

A study on Malaysian food and beverage manufacturing SMEs practices of pre-development process

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Abstract. Product innovation is an important driver for organizations to improve their performance. Large-scale organizations have received full attention from many researchers with respect to efficient pre-development implementation and practices compared to small and medium enterprises (SMEs). Therefore, this study was performed with the main objective to identify SMEs practices in pre-development process. A survey questionnaire was developed and was sent to 687 Malaysian food and beverage manufacturing SMEs. Descriptive analysis was carried out to determine respondent profile and rank of eight critical success factors (CSFs) based on its contribution. Tests to investigate any differences between the level of importance and practice among SMEs were conducted using paired sample *t*-test. The results of the study indicated that Malaysian SMEs are aware of the importance of pre-development practices to improve organizational performance through the successful development of new products. However, several limitations (i.e. financial, work force, knowledge, experience, and technologies) had caused Malaysian SMEs unable to achieve efficiency and effectiveness in the pre-development implementation practice.

Introduction

According to Jang et al. [1], an organization needs to continuously introduce new products in order to improve performance. The business process for developing new products and then introducing them into the marketplace is defined as the new product development (NPD) process [2]. Meanwhile, Backman et al. [3] had stressed that success or failure of the NPD process depends very much on the performance in the earliest phase of the NPD process, also known as the pre-development process. In a turbulent market environment, managing the effective pre-development process will be very challenging for any organization, especially SMEs [4].

The objective of this paper is to present the findings of an investigation into the Malaysian food and beverage manufacturing SME practices of the pre-development implementation. There is a need to identify the practices due to their role in the growth of the Malaysian economy. Finally, the results obtained from this research shall have significant value to a large number of SMEs, as well as aiding in future research to develop a framework for pre-development process implementation which suits SMEs.

Pre-development Process

The pre-development process refers to the earliest stage of the NPD process. The process plays an important role in determining which projects will be executed in the manufacturing process. Backman et al. [3] believed that successful management of pre-development stages make it possible for an organization to reduce manufacturing cost, increase customization, and improve quality of new product.

Murphy and Kumar [5] distinguished that pre-development consists of three main stages: idea generation, development of new product concepts and finally project evaluation. Idea generation stage plays a major role in shaping the outcome of the whole NPD process. The second stage is the development of the new product concept. In this stage project team members will develop the new product concept based on the idea generation results. The final stage is project evaluation. Several analyses and evaluation procedures will be conducted during this stage such as business analysis, feasibility study, and risk analysis.

There is a lot of literature available that deals with the pre-development activities in large-scale industries [6-8] compared than SMEs. SMEs have different characteristics compared to large organizations. SMEs have limitations in terms of knowledge, resources, experience, and skills to become more innovative [4]. Pre-development practices in large organizations cannot be applied directly in the SME context due to different characteristics [9]. Thus to the authors knowledge, an empirical study is needed to be conducted in Malaysian SMEs to identify their level of understanding and practices on the pre-development practice.

SMEs are an important component of Malaysian economic growth and development. 90 percent of manufacturing sectors in Malaysia are made up of SMEs [10]. In 2005, SMEs contributed to 27.3 percent of the total manufacturing output, 25.8 percent to value-added production, owned 27.6 percent of fixed assets, employed 38.9 percent of the Malaysian workforce, and contributed RM75.2 billion in gross domestic product (GDP) [11]. On top of that, in manufacturing sectors by 2020, value-added products from SMEs are expected to be worth RM120 billion or 50 percent of the total production [11]. This has shown strong contribution of SMEs to the Malaysian economy, such as creating employment opportunities, new business ventures, innovation, and as a main supplier of goods and services to large companies [10].

Research Methodology

The survey questionnaire developed in this research consist of two main sections. The first section comprises questions about the company background, and the second section consists of questions about CSF for the pre-development process. The target participants for the survey were chosen from the Federation of Malaysian Manufacturing Directory (FMM), and the SME Corporation Malaysia directory. The questionnaire was sent randomly among directors, owners, and managers of food and beverage manufacturing SMEs. Of the 687 questionnaires mailed, a total of 171 were returned giving a response rate of 25%, but seven were non-usable. The responses were entered into the SPSS database and analyzed using both descriptive statistics and *t-test* statistics to generate and validate the results observed.

Results of the Study

The results are presented in Table 1. For the company size, the classification was done based on the SME Corporation directory. Small-sized enterprises employs between 5-50 full-time employees, and medium-sized enterprises employs between 51-150 full-time employees [12]. Based on this classification, 74% of the respondents in this study consisted of small-sized enterprises, followed by 26% medium-sized enterprises.

Table 1: Breakdown of organizations surveyed by employees

No. of Employees	Percentage (%)	N(164)
Small-sized enterprises	74%	121
Medium-sized enterprises	26%	43

The practice of SMEs through pre-development process implementation

In the first test respondents were introduced to eight factors which are considered critical in successful implementation of the pre-development process. Respondents were asked to rank the factors they considered to be the most critical to the least critical. Table 2 illustrates the eight listed most critical factors. The top three were ‘clear product strategy’, ‘strong project leader’, and ‘top management commitment’.

Approximately 81% of the respondents agreed that ‘clear product strategy’ was a very critical factor. Product strategy acts as an organizational guideline for adequate decision making on a new concept for product development to meet several target such as: time-to-market, customer needs, pricing targets, estimate the sales potential and costs [13]. The second most critical factor is ‘strong project leader’. Project leaders are very essential in managing the NPD process and a backbone to successful implementation of the pre-development process within the organization. As a leader for project team members, the team leader is responsible for defining goals, developing plans, prioritizing work, and gaining support and cooperation from senior management. ‘Top management commitment’, which came third, is important to effectively develop and communicate the vision, mission, and guiding principles to the rest of the organization [14]. Furthermore, the top management is accountable in allocating adequate resources such as: human, finance, and technology; and facilitating coordination and cooperation among project team members to motivate project team members in presenting full commitment during pre-development activities [15]. In other words, the top management plays major roles to facilitate continuous development of the project among project team members, customers, suppliers, and government agencies and institutions.

Table 2: List of CSF ranked by respondent

No.	Critical Success Factors	Percentage (%)
1.	Clear product strategy	81
2.	Strong project leader	76
3.	Top management commitment	66
4.	Team work commitment	29
5.	Motivation	14
6.	Customer involvement	13
7.	Training	12
8.	External organizations involvement	10

It is apparent that while the companies placed a high degree of importance on certain factors, the extent to which they were practiced was different. A paired comparison *t*-test was carried out to discover whether there is any significant difference between the level of importance and the extent

of practice for each factor individually. In the first step, the paired comparison *t*-test was conducted based on the total respondents involved in this study. In second step, a comparison was made according to the size of an organization, which is small-sized organization (121 companies) and medium-sized organizations (43 companies).

Table 3 shows the results of paired comparison *t*-test of 164 SMEs which were involved in this study. The results showed that there was a significant difference between perceived importance and the extent of practice for seven factors by the companies, all of which excluded the factor of 'product strategy'. The *p* values for seven factors were between 0.00 and 0.02. However the *p* value for 'product strategy' was $p \geq 0.05$. It can be concluded that the minimum value for extent of practice for 'top management', 'project leader', team work', 'external organization', 'customer', 'training', and 'motivation' is slightly lower compared with the minimum value of perceived importance. In other words, the importance placed by the companies on seven critical factors has not been implemented into practice. The company knows the importance of several factors but had failed to execute them to any great extent.

Table 3: Paired sample statistic for mean importance and practice

(Analysis based on 164 SMEs)

Critical success factors	Min Importance (n=164)	Min Practice (n=164)	<i>t</i> value	<i>P</i> * Sig.
Product strategy	4.29	4.19	1.92	0.311
Top management	4.54	4.39	3.85	0.000
Project leader	4.59	4.27	5.24	0.000
Team work	4.45	4.34	2.98	0.009
External organization	4.49	4.20	5.72	0.000
Customer	4.41	4.27	5.48	0.001
Training development	4.38	4.25	3.94	0.021
Motivation	4.50	4.28	4.85	0.000

*Value at 0.05 level of significance

Conclusion

The survey results showed that 'clear product strategy', 'strong project leader', and 'top management commitment' were ranked as the top three most critical factors for successful implementation of the pre-development process by SMEs. Furthermore, this study had discovered significant differences between SMEs' perceived importance and the extent of practice for several factors. It can be concluded that the importance placed by the companies on seven critical factors: top management, project leader, team work, external organization, customer, training, and motivation is slightly lower than when compared with the minimum value of perceived importance. The company aware the importance of several factors but had failed to execute them to any great extent. The results may serve as a guideline for SMEs to adopt good implementation practices of the pre-development process within the organization. Additionally, the finding may serve to the future studies in developing a more comprehensive framework for the successful implementation of the pre-development process that matches with the SMEs' perspective.

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