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KNOWLEDGE MANAGEMENT AND FIRM INNOVATIVENESS: THE MEDIATING ROLE OF INNOVATIVE CULTURE ON MNEs IN MALAYSIA

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Innovative culture; Firm innovativeness; Knowledge management; MNEs; Malaysia.

A B S T R A C T

This study exhibits the mediating effect of innovative culture on the correlation amid knowledge management and firm innovativeness. The implications of organizations which does not practice a creative culture will manifest in the failure to respond and adapt successfully to shifts in the competitive nature of the market world and thus would not be able to produce better outcomes. A convenient sampling approach is used to pick 296 Malaysian dependent MNE samples from different industries. Structural Equation Modeling (SEM) AMOS 24.0 is utilized in the whole study to evaluate the connection among the concepts (e.g. "knowledge management, innovative culture and firm innovativeness") as well as to evaluate the probabilistic strength of its framework. The outcomes emphasized on all four extents of knowledge management, namely knowledge acquisition, knowledge conversion, knowledge application and knowledge protection were confidently and considerably associated to firm innovativeness. In either side, the partnerships regarding development of information and business innovation and knowledge management and company innovation have been mediated by innovative culture. The research paper offers management teams & professionals with an ability to better appreciate skills and capacities such as KM and firm innovativeness. The findings of this research demonstrate that innovative culture, knowledge acquisition, knowledge conversion, knowledge application and knowledge protection enhance firm innovativeness. This study provides useful insights for managers who wish to enhance innovation culture activities in MNEs, and offers useful guidance to international business scholars, encouraging further research in this area.

1. INTRODUCTION

Firm innovation is essential even for multinational company (MNE) to remain relevant and competitive and be a dominant player. Firm innovation has been extremely relevant as a means of strategic edge within a business (Rubera & Kirca, 2012). MNEs have a propensity to gain connections to information and technologies from others to improve their international productivity (Dibrell, Craig, & Hansen, 2011; Menguc &

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Auh, 2006). Hau (2016) highlights crucial variables impacting the procurement of MNEs' technical abilities. Because of business competitive problems, MNEs have begun to use a firm innovativeness paradigm as well as to lessen business dependence on a limited invention that looks to the within. Multiple MNEs are actively involved in KM by applying these strategies to exploit information both within their borders and internationally to their interested parties. MNEs like Digital Media Solutions (DMS) Lucent, Procter & Gamble, and Intel, IBM, Millennium Pharmacy, are leaders in the introduction of firm innovativeness (Tsai & Yang, 2013). In an information-based community, MNEs experience not merely the task of providing creative goods and service by successful usage of existing knowledge resources accessible to everyone (Martín-de Castro, 2015), but often the task of capturing and exploiting the knowledge relevant beyond their borders (Soto-Acosta, Cegarra-Navarro, & Garcia-Perez, 2017). The firm's information-based view considers knowledge to be a competitive advantage from which the MNE can build demand while discovering and leveraging it by sound management and achieving a sustainable marketplace (Hörisch, Johnson, & Schaltegger, 2015; Kearns & Sabherwal, 2006; Martínez-Román & Romero, 2017).

Organizations are continuously pursuing opportunities to remain in front of potential competitors, however some of the many forms to remain successful is to arm oneself with knowledge. The significance of knowledge is evident because it has a history of firm innovation. Information Management (KM) is known to be a systemic tool for the utilization of knowledge by a company (Esposito & Evangelista, 2016) although other academics regard this as a coordinated mechanism for the processing of knowledge assets and strategies in the creation, distribution and implementation of knowledge for the achievement of organizational objectives (Nemati, 2002). Knowledge is seen as a fair value that assists clients to acquire unique resources and training for innovation. In addition to knowledge, technical competencies play an essential part in the organization's search for the creation of innovative goods or service that enable the organization to achieve sustainable strength (López-Torres et al., 2019).

As a consequence of the competitive existence of global competition, organizations have recognized the value of creativity in maintaining its efficiency, sustainability and results. It includes the successful use of innovative concepts and refers to the creation and application of knowledge (Jasimuddin & Zhang, 2014). The innovation phase relies primarily on awareness as knowledge characterizes an ecosystem which is much concrete than details, records, and conventional reasoning (Y. Sun, Liu, & Ding, 2020). In addition, the previous report proposes the ability of KM to boost innovation and competition across numerous KM interventions (Byukusenge & Munene, 2017).

Organizations which lacked the right culture may find information exchange to be limited and challenging, since organizations are made up of workers who have the requisite knowledge for the company to develop and strengthen. Organizational culture is seen as an underlying influence which allows its participants to share the ideals, standards, and convictions of an organization, as these ethical standards shape the potential behaviors and attributes of workers. Moreover, companies which rely on innovative culture become extremely probable to be intensely oriented and strongly efficient, since they are required to effectively adopt revolutionary technologies, methods or goods (Leal-Rodríguez, Roldán, Leal, & Ortega-Gutiérrez, 2013).

Given the value of KM and the appreciation of its value to organizations, the remainder of such KM programs have collapsed due to numerous reasons such as insufficient implementation of the KM plan, over-reliance on digital technologies and lack of knowledge of the consequence of KM. With this topic, researchers (Wong, Soh, & Goh, 2016; Zailani, Iranmanesh, Nikbin, & Jumadi, 2014) find that perhaps the idea of KM is relatively recent from the Malaysian point of view, and Malaysia's companies are behind other nations by embracing KM, because some organizations are unaware of the benefits of KM.

Organizations that reject creativity are difficult to cope with any corporate projects (Wu, Gu, Zhao, & Liu, 2020) and therefore will not be willing to produce innovative and better items / products which might transform into profits. The consequences of non-innovative companies will hinder their capacity to adjust and adapt successfully to shifts in the complex dynamics of the market world and minimize the organization's capacity to attain outstanding success (Delshab, Winand, Sadeghi Boroujerdi, Hoeber, & Mahmoudian, 2020). These companies would be unwilling to produce their goods successfully, culminating in low results, struggling to attain outstanding efficiency and struggling to retain competitive edge (Donate & Guadamillas, 2015).

The importance of knowledge management is recognized in literature in forecasting firm innovativeness: however, a review of previous study seems to occur in the same context which combines the management of knowledge and innovative culture and firm innovation since these frameworks have been separated. This research aims to explore the influence of KM, namely "knowledge acquisition, knowledge transfer, knowledge implementation and knowledge security", on the enhancement of firm innovation and, consequently, on the success of organizations. In conjunction, this study attempts to react if the interaction across KM and firm innovation is moderated by a creative community. The current study sought to identify a detailed understanding of the role of innovative culture in the relationships among firm innovativeness and knowledge management.

2. LITERATURE REVIEW

2.1 Firm Innovativeness

Firm innovation is seen as an organization's potential to engage in creative practices, often as the implementation of different goods or facilities, new processes or new approaches (Ratchukool & Igel, 2018). Even so, such creative businesses frequently incorporate product development and participate in innovative practices that affect the efficiency of new goods, technology, and procedures. Innovation is assumed to be the engine that pushes companies into global superiority (Yuan, Guo, & Fang, 2014) and the willingness of the corporation to evolve helps the enterprise to continually reshape and change in a dynamic market setting. In addition, it has also been repeatedly demonstrated that firm innovation is a major source of improved results for companies (Kalyar & Rafi, 2013; Sankowska & Paliszkiewicz, 2016).

2.2. Knowledge Management

Knowledge Management (KM) relates to the recognition, development, introduction, dissemination and development of knowledge to method requirements within the enterprise (Ammirato, Linzalone, & Felicetti, 2020). It entails the method of understanding and collecting evidence, facts and expertise that are essential from structured and unstructured data to allow organizations to make responsible choices. KM is a comprehensive mechanism that allows workers to receive and view information seamlessly, which will contribute to those workers increasing the working efficiency through freshly gained skills (Bouncken & Pyo, 2002; Chong & Chong, 2009; Ode & Ayavoo, 2020). In this vein, the knowledge management method is split into four types, comprising "knowledge protection, knowledge application knowledge conversion, and knowledge acquisition"; these key components are followed for its purposes of this study.

2.3 Innovative Culture

Innovative culture is defined as a set of ideals and beliefs that motivate organizations to be groundbreaking. Which also generates a tradition of creativity and receptivity to suggestions and openness in decision-making (Toaldo, Didonet, & Luce, 2013). The correlation among innovative culture and innovation is exacerbated in earlier research (Gabaldón-Estevan & Ybarra, 2017; Nawaz Khan et al., 2019; Park, Lee, & Kim, 2016), which shows the relation among corporate culture and innovation. Organizations that encourage inventive practices will contribute to creativity that goes beyond traditional or repetitive standards. Since these, innovative culture can be seen as a leading indicator that promotes the organization's willingness to be inventive. It is proposed in a recent report that an inventive community encourages companies to explore new goods, process innovations. In order to maintain a creative culture, companies are expected to establish a basis for creativity, needing improvements to the organization's activity to promote acceptable culture and guide organizations in a cycle of periodic transition (Choi & Choi, 2014; Seddighi & Mathew, 2020). An innovative culture which harmonizes innovation may encourage workers to set a high level of work which enhances the development of innovative goods and processes. In addition, an imaginative community amplifies the scale of inspiring workers and inspires everyone to be inventive and to improve their capacity to produce new goods and resources (Madrid-guijarro, Garcia, & Van auken, 2009).

2.4 Hypotheses Development

This paper explores the idea how efficient knowledge management helps an enterprise to turn knowledge resources into functionality: firm innovativeness in this case. "Knowledge management comprises of knowledge acquisition, knowledge conversion, knowledge application and knowledge protection" (Kmieciak & Michna, 2018, p. 562). KM demonstrates the recognition and usage of expertise in an organization that helps the organization to gain productivity (Burkhard, Hill, & Venkatsubramanyan, 2011). Their research emphasized the significance of KM in the influence of organizations and pointed to the reality that learning and growth practices improve efficiency.

A research by Jasimuddin and Zhang (2014) recommends that perhaps the emergence of fresh concepts including the use of knowledge in organizations make it possible for companies to be more creative, productive and profitable across the advancement of internal knowledge structures. Therefore, through examining the principles of KM and creativity, this implies how these principles are necessary to assist companies with a view to improving business performance. In addition, it is suggested that KM will facilitate organizations in making crucial choices efficiently by supplying workers with the appropriate details at the same moment (Mingers, 2008). Recent studies (Bibi, Padhi, & Dash, 2020; Kanter, 1999) find out that KM contributes to increased innovative technology efficiency and performs a significant part in improving innovation in software companies. Through introducing KM, innovation in companies will be extended and the introduction of KM could allow organizations to gain strategic advantages (Baskerville & Dulipovici, 2006). Which means although to gain and retain a competitive advantage, it depends on how organizations use and handle the information in their hands. In addition, this underlines that KM has a significant effect on creativity, that suggests that companies can take attempts to build channels and increase knowledge amongst workers to guarantee that KM continues to function (Harrington, Srai, & Kumar, 2019). It could therefore allow the expertise gained to be used by workers to improve creativity processes in organizations.

This paper suggests that KM would have a significant effect on firm innovativeness. In order for organizations to be creative, management will have to gain expertise, regardless of whether it is externally or internally. Therefore, more expertise is gained, the more apt the organizations would be to be inventive. The gained expertise will then have to be translated and extended through organizations. In addition, information inside the organization must be preserved as awareness is perceived to be a valuable resource (Okunoye & Karsten, 2002). Through safeguarding knowledge, companies may make use of it and adapt to business shifts. Sensitive and flexible companies are more likely to be creative (Alolayyan, Alalawin, Alyahya, & Qamar, 2020; Marm-Garcia & Zarate-Martinez, 2007). The assumption of this theory would therefore be: "Knowledge management has a positive impact on innovative culture and firm innovativeness". Centered on the theories formulated, this research would examine knowledge management through four different perspectives, i.e., "knowledge acquisition (H_1), knowledge conversion (H_2), knowledge application (H_3) and knowledge protection (H_4), in their partnership with a creative community. Consistent with extant literature, it is expected that innovative culture will be positively associated with firm innovativeness (H_5)".

- Hypothesis 1: Knowledge acquisition takes a meaningful positive effect on innovative culture.
- Hypothesis 2: Knowledge conversion takes a meaningful positive effect on innovative culture.
- Hypothesis 3: Knowledge application takes a meaningful positive effect on innovative culture.
- Hypothesis 4: Knowledge protection takes a meaningful positive effect on innovative culture.
- Hypothesis 5: Innovative culture takes a meaningful positive effect on firm innovativeness.

2.5 The Mediating Effects of Innovative Culture

Innovative culture is dedicated to promoting the development of innovative goods and services by supporting innovation while encouraging representatives of organizations to make use of their imagination in seeking out new things and pursuing fresh ideas (Gabaldón-Estevan & Ybarra, 2017; Tomasova, 2020). Innovative culture is an encouraging, thrilling job situation, output-oriented, optimistic, risk-taking as well as a central connection between knowledge-based assets and creativity (Conrad, 1999). Innovative culture is a complicated collection of corporate ideals, standards, obligations and traditions that would have an effect on the firm's innovation if it is properly implemented and implemented (Park et al., 2016). Rather As such an innovative culture can affect workers who are constructive in the use of complex technology for the production of new products. Rooted culture and value inside the company further affect employee actions towards being special and novel (Choi & Choi, 2014).
In addition, information can easily be exchanged by workers across an innovative culture, and exchanging could eventually encourage the development of new innovations that will contribute to improved results (Toaldo et al., 2013). In that similar vein, innovative culture can be critical to connecting technical knowledge-based resources and creativity, as the attitude to the use of technological tools is important to the effective use of the organization's resources and skills (Nawaz Khan et al., 2019; Park et al., 2016). Innovative culture has lately been seen to inspire managers and workers to embark on innovative practices that enable the company to be innovative (X. Sun, Li, Wu, Qian, & Tian, 2014). The theory is then proposed as the beneficial connection regarding knowledge management and firm innovation can be strengthened when the culture of innovation is strong. Implicit assumption established, this analysis would examine the mediator function of creative culture in the partnership between information management and firm innovation from four KM viewpoints i.e. "knowledge acquisition (H_6), knowledge conversion (H_7), knowledge application (H_8) and knowledge protection (H_9)". Figure 1 shows the theoretical model of the current study.

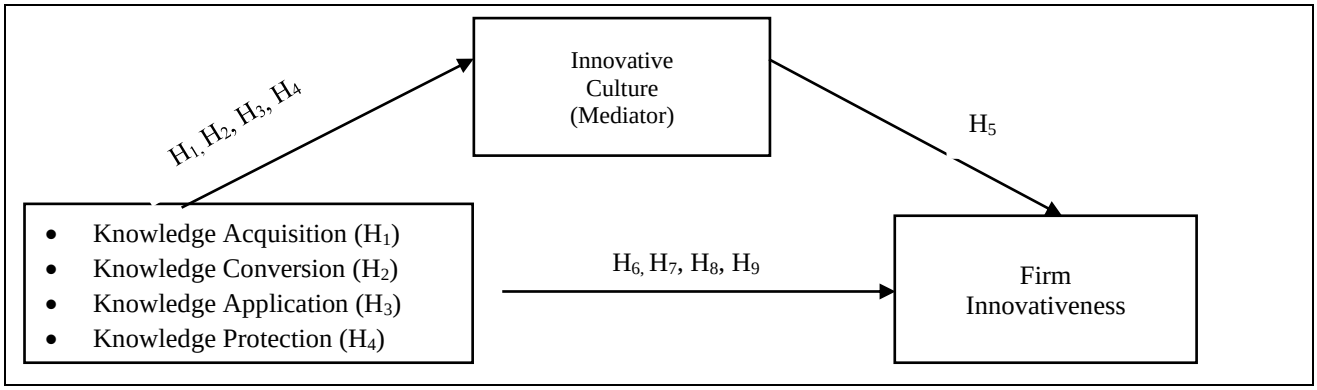

Figure 1. The Conceptual Framework

- Hypothesis 6: Innovative culture takes a meaningful mediating effect between knowledge acquisition and firm innovativeness.
- Hypothesis 7: Innovative culture takes a meaningful mediating effect between knowledge conversion and firm innovativeness.
- Hypothesis 8: Innovative culture takes a meaningful mediating effect between knowledge application and firm innovativeness.
- Hypothesis 9: Innovative culture takes a meaningful mediating effect between knowledge protection and firm innovativeness.

3. METHODOLOGY

3.1 Measurements

A 44-items scale by Gold, Malhotra, and Segars (2001) was used to quantify KM, that is supported by "knowledge acquisition, knowledge conversion, knowledge application and knowledge protection". In order to measure innovative culture, this study applied a 5-items scale from Ungan Mustafa (2007), while firm innovation from Calantone, Cavusgil, and Zhao (2002) was embraced using a 6-items scale. Every one of these components were connected on a 7-points Likert scale. This study uses AMOS 24.0 software package (Joseph F Hair, Black, Babin, Anderson, & Tatham, 1998; Kock & Hadaya, 2018) to measure the model.

3.2 Procedures

Structural Equation Modeling (SEM) AMOS 24.0 is utilized in the whole study to evaluate the connection among the concepts (e.g. "knowledge management, innovative culture and firm innovativeness") as well as to evaluate the probabilistic strength of its framework. SEM can handle multiplicity, from which integrated measurements are based on the compositional set of connections. This methodology is used to evaluate the research framework and predictions. In addition, it incorporates a dual emphasis on the estimation of systemic interactions between constructs and the calculation of latent, observed indicators (Gunzler, Chen, Wu, & Zhang, 2013). The observation of the track coefficients (direct and indirect effects from latent variables), the lineup of the whole framework and the boot-strapped ratings of Tubadji and Nijkamp (2015) will be provided through our functional model measurement.

3.3 Research Setting

The purpose of the paper is to decide how global corporations handle their "knowledge management, innovative culture, and firm innovativeness". A cross-sectional design was introduced, in which data was obtained from a sample of subsidiaries of corporations headquartered in Malaysia using a structured survey. There seem to be three explanations for conducting research in this sense. With that being said, innovative culture is fairly new to Malaysia's innovation research environment, so the analysis of firm innovativeness and innovation culture in Malaysia is still in the infancy stage. Furthermore, the Malaysian Government is promoting better communication of data and technology from public science to the corporate companies. Finally, Malaysia's goal in the 21st century was to open creativity to foreign cooperation in order to improve economic growth and prosperity (Bamgbade, Nawi, Kamaruddeen, Adeleke, & Salimon, 2019; Revilla Diez & Kiese, 2006).

3.4 Sample and Data Collection

In two categories, the OECD describes businesses. The very first category consists of high-tech industrial businesses with in manufacturing company, including the electronics, aviation, and biotechnology sectors, and the second category consists of knowledge-intensive financial institutions, including the schooling, telecom, and information services businesses. The businesses studied in this analysis are from the first group, i.e., high-tech firms in the industrial industry, as per OECD classifications (Revilla Diez & Kiese, 2006). A convenient sampling approach is used to pick 296 Malaysian dependent MNE samples from different industries. These are some of the advantages of this study methodology being that the sample targeted many fields. Consequently, future generic source problems have been minimized. The multi-industry sampling architecture has helped to extend the generalizability of results (Xu et al., 2019)), including automotive components, bioengineering, drug companies, chemical diagnostic supplies, machines, processed oil and gas, timber steel plant, and electrical industries. From October 2019 to December 2019, the knowledge was gathered. There have been deliveries of 600 questionnaires and returns of 490. Eventually, there were 296 correct answers available with a 60.4 percent successful response rate. This study aimed to classify participants that have adequate awareness of KM capacity, knowledge development, translation, deployment, and security in their organization. The survey questions are being sent to participants with a covering letter outlining the purpose of this study. The kit contained an automatically addressed postal packet. In the event that a participant decided to participate in the questionnaires online, a website address of the questionnaire edition was also included in the letter (Marinagi, Trivellas, & Reklitis, 2015).

Table 1 indicates that the comments in response come from different sectors with the highest response from the electric manufacturing equipment (22.9%) and telecommunications equipment (14.4%) sectors. The answers were 23.6 percent and 21.8 percent respectively, of top executives and business managers. For 3-5 years several of these administrators had worked on their "current" organizations (32.7%).

Table 1. Sample Demographic Variables

Variables	Values	Frequency	Percentage
Gender	Male	198	67
	Female	98	33
Age	19-23	1	0.3
	24-29	65	22.1
	30-39	100	33.6
	40-49	86	29.2
	≥ 50 years	44	14.9
Education	Higher Diploma	162	54.6
	Undergraduate degree	100	33.8
	Postgraduate degree	33	11.2
	Ph.D. degree	1	0.4
Shift Work	12-hours rotating shift/work	152	51.3
Working Experience	≥ 1 but less than 3 years	56	18.8
	≥ 3 but less than 5 years	97	32.7
	≥ 5 but less than 10 years	81	27.4
	≥ 10 years	62	21.1
Position	Clerical/Administrative	48	16.3
	Junior Manager	58	19.7
	Middle Manager	65	21.8
	Senior Manager	70	23.6
	Specialists	34	11.7
	Others	20	6.9
Firm Age	0 – 10 years	39	13.2
	11 – 20 years	87	29.4
	21 – 30 years	93	31.3
	31 – 40 years	49	16.4
	Above 40 years	29	9.7
Market Orientation	Local/National	85	28.6
	Regional	145	49.1
	Global	66	22.3
Firm Ownership	100% Foreign owned subsidiaries	157	52.9
	Mixed ownership (Joint venture)	139	47.1
Industry	Aircraft and Spacecraft	12	4.2
	Pharmaceuticals	28	9.3
	Office, accounting, computing	27	9.1
	Communications equipment	43	14.4
	Biotechnology	25	8.6
	Electrical machinery & apparatus	68	22.9
	Motor vehicles	41	13.7
	Transport & railroad equipment	18	6.2
	Others	34	11.6

Most of the organizations operated for 21–30 years (31.3%). Many of these companies have a geographic business focus (49.1%) and were wholly foreign-owned branches (52.9%).

4. FINDINGS

4.1 Non-response Bias and Common Method Bias

The *t*-test is being used to assess the lack of answer biased in the results. Comparative analysis is provided regarding all factors around 40 fast and 40 delayed reactions. Zero substantial variations (p >.05) have been established contributing to the inference that the results are clear from non-response bias. Likewise, we have taken steps from the implementation phase of the list of questions, namely psychological separators (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) to mitigate any possible consequences of common method bias. All the calculation objects were subject to a CFA in which the numbers of variables were reduced to 1. The method allows the researcher to incorporate all variables, perceptually evaluated, into a variable study in order to identify a non-rotated factor approach in order to define the quantity of variables required to compensate for factor variance (Podsakoff et al., 2003). The analysis of variance approach being evaluated, and a specific item was produced, which describes far less than 50 percent of

the variation, indicating a lack of common method bias. To validate this result, we built a typical latent factor and loaded all the products onto this factor. The evaluation of this model showed a low fitness of the model: χ^2/df=3.12, CFI=0.703 and RMSEA=0.11 (J.F. Hair, Black, Babin, & Anderson, 2013). Therefore, the data is allowed from common technique bias (Podsakoff et al., 2003).

4.2. Assessment of the Measurement Model

CFA is applied to calculate the efficiency, discriminatory validity, and probabilistic accuracy of the method while evaluation of the measurement model. Table 2 (Appendix), which displays the loads greater than 0.5 or $p < 0.01$, presents the loads for all products. In addition, all the average variance (AVE) removed, as indicated by Prasojo et al. (2020), exceeded 0.5 while composite reliability (CR) was greater than 0.7. This results in a convergent validity.

Table 3 explains the unequal validity of the constructions. In deciphering the discriminatory validity, AVE was squared embedded in opposition to the inter-correlation of the prototype as a way of verifying the discriminatory viability of the model (Halpin, da-Silva, & De Boeck, 2014). The findings indicate that the root of the AVE square exceeded the association with other parameters.

Table 3. Discriminant Validity HTMT of Measurement Model

Constructs	KQ	KC	KA	KP	FI	IC
KQ	-					
KC	.764	-				
KA	.759	.797	-			
KP	.562	.566	.632	-		
FI	.489	.435	.443	.512	-	
IC	.399	.467	.511	.538	.744	-

Note: KQ = Knowledge Acquisition, KC = Knowledge Conversion, KA = Knowledge Application, KP = Knowledge Protection, IC = Innovative Culture, FI = Firm Innovativeness.

4.3. Assessment of the Structural Model

In order to validate the conceptual model or to evaluate the suggested theories leveraging the AMOS application software 24.0, two parameters must be regarded and interpret: the coefficients of determinations (R^2) to be calculated for the intrinsic structures and the direction coefficients (Young, 2000). The path coefficients must be substantial, although the R^2 value can differ based on the study field. In the evaluation of R^2, the values of 0.19, 0.33 and 0.67 are rated as small, reasonable, and major (Young, 2000). In this study, the firm innovativeness of R^2 is at the level of 0.253.

5. DISCUSSION

The outcomes underscore significant observations on linkages in the current study as seen in Table 4. This study is perhaps the first to explore the measurements of KM, creative culture and company creativity within the system, as other research studies have done separately. Previous research has demonstrated how that expertise gained by consumers, trading associates and vendors could theoretically strengthen the technical capabilities of the company and facilitate the production of innovative technologies and promote the development of technical capabilities within the organization (Singh & Soltani, 2010). Table 4 displays the findings of the hypothesis's evaluation of the structural interaction between the testing variables. For Hypothesis 1, the researcher looked at the connection between information learning and creative community. As seen in Table 4, the influence of information learning on creative culture (β=0.189; p<0.05) is important. H_1 is also endorsed and corroborated by the previous research performed by Smedley (2010).

Table 4. Summary of Path Coefficient and Hypotheses Testing

Hypothesis	Relationship	β-value	Std. Error	t-Values	p-Value	BCI 95% LL	BCI 95% UL	*Effect Size (f^2)*	Decision
H1	KQ-IC	.189	.076	2.796*	0.002	0.064	0.318	0.096	Supported
H2	KC-IC	.272	.069	2.696*	0.001	0.057	0.127	0.078	Supported
H3	KA-IC	.416	.077	2.832*	0.000	0.113	0.326	0.066	Supported
H4	KP-IC	.232	.066	1.876**	0.006	0.163	0.429	0.074	Supported
H5	IC-FI	.376	.068	2.236*	0.003	0.069	0.338	0.091	Supported
H6	KQ-IC-FI	.178	.071	2.676*	0.002	0.157	0.409	0.093	Supported
H7	KC-IC-FI	.234	.072	1.098**	0.005	0.098	0.379	0.075	Supported
H8	KA-IC-FI	.378	.065	3.096*	0.001	0.055	0.355	0.088	Supported
H9	KP-IC-FI	.204	.075	2.116*	0.002	0.178	0.299	0.067	Supported

Note: KQ = Knowledge Acquisition, KC = Knowledge Conversion, KA = Knowledge Application, KP = Knowledge Protection, IC = Innovative Culture, FI = Firm Innovativeness. * p<0.05, ** p<0.01

The findings of Hypothesis 2 indicate that the association between information transfer and creative culture (β=0.272; p<0.05) is substantial; therefore, H_2 is accepted. The results indicate that information conversion practices influence creative community. One approach to sustain awareness conversion that will promote innovative culture is by practices like as face-to-face conversation and observational learning (Choo, 2003). Knowledge transfer includes tasks performed by workers to upgrade the old information of the company with modern information, and because MNEs are software businesses with technologically-savvy employees, it is extremely likely that employees themselves would be held up to date with current knowledge in attempt to be properly prepared to conduct their employment (Nonaka & Toyama, 2003). In addition, these workers are often technologically oriented and might have the perception that the on-the-job phase of transfer of new skills, like coaching, is essential and important. The results of Hypothesis 3 indicated that the implementation of information promotes creative culture (β=0.416; p<0.05), thereby endorsing H_3. This is in line with the Jasimuddin and Zhang (2014) reports, which demonstrate that the implementation of knowledge accelerates the transition of knowledge into a creative society. Indisputably, the results of this study also reinforce the work of others who have established that the implementation of information is a significant indicator of creative culture (Racherla, Hu, & Hyun, 2008).

The findings of Hypothesis 4 suggest that knowledge protection does have important and optimistic association (β=0.232; p<0.01) with innovative culture (H_4). This would be in conformity with the findings (Väyrynen, Hekkala, & Liias, 2013) which shows that the security of information has a major effect on creative culture. The findings confirm the Chang, Liao, and Wu (2017) studies, which demonstrate that information security enables organizations to develop a structured contact line by a creative process, like the assignment of technical communicative coding on the responsibilities and duties of organizations. Around the similar time, organizations must develop creativity that regulates and creates appropriate rules for the security of information and offers workers with a creative and technical framework that avoids unauthorized exposure to knowledge (Moser & Deichmann, 2020). Hypothesis 5 also points out that the creative community (β=0.376; p<0.05) strengthens the interaction between firm innovativeness and thereby facilitates H_5. The results are consistent with a study by Jun, Lee, and Park (2020) which found that innovative culture is moving organizations towards innovation, as well as by Brettel, Chomik, and Flatten (2015), who recommended that innovative culture strengthen this partnership.

5.1 Mediating Effects Analysis

The structural model fitness was measured until the hypothesis (H_6, H_7, H_8 & H_9) were evaluated. Centered on J. Hair (2011)'s recommendations an appropriate model equation was collected: Chi-square=833.27; df=516; ratio=1.67; CFI=0.921; RMSEA=0.070. Next, we checked the direct association between knowledge management parameters (KQ, KC, KA & KP) and firm innovativeness. Hypothesis 6 (β=0.419; p<0.01), 7 (β=0.332; p<0.01), 8 (β=0.511; p<0.01), and 9 (β=0.228; p<0.01) projected a favorable interaction with firm innovativeness and were assisted. These four models indicated a major mediating impact of the innovative culture on the partnership among knowledge management and firm innovativeness. Under the interests of rigor, we adopted two methods to mediation research. Next the conventional method of Baron and Kenny (1986) was used. The findings as seen in Table 5. The findings show that the important indirect impact of "knowledge acquisition (β=0.312; p<0.01), knowledge conversion (β=0.136; p<0.01), knowledge application (β=0.378; p<0.01) and knowledge protection (β=0.192; p<0.01)" is substantially diminished when the innovative culture (mediator) is implemented throughout the framework. This large decline suggests complete mediation by Baron and Kenny (1986).

Table 5. Direct, Indirect and Total Effects Analysis

Path	Direct Effect	Indirect Effect	SE	LL95% CI	UL95%CI
KQ→IC→FI (H_6)	0.419**	0.312**	0.03	[0.11]	[0.28]
KC→IC→FI (H_7)	0.332**	0.136**	0.04	[0.18]	[0.34]
KA→IC→FI (H_8)	0.511**	0.378**	0.03	[0.13]	[0.31]
KP→IC→FI (H_9)	0.228**	0.192**	0.05	[0.09]	[0.18]

Note: N=296, KQ = Knowledge Acquisition, KC = Knowledge Conversion, KA = Knowledge Application, KP = Knowledge Protection, **p < 0.01

Second, we have used a conventional approach that Preacher and Hayes (2008) proposed after the Baron and Kenny (1986) were lately questioned. Hence, we employed the bootstrapping system with bias-corrected confidence estimates to determine the mediating function of the knowledge management factors utilizing the process macro (Hayes, 2013). The lower and upper limit confidence intervals (LLCI & ULCI) were therefore established for the implicit impact of knowledge acquisition, knowledge conversion, knowledge application and knowledge protection on firm innovativeness. It was found that with 10,000 bootstraps resamples, the confidence interval for the indirect impact of knowledge acquisition [LLCI=0.11; ULCI=0.28], knowledge conversion [LLCI=0.18; ULCI=0.34], knowledge application [LLCI=0.13; ULCI=0.31], and knowledge protection [LLCI=0.09; ULCI=0.18] did not contain zero. The mediation in the bootstrapped

confidence interval method includes omitting zero from the confidence interval for unstandardized indirect effect outcomes. Although, in this situation, the upper and lower limit confidence ranges do not include zero among them, it is inferred that the indirect impact is substantially different from zero at p<0,01 which implies that the innovative culture mediates the relationship between knowledge acquisition, knowledge conversion, knowledge application and knowledge protection with firm innovativeness (see Table 5). This shows the existence of complete mediation and supports the findings obtained earlier using the Baron and Kenny (1986) process.

The results of this analysis confirm the assumptions that innovative culture strengthens the positive relationship among all four knowledge management variables (H_6, H_7, H_8 & H_9) and firm innovativeness (see Table 5). As companies practice high levels of innovative culture, they increase inventive activities inside the company (Gabaldón-Estevan & Ybarra, 2017). By gaining knowledge, this will have a beneficial influence on firm innovativeness and as a direct consequence, innovative culture will intensify this influence. The findings of this study underscore the reality that innovative culture makes a difference in encouraging performance amongst workers which inspires themselves to master new techniques required to enhance innovation across industries.

The results are also aligned with the research by Nawaz Khan et al. (2019), which showed that innovative culture promotes the concept of innovative goods and processes in organizations. This demonstrates when innovative culture is cultivated by MNEs in Malaysia, workers and companies will profit from all of this. Innovative culture could successfully bring innovation which would result in superior performance (James, 2005; Ramella, 2017). This research strengthens resource-based view, which asserts that companies which make better utilization of their knowledge and culture as a resource possess the capability to attain higher levels of innovation and produce better results (Austin & Ciaassen, 2008; Wilson & Douglas, 2007). The results support that innovative culture significantly affects MNEs performance. Innovative culture enhances the capability of MNEs to innovative that finally leads to the superior performance of firm innovativeness (Martínez-Costa, Jiménez-Jiménez, & Dine Rabeh, 2019; Wang, Begley, Hui, & Lee, 2012).

6. CONCLUSIONS AND MANAGERIAL IMPLICATIONS

The whole study epitomizes the conceptual viewpoint of the analysis of the role of innovative culture in the sense of the partnership among KM and firm innovativeness in MNEs in Malaysia. The value of KM as an antecedent of firm innovativeness is well known in the literature; furthermore, this exists a lack of empirical studies on the relation between KM and firm innovation. This research offered an in-depth understanding of the moderating mechanism of innovative culture in the partnership between KM and firm innovation. This study has therefore added to an increasing body of knowledge on the context of "KM, innovative culture and firm innovativeness".

The research paper offers management teams & professionals with an ability to better appreciate skills and capacities such as KM and firm innovativeness. The findings of this research demonstrate that "innovative culture, knowledge acquisition, knowledge conversion, knowledge application and knowledge protection enhance firm innovativeness". It is thus essential that managers of MNEs in Malaysia establish an effective culture, in this situation a creative culture, as the current analysis has demonstrated how it is considered a catalyst that stimulates organizations to learn, transform and implement appropriate information that enhances firm innovation (Gonzalez-Loureiro, Sousa, & Pinto, 2017; Rajapathirana & Hui, 2018). Companies who are prone to evolve would have a greater probability of producing superior results, and it is thus important for organizations to step up the practice of innovative culture within the company in order to establish the standard for other workers to be innovative, such as in the production of innovative goods, procedures or concepts. Likewise, the findings of the present study indicate that an inventive community is beneficial to accelerating the partnership among KM and firm innovation. Consequently, it underscores the reality that managers are urged to assign capital appropriately based on the results of this study to promote firm innovativeness between MNEs in Malaysian companies. As such, it is advised that managers in MNE firms pay more importance to the development and applying knowledge, as well as to the inculcation of an innovative culture, in order to achieve firm innovativeness that can eventually contribute to improved results (van Oostrom & Fernández-Esquinas, 2017).

7. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

As many other reports, this analysis endured a range of weaknesses that hinder the generalization of results and start opening opportunities for new analysis. While this report aims to be as comprehensive and analytical as practicable, the foregoing drawbacks exist dependent on review of the literature, empirical methodology, information gathering and statistical analysis. Second, study results are extracted from self-reported data. This may contribute to possible common method variances. Furthermore, the methodology utilized in this analysis is cross-sectional and does not represent the long-term efficiency of the pathways explored in this review. Second, the practice of KM is highly complex. The research centered on just four KM variables: "knowledge acquisition, knowledge conversion, knowledge

application and knowledge protection". There are many other measurements of KM that have not been studied which can also be helpful in illustrating the firm innovativeness of other sectors. As a recommendation for potential studies, other researchers may explore the influence of other KM variables on firm innovation through various industries. This research can also follow a specification outlined to the long-term consequences of these KM activities. The generalizations of existing studies to other sectors or countries really should entail more study. Even more analysis should be carried out utilizing various countries and respondents from different divisions across organizations to allow research more relevant and generally applicable. While managers are most probable to be well educated, we never rule out discrepancies in understanding within the company of other KM variables. For this purpose, a study design involving several participants may have benefits over the design used for this article.

Second, this analysis examined only MNEs from Malaysia, culminating in a possible geographic bias. In addition, this analysis often confronted sectoral prejudice, since the survey came from a variety of business industries that were involved in decision makers at the time of this research. While any of these problems might be troublesome, it is not simple to gather data from MNEs. Numerous attempts have been made to validate the integrity of the evidence, the variation, reliability, and accuracy of the common procedure. Study is often restricted by the usage of the same scale of creativity culture in all industries. Relevant market innovation scales could offer a more detailed explanation of the partnership between variables in various industries (Mlozi, Pesämaa, & Jack, 2018). Another constraint is the shortage of predictors in the individual-level analysis and the shortage in the industry-level analysis (Pater & Lewandowska, 2015) in our firm innovativeness model due to the constraints placed by the accessible database.

Given these limits, this research presented realistic scientific data to show the connection between KM and the firm innovativeness of MNEs. Future studies can be extended to discuss relevant corporate reactions to a far broader variety of external knowledge management inputs. The empiric emphasis of this paper was on the Malaysian background. While we assume that our hypothesis can take root in other empiric contexts, potential studies may explore the generalization of this study by utilizing evidence from other geographical contexts.

References:

Alolayyan, M. N., Alalawin, A. H., Alyahya, M. S., & Qamar, A. (2020). The impact of knowledge management practice on the hospital performance in Abu Dhabi. *Cogent Business & Management, 7*(1), 1827812.

Ammirato, S., Linzalone, R., & Felicetti, A. M. (2020). Knowledge management in pandemics. A critical literature review. *Knowledge Management Research & Practice*, 1-12.

Austin, M. J., & Ciaassen, J. (2008). Impact of Organizational Change on Organizational Culture. *Journal of Evidence-Based Social Work, 5*(1-2), 321-359.

Bamgbade, J. A., Nawi, M. N. M., Kamaruddeen, A. M., Adeleke, A. Q., & Salimon, M. G. (2019). Building sustainability in the construction industry through firm capabilities, technology and business innovativeness: empirical evidence from Malaysia. *International Journal of Construction Management*, 1-16.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Baskerville, R., & Dulipovici, A. (2006). The theoretical foundations of knowledge management. *Knowledge Management Research & Practice, 4*(2), 83-105.

Bibi, G., Padhi, M., & Dash, S. S. (2020). Theoretical necessity for rethinking knowledge in knowledge management literature. *Knowledge Management Research & Practice*, 1-12.

Bouncken, R. B., & Pyo, S. (2002). Achieving Competitiveness Through Knowledge Management. *Journal of Quality Assurance in Hospitality & Tourism, 3*(3-4), 1-4.

Brettel, M., Chomik, C., & Flatten, T. C. (2015). How Organizational Culture Influences Innovativeness, Proactiveness, and Risk-Taking: Fostering Entrepreneurial Orientation in SMEs. *Journal of Small Business Management, 53*(4), 868-885.

Burkhard, R. J., Hill, T. R., & Venkatsubramanyan, S. (2011). The Emerging Challenge of Knowledge Management Ecosystems: A Silicon Valley High Tech Company Signals the Future. *Information Systems Management, 28*(1), 5-18.

Byukusenge, E., & Munene, J. C. (2017). Knowledge management and business performance: Does innovation matter? *Cogent Business & Management, 4*(1), 1368434.

Calantone, R. J., Cavusgil, S. T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. *Industrial Marketing Management, 31*(6), 515-524.

Chang, W.-J., Liao, S.-H., & Wu, T.-T. (2017). Relationships among organizational culture, knowledge sharing, and innovation capability: a case of the automobile industry in Taiwan. *Knowledge Management Research & Practice, 15*(3), 471-490.

Choi, S., & Choi, J.-S. (2014). Dynamics of Innovation in Nonprofit Organizations: The Pathways from Innovativeness to Innovation Outcome. *Human Service Organizations: Management, Leadership & Governance, 38*(4), 360-373.

Chong, C. W., & Chong, S. C. (2009). Knowledge management process effectiveness: measurement of preliminary knowledge management implementation. *Knowledge Management Research & Practice, 7*(2), 142-151.

Choo, C. W. (2003). Perspectives on Managing Knowledge in Organizations. *Cataloging & Classification Quarterly, 37*(1-2), 205-220.

Delshab, V., Winand, M., Sadeghi Boroujerdi, S., Hoeber, L., & Mahmoudian, A. (2020). The impact of knowledge management on performance in nonprofit sports clubs: the mediating role of attitude toward innovation, open innovation, and innovativeness. *European Sport Management Quarterly*, 1-22.

Dibrell, C., Craig, J., & Hansen, E. (2011). Natural environment, market orientation, and firm innovativeness: An organizational life cycle perspective. *Journal of Small Business Management, 49*(3), 467-489.

Donate, M. J., & Guadamillas, F. (2015). An empirical study on the relationships between knowledge management, knowledge-oriented human resource practices and innovation. *Knowledge Management Research & Practice, 13*(2), 134-148.

Esposito, E., & Evangelista, P. (2016). Knowledge management in SME networks. *Knowledge Management Research & Practice, 14*(2), 204-212.

Gabaldón-Estevan, D., & Ybarra, J.-A. (2017). Innovative culture in district innovation systems of European ceramics SMEs. *European Planning Studies, 25*(11), 2021-2036.

Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. *Journal of management information systems, 18*(1), 185-214.

Gonzalez-Loureiro, M., Sousa, M. J., & Pinto, H. (2017). Culture and innovation in SMEs: the intellectual structure of research for further inquiry. *European Planning Studies, 25*(11), 1908-1931.

Gunzler, D., Chen, T., Wu, P., & Zhang, H. (2013). Introduction to mediation analysis with structural equation modeling. *Shanghai archives of psychiatry, 25*(6), 390-394.

Hair, J. (2011). Hair, JF, Black, WC, Babin, BJ & Andersan, RE (2010). Multivariate Data Analysis. In: New Jersey: Pearson Prentice Hall. http://doi. org/10.1016/j. ijpharm.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate Data Analysis*: Pearson Education Limited.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (1998). *Multivariate data analysis* (Vol. 5): Prentice hall Upper Saddle River, NJ.

Halpin, P. F., da-Silva, C., & De Boeck, P. (2014). A Confirmatory Factor Analysis Approach to Test Anxiety. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(3), 455-467.

Harrington, T. S., Srai, J. S., & Kumar, M. (2019). Knowledge management in SMEs and MNCs: matching knowledge mobility mechanisms to supply network configuration profiles. *Production Planning & Control, 30*(10-12), 971-994.

Hau, Y. S. (2016). An empirical analysis of the influence of external knowledge network on SMEs' new technology development and technology commercialization capabilities in the perspective of open innovation. *Journal of Digital Convergence, 14*(5), 149-156.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY, US: Guilford Press.

Hörisch, J., Johnson, M. P., & Schaltegger, S. (2015). Implementation of sustainability management and company size: A knowledge-based view. *Business Strategy and the Environment, 24*(8), 765-779.

James, A. (2005). Demystifying the role of culture in innovative regional economies. *Regional Studies, 39*(9), 1197-1216.

Jasimuddin, S. M., & Zhang, Z. (2014). Knowledge management strategy and organizational culture. *Journal of the Operational Research Society, 65*(10), 1490-1500.

Jun, J., Lee, T., & Park, C. (2020). The mediating role of innovativeness and the moderating effects of strategic choice on SME performance. *Journal of Small Business Management*, 1-21.

Kalyar, M. N., & Rafi, N. (2013). 'Organizational learning culture': an ingenious device for promoting firm's innovativeness. *The Service Industries Journal, 33*(12), 1135-1147.

Kanter, J. (1999). Knowledge Management, Practically Speaking. *Information Systems Management, 16*(4), 7-15.

Kearns, G. S., & Sabherwal, R. (2006). Strategic alignment between business and information technology: a knowledge-based view of behaviors, outcome, and consequences. *Journal of management information systems, 23*(3), 129-162.

Kmieciak, R., & Michna, A. (2018). Knowledge management orientation, innovativeness, and competitive intensity: evidence from Polish SMEs. *Knowledge Management Research & Practice, 16*(4), 559-572.

Kock, N., & Hadaya, P. (2018). Minimum sample size estimation in PLS-SEM: The inverse square root and gamma-exponential methods. *Information Systems Journal, 28*(1), 227-261.

Leal-Rodríguez, A. L., Roldán, J. L., Leal, A. G., & Ortega-Gutiérrez, J. (2013). Knowledge management, relational learning, and the effectiveness of innovation outcomes. *The Service Industries Journal, 33*(13-14), 1294-1311.

López-Torres, G. C., Garza-Reyes, J. A., Maldonado-Guzmán, G., Kumar, V., Rocha-Lona, L., & Cherrafi, A. (2019). Knowledge management for sustainability in operations. *Production Planning & Control, 30*(10-12), 813-826.

Madrid-guijarro, A., Garcia, D., & Van auken, H. (2009). Barriers to Innovation among Spanish Manufacturing SMEs. *Journal of Small Business Management, 47*(4), 465-488.

Marinagi, C., Trivellas, P., & Reklitis, P. (2015). Information Quality and Supply Chain Performance: The Mediating Role of Information Sharing. *Procedia - Social and Behavioral Sciences, 175*, 473-479.

Marm-Garcia, J. A., & Zarate-Martinez, E. (2007). A thoretical review of knowledge management and teamworking in the organizations. *International Journal of Management Science and Engineering Management, 2*(4), 278-288.

Martín-de Castro, G. (2015). Knowledge management and innovation in knowledge-based and high-tech industrial markets: The role of openness and absorptive capacity. *Industrial Marketing Management, 47*, 143-146.

Martínez-Costa, M., Jiménez-Jiménez, D., & Dine Rabeh, H. A. (2019). The effect of organisational learning on interorganisational collaborations in innovation: an empirical study in SMEs. *Knowledge Management Research & Practice, 17*(2), 137-150.

Martínez-Román, J. A., & Romero, I. (2017). Determinants of innovativeness in SMEs: disentangling core innovation and technology adoption capabilities. *Review of Managerial Science, 11*(3), 543-569.

Menguc, B., & Auh, S. (2006). Creating a firm-level dynamic capability through capitalizing on market orientation and innovativeness. *Journal of the academy of marketing science, 34*(1), 63-73.

Mingers, J. (2008). Management knowledge and knowledge management: realism and forms of truth. *Knowledge Management Research & Practice, 6*(1), 62-76.

Mlozi, S., Pesämaa, O., & Jack, S. (2018). Role of reciprocity and innovativeness on performance in a developing context: Empirical evidence from Africa. *African Journal of Science, Technology, Innovation and Development, 10*(1), 69-84.

Moser, C., & Deichmann, D. (2020). Knowledge sharing in two cultures: the moderating effect of national culture on perceived knowledge quality in online communities. *European Journal of Information Systems*, 1-19.

Nawaz Khan, S., Hussain, R. I., Ur-Rehman, S., Maqbool, M. Q., Engku Ali, E. I., & Numan, M. (2019). The mediating role of innovation between corporate governance and organizational performance: Moderating role of innovative culture in Pakistan textile sector. *Cogent Business & Management, 6*(1), 1631018.

Nemati, H. R. (2002). Global Knowledge Management: Exploring A Framework For Research. *Journal of Global Information Technology Management, 5*(3), 1-11.

Nonaka, I., & Toyama, R. (2003). The knowledge-creating theory revisited: knowledge creation as a synthesizing process. *Knowledge Management Research & Practice, 1*(1), 2-10.

Ode, E., & Ayavoo, R. (2020). The mediating role of knowledge application in the relationship between knowledge management practices and firm innovation. *Journal of Innovation & Knowledge, 5*(3), 210-218.

Okunoye, A., & Karsten, H. (2002). Where The Global Needs The Local: Variation in Enablers in the Knowledge Management Process. *Journal of Global Information Technology Management, 5*(3), 12-31.

Park, J., Lee, K.-H., & Kim, P. S. (2016). Participative Management and Perceived Organizational Performance: The Moderating Effects of Innovative Organizational Culture. *Public Performance & Management Review, 39*(2), 316-336.

Pater, R., & Lewandowska, A. (2015). Human capital and innovativeness of the European Union regions. *Innovation: The European Journal of Social Science Research, 28*(1), 31-51.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903.

Prasojo, L. D., Habibi, A., Mohd Yaakob, M. F., Pratama, R., Yusof, M. R., Mukminin, A., Hanum, F. (2020). Teachers' burnout: A SEM analysis in an Asian context. *Heliyon, 6*(1), e03144.

Preacher, K. J., & Hayes, A. F. (2008). Contemporary approaches to assessing mediation in communication research. In *The Sage sourcebook of advanced data analysis methods for communication research.* (pp. 13-54). Thousand Oaks, CA, US: Sage Publications, Inc.

Racherla, P., Hu, C., & Hyun, M. Y. (2008). Exploring the Role of Innovative Technologies in Building a Knowledge-Based Destination. *Current Issues in Tourism, 11*(5), 407-428.

Rajapathirana, R. P. J., & Hui, Y. (2018). Relationship between innovation capability, innovation type, and firm performance. *Journal of Innovation & Knowledge, 3*(1), 44-55.

Ramella, F. (2017). The 'Enterprise of Innovation' in hard times: corporate culture and performance in Italian high-tech companies. *European Planning Studies, 25*(11), 1954-1975.

Ratchukool, N., & Igel, B. (2018). The effect of proximity between universities and research institutes and firms on firm innovativeness. *Asian Journal of Technology Innovation, 26*(1), 69-89.

Revilla Diez, J., & Kiese, M. (2006). Scaling Innovation in South East Asia: Empirical Evidence from Singapore, Penang (Malaysia) and Bangkok. *Regional Studies, 40*(9), 1005-1023.

Rubera, G., & Kirca, A. H. (2012). Firm innovativeness and its performance outcomes: A meta-analytic review and theoretical integration. *Journal of Marketing, 76*(3), 130-147.

Sankowska, A., & Paliszkiewicz, J. (2016). Dimensions Of Institutionalized Organizational Trust And Firm's Innovativeness. *Journal of Computer Information Systems, 56*(2), 168-174.

Seddighi, H. R., & Mathew, S. (2020). Innovation and regional development via the firm's core competence: some recent evidence from North East England. *Journal of Innovation & Knowledge, 5*(4), 219-227.

Singh, A., & Soltani, E. (2010). Knowledge management practices in Indian information technology companies. *Total Quality Management & Business Excellence, 21*(2), 145-157.

Smedley, J. (2010). Modelling the impact of knowledge management using technology. *OR Insight, 23*(4), 233-250.

Soto-Acosta, P., Cegarra-Navarro, J.-G., & Garcia-Perez, A. (2017). From the Guest Editors:" Enterprise Social Media for Knowledge Management and Innovation in SMEs". *IS Management, 34*(3), 203-204.

Sun, X., Li, J., Wu, G., Qian, Y., & Tian, Y. (2014). Construction of Collaborative Innovation Mechanism of Knowledge Alliance between Chinese State-Owned Enterprises and Organizations. *Transnational Corporations Review, 6*(4), 317-343.

Sun, Y., Liu, J., & Ding, Y. (2020). Analysis of the relationship between open innovation, knowledge management capability and dual innovation. *Technology Analysis & Strategic Management, 32*(1), 15-28.

Toaldo, A. M. M., Didonet, S. R., & Luce, F. B. (2013). The Influence of Innovative Organizational Culture on Marketing Strategy Formulation and Results. *Latin American Business Review, 14*(3-4), 251-269.

Tomasova, D. (2020). Analysis and assessment of innovative culture development. *African Journal of Science, Technology, Innovation and Development, 12*(6), 665-677.

Tsai, K.-H., & Yang, S.-Y. (2013). Firm innovativeness and business performance: The joint moderating effects of market turbulence and competition. *Industrial Marketing Management, 42*(8), 1279-1294.

Tubadji, A., & Nijkamp, P. (2015). Cultural Gravity Effects among Migrants: A Comparative Analysis of the EU15. *Economic Geography, 91*(3), 343-380.

Ungan Mustafa, C. (2007). Manufacturing best practices: implementation success factors and performance. *Journal of Manufacturing Technology Management, 18*(3), 333-348.

van Oostrom, M., & Fernández-Esquinas, M. (2017). Exploring the links between culture and innovation in micro firms: cultural dimensions, social mechanisms and outcomes. *European Planning Studies, 25*(11), 1932-1953.

Väyrynen, K., Hekkala, R., & Liias, T. (2013). Knowledge Protection Challenges of Social Media Encountered by Organizations. *Journal of Organizational Computing and Electronic Commerce, 23*(1-2), 34-55.

Wang, H., Begley, T., Hui, C., & Lee, C. (2012). Are the effects of conscientiousness on contextual and innovative performance context specific? Organizational culture as a moderator. *The International Journal of Human Resource Management, 23*(1), 174-189.

Wilson, G., & Douglas, H. (2007). Developing a culture of evidence-based practice in social work agencies in Northern Ireland. *Practice, 19*(1), 19-32.

Wong, W. P., Soh, K. L., & Goh, M. (2016). Innovation and productivity: insights from Malaysia's logistics industry. *International Journal of Logistics Research and Applications, 19*(4), 318-331.

Wu, H., Gu, X., Zhao, Y., & Liu, W. (2020). Research on the Relationship between Structural Hole Location, Knowledge Management and Cooperative Innovation Performance in Artificial Intelligence. *Knowledge Management Research & Practice*, 1-10.

Xu, J., Wu, H.-C., Zhu, C., Ehrlich, A., Shaw, L., Nikolka, M., . . . Luo, S. (2019). Multi-scale ordering in highly stretchable polymer semiconducting films. *Nature materials, 18*(6), 594-601.

Young, P. H. (2000). Generalized Coefficient of Determination. *The Journal of Cost Analysis & Management, 2*(1), 59-68.

Yuan, X. n., Guo, Z., & Fang, E. (2014). An examination of how and when the top management team matters for firm innovativeness: The effects of TMT functional backgrounds. *Innovation, 16*(3), 323-342.

Zailani, S., Iranmanesh, M., Nikbin, D., & Jumadi, H. B. (2014). Determinants and environmental outcome of green technology innovation adoption in the transportation industry in Malaysia. *Asian Journal of Technology Innovation, 22*(2), 286-301.

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Appendix

Table 2. Results of the Measurement Model

Construct	Measurement Items	Loadings	AVE	CR
Knowledge Acquisition	KQ1: My organization acquires knowledge about our customers	0.597	0.643	0.898
	KQ2: My organization generates new knowledge from existing knowledge	0.725		
	KQ3: My organization acquires knowledge about our suppliers	0.581		
	KQ4: My organization uses feedback from projects to improve subsequent projects	0.714		
	KQ5: My organization distributes knowledge throughout the organization	0.677		
	KQ6: My organization exchanges knowledge with our business partners	0.712		
	KQ7: My organization collaborates with other organizations	0.662		
	KQ8: My organization acquires knowledge about new Products/services within our industry	0.608		
	KQ9: My organization acquires knowledge about our Competitors within our industry	0.713		
	KQ10: My organization has the ability to benchmark the organizational performance compared to the industry	0.655		
	KQ11: My organization identifies best practice for the company	0.761		
	KQ12: My organization exchanges knowledge between employees	0.666		
Knowledge Conversion	KC1: My organization converts knowledge into the design of new products/services	0.557	0.629	0.812
	KC2: My organization converts competitive intelligence into plans of action	0.713		
	KC3: My organization filters knowledge that are acquired	0.745		
	KC4: My organization transfers organizational knowledge to individuals	0.765		
	KC5: My organization absorbs knowledge from individuals into the organization	0.633		
	KC6: My organization absorbs knowledge from business Partners into the organization	0.692		
	KC7: My organization distributes knowledge throughout the organization	0.778		
	KC8: My organization integrates different sources and types of knowledge	0.811		
	KC9: My organization organizes knowledge	0.713		
	KC10: My organization replaces outdated knowledge	0.699		

Knowledge Application	KA1: My organization applies knowledge learned from mistakes	0.771	0.662	0.922
	KA2: My organization applies knowledge learned from experiences	0.786		
	KA3: My organization uses knowledge in development of new products/services	0.589		
	KA4: My organization uses knowledge to solve new problems	0.713		
	KA5: My organization matches sources of knowledge to problems and challenges	0.605		
	KA6: My organization uses knowledge to improve efficiency	0.801		
	KA7: My organization uses knowledge to adjust strategic direction	0.706		
	KA8: My organization is able to locate and apply knowledge to changing competitive conditions	0.778		
	KA9: My organization makes knowledge accessible to those who need it	0.764		
	KA10: My organization takes advantage of new knowledge	0.649		
	KA11: My organization quickly applies knowledge to critical competitive needs	0.765		
	KA12: My organization quickly links sources of knowledge in solving problems	0.734		
Knowledge Protection	KP1: My organization protects knowledge from inappropriate uses inside the organization	0.762	0.639	0.952
	KP2: My organization protects knowledge from inappropriate use outside the organization	0.687		
	KP3: My organization protects knowledge from theft from within the organization	0.887		
	KP4: My organization protects knowledge from theft from outside the organization	0.817		
	KP5: My organization provides incentives to employees who protects knowledge	0.653		
	KP6: My organization has technology that restricts access to some sources of knowledge	0.742		
	KP7: My organization has extensive policies and procedures for protecting trade secrets	0.822		
	KP8: My organization values and protects knowledge embedded in individuals	0.863		
	KP9: My organization has restricted knowledge that is clearly identified	0.844		
	KP10: My organization clearly communications the importance of protecting knowledge	0.811		
Innovative Culture	IC1: The people in my organization are encouraged to try new and better ways of doing their jobs	0.866	0.739	0.942
	IC2: Innovation is highly rewarded in our organization	0.787		
	IC3: Trying new ways of solving problems is encouraged in our organization	0.901		
	IC4: Our organization's culture allows people to be creative	0.827		
	IC5: In our organization, change is viewed as a positive factor which brings new opportunities	0.888		
Firm Innovativeness	FI1: Our organization frequently tries out new ideas	0.876	0.619	0.871
	FI2: Our organization seeks out new ways to do things	0.687		
	FI3: Our organization is creative in its methods of operation	0.870		
	FI4: Our organization is often the first to market with new products and services	0.822		
	FI5: Our new product introduction has increased over the last 5years	0.788		

Notes: AVE = Average Variance Extracted, CR = Composite Reliability