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INNOVATION AND TECHNOLOGY ADOPTION CHALLENGES: IMPACT ON SMEs' COMPANY PERFORMANCE

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Abstract: *Small and Medium Enterprises (SMEs), although a vital component in fostering economic growth of a country, failed to rise to its full potential due to various challenges. In the SME Masterplan 2012-2020, the government of Malaysia has outlined six of these challenges: human capital development, access to financing, market access, infrastructure, innovation and technology adoption, and legal and regulatory environment. This paper seeks to study one of the challenge, innovation and technology adoption, and determine its effect on the performance of the SMEs in Malaysia. Data was collected through a survey to Malaysian SME manufacturing companies yielding a response from 152 companies. Results indicate a significant relationship between innovation and technology adoption challenge and company performance.*

Keywords: *Innovation and Technology Adoption, Risk, Small and Medium Enterprise, Performance, Manufacturing.*

Introduction

Small and Medium Enterprises (SMEs) are a vital component in economic development (Hashim, 2011) and bring benefits to the country as they provide employment, increase income, and foster economic growth. According to Official Website SME Corp Malaysia (OWSCM), Economic Census 2016 stated 98.5 percent business establishment are SME providing 65.3 percent of employment, 36.6 percent of GDP and 18.6 percent of export signalling the important contribution of SME towards Malaysian economy. However, despite its vital contribution, SMEs have many shortcomings including lack of structure, small management, inadequate organization and lack of risk management (Lavastre, Gunasekaran & Spalanzani, 2012).

Malaysian government, in its effort to realize the full potential of SME and achieving the goal of high income nation, has launched the SME Masterplan 2012-2020, a guideline that includes the policy direction of SME's in all sectors. In this SME Masterplan 2012-2020, six challenges faced by the Malaysian SME were demarcated: human capital development, access to financing, market access, infrastructure, innovation and technology adoption, and legal and regulatory environment.

Previous studies have found that innovation and technology have a positive relationship with performance (Rosli & Sidek, 2013; Kim-Soon, Ahmad, Kiat & Sapry, 2017) and thus it follows that if the SMEs do not adopt innovation and technology, they risk a negative impact on company performance. Based on this premise, the paper proposes to address the following research questions:

RQ1: What are the challenges SMEs face with regards to innovation and technology adoption?

RQ2: How have the challenges in innovation and technology adoption influence SMEs' company performance?

Literature Review

Malaysian SME

The definition of SMEs is diverse across countries and in Malaysia, it is based on two factors: annual sales turnover and number of full-time employees (Hashim, 2011). According to Bank Negara Malaysia, the latest SME definition has been revised and effectively used in 1st January 2014. The definition if further categorised under two categories: manufacturing and services and other sectors. In manufacturing, the sales turnover is not exceeding RM50 million or full-time employees not exceeding 200 employees. For services and other sectors, sales turnover not exceeding RM20 million or full-time employees not exceeding 75 employees.

Dynamic Capabilities Theory

Dynamic capabilities theory is the extension of resource-based view theory (RBV) and mostly utilised to explain competitive advantage in unpredictable circumstances as it also includes elements of market dynamism (Eisenhardt & Martin, 2000). Teece, Peteraf and Leih (2016) defined dynamic capabilities as *"the firm's capacity to innovate, adapt to change, and create change that is favourable to customers and unfavourable to competitors"*. In a dynamic environment, company have to develop new product in order to gain competitive advantage (Blonigen & Taylor, 2000). In this sense, innovation and technology would contribute to dynamic capabilities as supported by Alves, Barbieux, Reichert, Tello-Gamarra and Zawislak (2017) who stated that dynamic capabilities should be recognised as innovation-driven. Innovation and dynamic capabilities create superior capabilities (Wang & Ahmed, 2007) and contributes to the firm's competitive environment. Zhou, Zhou, Feng and Jiang (2017) further propose that dynamic capabilities encourage company performance through innovation activities. This study shall utilise the premises of dynamic capabilities theory to support our main tenet of innovation and technology contributing to better company performance and that if SME's do not adopt innovation and technology, they risk a negative impact on their company performance.

Innovation and Technology Adoption Risk

As stated above, SME Masterplan 2012-2020 listed six challenges faced by Malaysian SME, one of it is innovation and technology adoption. The National SME Development Council (2012) claimed that the most vital performance lever is innovation and technology adoption. Innovation can be defined as *"implementing new ideas that create value"* (Linder, Jarvenpaa, & Davenport, 2003). In other words, the implementation of ideas which is new to the company and bring value either indirectly to customer or directly to company, and can occur in product, process, organizational system or marketing system (Weerawardena, 2003). Being innovative is imperative for the company in order to sustain its market position and to strengthen performance level. However, to become innovative is difficult for SME even if they quickly adapt their resources to respond to business environment and demands. SMEs have many challenges in adopting innovation. Torres, Guzman and Castro (2015) indicated that SMEs have several challenges that prevent innovation activities due to lack of investment on research and development. Not only that, the authors argue that there are three challenges to innovation that significantly affect SMEs performance: financial, environmental and human resource and these challenges have to be eliminated in order to increase SME performance. In another study by Bobera (2013), innovation challenges perceived by entrepreneur with strong negative influence are: inadequate fund from its own resources, high cost of innovation and corruption. The challenges emerged should be taken priority as innovation affects companies' ability to compete successful in global market.

Technology is defined as *"firm-specific information concerning characteristics and performance properties of production processes and product design"* (Dean & LeMaster, 1995). According to Li-Hua and Khalil (2006), technology is referred as competitive advantages against rivals and is classified into four inter-linked elements which are technique, knowledge, the organisation of the production and the product. SME has been argued to lack knowledge in technology, resource constraint and unskilled worker. However, nowadays, people can access internet from anywhere with the presence of sophisticated technology. The more advance is the technology, the more are company's afraid information exposure to outsiders. This is supported by Alam (2009) and Walker, Bode, Burn and Webster (2003), in which small-scale industries agreed that failure of a company can be due to the security of information available on the internet. They view this as a threat and risk for companies.

Although the world is at present digitally driven, some SMEs in Malaysia are still not well-established in ICT because they lack educated personnel to implement information technology (IT) (Alam & Ahsan, 2007; Saleh & Ndubisi, 2006). Some studies suggested that in order to solve the problem of capable IT personnel, SME could engage in open innovation. Open innovation is an approach where a company uses external ideas, as well as internal ideas, to assist in improving their technology and generate additional value (Chesbrough, Vanhaverbeke & West, 2006). An open innovation can be established by collaborating with suppliers, rivals, customers, and universities. Supported by Alam and Ahsan (2007), SMEs can improve ICT implementation with cooperation across various parties. However, Cora and Tanţău (2013) found some reasons that prevent the application of open innovation in SMEs, which are lack of finance, experience people, knowledge sharing, technology adoption, regulation risk, and unmotivated and unwillingness to cooperate. Furthermore, lack of knowledge in advance technology can also be the main problem that causes fear among SMEs towards technology development. In fact, inadequate skilled personnel in technology development is one of the reasons normally used by the SMEs to refuse the improvement of their technology system.

In this study, we viewed innovation and technology adoption risk as the complexity of a company in improving the process of transforming ideas, tools, and machines into new or improved products, services, or processes. In the study done by Anuar and Yusuff (2011), they found the absence of technology and product innovation in Malaysian manufacturing SMEs' practice. They suggest that SMEs would be able to enhance the company's performance if they take serious consideration on technology and product innovation. The improvement on innovation and technology can help company to obtained value added and competitive advantages. Moreover, Chan Kim and Mauborgne (2005) suggest that innovation is the solution for companies to remain and succeed in increasingly hypercompetitive markets.

Because of the challenges faced, this study posits that SME is not paying much attention on innovation and technology adoption benefits to increase the company's performance. Determining the root cause of the innovation and technology dilemma in SMEs will help to enhance the SMEs' understanding on their challenges. Based on this proposition, this study examined six items to identify challenges in innovation and technology adoption in SMEs' companies. The six items are: quality of production, resources, implement new research, utilise new knowledge, inefficient technology and inadequate budget. Also this study is interested to investigate the relationship between innovation and technology adoption risk and company performance. These result are expected to answer the two research questioned raised above. Figure 1 presents the conceptual model used in the present paper.

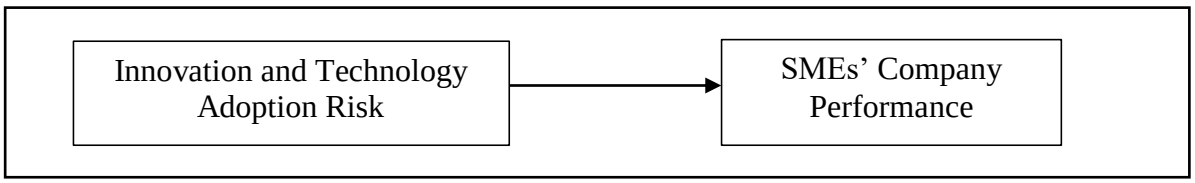

Figure 1: Conceptual Model

Methodology

This study focuses on Malaysian manufacturing sectors among small to medium sized companies as the population. According to Salleh and Ndubisi (2006), manufacturing sectors are expected to contribute around RM120 billion or 50 percent of the total production by 2020. The selected companies were companies with sales turnover of less than RM50 million (SME definition by Bank Negara Malaysia, 2013). Data were collected using a questionnaire and the respondents consist of the owner, director or manager of Malaysian manufacturing SMEs with experience in companies operations. This study obtained 152 useable responses after rejecting 39 unusable questionnaire due to incomplete parts answered and the respondents' position below than manager. Data analysis was conducted using SPSS 24. The questionnaire consists of three sections, which are innovation and technology adoption risk, company performance, and demographic background (respondent profile and company profile). The population frame of this study is companies registered with SME Corporation Malaysia. This study used a list of companies from SME Corporation Malaysia because it is a one-stop agency for the overall coordination of SME policy formulation and evaluation of SME development programs in all sectors.

Finding and Results

Demographically (refer to Table 1.1), the majority of the respondent companies are from small companies (54.6 percent), followed by micro companies (37.5 percent) and medium companies (7.9 percent) with 65 (42.8 percent) are owners, 30 (19.7 percent) directors and 57 (37.5 percent) are managers. Most of the companies have an annual sale between RM300,000.00 and less than RM15 million.

Table 1.1: Demographic Profile of The Respondent.

Demographic Profile	Frequency	Percentage
Annual Sales:		
Less than RM 300,000	57	37.5
Between RM 300,000 and less than RM 15 million	83	54.6
Between RM 15 million and less than RM 50 million	12	7.9
More than RM 50 million	0	0
Position:		
Owner	65	42.8
Director	30	19.7
Manager	57	37.5

The first research question were concern about the challenges SMEs face with regards to innovation and technology adoption. To answer the question, the descriptive analysis were conducted in order to create a hierarchy of challenges. The descriptive analysis aims to explain the characteristic of the variables of interest situation and phenomenon of interest perspective (Sekaran & Bougie, 2010). Table 1.2 shows the detail of mean and standard deviation for each items in innovation and technology adoption risk.

Table 1.2: Mean and Standard Deviation of Innovation and Technology Adoption

Questions	Mean	Std. Deviation
Our company has **inadequate budget** to invest in new technology.	3.63	1.26
Our company's **lack the resources** to develop higher value-added products that will improve the competitiveness of company.	3.20	1.153
Our company has difficulty to build up the existing capacity and improved the **quality of production.**	3.12	1.0956
Our company rarely implement a **new research.**	2.78	1.241
Our company has **low productivity** due to using **inefficient technology.**	2.67	1.222
Our company rarely **utilise new knowledge** to design new products.	2.57	1.232

Results showed that overall innovation and technology adoption challenge's elements were at a moderate level with the range of mean of 2.57 to 3.63. It would seem that SME's biggest challenge in their efforts to adopt innovation and technology comes from inadequate budget to

invest in new technology. Another interesting factor is that SMEs also lack the resources to develop higher value added products that would improve their competitiveness followed by having difficulties in building up their capacity and therefore improve the quality of production. Another equally interesting finding is that apart from efforts that require money or resources, these companies do practice innovation as evidenced by low mean value when we ask them negatively worded questions regarding innovation such as rarely implementing new research, low productivity stemming from inefficient technology and rarely utilise new knowledge to design new products. If seen from a positive angle, we could assume that these companies do implement new research, they do not use inefficient technology and utilise new knowledge to design new products. It would seem that if we demarcate between innovation and technology, SMEs seem to face a bigger challenge in terms of technology enhancement than innovation. Furthermore, this study's findings also indicate that the challenge could be due to lack of financial resources. This is in line with previous studies that indicated that SMEs' lack of financial resources is the main barrier that impact innovation and performance (Torres et al., 2015; Larsen & Lewis 2007). This would also mean that even if SMEs come up with various idea, but, without adequate budget to buy the equipment, they still cannot implement it. For example, in a study conducted by Larsen and Lewis (2007), one of companies from their case study faced financial ruin when they developed new product that nearly closed the business. The lack of financial resources can create obstruction, especially in innovation and technology which would normally require high cost investment.

The second research question was concerned with how the challenges in adopting innovation and technology would affect companies' performance. In order to answer the second research question, this study used simple regression analysis, with one independent variable and a single predictor variable. The analysis showed that there is significant and negative relationship between innovation and technology adoption risk and SMEs performance with the significance value of p=. 000 and the F value equal to 13.149 and R^2=.081. The research model explained 8.1% of the total variance in innovation and technology adoption risk contributing to the company performance. The value of t innovation and technology adoption risk relationship in coefficient is -3.626 and the significant value is (p=.000). As indicated in Table 1.3, the value of constant is 4.128, which means there are other factors that affect company performance. Therefore, innovation and technology adoption risk influenced the company performance with the value of -0.185.

Table 1.3 Relationship Between Company Performance and Innovation and Technology Adoption Risk

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	4.128	0.159		25.909	0.000
Innovation and Technology	-0.185	0.051	-0.284	-3.626	0.000

The result indicated that there is a negative effect of not adopting innovation and technology to company performance. This is also supported with previous studies who stressed that coupled with unstable environment of global competition, SMEs do face high risk when they put little emphasis on innovation (Rosli & Sidek, 2013). It is important for companies in implementing and focusing on benefits of innovation and technology adoption in gaining competitive

advantages (Aziz & Samad, 2016). Logically, when company attempt to emphasize on innovation and technology adoption, the probability for companies to achieve something new, superior or irreplaceable products increases and this would then increase the beneficial impact on company's performance.

Conclusion

This study has presented some evidences on the challenges of innovation and technology and its impact on the companies' performance. It would seem that scarcity of innovation and technology adoption in SMEs would lead to negative influences on its performance. When companies failed to be innovative and adopt technology, it is likely to result in reduced performance and this would spell trouble in view of aggressive and competitive business environment. Several previous studies suggested that it is beneficial when SMEs put essential emphasis on innovation and technology adoption, as it will increase the company performance (Rosli & Sidek, 2013; Atalay, Anafarta & Sarvan, 2013). Moreover, innovation is the key surviving competitive strategy and growth strategy with added value products that could create competitive advantages and compete against rival companies (Conto, Antunes Jr. & Vaccaro, 2016; Li-Hua & Khalil, 2006).

Past literatures have iterated that innovation plays a significant role for SME as well as large firms (Jong & Vermeulen, 2006). However, there are plenty of challenges in implementing innovation and technology, especially for SMEs. Therefore, SME should make careful decision regarding planning and operation to avoid any loss to the company, especially in cost of implementation. Along this note, SMEs could also turn to the government for assistance. Malaysian government, for example, had performed an important role in supporting and designing programmes to create a competitive environment for SMEs. There are programmes provided by government in helping SMEs on innovation and technology adoption such as sharing knowledge, offering funds and expert advisory (the programmes offered are listed in OWSCM).

Limitations and Further Research

Since the study of Malaysian SME is constantly growing, there are further avenues future researchers could pursue. The scope of this study is to explore the impact on SME performance from innovation and technology adoption risks perspective. In order to obtain a full picture of the challenges in SME (as mentioned in SME Masterplan 2012-2020) which could have an impact to SME performance, further research is required. As our result showed negative relationship, there might be other risks that have a negative (or positive) relation towards SME performance. Furthermore, SME is an independent and small enterprise that lack big firm's size, number of workers, and size of income and future research would further study is essential for Malaysian SMEs to help them sustain their business and overcome current challenges. In fact, additional research is needed by taking consideration of all possible challenges and the impact towards SME performance. Future research can also be extended to investigate the relationship between these challenges with strategies to control the challenges and the impact to company performance. In addition, future research can propose some strategies that could possibly handle these challenges in improving SME's performance.

Because of the limitation of time and fund, this study only focuses on Peninsular Malaysia and doesn't include SMEs from Sabah and Sarawak. As there are 6.2 % SME in Sabah while 6.7 % SME in Sarawak (OWSCM, 2017), the proportion of these two states represent 117,012 SME companies, as sizeable number and would be a significant avenue for further research.

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