THE MEDIATING EFFECT OF CUSTOMER KNOWLEDGE MANAGEMENT AND KNOWLEDGE SHARING ON INNOVATION

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ABSTRACT

In today global economy firms are becoming more dependent on their intangible assets rather than tangible assets. As such market knowledge has become one of the most important strategic resources for organizations. Moreover, the ability to effectively manage and transfer such knowledge within an organization can help to improve organizational innovation. Especially, the ability to manage market knowledge through customer knowledge management (CKM) and knowledge sharing can positively affect innovation outcomes. However, the use of CKM and knowledge sharing (KS) has not been very popular in SMEs. This study aims to investigate the effect of market knowledge on organizational innovation. More importantly, the study examines the mediating effect of CKM and KS on the relationship between market knowledge and organizational innovation. SmartPLS version 3.8.2 was used to analyze data collected from 204 SMEs. The study found a positive effect of market knowledge (customer, competitor and supplier) on organizational innovation (innovative products and services, process innovation, market identification and behavioral change) More importantly, the study found that both CKM and KS mediate the relationship between market knowledge and organizational innovation. The results also show that KS contributes more in creating innovation in an organization.

Keywords: Market knowledge, customer knowledge management, knowledge sharing, innovation.

INTRODUCTION

Innovation has become the key factor that drives an organization to create value and compete with global rivals. Knowledge management (KM) emphasizes the deployment of knowledge to gain competitive advantage and innovation (Wahid, Numprasertchai, Sudharatna and Laohavichien, 2016). Therefore, knowledge management produces the source of knowledge that is integral to support innovation. In addition, it is important to understand and enhance the creation of knowledge in organizations so that organizations can gain value and outperform rivals through the adoption of knowledge management that support innovation. For businesses to survive, they must have sustainable growth which is achieved by outperforming the competition. In order to beat the competition, innovation that is differentiated from those of the competitors must be introduced into the market continuously. The question is how do organizations create new knowledge to support innovation? Innovation is very crucial in SMEs in order to sustain their survival in the market especially when they must compete with large companies that possess high investment capitals, sophisticated technologies and highly skilled workforces. The aims of this study are to investigate the effect of customer knowledge

management and knowledge sharing as mediators in organizational innovation. This study also aims to investigate the effect of market knowledge on organizational innovation. More importantly, the study examines the mediating effect of CKM and KS on the relationship between market knowledge and organizational innovation.

LITERATURE REVIEW

2.1. Organizational Innovation

Knowledge creation is an integration process through which an organization interacts with individuals and the environment. This interaction means that the knowledge process occurs as a dynamic and inter-linked interactional process from an individual-to-societal level (Nonaka and Toyama, 2003). The knowledge-based innovation literature explains the role of knowledge in the process of innovation (Quintance, Casselman, Reiche, and Nylund, 2011). Several models of a knowledge-based process of innovation can be found in the literature (Galunic and Rodan, 1998). These models explore the characteristics of knowledge and their impact on the knowledge creation process whose output is implicitly viewed as an innovation. For example, Tsai and Ghoshal (1998) and Tsai (2001) present models of organizational innovativeness that draw a parallel between knowledge creation and innovation. These models highlight the role of various processes of knowledge creation and recombination for the generation of new knowledge that can be considered as innovation.

The recombination for the generation of new knowledge is called knowledge integration (Quintance et al., 2011). Knowledge integration is a strategic approach of the firm aimed at key boundary-spanning initiatives for fostering high-level coordination and communication between a firm, its customer, competitor and supplier to effectively support innovation activities (Wahid and Chaiyanupong, 2018; Wahid, Mohd Zahari, Zakaria and Abu Bakar, 2019). More than ever companies are experiencing the need to develop new innovations more rapidly to satisfy expanding and changing customer's requirements considering new technologies and strengthening global competition (Millson and Wilemon, 2002). More information and knowledge available at the beginning of the development process is beneficial to reduce market and technological uncertainties, and to boost the possibility of new innovation success. Market knowledge integration is related to the ability to gain further information and knowledge by involving external entities in the innovation process through network relationships (Paolo, 2007). A firm can enforce and increase the knowledge integration of its innovation process by collecting the information and knowledge needed to achieve substantial reductions in uncertainty during development from well-informed external entities. The study conducted by Lin and Chen (2008) shows that market knowledge integration positively influences organizational knowledge for the innovation.

The study of Wahid et al. (2016) identified four outcomes of organizational innovation. Those outcomes are innovative products/services (PRO), process innovation (PROC), market identification (MAR) and behavioral change (BHV). New knowledge creation in innovative products and services allows companies to establish a dominant position in the competitive marketplace and afford new entrants an opportunity to gain a foothold in the market. The discovery of new knowledge can lead to process innovation, which captures the introduction of new production methods, new management approaches, and new technology that can be used to improve production and management process. Market identification refers to the discovery of a new market segment, which is related to market research, advertising and promotion. The main reasons for an organization to enter a new market segment or focus on a particular group of customers are to identify new market opportunities and fulfil a market gap by monitoring market trends.

Behavioral change (BHV) can be seen at different levels: individual, team and management. It results as an outcome from a response to the environment as suggested by Jaworski and Kohli (1993). Individual level can be considered as a willingness to change (Hurt, Joseph and Cook, 1977). They will react in accordance with the organizational expectation for potential outcomes by regulating their own behavior in order to realize positive self-evaluative consequences (Bandura and Dickson, 1983).

Behavioral change (BHV) at a team level is initiated by the willingness of every member in the organization to adopt the change (Zaltman, Duncan and Holbek, 1973). The adoption of change will lead to behavioral outcome at the management level in recognizing the need for new ideas and action in the organization (Van de Ven, 1986). Managerial innovativeness demonstrates management's willingness to change and commitment to encourage new ways of doing things as well as to encourage new ideas (Rainey, 1999). Management level will emphasize learning, participative decision making, support and collaboration and power sharing (Hurley and Hult, 1998).

2.2. Market Knowledge

Market knowledge is not explicit but rather difficult to codify and communicate. Prior research showed that the acquisition of market knowledge leads to short-term improvements in sales, profitability growth, market share, new product success, customer satisfaction and return on assets (Slater and Narver, 1999). According to a knowledge-based view of the firm (KBV), knowledge acquisition from a market becomes one of the critical means for organizational innovation in order to achieve competitive advantage (Lavie, 2006). Organizations can acquire information and knowledge from their interactions with a variety of external stakeholders which include customers, competitors and suppliers (Ayuso, Rodriguez, Garcia-Castro, and Arino, 2011).

The voice of the customer becomes an input in innovation. Customers should be the driving force behind the development of innovation. A firm that commits itself to superior customer service and integrates customer preferences and needs into innovation development strategy has the best guarantee for long-term success. Any changes in customer's demands may negatively affect the value of current marketing capabilities. A competitor is defined as organization or firm offering products or services that are close substitutes (Kotler, 2000). A competitor would provide information pertaining to present and potential competitors for executive actions. It can also enhance a firm's competitive advantage by improving the innovation of successful competitors. Supplier refers to a supplier who has a clear understanding of the manufacturer's needs and expectations (Gwinner, Bitner, Brown, and Kumar, 2005). To remain competitive in their mainstream markets, an organization should establish a cooperative relationship with suppliers in order to reduce transaction costs (Verbeke and Tung, 2013).

2.3. Customer Knowledge Management

Customer knowledge management (CKM) is recognized as a key strategic resource in organization's success. CKM is an area of management where knowledge management instruments and procedures are applied to support the exchange of customer knowledge within an organization and between an organization as well as its customers. According to Srikantaiah and Koenig (2000), having good process and system to manage customer is important for better and timely design of new products and services, early warning and competitive intelligence, customer commitment and loyalty and lastly, the synergy of collaboration. Mohaghar, Jafarnejad, Mood and Youshanlouei (2012) argued that if customer knowledge is not organized, then there is no way to deliver it. In addition, Rollins and Halinen (2005)

emphasized that customer knowledge is used to manage customer relationships and to improve customer relationship processes such as customer service, customer retention and relationship profitability. Thus, it can further improve the creation of organizational knowledge. According to Garcia-Murillo and Annabi (2002) there was a gap in knowledge management literature, which has recognized the importance of customers as a source of knowledge but has not addressed it. By expanding the scope of knowledge management effort to include its customers, an organization can gain new knowledge to bolster its service, improve its operation, and enhance organizational performance through its innovation. Therefore, this gap can be clearly overcome by the concept of CKM.

2.4. Knowledge Sharing

According to Kang, Kim and Chang (2008), knowledge sharing is defined as the transmission or distribution of individual knowledge in an organization. Furthermore, individual members of an organization with different ideas, jobs and experiences will create new knowledge by communicating and sharing knowledge (Kang et al., 2008). In relation to this, Haas and Hansen (2007) mentioned that there are two distinct ways of transferring knowledge across organizations which are transferring knowledge between individuals and transferring knowledge through written documents.

The formation and use of market knowledge are necessary to the survival of businesses. Market knowledge that has been gathered in an organization is useless unless it is shared with those people who need to know. According to Okyere-Kwakye and Khalil (2011), knowledge sharing has been tagged as the key element within an organization in the 21st century. Therefore, knowledge sharing has been given great attention by both academicians and practitioners. They further argued that sharing of market knowledge is not easy to implement due to the nature of knowledge. Therefore, employees should have the ability to share, collaborate with others to solve problems, develop new ideas or implement policies or procedures pertaining to sharing of knowledge.

To create a knowledge sharing culture, organizations need to encourage employees to work together more closely to collaborate and to share organizational knowledge more effectively, therefore performing their jobs better. According to Huang and Huang (2012), effective knowledge sharing among members has become a competitive requirement for organizations. Therefore, the implementation of knowledge sharing among employees within an organization can improve an organization as a whole to meet its business objectives. Figure 1 shows the study framework.

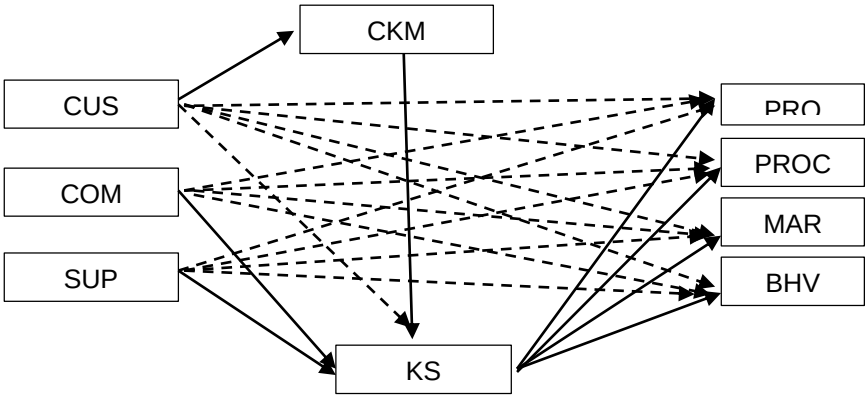

Figure 1. The Research Framework

The above discussion shows that there is a relationship between market knowledge, customer knowledge management, knowledge sharing and organizational innovation. Hence, the hypotheses are put forward:

H1: There is a positive effect of customer (CUS) on customer knowledge management (CKM).

H2: There is a positive effect of competitor (COM) on knowledge sharing (KS).

H3: There is a positive effect of supplier (SUP) on knowledge sharing (KS).

H4: There is a positive effect of customer knowledge management (CKM) on knowledge sharing (KS).

H5: There is a positive effect of knowledge sharing (KS) on innovative products/services (PRO).

H6: There is a positive effect of knowledge sharing (KS) on process innovation (PROC).

H7: There is a positive effect of knowledge sharing (KS) on market identification (MAR)

H8: There is a positive effect of knowledge sharing (KS) on behavioral change (BHV).

H9: The relationship between customer (CUS) and knowledge sharing (KS) will be mediated by customer knowledge management (CKM).

H10: CKM and KS mediate the relationship between CU and PRO

H11: CKM and KS mediate the relationship between CU and PROC

H12: CKM and KS mediate the relationship between CU and MAR

H13: CKM and KS mediate the relationship between CU and BHV

H14: KS mediates the relationship between COM and PRO

H15: KS mediates the relationship between COM and PROC

H16: KS mediates the relationship between COM and MAR

H17: KS mediates the relationship between COM and BHV

H18: KS mediates the relationship between SUP and PRO

H19: KS mediates the relationship between SUP and PROC

H20: KS mediates the relationship between SUP and MAR

H21: KS mediates the relationship between SUP and BHV

3. RESEARCH METHODOLOGY

This study utilized survey research using questionnaire for data collection. A corresponding 5 Likert scale was deployed (1 for “Strongly Disagree”; 2 for “Disagree”; 3 for “Neither Agree nor Disagree”; 4 for “Agree” and 5 for “Strongly Agree”). Prior to pilot testing and main data collection, the questionnaire was pre-tested with several experts in the field and also several SMEs’ managers who constitute potential respondents. The questionnaires were pilot tested with 30 SMEs’ managers. Using the SPSS, the responses of these 30 companies were analyzed for assessing the reliability of the measurements. The recorded Cronbach Alpha for all variables employing multi-items estimated range from 0.69 – 0.87 which suggests that the questionnaires were reliable (Kline, 2011).

The populations of the study were 411 SMEs. There were 210 companies responded. However, only 204 questionnaires were valid for the data analysis. The remaining 204 were analyzed using Partial Least Square (SmartPLS version 3.8.2). This study first developed and assessed the measurement model and followed by the development and assessment of the structural model.

Previous studies have indicated a sample threshold of as little as 100 samples for PLS-SEM (Reinartz, Haenlein, and Jenseler 2009). Alternatively, one can revert to the more restrictive minimum sample size recommended based on statistical power (Hair, Hult, Ringle and Sarstedt, 2014). The study used G*power to calculate the minimum sample size based on statistical power (Faul, Erdfelder, Buchner and Lang. 2009). The software suggests that we needed a sample size of 85 for a statistical power of 0.80 for model testing. Since, our sample size exceeded 85, the power value in this study was 0.803 which also exceeded 0.80. Moreover, the minimum power required in social and behavioral science research is typically 0.80. Therefore, in both cases, we can conclude that our sample size was acceptable for the purposes of this study.

4. RESULTS

Before continuing to the measurement model, Hair, Black, Babin, Anderson and Tatham (2010) suggested to test normality first using the multivariate skewness and kurtosis. The link at https://webpower.psychstat.org/models/kurtosis/results.php?url=a9a98a6ac666faf67aa1696b14a6e9cc (Web Power, 2019) shows that the Mardia's multivariate skewness (β = 15.3200, $p<0.01$) and Mardia's multivariate kurtosis (β = 120.8027, $p<0.01$). This indicates that the data was slightly not normal, and it is appropriate to apply the Smart PLS software in this study.

4.1. Common Method Variance (CMV)

Common method variance is a phenomenon that is caused by the measurement method used in a SEM study and not by the network of causes and effects in the model being studied. For example, the instructions at the top of a questionnaire may influence the answers provided by different respondents in the same general direction, causing the indicators to share a certain amount of common variation. Another possible cause of common method variance is the implicit social desirability associated with answering questions in a questionnaire in a certain way, again causing the indicators to share a certain amount of common variation (Kock, 2015).

Common method variance could be a severe issue in the study when a researcher adopts the single-source data (Mackenzie, Podsakoff and Podsakoff, 2011). To overcome this issue, the study was utilised a statistical method which is full collinearity test. Kock and Lynn (2012) proposed the full collinearity test as comprehensive procedure for the simultaneous assessment of both vertical and lateral collinearity (Kock and Gaskins, 2014). Through this procedure variance inflation factors (VIFs) are generated for all latent variables in a model. The occurrence of a VIF greater than 3.3 is proposed as an indication of pathological collinearity, and also as an indication that a model may be contaminated by common method variance. Therefore, if all VIFs resulting from a full collinearity test are equal to or lower than 3.3, the model can be considered free from common method variance. Table 1 shows the VIFs obtained for all the latent variables in the model, based on a full collinearity test. The latent variables in the model with VIF are less than 3.3. Therefore, the model is free from the common method variance as proposed by Kock and Lynn (2012), based on the full collinearity test procedure.

Table 1. Full Collinearity VIFs

CMV	CUS	COM	SUP	CKM	KS	PRO	PROC	MAR	BHV

VIFs	2.186	1.667	1.956	1.546	1.917	1.888	2.537	1.888	1.869

CUS=Customer, Com=Competitor, SUP=Supplier, CKM=Customer Knowledge Management, KS=Knowledge Sharing, PRO=Product/ Service Innovation, PROC=Process Innovation, MAR=Market Identification, BHV=Behavioral change

4.2. Assessment of Measurement

To examine the research model Partial Least Square (PLS) analysis technique was employed by using the SmartPLS 3 software version 3.2.8 (Ringle, Wende and Becker, 2015). In an effort to refine all structural equation models two stage analytical procedure was employed, where researchers tested the measurement model and structural model recommended by Hair, Sarstedt, Hopkins and Kuppelwieser (2014). Prior to structural modelling, the study has to assess the measurement model of latent constructs for their dimensionality, validity, and reliability. Cronbach's (α) and composite reliability were also tested as recommended by Henseler, Ringle and Sarstedt (2015).

The measurement model used in this study included nine constructs: customer (CUS), competitor (COM), supplier (SUP), customer knowledge management (CKM), knowledge sharing (KS), innovative products/ services (PRO), process innovation (PROC), market identification (MAR) and behavioral change (BHV). In assessing a model's reliability, the loading of each indicator on its associated latent variable must be calculated and compared to a threshold. Generally, the loading should be higher than 0.5 for indicator reliability to be considered acceptable (Kim, 2010). A loading lower than 0.4 indicates that an item should be considered for removal, and items with a loading of 0.4–0.5 should be considered for removal if they decrease the composite reliability (CR) and Average Variance Extracted (AVE) above the threshold (Kim, 2010). Table 1 indicates that most of the indicator loadings on their corresponding latent variables for the respondents were higher than 0.5.

4.3. Validity Assessment

4.3.1 Assessment of Measurement Model

Validity was assessed in terms of convergent validity and discriminant validity. Convergent validity is the extent to which the scale correlates positively with other measures of the same constructs (Malhotra, 2002). Convergent validity of measurement model is usually ascertained by examining the factor loading, average variance extracted (AVE) and composite reliability (CR) (Hair et al., 2010). All the values were above 0.5, which shows the convergent validity of the model. Convergent validity can be evaluated by examining the loading ≥ 0.5, AVE ≥ 0.5, and CR ≥ 0.7 (Kim, 2010). Each item's coefficients on its underlying construct were observed. A test of each item's coefficient was used to assess convergent validity. All values fulfil the required standard, indicating high convergent validity. Table 2 shows the results of factor loadings threshold level of 0.5 as recommended by Kim (2010).

Table 2. Factor loading, C.R. and AVE

Constructs	Loading	C.R.	AVE
Customer (CUS)	0.799	0.882	0.713
Competitor (COM)	0.866	0.904	0.653
Supplier (SUP)	0.807	0.873	0.633
Customer Knowledge Management (CKM)	0.838	0.890	0.670
Knowledge sharing (KS)	0.696	0.814	0.524

Innovative Products/Services (PRO)	0.688	0.826	0.615
Process Innovation (PROC)	0.729	0.846	0.647
Market Identification (MAR)	0.698	0.829	0.618
Behaviour Change (BHV)	0.829	0.897	0.744

Besides assessing the convergent validity, the study also evaluated the discriminant validity. Discriminant validity can be evaluated by examining Heterotrait-Monotrait Ratio (HTMT) (Henseler, Ringle and Sarstedt, 2015). Assessing HTMT as a criterion involves comparing it to a predefined threshold. If the value of HTMT is higher than this threshold, one can conclude that there is a lack of discriminant validity. Some authors suggest a threshold of ≤ 0.85 (Kline, 2011), whereas others propose a value of ≤ 0.90 (Gold, Malhotra and Segars, 2011). Table 3 shows the result of the discriminant validity assessment of the measurement model using HTMT ratio which indicates that the models possess acceptable discriminant validity.

Table 3. Heterotrait-Monotrait Ratio (HTMT)

	BHV	**CKM**	**COM**	**CUS**	**KS**	**MAR**	**PRO**	**PROC**	**SUP**
BHV									
CKM	0.436								
COM	0.395	0.453							
CUS	0.736	0.508	0.596						
KS	0.540	0.684	0.625	0.578					
MAR	0.554	0.339	0.274	0.459	0.557				
PRO	0.509	0.414	0.445	0.411	0.413	0.773			
PROC	0.661	0.477	0.466	0.620	0.682	0.894	0.850		
SUP	0.619	0.492	0.534	0.735	0.640	0.479	0.562	0.668	

4.3.2 Assessment of Structural Model

The study performed bootstraping involved 500 samples whislt our actual sample stood at 204. The SEM results are presented in Table 4. It can be observed that R^2 values for CKM is 0.182, KS is 0.389, PRO is 0.075, PROC is 0.241, MAR is 0.150 and BHV is 0.169 suggesting that 18.2% of the variance in CKM is explained by the customer (CUS), 38.9% of the variance in KS is explained by CKM, COM and SUP. Meanwhile the KS construct in turn contributes to 7.5% of the variance in innovative products and services (PRO), 24.1% of the variance in innovative process (PROC), 15% of the variance in market identification (MAR) and 16.9% of the variance in bahaviour (BHV) based on R^2 values. Table 4 shows that all beta path coefficients were positive and in the expected direction and were statistically significant. To elaborate the customer (CUS) ($\beta = 0.436$, $p < 0.05$) was found to have significant effect on CKM. Customer knowledge management (CKM) ($\beta = 0.328$, $p < 0.05$), competitor (COM) ($\beta = 0.249$, $p < 0.05$) and supplier (SUP) ($\beta = 0.237$, $p < 0.05$) were found having a significant effect on knowledge sharing (KS). Meanwhile knowledge sharing (KS) ($\beta = 0.291$, $\beta = 0.499$, $\beta = 0.398$, $\beta = 0.421$, $p < 0.05$) was found to have significant effect on innovative products/services (PRO), process innovation (PROC), market identification (MAR) and behavioral change (BHV) respectively. Thus H1, H2, H3, H4, H5, H6, H7 and H8 were supported. The result also reveals that customer (CUS), competitor (COM) and supplier (SUP) are equally important predictors of market knoweledge sharing (KS).

Table 4. Path coefficient and hypotheses testing

Hypotheses	**β**	**S.E.**	***t* value**	**p value**	**R^2**	**VIF**	**Decision**	**f^2**
H1 CUS -> **CKM**	0.436	0.079	5.522	0.000	0.182	1.000	Supported	0.234

Hypotheses	β	S.E.	*t* value	p value	R^2	VIF	Decision	f^2
H2 COM-> **KS**	0.249	0.087	2.842	0.002		1.341	Supported	0.078
H3 SUP -> **KS**	0.237	0.092	2.571	0.005	0.389	1.366	Supported	0.069
H4 CKM -> **KS**	0.328	0.097	3.376	0.000		1.301	Supported	0.140
H5 KS -> **PRO**	0.291	0.087	3.332	0.000	0.075	1.000	Supported	0.090
H6 KS -> **PROC**	0.499	0517	0.067	0.000	0.241	1.000	Supported	0.329
H7 KS -> **MAR**	0.398	0415	0.082	0.000	0.150	1.000	Supported	0.205
H8 KS -> **BHV**	0421	0.436	0.072	0.000	0.169	1.000	Supported	0.215

To test indirect effect, the study employed Preacher and Hayes (2008) bootstrapping method. First the study tested the indirect effect of CUS on KS. The bootstrapping analysis revealed the indirect effect (β=0.143) with *t* values of 2.693 (Table 5). This study also confirmed there was mediation given that the indirect effect of market knowledge-> organizational innovation (CUS->CKM->KS->PRO, β=0.042, t value = 1.839; CUS->CKM->KS->PROC, β=0.071, t value = 2.380; CUS->CKM->KS->MAR, β=0.057, t value = 2.120; CUS->CKM->KS->BHV, β=0.060, t value = 2.472; COM->KS->PRO, β=0.072, t value = 1.839; COM->KS->PROC, β=0.124, t value = 2.600; COM->KS->MAR, β=0.099, t value = 2.376; COM->KS->BHV, β=0.105, t value = 2.302; SUP->KS->PRO, β=0.069, t value = 1.728; SUP->KS->PROC, β=0.118, t value = 2.184; SUP->KS->MAR, β=0.094, t value = 2.080 and SUP->KS->BHV, β=0.100, t value = 2.115). Based on the above result the study can conclude that H9 to H21 were supported.

Table 5. Indirect effect

Hypotheses		β	S.E.	*t* value	Decision
H9	CUS-> CKM-> KS	0.143	0.053	2.693	supported
H10	CUS->CKM->KS -> PRO	0.042	0.023	1.839	supported
H11	CUS->CKM->KS -> PROC	0.071	0.030	2.380	supported
H12	CUS ->CKM->KS -> MAR	0.057	0.061	2.120	supported
H13	CUS->CKM->KS -> BHV	0.060	0.024	2.472	supported
H14	COM->KS -> PRO	0.072	0.039	1.839	supported
H15	COM ->KS -> PROC	0.124	0.048	2.600	supported
H16	COM->KS -> MAR	0.099	0.042	2.376	supported
H17	COM ->KS -> BHV	0.105	0.045	2.302	supported
H18	SUP ->KS -> PRO	0.069	0.040	1.728	supported
H19	SUP->KS -> PROC	0.118	0.054	2.184	supported
H20	SUP->KS -> MAR	0.094	0.045	2.080	supported
H21	SUP ->KS -> BHV	0.100	0.047	2.115	supported

The study evaluated for multicollinearity among the variables in the model and did not find any cause for concern using the criteria of variance inflation factor (VIF), which is (Table 4) the suggested value of 3.3 (Hair et al., 2014). As proposed by literature, besides the blindfolding procedure, it also beneficial to run the PLS predict (Shmueli, Ray, Velasquez Estrada and Chatla, 2016; Shmueli, Sarstedt, Hair, Cheah, Ting, Vaithilingam and Ringle, 2019). The model assumes to have less error in predicting performance if the RMSE, MAE and MAPE values in the PLS model has lower values compared to the Linear Model (LM) and the

Q^2 value for PLS is higher than LM (Shmueli et al., 2016, Shmueli et al., 2019). As shown in Table 6, most of the values fulfill the requirements except for BHV1, BHV2, BHV3 and PRO3, hence indication that theoretically establish a path model improves the predictive performance of the available indicator data.

Table 6. PLS Predict

	PLS Model				Linear Model			
	RMSE	**MAE**	**MAPE**	**Q^2_predict**	**RMSE**	**MAE**	**MAPE**	**Q^2_predict**
BHV2	0.624	***0.509***	***12.902***	0.131	0.631	***0.506***	***12.526***	0.110
BHV3	***0.618***	***0.481***	***12.265***	***0.176***	***0.579***	***0.466***	***11.832***	***0.277***
BHV1	0.623	***0.545***	***13.361***	0.128	0.634	***0.516***	***12.527***	0.094
CKM3	0.685	0.551	14.396	0.094	0.720	0.581	15.221	-0.003
CKM4	0.751	0.596	15.811	0.017	0.802	0.650	17.255	-0.119
CKM1	0.649	0.509	14.026	0.227	0.714	0.579	15.775	0.064
CKM2	0.773	0.581	17.678	0.037	0.795	0.596	17.800	-0.017
KS2	0.713	0.571	17.598	0.115	0.775	0.616	19.113	-0.044
KS3	0.814	0.656	19.916	0.169	0.852	0.680	20.078	0.090
KS5	0.679	0.488	15.072	0.125	0.750	0.553	16.846	-0.066
KS4	0.692	0.565	15.207	0.176	0.724	0.593	15.943	0.097
MAR1	0.635	0.430	11.682	0.065	0.707	0.524	13.842	-0.159
MAR2	0.712	0.528	14.849	0.045	0.741	0.574	15.666	-0.033
MAR3	0.727	0.581	15.231	0.069	0.807	0.652	16.898	-0.148
PRO3	***0.667***	0.487	13.383	***0.125***	***0.635***	0.509	13.570	***0.207***
PRO2	0.830	0.619	19.922	0.041	0.918	0.713	22.527	-0.173
PRO1	0.807	0.605	18.470	0.035	0.884	0.672	20.125	-0.156
PROC1	0.692	0.557	14.314	0.076	0.748	0.600	15.360	-0.080
PROC2	0.767	0.640	18.442	0.171	0.774	0.649	18.536	0.157
PROC3	0.689	0.540	14.517	0.157	0.726	0.594	15.478	0.066

5. CONCLUSION

This study shows that market knowledge (customer, competitor and supplier) is an important element for organizational innovation. The study shows that market knowledge significantly affects organizational innovation. It becomes an important asset in an organization for the competitive advantage. Based on the results of Importance-Performance Matric Analysis (IPMA) show that customer knowledge management (CKM) and knowledge sharing are the most important and high-performance factors for selecting and managing crucial resources to implement the desired strategy to achieve innovation. CKM becomes an important tool in sharing customer knowledge. Therefore, SMEs should share the market knowledge in terms of customer, competitor and supplier within an organization for the purpose of creating innovation. However, SMEs should deploy information technology in managing customer data in order to discover useful knowledge. Managers should be aware that the unique and relevant knowledge is usually linked to market stakeholders. Organizations may achieve performance and profit not because they possess better resources, but because their knowledge sharing implementation will allow them to make better use of their resources.

Researchers identified some limitations in this study. Firstly, the study used a cross sectional research design rather than a longitudinal study. Thus, it is not able to examine the organizational behavior over a period of time. The longitudinal study can cope with the long-term nature of knowledge sharing and organizational innovation. Secondly, this research concerns the sample drawn from small to medium companies. Since CKM and KS may be

influenced by the differences of implementation between SMEs and large companies. Hence, future research model should be tested further using samples from other companies, such as multinational companies or foreign companies to compare and further generalize the results of the study. New insights and findings can be achieved if the study focuses on various companies. Lastly, this study only investigated the effect of the primary market stakeholders on innovation. It is very useful for the future study to investigate the effect of secondary market stakeholders on innovation.

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