge management to organizational performance outcomes in a transitional economy. J. World Bus., 44: 421-433.

King, W.R. and P.V. Marks Jr., 2008. Motivating knowledge sharing through a knowledge management system. Omega, 36: 131-146.

King, W.R., 2009. Knowledge Management and Organizational Learning. Springer, Berlin, Germany, ISBN:978-1-4419-0007-4, Pages: 395.

Kongolo, M., 2010. Job creation versus job shedding and the role of SMEs in economic development. Afr. J. Bus. Manage., 4: 2288-2295.

Krejcie, R.V. and D.W. Morgan, 1970. Determining sample size for research activities. Educ. Psychol. Meas., 30: 607-610.

Lammers, J., 2009. The human factor in knowledge management for development: Using theories from social psychology to investigate the predictors of knowledge behaviour in development organizations. Knowledge Manage. Dev. J., 5: 127-142.

Lin, C., J.C. Wu and D.C. Yen, 2012. Exploring barriers to knowledge flow at different knowledge management maturity stages. Inform. Manage., 49: 10-23.

Lord, M.J. and P. Tangtrongjita, 2014. Special Border Economic Zone (SBEZ) in the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT). Master Thesis, University Library of Munich, Germany.

Mann, L., P. Burnett, M. Radford and S. Ford, 1997. The melbourne decision making questionnaire: An instrument for measuring patterns for coping with decisional conflict. J. Behav. Decis. Making, 10: 1-19.

Mohammed, W. and A. Jalal, 2011. The influence of Knowledge Management System (KMS) on enhancing Decision Making Process (DMP). Intl. J. Bus. Manage., 6: 216-229.

Muhammad, N.M.N. and R. Ridwan, 2015. Influence of third opinion leaders on decision making quality: A case on financial decision making. Mediterr. J. Soc. Sci., 6: 292-300.

Mushraf, A.M., 2012. Investigating the relationship between knowledge management, intellectual capital and business performance of industries in Iraq. Ph.D Thesis, Universiti Utara Malaysia,Changlun, Malaysia.

Namusonge, M.J., 2014. Linking competencies with strategies: The case of small and Medium-sized exporting firms in Kenya. Intl. J. Soc. Sci. Entrepreneurship, 1: 418-439.

Nawi, M.H., 2015. Determinants of capital structure in small and medium sized enterprises in Malaysia. Ph.D Thesis, Brunel University London, England, UK.

Nonaka, I. and H. Takeuchi, 1995. The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation. Oxford University Press, New York, ISBN: 0195092694, Pages: 284.

Nonaka, I. and H. Takeuchi, 1998. The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation. In: Harward Business Review on Knowledge Management, Drucker, P.F. (Ed.). Harvard Business School Press, Brighton, Massachusetts, USA., ISBN:9780875848815, pp: 21-46.

Nonaka, I. and H. Takeuchi, 2004. Theory of Organisational Knowledge Creation. In: Hitotsubashi on Knowledge Management, Takeuchi, H. and I. Nonaka (Eds.). Wiley, Hoboken, New Jersey, USA., ISBN:9780470820742, pp: 56-94.

Nonaka, I., R. Toyama and N. Konno, 2000. SECI, Ba and leadership: A unified model of dynamic knowledge creation. Long Range Plann., 33: 5-34.

Nonaka, L., H. Takeuchi and K. Umemoto, 1996. A theory of organizational knowledge creation. Intl. J. Technol. Manage., 11: 833-845.

Olatokun, W. and C.I. Nwafor, 2012. The effect of extrinsic and intrinsic motivation on knowledge sharing intentions of civil servants in Ebonyi State, Nigeria. Inf. Dev., 28: 216-234.

Omotayo, F.O., 2015a. Knowledge management as an important tool in organisational management: A review of literature. Lib. Philosophy Pract. E. J., 1238: 1-23.

Omotayo, F.O., 2015b. Knowledge management as an important tool in organizational Management: A review of literature. Lib. Philosophy Pract. E. J., 2015: 1-24.

Othman, R., 2001. Great expectations, CEOs` perception of the performance gap of the HRM function in the Malaysian manufacturing sector. Personnel Rev., 30: 61-80.

Pham, T.B.N., 2008. Intra-organizational knowledge transfer process in Vietnam's information technology companies. Ph.D Thesis, University of Fribourg, Fribourg, Switzerland.

Polanyi, M., 1996. The Tacit Dimension: With a New Foreword by Amartya Sen. The University of Chicago Press, Chicago, Illinois,.

Roxas, B., M. Battisti and D. Deakins, 2014. Learning, innovation and firm performance: Knowledge management in small firms. Knowl. Manage. Res. Pract., 12: 443-453.

Savolainen, R., 2009. Epistemic work and knowing in practice as conceptualizations of information use. Inf. Res. Intl. Electron. J., 14: 1-12.

Svobodova, A. and P. Koudelkova, 2011. Collective intelligence and knowledge management as a tool for innovations. Econ. Manage., 16: 942-946.

Vroom, V.H. and P.W. Yetton, 1973. Leadership and Decision-making. Vol. 110, University of Pittsburgh Press, Pittsburgh, Pennsylvania, USA., Pages: 175.

Wang, M.H. and T.Y. Yang, 2016. Investigating the success of knowledge management: An empirical study of small-and medium-sized enterprises. Asia Pac. Manage. Rev., 21: 79-91.

Wei, C.C., C.S. Choy and G.G. Chew, 2011. The KM Processes in Malaysian SMEs: An Empirical Validation. Knowl. Manage. Res. Pract., 9: 185-196.

Wu, J.H. and Y.M. Wang, 2006. Measuring KMS success: A respecification of the DeLone and McLean's model. Inform. Manage., 43: 728-739.

Zaim, H., O.F. Gurcan, M. Tarým, S. Zaim and L. Alpkan, 2015. Determining the critical factors of tacit knowledge in service industry in Turkey. Procedia Soc. Behav. Sci., 207: 759-767.

Zuraimi, A.A., Y.M. Rafi, I.M. Dahlan and M.Z.N. Fadiah, 2012. A study of logistics development in the Malaysia Eastern region: A descriptive analysis. Intl. J. Bus. Soc. Res., 2: 309-321.