

## *Factors affecting on purchasing in the Thai automotive industry*

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### **Abstract**

*Now a day the importance of suppliers in the Thai automotive industry have on the success and progress of the industry in Thailand, very little empirical research has so far been performed to examine aspects of the suppliers. This research article is an attempt to investigate the relative importance of relevant factors in the supplier selection decisions. The results show that the relative importance of factor which have been found to affect supplier selection decisions, ranked in order of importance, are product quality, price, after-sales service, delivery time, and product information. In addition, the most influential departments in supplier selection were purchasing, top management, production, and finance.*

### **Keywords:**

Purchasing, Procurement, Logistics, Supply Chain, Thai Automotive Industry.

### **Rational for study and Background**

In spite of the importance of supplier selection decisions, relatively few research studies have been conducted in Asia to investigate the topics of supplier selection attributes and relative influence of buying center members. A few exceptions are : a study by Mummalaneni et al. (1996) which examined six attributes frequently used as performance criteria by Chinese purchasing managers in the People's Republic of China to understand how these managers made their supplier choice decisions; a study of Lau et al. (1999) which investigated purchase- related factors and the structure of the buying center in Singapore; and a study of Millington et al.(2006) which interviewed senior and purchasing managers in the People's Republic of China regarding their perception of supplier performance evaluation and relationships. How ever, in the context of business firms in Thailand, no published empirical research dealing specifically with supply selection decisions is found, especially in the Thai automotive industry. This study is an attempt to fill this gap by studying six factors and their attributes used in supplier selection decisions and the relative influence of the persons involved in automotive firms' buying process in Thailand.

### **Review of the Literatures**

Purchasing is considered a support activity in a value chain which is composed of primary and support activities that can lead to competitive advantage when configured and executed properly. Figure 1 illustrates a modified version of the extended value chain model. In the value chain, purchasing provides a service to a firm's internal customers and is the central link with outside suppliers that provide direct materials (Monczka et al., 2005).

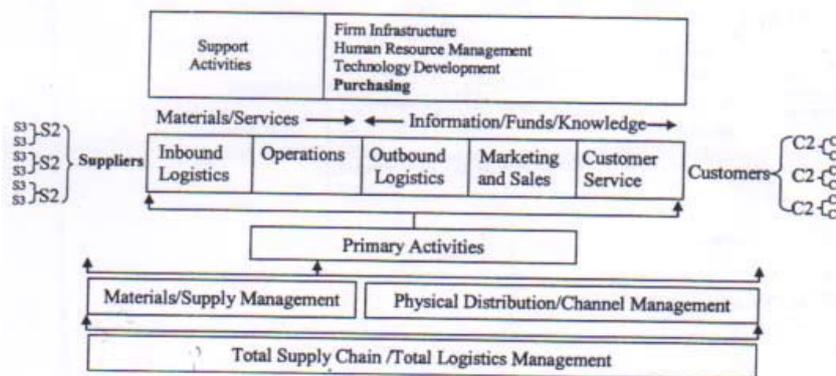


Figure 1: The Extended Value Chain

Source: Monczka et al., 2005

In the automobile industry, the process of manufacturing cars involves selecting qualified and reliable suppliers. The materials, planning, and logistics for an automotive company are shown in Figure 2 which demonstrates the complexity of an automotive supply chain. The automotive company's supplier network includes thousands of firms that provide items ranging from raw materials, such as steel and plastics, to complex assemblies and subassemblies, such as transmissions, brakes, and engines (Monczka et al., 2005). Purchasing staff need to regularly communicate and coordinate with other functions in the company during the purchasing process for the acquisition of parts, components, and supplies of the company.

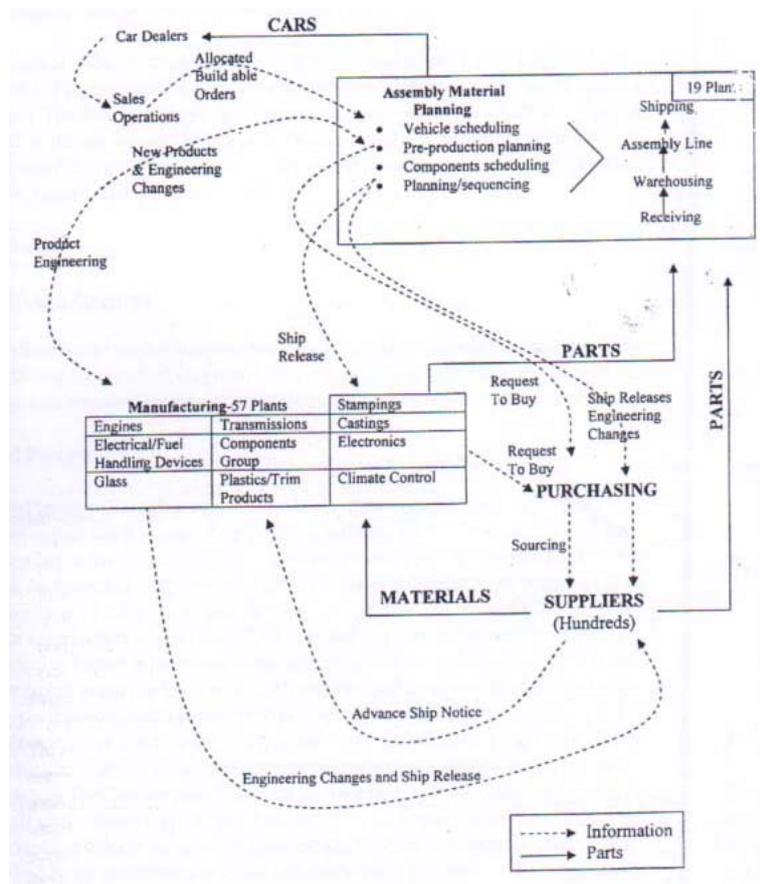


Figure 2: An Automotive Supply Chain

Source: Monczka et al., 2005

## **Development of the Proposed Model**

### **Operationalization and Instrument Development**

This part explains how the six constructs derived from previous research were integrated in the proposed model of supplier selection and how the research instruments were developed and operationalized. The dependent factor is the supplier selection decisions which are supposed to be affected by the six independent factors. The six important factors are (1) individual factors, (2) group factors, (3) organizational factors, (4) purchase-related factors, (5) seller factors, and (6) buyer-seller relationship factors.

### **Dependent Factor**

#### **Supplier selection decisions**

These are the final decisions that business buyers make to select suppliers for new products/ services/ parts/ components which they need to use in their operation. In this study, the supplier selection decisions are assumed to be affected by the six factors as previously described.

### **Independent Factors**

1. **Individual factors** Although groups are involved in most organizational choice processes, individual impact can dominate the process (Kauffman, 1996). Previous research confirms that many individuals are normally involved in making supplier selection and buying decisions, Jackson et al. (1984) pointed out that relative influence of participants varies across purchases of different products, buying class, and buying decisions, Kohli (1989) found that expert power or expertise of the individual was the most important determinant of individual influence in business buying decisions. Wilson and Woodside (1993) proposed that an individual was likely to be highly involved and influential in supplier selection when the purchase decision was perceived as related to his/her interest, expertise or status in the outcome. As pointed out by Johnston and Lewin (1996), individual buyer factors included education, motivation, perception, personality, perceives risk, and experience.
2. **Group factors** The “buying center” concept has long been used to identify the groups of individuals who collectively make purchase decisions for firms. The main research of investigation of this concept includes: composition and structure, membership, relative influence of the buying center members, and communication patterns in the buying center (Kauffman, 1996). Johnston and Lewin (1996) described group factors as size, structure, authority, group membership, experience, expectations, leadership, objectives, and background of all the participants in the buying center. Kohli (1989) defined size as the number of individuals involved in a buying center and familiarity as the extent to which members of a buying center were familiar with each other.
3. **Organizational factors** They are characteristics of the company that influence buying behavior and decisions (Dwyer and Tanner, 2002). Various organizational aspects have been addressed to determine the influence of organization on the buying and supplier selection decisions. These aspects include size of the company (small, medium, or large), structure of the company (centralized or decentralized), level of technology of the company, roles of individuals and functions, previous buying experience, profitability, corporate culture, organizational policy, and goals of the company (Johnston and Lewin, 1996; Kauffman, 1996; Dwyer and Tanner, 2002; Park and Bunn, 2003)
4. **Purchase-related factors** They refer to variables related to the specific purchase, and include buy task, product type, perceived risk, prior experience, product complexity, and time pressure (the extent to which a buying center member feels pressured to make a decision quickly) (Johnston and Lewin, 1996). Lau et al. (1999) studied the impact of the purchase-related factors on the buying center structure. They noted that product complexity can be characterized by four dimensions: the number of available alternatives, the degree of differences among the alternatives, the degree of difficulty in understanding alternatives, and the degree of difficulty in comparing alternatives.
5. **Seller factors** These refer to the characteristics of the selling firms that are used by the buying firms as the criteria or requirements that they use to choose selected suppliers. They include price, ability to meet

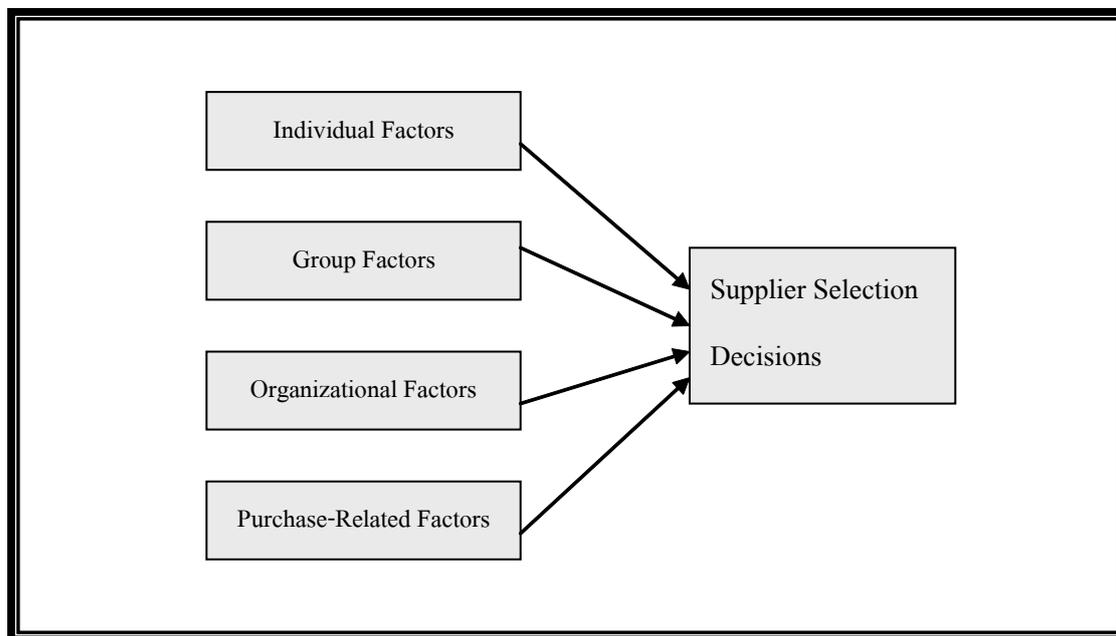
buyers' specifications, product quality, delivery time, and after-sale service (Johnston and Lewin, 1996). Scheuing (1989) suggested some criteria that most purchasers use to select suppliers. They are: the ability to handle the required level of demand (size, location and technology of the plant), production factories, labor's skill, supplier management's capability, prices, quality and terms of the items.

6. **Buyer-seller relationship factors** These refer to the interpersonal characteristics of relationships between buying and selling persons, The dyadic and network natures of organizational buying behavior have been recognized and accepted as important determinants of the purchase process. Johnston and Lewin (1996) indicated that organizational buying behavior within the buying company affects and was affected by buyer-seller relationships.

### **The Proposed Model**

The proposed model of supplier selection (Figure 3) is simply a basic relational model which contains merely a dependent variable and some independent variables. The purpose of the proposed model is to simplify the factors that are believed to affect supplier selection decisions in the Thai automotive industry. Intervening variables are not included in the model so as not to complicate the research, in particular the data analysis parts and the survey questionnaire was designed to make it relatively easy and convenient for respondents to fill out. In addition, as the Spearman rank order technique is used to find out the relative attribute importance rankings of the six factors, it is not meant to examine any causal relationships between the six factors/their attributes and the supplier selection decisions.

## **RESEARCH METHODOLOGY**



**Figure 3**

### **Sampling Design**

For this study, the target population consists of 518 automotive firms, all of which are members of Thailand Automotive Institute (TAI) (Thailand Automotive Institute, 2004). Out of the 518 firms, 475 firms or 92 percent are auto-parts producers and 43 firms or 8 percent are auto manufacturers. The sample group comprises 350 member firms of the TAI randomly selected from its list. Sekaran (2000) suggested that if the population size is 550, the sample size should be 226. Thus, the 350 sample firms in this study were appropriate. Two groups of managers of the 350 firms, purchasing and production, were the units of analysis in this study. These two groups were chosen

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because previous research results show that they were among the most influential and involved in the organizational purchase and supplier selection (e.g. Erickson and Gross, 1980; Johnston and Bonoma, 1981; Jackson et al., 1984; Naumann et al., 1984; Lau et al., 1999).

### **Questionnaire Design**

The questionnaire used in this study included both closed and open questions. The respondents were asked to respond to questions in a hypothetical new task buying situation in which they wanted to purchase a new product/ part/ component that their firms had never bought before. In Section 1, the questions were concerned with general information about their position and their firms. The major part of the questionnaire (Section 2) asked respondents to rank order the variables in each factor. It contained only relevant and necessary questions required to answer the research questions and to test the hypotheses. Section 3 of the survey instrument asked respondents to identify other factors/ attributes not included in Section 2, to rank the five most important factors/ attributes they deemed as most affecting the supplier selection, to choose the departments mostly involved in supplier selection in their firms, and to indicate only the make comment and/ or recommendations about supplier selection or the research. The language in the questionnaire mailed to the sample firms was in Thai.

### **Pretesting**

Out of the target population of 518 automotive firms, a random sample of 30 firms from the sampling frame was chosen to help the pretesting. 518 firms consisted of 475 auto-parts producers and 43 auto manufacturers (Thailand Automotive Institute, 2004). The 30 firms were divided into 15 automotive manufacturers and 15 auto-parts producers randomly selected as these two groups were the major components of the Thai automotive industry, to obtain their feedback on the format, wording, and ordering of the questionnaires. One questionnaire was for a purchasing manager and the other was for the production manager to fill out. The purchasing and production managers of each firm were asked to answer all questions from their experience and then return the completed questionnaires by self-addressed envelopes to the researcher.

### **Data Collection Method**

After the completed questionnaires from the pretesting were returned, they were checked to find out whether the respondents filled them out accurately. Then, 700 questionnaires were sent to 350 sample firms for the study. Each firm received a cover letter and two sets of the same questionnaires, one for the purchasing manager and the other for the production manager. The purchasing manager and the production manager were chosen as respondents because they are among the most influential persons in the supplier selection process as found in previous research.

Each respondent was asked to answer three sections in the questionnaire. The first section of the questionnaire asked for the personal background of the respondent. In the second section, each respondent was asked to rank order the attributes of the six factors based on their experience in the firm. The scale items for ranking are between 6-11 attributes. In the third section each respondent indicated other variables that they deem are relevant, rank order the five most important variables, identified which departments in the firm are mostly involved and which one has the most influence in supplier selection decisions. The last section was open for their suggestions or comments about supplier selection or the study.

### **Reliability**

In this study, test-retest reliability was applied by first mailing 60 questionnaires to the two groups of sample respondents (purchasing and production managers), and two weeks later 60 more questionnaires were sent to the same groups of 60 sample respondents. Cronbach's alpha is calculated to examine the internal consistency reli-

ability. Correlation coefficient of 0.9 is desired for this study.

## **Validity**

The construct validity approach was used for this study. Construct validity is for measures with multiple indicators. It addresses the question of what construct or characteristic the scale is measuring, why the scale works and what deductions can be made regarding the underlying theory. All the attributes of the six factors were derived from previous research on organizational purchasing and supplier selection.

## **RESULTS AND DATA ANALYSIS**

700 questionnaires were mailed to 350 automotive manufacturers and auto-parts producers in early August 2004. Only four were returned undelivered. 85 completed questionnaires were returned after the first mailing. In total, 198 completed questionnaires were returned and usable for the research purpose, representing a 28% response rate which is not much different from 20.1% in the study by Cooper et al.(1991) in the USA, 28.7% in the research by Patton (1996) in the work by Mummalaneni et al.(1996) in the People's Republic of China.

### **Description of Respondents**

The respondents consisted of 123 purchasing managers (62.12%) and 75 production managers (37.88%) and 149 (75.25%) respondents who worked for auto-parts producers, and 49 (24.75%) respondents who worked in car manufacturing firms. 68.18% were male and 31.82% were female, while the majority of respondents were between 20-30 years old (41.92%) and between 31-40 (40.91%), and most of them (64.14%) had a bachelor's degree. Most respondents (29.80% and 34.43%) had between 1-5 years of working experience involved in purchasing, while working between 1-2 years (26.26%) and 3-5 (31.31%) in their firms.

The results reveal some implications. First, the result that the majority of respondents (62.12%) were purchasing managers implies that they might be more interested in the topic of supplier selection than production managers were because the purchasing function is their direct responsibility. It is similar to two mail surveys in the research of Erickson and Gross (1980) that showed 64.3% and 65.5% of respondents worked in the purchasing function. In addition, the result that most of the respondents (74.24%) in the USA worked for auto-parts firms was in line with the information that auto-parts manufacturers comprise the majority (92%) of the Thai automotive industry. Second, male respondents (68.18%) seemed to dominate in the sample auto firms. This is similar to a study of Mummalaneni et al. (1996) in the People's Republic of China which had 46 men and 1 woman as respondents. Moreover, most respondents (82.83%) were quite young as 41.92% were aged between 20-30 years and 40.91% aged between 31-40 years. That is why most of them (64.14%) had only 1 to 5 years of work experience in the purchasing function. The work experience of the respondents was quite short compared to Patton's study (1997) which showed the buying experience of sample respondents at merely 14%, and 27% had 6-10 years of experience. Third, only 64.14% of respondents in this study had a bachelor's degree while 8% had a master's degree and 27.28% had vocational or senior high school education

### **Results and Discussion**

The major findings of the study are provided in this part and are divided into two groups of respondents; purchasing managers and production managers, as follows:

#### **Individual Factors**

These factors refer to the characteristics of each individual who is involved in the buying process of their firms. The following are results of attribute importance rankings divided into purchasing and production managers. Both

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purchasing and production managers ranked buyers' experience and personal interest in the purchased items the highest two rankings. However, purchasing managers gave a much higher ranking (third) for buyers' risk preference than production managers did (seventh). This may imply that purchasing managers perceived risk preference of buyers as more important in selecting suppliers. As such, if buyers were risk-taking, they would be more willing to choose new suppliers; whereas if they were risk-averse, they would continue with existing suppliers. Patton found in his study (1997) that purchasing managers tended to be risk-averse in supplier selection decisions when selecting different suppliers. As for other attributes, the rankings of both groups were not much different.

### **Group Factors**

These factors refer to the characteristics of all individuals involved in supplier selection and buying decision. The following are results of attribute importance rankings divided into purchasing and production managers. One surprising result was that production managers ranked education of participants in the buying process as the most important attribute while purchasing managers rated it as the sixth important. The reason may be that in a new buying situation, the production managers felt that those involved in the buying center need to have enough education to make supplier selection decisions.

### **Organizational Factors**

These factors include the characteristics of the buying company that affect their supplier selection decisions. The following are results of attribute importance rankings divided into purchasing and production managers. The rankings for the attributes of these factors were not significantly different between purchasing and production managers. That is, they ranked all attributes in similar order of importance.

### **Purchase-related Factors**

These are the characteristics of the purchase or product as perceived to affect supplier selection. The following are results of attribute importance rankings divided into purchasing and production managers. One striking result for these factors is the importance ranking given to the time pressure attribute. Purchasing managers ranked time pressure the second while production managers ranked it the fifth. This may mean that production managers felt less time pressured in making supplier selection decisions in a new buy in which they were not familiar with the new item to buy.

### **Seller Factors**

These are the criteria that the buying firm uses to select their suppliers. In other words, they are characteristics of desirable suppliers. The following are results of attribute importance rankings divided into purchasing and production managers. The results indicate many attributes of these factors were ranked quite differently between purchasing and production managers. The four attributes which were ranked rather differently were: ability of suppliers to meet buyers' specifications, after-sales service, supplier's ability to manage production, and supplier's ability to meet required demand. This result reflects the different importance that purchasing and production managers perceived and gave to each of the four attributes.

### **Buyer-Seller Relationship Factors**

These are the characteristics of the interpersonal relationships between the personnel involved in the buying and selling companies. The following are results of attribute importance rankings divided into purchasing and production managers. The findings reveal that purchasing and production managers perceived the relative importance of the attributes for these factors quite similarly. One slight difference is the seller's past behavior attribute, which

production managers ranked somewhat higher than purchasing managers did. This may be because, in general, purchasing managers are more familiar with available suppliers and know them better than production managers do.

### **Other Factors**

The above results of other factors/ attributes given by both purchasing and production were surprisingly ranked in almost the same order of importance. However, they are similar to or the same as the attributes used in previous research (e.g. Matthyssens and Faes, 1985; Mummalaneni et al., 1996; Patton, 1996). It indicates that these attributes should be included in any future research which wants to examine important attributes of supplier evaluation and selection criteria in Thailand

### **Five Most Important Factors**

The findings for this question indicate that both purchasing and production managers perceived they were the five most important factors when making supplier selection decisions. Although approximately half of the respondents of both groups (76 and 48) answered this question, it is surprisingly similar to the attributes used in prior studies (e.g. Mummalaneni et al., 1996; Patton, 1997)

### **Departments mostly involved in Supply Selection**

The findings for this question are surprising in the respondents gave the same importance rankings to the same functions, even though purchasing and operations people were supposed to have different perceptions in this issue because of different job functions and experience. The result that purchasing was perceived as most involved in supplier selection process is in line with other previous research (e.g. Doyle et al., 1979; Erickson and Gross, 1980; Jackson et al., 1984; Naumann et al., 1984).

### **Five Most Influential Departments in Supplier Selection**

The results, show that 120 purchasing and 74 production managers perceived top management as the most influential in the supplier selection decisions in the new buy situation, imply that the respondents might work in small firms where the owners or senior managers usually make important decisions.

### **Any Comments/ Suggestions ?**

This part was open space for respondents to indicate their comments and/ or suggestions about supplier selection or this research. They are not listed in sequence of importance, as follows:

- (1) New suppliers should present more product information than explain price lists and give trial products. In addition, salespersons should be trained more to present their products.
- (2) Development of products and delivery are recommended.
- (3) Supplier selection decisions are made after examining the products.
- (4) Some companies have a policy to limit the number of suppliers.
- (5) Selection criteria are decided before assessing each supplier.
- (6) Good after-sales service is necessary.
- (7) Companies should have a standardized system of selecting their salespersons.

The results are in line with previous research such as Doyle et al. (1979), Erickson and Gross (1980), Johnston and Bonoma (1981), Jackson et al. (1984), Naumann et al. (1984), Matthyssens and Faes (1985), Patton et al.

(1986). It is clear from the results above that both groups of respondents, purchasing and production managers, give the same rankings of attribute importance and close percentages for both the departments involved and the most influential departments in supplier selection decisions.

## **CONCLUSINOS**

The importance of vendor or supplier selection has been recognized as a focal topic of research for more than two decades in western countries (e.g. Erickson and Gross, 1980; Jackson et al., 1984; Naumann et al., 1984; Patton, 1996). However, the topics of industrial purchasing, and in particular supplier selection, have received relatively little attention by academics in Thailand. This research project made an attempt to examine the six factors and attributes that have been found in previous studies to affect supplier selection decisions in the automotive industry. The overall results indicate that the six factors and their attributes were relevant for the sample automotive firms. Product quality, price, after-sales service, delivery time, and product information were ranked as the most important respectively by both purchasing and production managers in their supplier selection decisions.

Furthermore, purchasing, top management, and production were mostly involved in the supplier selection while top management, purchasing, and production were ranked as most influential in selection decisions by both purchasing and production managers. The results of this study are in line with those of previous research.

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