

The Influence of Innovation Types towards Small Medium Enterprises Performance: A Study of Malaysian Manufacturing Industry

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Abstract-Malaysian SMEs is very important to the country especially in contribution to creating more job opportunities, generating higher production volumes, increase export and many others. SMEs has been recognized because of the essential role that has been carried out towards the economic growth, but it is actually disappointed because the fact shows that the developments and performances of Malaysian SME considered low if compared to the others developing's country. Even though numerous government efforts have been and are being implemented over the years, SMEs performance is still not achieved as expected. In addition, with globalization economy nowadays, SME also faced the difficulties in order to sustain and survive especially to compete with foreign company. The competition from foreign company has forced SME to strategies their organization to be more competitive particularly through innovation performance. Therefore, this study has selected innovation as variables and aim to find out the influence of innovation towards Malaysian SME performance. This study measured innovation by four types of innovation namely product innovation, process innovation, administrative innovation, and marketing innovation. SMEs performance was measured from the perspective of financial and non-financial. The survey was conducted among top-level management of 440 Manufacturing SME in Malaysia. The data was analyzed through Statistical Package for the Social Sciences (SPSS) and the hypotheses were tested through regression analysis.

Keywords: Product innovation, process innovation, administrative innovation, marketing innovation, Small Medium Enterprises, Manufacturing, Malaysia.

INTRODUCTION

Currently, small and medium enterprises (SMEs) have received a lot of attention regardless developed or developing countries due to the important role they play in economies. SMEs are perceived as the main drivers of economic

development and job creation [1], [17]. As well as in Malaysia, SMEs play a essential role and have been regarded as a most important driver in the nation's progress towards industrialization [6], [19], [38], [39]. As Malaysia is now moving towards becoming a developed nation which targeting on high-income salary and knowledge-based country, SMEs have become important sources of economic growth. In Malaysian context, SME is a critical component to achieve strong economic growth and play a key role in developing the business value chain which expected to contribute 41% of GDP by 2020 [30].

Existing researches' [7], [8], [9], [37] agreed that SMEs and entrepreneurial firms are a key segment and driver for most national economies, thus need significant consideration in developing efficient strategies for SME sustainable. Therefore, it is crucial to ensure the growth of SMEs is consistent and increasing as expected. Several programs have been done by Malaysian government as an effort to develop SMEs and its performance. However, even a number effort has been done to ensure growth of SMEs but currently SMEs has been reported are not achieving expected performance [29], [43].

As reported by [35] SMEs contribution to the Malaysian economy is still comparatively low compared with the contributions of SMEs in industrialized countries as well as other developing countries. A study done by the World Bank has found that productivity level of SMEs in Malaysia was comparatively low at RM44,300 per worker, about one-third that of the large companies (RM143,000 per worker) [34]. Previous study has indicated several causes of failure among SME such as lack of innovation activities[22], [23] lack of entrepreneurial competencies and skills [[5], [10] low financial [14], [33] technology adoption [23], [24]. However, for this study, the researcher focused on innovation as element to improvement SME performance in Malaysia. Innovation is an important tool to SMEs to ensure sustainability in the competitive economy nowadays [26]. And furthermore, to remain competitive in today's

modern world would require organizations to pursue innovation [42].

Although role of innovation in SMEs is important, however, it has received only scant attention, while the majority of studies explore innovation in large organization [15] and researchers tend to explore on certain types of innovation only. It is also found out that very limited number of research done in Malaysian SMEs to explore the potential of innovation. The meaning of Innovation according to [20] is the embracing of an idea or behavior that is new to the organization. The process, product, technical, administrative, incremental and radical were the six types of innovation classified by [12] in his study of relationships; whereas process, product and administrative are the three forms of innovation categorized by [32]. Some organizations aim to enrich their products, and new marketing strategies or new administrative or management systems, new technology [27]. [11] has specified types of innovation that always been neglected which is organizational innovation or also called administrative innovation.

Administrative innovation according to [11] can be established in the special division, a new communication system, and a new accounting practice. Administrative innovations reflect to the program such as total quality management, business process re-engineering, production innovation, consists of Quality Circles, just-in-time manufacturing system and many others. [13] define administrative innovation as a non-technological process innovation which include the new working and managing practices, techniques, processes and structures which take place in both the technical and social or administrative system that enable to increase the efficiency and effectiveness of organizational performance. Product innovation is defined as development driven by a desire to improve the quality of finished products. Some of the objectives of product innovation is to develop new products, improve product value, improve product quality, etc [25] and process innovation is defined as improvement of objectives in internal production. Such objectives includes reduction of production costs, higher production yields, product recoveries, environment-friendly production, etc [25]. According to [36], marketing innovation reflect to the development of new marketing strategies which relates to redesign the packaging, product placement, advertising, pricing and etc whereas, administrative innovation reflect the new development of organizational structure in the firm's business practices, workplace organization or external relations which result in strengthen firm performance through reduction of administrative and transaction cost, increase employee satisfaction and many other [36].

Based on the above discussion, the following hypotheses are proposed 1) H1: Product innovation

has an influence on SME performance, 2) H2: Process innovation has an influence on SME performance, 3) H3: Administrative innovation has an influence on SME performance, 4) H4: Marketing innovation has an influence on SME performance.

METHODOLOGY

Research methodology of this study was present includes population, sample size, sampling technique, research instrument. The populations of this study was determined SMEs in manufacturing sectors. The survey of this study was conducted based on a listed questionnaire adapted from previous study [4], [16], [28].

The questionnaire consisted of open-ended items. The questionnaires were designed in two languages which are English and Malay. This study used self-administered approach to distribute questionnaire to anticipate low response rate. According to [6] and [2], low response rate among respondent be explained by the growing trend that people are reluctant to respond to random questionnaire survey. [6] and [2] have conducted research among Malaysia SME. They have stated the response rate of [2] was 15.5% and [6] was 20.1%. Sampling technique of this study was purposive sampling.

Unit of analysis of this study is organizational level. The response rate was 32.2% (440 of 1300). This response rate was considered satisfactory because if compare with the previous study in SMEs sector in Malaysia [6], [41], [3] reported low response rate.

RESULTS AND DISCUSSION

Respondents Profile

In this section, information about the respondents' background who participated in this study is presented. Table 1 below shows the distribution of the respondents based on the gender indicated that about 59.1% of the respondents were female respondents, whereas 40.9% of the respondents were male respondents. On another hand, it can be concluded that majority of the respondents participated in this study were in the range of 31 to 40 years old (41.8%), whereas only (1.8%) of the respondents were in the ranged of 20 years old or younger and also more than 61 years old (1.6%) respectively.

Table 1: Respondents Profile

Profile	Frequency	Percentage
Gender		
Male	180	40.9
Female	260	59.1
Age		
20 years old or younger	8	1.8
21-30 years old	136	30.9
31-40 years old	184	41.8
41-50 years old	66	15.0
51-60 years old	39	8.9
61 years old and above	7	1.6
Education		
Secondary School	43	9.8
STPM / Certificate Level	73	16.6
Diploma	139	31.6
Bachelor of Degree	163	37.0
Master	19	4.3
Doctorate / PhD	3	0.7
Organizational size		
Fewer than 5 employees	144	32.7
5-75 employees	239	54.3
76-200 employees	57	13.0
Years of operation		
2 years or less	54	12.3
3-5 years	144	32.7
6-10 years	131	29.8
11-20 years	65	15.5
More than 21 years	41	9.8
Ownership of organization		
Malaysian owned company	387	88.0
Local and foreign joint venture	53	12.0
Sales turnover		
Less than RM 300,000	236	56.3
RM 300,000 to less than RM 15 million	162	38.7
RM 15 million to not exceeding RM 50 million	21	5.0

Regarding the education qualification, majority of the respondents can be concluded having a Bachelor's Degree (37%) qualification, followed by Diploma (31.6%) qualification. In terms of years if operation, majority of the respondents indicates the organizations have been operating around 3 to 5 years (32.7%), followed by 6 to 10 years (29.8%). As for organizational size, the descriptive analysis reported in Table 1 indicated that most of the organizational having around 5 to 75 employees (54.3%), whereas only (13.0%) of the organizational having around 76 to 200 employees. The most important facts that, around (88.0%) of this organizational were owned by the Malaysian, with the majority sales turnover, were less than RM 300,000 (56.3%).

The data then analyze to find out the effect of innovation types on the SMEs performance. Four hypotheses were tested through hierarchical regression analysis. To begin with, a factor analysis was conducted to explain how much that factor explains a variable in factor analysis. The finding of

factor analysis conducted on the 21 items of innovation indicates the factor loading for 20 items was in the range from -1 to 1. Only 1 item of the scale indicates weak. This item was removed to leave 20 items with factor loadings shows in table 2. With these 20 items measuring innovation, the cumulative variance explained is 65.87%, which is above the acceptable limit of 60%.

The KMO measure of sampling adequacy is 0.95 which is an acceptable value and close to 1. The value of Bartlett test of sphericity which indicates sufficient correlation between the variables is 210.00 and it is significant (p=0.000). The factor loadings for the items range from 0.56 to 0.81. Accordingly, all the mentioned results of factor analysis are in acceptable range [44].

Table 2: Factor analysis results for innovation type's scale

	Product	Process	Administrative	Marketing
This organization has enough new products introduced to the market.	0.56			
This organization is able to produce products with novelty features.	0.62			
This organization develops new products with technical specifications and functionalities which are totally different from current ones.	0.67			
This organization develops new products with components and materials which are totally different from the current ones.	0.65			
This organization reduces manufacturing costs in components and materials of current products.	0.59			
This organization determines and eliminates non-value adding activities in production processes.		0.68		
This organization increases delivery speed in delivery related logistics processes.		0.77		
This organization reduces variable cost in manufacturing processes.		0.73		
This organization reduces variable cost in machinery/software.		0.76		
This organization increases output quality in manufacturing processes.		0.67		
This organization uses new technology in the process.				0.72
This firm restructures its hierarchy of organizational structure to facilitate teamwork.				0.81
This organization revises the production and quality management systems.				0.65
This organization revises the routines, procedures and processes employed to execute firm activities.				0.72
This organization revises the in-firm management information system and information sharing practices.				0.72

This organization updates the human resources management system.	0.69			
This organization constantly revises product promotion techniques used for existing and new product.	0.76			
This organization renews the distribution channels without changing the processes of delivery the product.	0.72			
This organization renews the product pricing techniques employed for the pricing of the current and new product.	0.74			
This organization renews the design of the current product through changes such as in appearance packaging, shape and volume without changing basic technical and functional features.	0.66			
This organization renews general marketing management activities.	0.69			
Eigenvalues	10.3 0	1.28	1.17	1.08
Cumulative variance explained (%)	49.0 3	55.1 6	60.7 5	65.8 7

K-M-O measure of sampling adequacy =0.95, Bartlett test of sphericity (df) = 210.00; p<0.000

As shown in Table 3, Cronbach Alpha values of the factors range from 0.70 to 0.95 suggesting satisfactory levels of construct reliability, since Cronbach Alpha values equal to or higher than 0.70, indicating the reliability of scales [18] used in this study. Marketing innovation has the highest mean value (4.09 ±0.64) followed by process innovation (4.00±0.70), administrative innovation (3.94 ±0.72) and product innovation (3.93±0.82) receiving the lowest value. The mean value of SME performance (4.01± 0.54) indicates average performance SME.

Table 3: Cronbach Alpha values and descriptive statistics (N=440)

	Mean	SD	Cronbach Alpha	Number of items
Product innovation	3.9377	.82470	.70	5
Process innovation	4.0004	.70221	.89	5
Administrative innovation	3.9423	.72535	.89	5
Marketing innovation	4.0900	.64380	.87	5
Firm performance	4.0096	.54713	.95	26

P Plot indicates a plot of the residuals versus predicted Y. The pattern shown for this research study notified that there are no problems with the assumption that the residuals are normally distributed at each level of Y and constant in variance across levels of Y. Residual scatter plots illustrated the assumption of homoscedasticity between the predicted dependent variable scores and the errors of prediction. It was purposely to omit any

outliers or extreme scores in the study. The assumptions underlying homoscedasticity was the difference between the obtained DV and the predicted DV scores and the variance of the residuals should be the same for all predicted scores [40]. In this study scatter plot shows that the assumption of homoscedasticity is met. Durbin-Watson test should be in the range of 1.5 to 2.5, relatively normal. Durbin-Watson test for this regression was 1.822. The severity of multi-collinearity measured with variance inflation factor (VIF) values that ranged from 1 to 2.130 indicated no multi-collinearity between independent variables [31]. An assumption of VIF mentioned that VIF values should be less than 10 variables [31], whereas, the tolerance (1-R2) values must be greater than 0.1. If it indicates that there are lower than 0.1, there is a serious multi-collinearity and further action need to be taken. The findings of hierarchical regression analysis were shown in table 5. The influences of innovation types (product innovation, process innovation, organizational innovation, and marketing innovation) on SMEs performance are presented.

In this analysis, independent variables which are four innovation types are sequentially added to the model to see their impact on the explanation percentage of the dependent variable which is SMEs performance and determine the best model that explains the variation in the dependent variable. Hierarchical regression analysis is performed in four stages. In the first stage product innovation, in the second stage product and process innovation, in the third stage product, process, and administrative innovation and in the fourth stage all four innovation types product, process, administrative and marketing innovation are included in the analysis.

Table 5: Hierarchical regression analysis for Variables predicting SMEs Performance

Dependent Variable: SME performance				
Independent Variables	Beta Coefficients for Models 1-4			
	Model 1	Model 2	Model 3	Model 4
Product innovation	.634*	.324*	.212*	.121*
Process innovation		.496*	.277*	.129*
Administrative innovation			.417*	.268*
Marketing innovation				.468*
R2	.402*	.552*	.634*	.737*
Change in R2	.403*	.150*	.083*	.103*
F	294.557*	268.929*	252.074*	305.008*

The hierarchical regression analysis revealed that at Stage one, product innovation contributed significantly to the regression model, (β=0.634, p<0.000) and accounted for 40.2% of the variation in

SMEs Performance. In Stage two (model 2), introducing the process innovation variables jointly explained an additional 55.2% of variation in SMEs Performance. It is observed product innovation and process innovation has a significant influence on firm performance where product innovation ($\beta=0.324$, $p<0.000$), process innovation ($\beta=0.496$, $p<0.000$). In stage three (Model 3), adding administrative innovation to the regression model jointly explained an additional 63.4% of the variation in SMEs Performance. In model 3, product innovation ($\beta=0.212$, $p<0.000$) and process innovation ($\beta=0.277$, $p<0.000$) and administrative innovation ($\beta=0.417$, $p<0.000$), has significant influence to the SMEs performance but administrative innovation is most important predictor of SMEs performance in this model.

Finally, next stage (model 4) is adding marketing innovation and it is jointly explained 73.7% of the variation in SMEs performance. In model 4, product innovation ($\beta=0.121$, $p<0.000$), process innovation ($\beta=0.129$, $p<0.000$), administrative innovation ($\beta=0.268$, $p<0.000$), and marketing innovation ($\beta=0.468$, $p<0.000$). As a result of the analysis, it is found that product, process, administrative and marketing innovation, has a significant influence on firm performance with administrative and marketing innovation is most important predictor to SMEs performance while process and product innovation have very little impact or low predictor of SMEs performance. Therefore, according to the findings of the hierarchical regression analysis H1, H2, H3, and H4 are accepted.

CONCLUSION

The present study was conducted to find out the relationship between innovation types and SMEs performance in manufacturing industry located in Malaysia. The result indicated that product, process, administrative and marketing innovations were found to be statistically significant in predicting factor to increase SMEs performance. All of the factors, two most significant factor are administrative innovation ($\beta=0.268$) and marketing innovation ($\beta=0.468$). Based on this study, it can be recommended that to the top management of SMEs consider focusing on administrative and marketing innovation since this two is the best predictor to increase performance. Difference with previous research done by [4] found out product and process innovation most significant effect on the firm performance. This result maybe influences by the characteristic of the industry which was done in Turki among automotive industry. Whereas similar study was done by [21] find out that process innovativeness has positively influenced the performance of Malaysian SMEs, compare to product innovativeness. [21] stated the result of the study may be because of the respondent is passive

entrepreneurs. However, this study shows that marketing and administrative are important maybe because of the globalization has introduced new marketing strategies such as e-commerce and online market. The findings of this study have significant implication for SME where top management and managers should put more emphasis on administrative and marketing innovations, as these types of innovation are found to be important tool for achieving sustainable organizational performance.

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