

NEW PRODUCT DEVELOPMENT AND ITS CONTRIBUTING FACTORS OF PRODUCT INNOVATION AND PRODUCT STRATEGY IN MALAYSIA MANUFACTURING FIRM

M.Nasrun M.Nawi
nasrun@uum.edu.my

Naimah Amlus
naimah@uum.edu.my

School of Technology Management
Universiti Utara Malaysia
Kedah, Malaysia

ABSTRACT

The manufacturing sector is the most important component in the economic development of a country. The effect of the explosion in development of the product manufacturing world generally, especially in Asia and in Malaysia, in particular, has led to a requirement of the importance of the study was designed to investigate the relationship between product strategy, , innovation towards the development of new products in manufacturing industry. The sample of this study is among employees in the manufacturing industry in Malaysia. The methodology used for this study is through the quantitative method which is through Pearson correlation analysis and multiple regression analysis in which the questionnaire was distributed among employees in manufacturing industries in Malaysia. The statistical approach used to describe the data obtained in this study. Some of the studies have been conducted to analyze data such as factor analysis, reliability test, normality test, descriptive analysis, Pearson correlation analysis and multiple regression analysis. Factor analysis was conducted to determine the number of factors selected. Multiple regression analysis was used to examine the influence of product strategy, design, innovation and product features towards new product development. Pearson correlation analysis was performed to examine whether the dimension in product strategy, and innovation have a direct relationship with the development of new products. The results showed that the product strategy, and product innovation have a direct relationship with new product development. In multiple regression analysis, there is a strong influence on the product strategy and innovation towards new product development. The results of this study also show that the theory of Key Success Factors (KSFs) can increase a company's production performance. The impact of this research will provide knowledge and better understanding among researchers and entrepreneurs of the manufacturing industries in developing the formula to develop new products.

Keywords: Product Strategy, Design, Innovation, Features, New Product Development.

Introduction

According to Cumming, B. S. (1998). the development of Industrial products, our customers' needs is dominant to achieve the purposes of concept development of innovative products success that can reduce production time and improve the concept of the product and study on the concept of this product idea leads to more data details, product ideas and also includes the ideas of usability. According to Malaysia External Trade Development Corporation (MATRADE) (2015), the manufacturing sector in Malaysia accounted for nearly 80 percent of the country's exports as a whole. In addition, Malaysia is also known as the nation's 17th largest exporter in the world. Therefore, companies should work harder to maintain, preserve and increase production in the manufacturing sector. This states that new products are manufactured in Malaysia, are well accepted in developed countries like the United States, European Union, and Japan. This indicates that the manufacturing sector in Malaysia have already reached levels that can be proud of and it is closely related with the help of new product design activities which play an important role in maintaining the success of the product in the local and international markets. This fact has been refined by Morgan (1995), which states that understand the strategic role of product success in product development has the potential to greatly contribute to the future products success. However, according to Rashid, M. H. (2010). , shows that recognition is given about the potential of design to generate innovation has become a priority for research in Marketing Science Institute. In a special issue of the journal of product innovation management that discuss the article on the role of design in marketing and product development that the relationship between marketing and engineering in product design and the impact of the selection of the products to customer needs. Thus, in the opinion of Barczak, G. (1995) every effort is made to new products developments success.

Product Strategy and New Product Development

In the light of product development the idea need to highlight is product strategy. It must come into manufacturer mind is the aspect of product strategy which is a form of planning and implementation for developing a product in the industry. The product strategy of high technology companies can be seen into three dimensions which are product platforms, product lines, and individual products (McGrath, 1995). Products are created or produced by a company should implement an effective product strategy for ensuring the product can compete in the market. There are several important factors that must be considered in the preparation of the company's product strategy. The first factor is the strategic choice of market segments. Thus, the understanding of the nature of the product among of the consumers is the second factor. Then, the third factor is the combination of product strategy at the level of individual products, at this stage, the product and the level of overall product mix. The fourth factor is focus on marketing strategies at each stage of the product life cycle. Among the factors to produce a product, the marketing strategy is the most effective and covers all the factors for the production of a product. By using a marketing strategy that focuses on the marketing mix contains four elements of product, price, place and promotion, companies or firms are able to develop their products. According to Gronroos (1994), in his research mention that the textbook about marketing today's was introduced around 1960 ago. The concept of marketing mix which includes the 4P's of product, price, place and promotion has been

in marketing textbooks at that time. However, the concept of the 4P's used only for the final product was ready to be marketed to consumers. Hence, to develop products, promotional strategies need not be implemented yet because the product is still in the making.

A product is an item or service that we want to offer to customers. Products can be a physical objects or services and also can refer to one good or unit, a group of the same product and so on. As is known, the development of new products is very rapid pace with technological advances that exist. Therefore, any company or organization that produces new products in the market should maintain the performance of their new product development to improve the product in order to achieve the development goals of new products. Faced with rapidly shrinking product life cycles, these firms must aggressively pursue the quest for more effective new product development (Barczak, 1995). Most textbooks give the definition of a strategy that includes the addition of continuous product and product removal. On the other hand, the product strategy that can be planned by the company to develop a new product must be a strategy in which each product is easy to use and should be very useful to users. In business world, the product is the goods or services that can be traded while in marketing view, the product is something that can be offered to a market and can fulfill the consumer's wants and needs. Besides that, in a wider use, the product can refer to an item or unit, the same group of products, a group of goods and services, or an industrial grouping for goods and services. A company that produces a product has the ability to maintain the reputation of the product depends on the situation of competition in the industry.

The product is a base thing in the brand because it has a relationship with each other that is, without a good product, the brand is not likely to last long. In the study Lee, Cheng, and Chen (2008), based on statement Doyle, Day and Farduhar (1990), usually through two angles, namely the quality and packaging (Keller 1998) studied for product strategy. According to Coskun and Weber (2000), they stated in their research about the ability of a firm to produce new products in the market which is will make a firm has a competitive advantage and therefore, if the firm is able to compete, the ability of firms to remain viable in the market will be high. In addition, they also explain in their study that in order to develop a product that is really great special effects that have in the daily lives of users is difficult, risky and expensive. However, to develop new products that can be successful in the market is almost impossible.

Product Innovation and New Product Development

According to Rashid (2010), he stated on his study that in general, product innovation is the successful commercial exploitation of new ideas and it is also an interactive process that can gain knowledge from a variety of sources, whether internal or external, or both. From previous literature, Joseph Schumpeter (1989) was the first scholar who coined the concept of product innovation as gales of creative and design of new product (Felekoglu & Moultrie, 2014). According to Schumpeter (1989), product innovation is reflected in novel outputs which are different from others. To meet customer needs, innovative companies can thrive because they are able to generate and utilize new technologies, products and processes faster and more efficiently than their competitors. Furthermore, in the current challenging economy situation with diverse

customer demands that is constantly changing, product innovation is the challenged manufacturer need to focus in order to remain complete.

For the purposes of the definition of new products, innovation is the use of a newly created or discovered, a feature adjunctive or superior sophistication that forms part of the product or category that is already well established (Gruenwald, 1985). Product innovation is a new technology or combination of technologies introduced commercially which aims to find the user and market needs in the industry (Roger, 1983).

Innovation is a means of finding ways to produce products or services that better either through renovations or improvements. It is the brainchild of creative ideas and innovative in any aspect of work that can improve the quality and productivity of the organization. In other words, innovation also is a new invention that is different from existing or previously known. The person or entrepreneur who always innovate, then it is to say as an innovative entrepreneur. An innovative will always try to make improvements, to present something new or unique which is different with existing ones.

According to Rogers (1983), innovation is an idea, an idea, practice, object or thing that is recognized and accepted as a new thing by any person or group for adoption. Other point of view, innovation is often coupled with creativity. Most researchers agree that creativity is producing something from nothing while the 'innovation' is a modification to the design of products and services as indicated by (Cumming, 1998). According to Cumming (1998) also, innovation consists of generating new ideas and applied to new products, processes and services. Table 2.1 below shows the others innovation definitions

Result

The result of the analysis discuss as follows. First, reliability test which is to measure the goodness of the data which includes the internal consistency and stability of the items (Hair et al., 2010). Table 1 below represents the Cronbach's alpha for two variables.

Table 1
Cronbach's Alpha for each Variable.

Variables	Cronbach's Alpha
Product Strategy	0.908
Innovation	0.904
New Product Development	0.935

Table 1 indicates the Cronbach's Alpha for each variable in this study. As the results, the new product development states the highest rate with 0.935, followed by product strategy (0.908), innovation (0.904), features (0.903) and design (0.874). Based on the results obtained, the internal consistency among all items both of dependent variable and independent variables are considered as very good, which are above 0.8 as suggested by Sekaran (2003).

Table 1
Types of Department in Company

Types of Department	Frequency	Percent
R&D	17	13.1
Engineering	21	16.2
Production/Manufacturing	44	33.8
Quality Management	17	13.1
Purchasing	19	14.6
Planning Control	12	9.2
Total	130	100

Table 1 highlights the variance of department type in company among manufacturing firms involved as production or manufacturing tops with the highest percentage at 33.8%. Engineering comes second with 16.2%. Then, purchasing at 14.6%, followed by quality management and R&D share same percentage at 13.1% and the result also shows that the lowest percentage at 9.2% is planning control.

Employee's Experience with Design or Innovation of the Product

Employee's Experience	Frequency	Percent
Yes	80	61.5
No	50	38.5
Total	130	100

Table above shows the result where the highest percentage of employee's experience with design and innovation of the product said yes is 61.5%. This result shows that most of the employees in manufacturing industries in Malaysia have experience with the design and innovation of the product which is the frequency is 80 out of 130. The percentage that the employees said no experience with the design and innovation is 38.5% which 50 total frequency.

Table 2
Employee's Experience in Engaging with New Product Development

Employee's Experience	Frequency	Percent
Yes	91	70.0
No	39	30.0
Total	130	100

Based on the table 2, the result shows the highest percentage at 70.0% which is shows the most employees experience in engaging with new product development in manufacturing industries said yes, followed by 30.0% said no experience in engaging with new product development.

Table 3
Company's Product Launch in Last 5 Years

Number of Products	Frequency	Percent
1-5 Products	38	29.2
5-10 Products	51	39.2
More than 10 Products	41	31.5
Total	130	100

The result from Table 3 shows that 39.2% are company's new product launch in last 5 years is 5-10 products. The number of product launches more than 10 product follow with 31.5%. Respectively, the number of product launch between 1-5 products shows the least percentage at 29.2%.

Table 4
Percentage of Company's Expenditure towards R&D per Year

Company's Expenditure Percentage	Frequency	Percent
Below 1%	16	12.3
1-5%	28	21.5
5-10%	45	34.6
10-25%	29	22.3
More than 25%	12	9.2
Total	130	100

Lastly, from Table 4 the data of company's expenditure towards R&D in new product per year. Percentage shows that 34.6% as the highest with 5-10% R&D per year. Then, 10-25% R&D per year took a second place at 22.3%, followed by 1-5% R&D per year at 21.5% in third place and

below 1% R&D per year at 12.3%. The result also shows the lowest percentage of company's expenditure towards R&D per year is more than 25% years with 9.2%.

The correlation analysis was carried out to determine the type and the strength of relationship exists between the variables in the hypothesis. In order to achieve the first objective of the study, the Pearson's correlation was used to examine the relationship between product strategy, product innovation and new product development. One-tailed test was used since the statements of hypotheses stipulate the directions of the relationships are positive. One-tailed test allows to determine if one mean is greater or less than other mean but not both. In other words, one-tailed test tell the effect of a change in one direction and not the others. Table 5 represents the result of Pearson's correlation analysis:

Table 5
Correlation between Independent Variables and New Product Development (N=130)

Variables	Pearson Correlation
Product Strategy	New Product Development 0.842
Product Innovation	0.830

** Correlation is significant at the 0.01 level (1-tailed)

According to Table 5 the correlation analysis shows that product strategy has positive correlations with new product development and it's at significance level of 0.01. The result also shows that the strength of the relationships is strong. Referring to Hair et al. (2008), when the coefficient scale is between ± 0.41 and ± 0.70 , the relationship strength is considered as strong. The innovation has also been found to have positive relationship with new product development. With correlation coefficients of 0.830, and the relationship is strength of innovation and new product development at significance level of 0.01.

Multiple regression analysis was applied to identify the best predictor influencing the new product development in manufacturing industries in Malaysia. The variables of product strategy, innovation and features were tested using multiple regressions to achieve the objective of this study.

Table 6
Multiple Regression Result Model

R	R Square	Adjusted Square	R Std. Error of the Estimate	F	Sig
0.883	0.780	0.773	0.475	110.793	0.000
Dependent Variable: New Product Development					
Model	Standard Coefficient Beta			T	Sig
(Constant)				0.747	0.457
Product Strategy	0.352			3.864	0.000
Innovation	0.315			3.655	0.000

The regression result in Table 6 shows that product strategy and innovation jointly explain 78.0% of the variance in predicting new product development. The model proposed is significant at 0.00 level (F=110.793, p=0.000). Two variables had been found to have statistically significant associations with new product development. The variables are product strategy (Beta=0.352, p=0.000) and innovation (Beta=0.315, p=0.000). The largest beta coefficient obtained was 0.352 for product strategy and this corresponds with the highest t-statistic of 3.864. This means that this variable makes the strongest unique contribution in explaining the dependent variable, new product development when the variance explained by all other predictor variables in the model was controlled for. It suggests that one standard deviation increase product strategy is followed by 0.352 standard deviation increase in new product development. The Beta value for innovation was the second highest with 0.315.. Therefore, product strategy and innovation are the strongest predictors in influencing new product development in manufacturing industries in Malaysia based on the findings of this analysis.

Conclusion

From above analysis, researcher outlines the conclusion from the data of 130 respondents. For the multi item scale, the set of items that match up to each theoretical construct was initially subjected to the result of Cronbach's Alpha. In addition, there are also items of a total correlation and regression test. All the measurement appeared to be one dimensional, internally consistent, reliable and valid for analysis of the mode. Furthermore, the relationship between variables which are product strategy, and product innovation towards new product development also has been determined. The result of a Pearson Correlation analysis has shown that each of the variables has positive and significant relationship with the new product development. Hence, this has providing the initial proved and supported to the previously developed research hypothesis. This study also deliberates on the findings congregated from the data analyses. The validation of instruments was conducted through factor analysis. After testing the reliability and normality of data, descriptive test was prepared. Finally, correlation test and multiple regression tests were done to answer the

research questions and to achieve the research objectives. Most of the findings under Pearson's correlation were as expected and in concurrent with previous findings. Further to that the outcome of this study contributed significantly to manufacturer and policy maker in industry to make as reference in their future product strategy and innovation..

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