

A Multi-criteria Approach for Supplier Selection: Case of Motorcycle Parts Manufacturer in Thailand

Nuttawut Rojniruttikul*

King Mongkut's Institute of Technology Ladkrabang,
Thailand

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ABSTRACT

The objectives of this research were 1) to study the importance of supplier selection criteria for motorcycle parts manufacturer and 2) to compare the importance of supplier selection criteria for motorcycle parts manufacturer by organizational factors. The research instrument was the questionnaire. Data were collected from 160 motorcycle parts manufacturers in Thailand by simple random sampling method and analyzed by using statistical program. Statistics include percentages, arithmetic means, and standard deviations. t-Test was used to test the hypotheses. The results of the research found that in overall, the importance of supplier selection criteria for motorcycle parts manufacturer was at high level. The most importance selection criterion was management system, followed by price, engineering capability, delivery, and quality, respectively. Company with different organizational structure, nationality, and purchasing method indicated the difference in the importance of supplier selection criteria for motorcycle parts manufacturer at statistically significant level of 0.01. In addition, company with different size had no difference in the importance of supplier selection criteria motorcycle parts manufacturer.

Keywords: Supplier selection criteria, Organizational structure, Purchasing method, Motorcycle

1. INTRODUCTION

The motorcycle is the most important mode of transportation in Thailand. Motorcycle can be found on paved streets and dirt roads for either short-distance or long-distance transportation purposes. This kind of two-wheeled vehicle can be used for personal living (going to work, heading to school, visiting friends, etc.) and economic purpose (public transportation). The motorcycle industry established itself in the Kingdom of Thailand back in 1964. (Industry Focus, 2014) There are many brand of motorcycle in the market, which includes Honda, Yamaha, Kawasaki, and Suzuki.

According to a global management consulting and market research firm Lucintel, they note that in developing regions "which perceive two-wheelers as a basic mode of transportation, are expected to remain the most promising markets for scooters, light motorcycles, and mopeds. A combination of factors such as demographic condition, economic condition, and environmental regulations is seen to have important impact on market dynamics. Therefore, the reliable supplier is a precondition to meet firm performance and product quality target. As Pal, O., et al. (2013) stated that for many years, the traditional approach to supplier selection has been to select suppliers solely on the basis of price. However, as companies have learned that the sole emphasis on price as a single criterion for supplier selection is not efficient, they have turned into a more comprehensive multi-criteria approach. To this regard, the supplier selection criteria plays vital role for product quality especially the motorcycle parts which is the main components of two-wheeled vehicle.

2. RESEARCH FRAMEWORK

The two main objectives of this research are (1) to study the importance of supplier selection criteria for motorcycle parts manufacturer and 2) to compare the importance of supplier selection criteria for motorcycle parts manufacturer by organizational factors. Independent variables in this research are organizational structure, size of company, nationality, and purchasing method. Dependent variable is supplier selection criteria for motorcycle parts.

Hypothesis: Company with different organizational factors had different important level of supplier selection criteria.

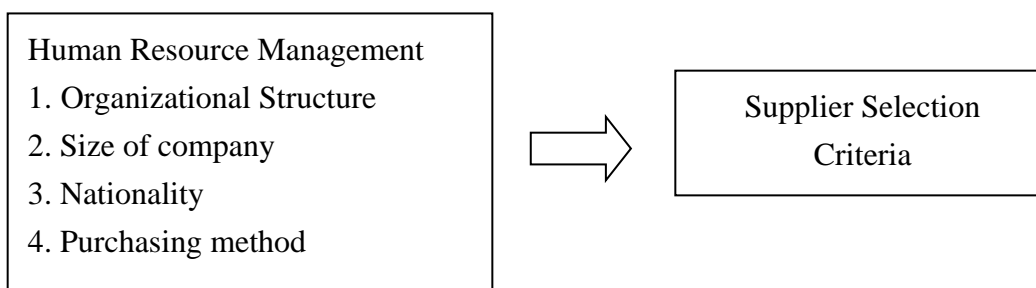


Fig.1. Research Model

3. RESEARCH METHODOLOGY

The paper analyses the results of a mail survey to 160 purchasing managers in motorcycle parts factories in Thailand. The data for this study were drawn from a random sample of purchasing managers by using questionnaires as research instrument. The questionnaire asked the respondents to rate the importance of supplier selection criteria of motorcycle parts using a five-point Likert scale. Supplier selection criteria was operationalized as the extent to which company considered the importance of price, delivery, quality, engineering capability, and management system of supplier as shown in Table I. The reliability of all constructs have acceptable internal consistency reliability (Cronbach's alpha is 0.854 which is over 0.7 according to Nunnally (1978)).

Table 1: Operationalization of scale variables

Variables	Description
Price	Extent to which amount of money expected, required or given in payment for material.
Delivery	Extent to which the right material is transported at the right quantity at the right time.
Quality	Extent to which the properties of material meet the technical specification as required by the firm.
Engineering capability	Extent to which the ability of supplier to execute and support any new technology that required for material specification changes.
Management system	Extent to which organizational policies, processes, and procedures is managed to ensure smooth operation that fulfill customers' needs.

4. RESEARCH RESULTS

After collecting the data, it was revealed that majority of the respondents work in large Japanese company. Almost 75% of the respondents work in the companies that have research and development (R&D) department in the organizational structure. In addition, most of the respondents develop their unique purchasing method that applied within their companies.

Table 1: Organizational Factors

Organizational Factors	Frequency	Percentage
Organizational Structure		
- R&D department	119	74.4
- No R&D department	41	25.6
Size		
- Medium	23	14.4
- Large	137	85.6
Nationality		
- Japanese company	129	80.6
- Others	31	19.4
Purchasing Method		
- Unique	105	65.6
- Mix (Centralization & Decentralization)	55	34.4

As indicated in table I, majority of respondents work as purchasing managers in large Japanese companies with R&D department in the organizational structure and have unique purchasing method.

Table 2: Mean, Standard Deviation, and Importance of Supplier Selection Criteria

Selection Criteria	Mean	S.D.	Level
Price	4.144	0.784	High
Delivery	4.025	0.793	High
Quality	4.013	0.854	High
Engineering Capability	4.125	0.822	High
Management System	4.150	0.848	High
Overall	4.091	0.714	High

As indicated in Table II, the level of all supplier selection criteria were highly importance, especially the management system has the highest rank, followed by price, engineering capability, delivery, and quality, respectively.

Table 3: Comparison of the importance of supplier selection criteria with organizational factors

Organizational Factors	Importance of Supplier Selection Criteria (Mean)	p-value
Organizational Structure		
- R&D department	4.249	0.000**
- No R&D department	3.634	
Size		
- Medium	4.072	0.395
- Large	4.209	
Nationality		
- Japanese company	4.309	0.000**
- Others	3.187	
Purchasing Method		
- Unique	3.872	0.000**
- Mix (Centralization & Decentralization)	4.509	

** P < 0.01

As indicated in Table III, company with different organizational structure, nationality, and purchasing method indicated the difference in the importance of supplier selection criteria for motorcycle parts manufacturer at statistically significant level of 0.01. In addition, company with different size had no difference in the importance of supplier selection criteria motorcycle parts manufacturer.

5. CONCLUSIONS

Analysis of data from questionnaires strongly indicated that the important level of supplier selection criteria for motorcycle parts manufacturer was considered as high level. Purchasing manager in motorcycle parts manufacturer had the awareness on the importance of management system. Supplier who had excellent management system should be able to manage the production system, quality, cost, delivery, safety, and morale to meet the company goals. Liu, L. et al. (2011) stated that modern trend of

purchasing management is to reduce the number of vendors, and establish the long-term and stable partnership of mutual trust, benefit and support.

In addition, Japanese companies with R&D department focus on mixed purchasing method for their supplier. This leads the company to have the flexibility to manage their manufacturing capability to support new product development and innovation. Lai, W. (2017) stated that the firm should differentiate themselves by focusing on the innovation rather than competing on price. Molamohamadi, Z., et al. (2013) summarized that one of the criteria for sustainable supplier evaluation and selection which best fit the stakeholders' expectations is business criteria. This includes quality of the products and services, time of delivery, commitment to continuous improvement, information sharing, product development, flexibility in changing product volume, launching new products, using new technologies, warranty and insurance, and geographical location.

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