INFLUENCES ON PURCHASING IN THE THAI AUTOMOTIVE INDUSTRY

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Abstract

In spite of the importance which the 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 factors 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. Finally, implications for researchers and practitioners are suggested for consideration and further research.

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

INTRODUCTION

Rationale of the Study

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-

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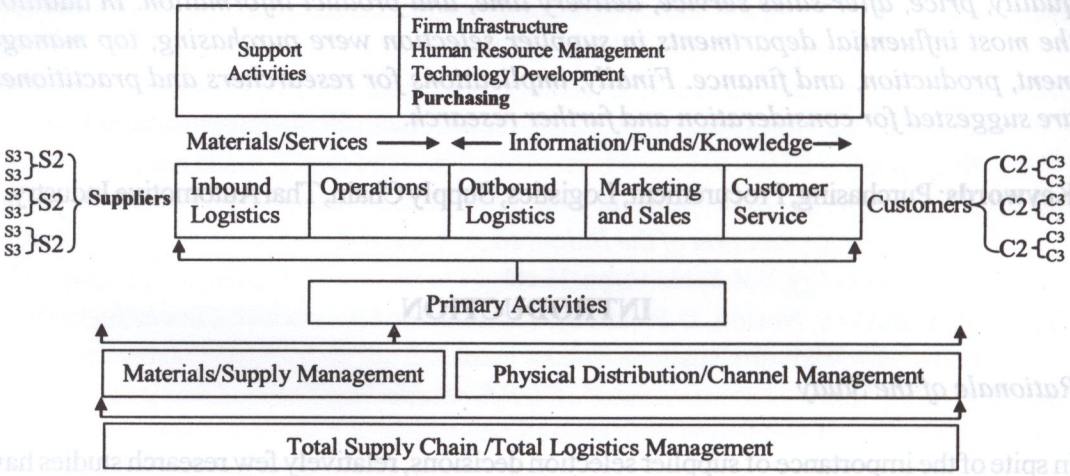
ever, in the context of business firms in Thailand, no published empirical research dealing specifically with supply selection decisions is found, especially in the Thai automotive industry. This study is an attempt to fill this gap by studying six factors and their attributes used in supplier selection decisions and the relative influence of the persons involved in automotive firms' buying process in Thailand.

Significance of Purchasing

Today, 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).

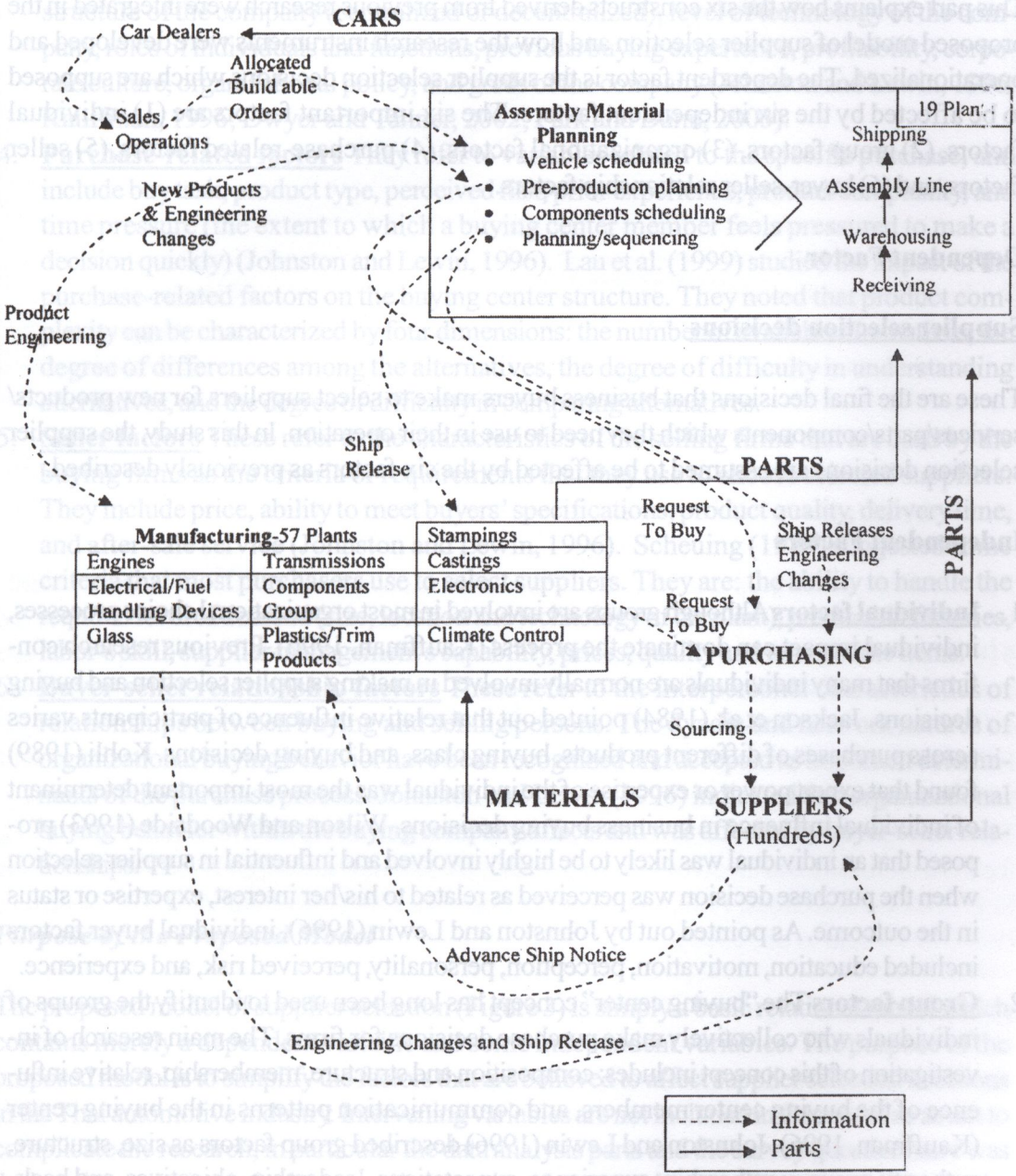
Figure 1: The Extended Value Chain



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, perceived 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.

Purpose of 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

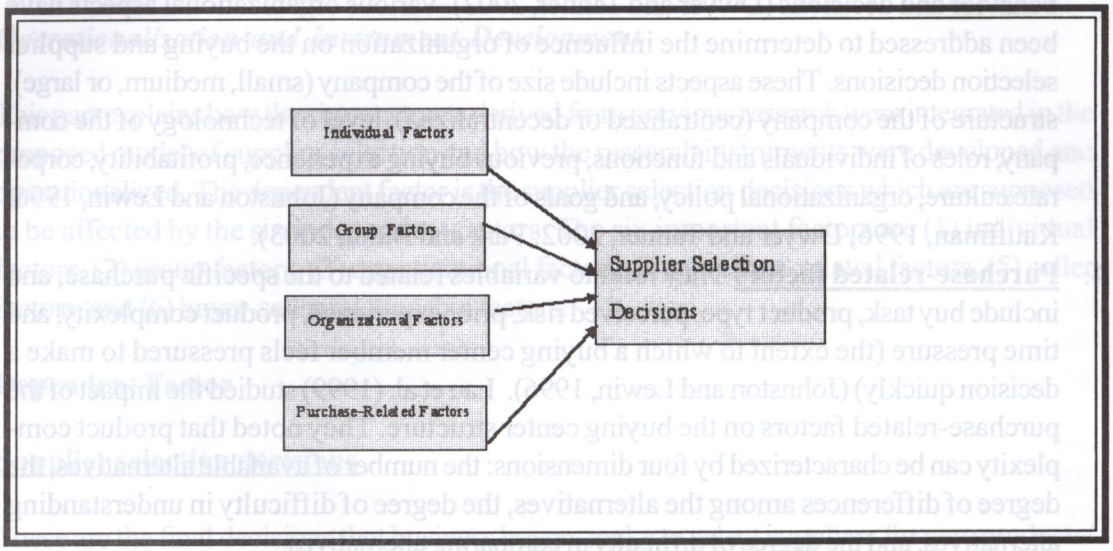


Figure 3

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 because previous research results show that they were among the most influential and involved in the organizational purchase and supplier selection decisions (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 chose the departments mostly involved in supplier selection in their firms, and to indicate only the most influential department in supplier selection. The last section was open space for them to make comments 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 questionnaire. Each firm received a cover letter and two 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 the 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 reliability. 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

Response Rate

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 USA, and 22% 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 34.34%) had between 1-5 years of working experience involved in purchasing, while working between 1-2 years (26.26%) and 3-5 years (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:

(1) **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.

Purchasing Managers (Sample respondents n = 123)

Attribute	No. of respondents	Percent	Rank
1. Buyers' experience	28	22.76	1
2. Buyers' personal interest in the purchased items	22	17.89	2
3. Buyers' risk preference (risk-taking or risk-averse)	19	15.45	3
4. Buyers' gender	18	14.63	4
5. Buyers' age	12	9.76	5
6. Buyers' educational level	9	7.32	6
7. Buyers' personality (conservative, passive, active, practical)	8	6.5	7
8. Buyers' job function	7	5.69	8

Production Managers (Sample respondents n = 75)

Attribute	No. of respondents	Percent	Rank
1. Buyers' experience	21	28	1
2. Buyers' personal interest in the purchased items	17	22.67	2
3. Buyers' age	11	14.27	3
4. Buyers' personal interest in the purchase	7	9.33	4
5. Buyers' job function	6	8	5
6. Buyers' gender	5	6.67	6
7. Buyers' risk preference (risk-taking or risk-averse)	4	5.33	7
8. Buyers' personality (conservative, passive, active, practical)	4	5.33	8

Both 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.

(2) **Group Factors**

These factors refer to the characteristics of all individuals involved in supplier selection and buying decisions. The following are results of attribute importance rankings divided into purchasing and production managers.

Purchasing Managers (Sample respondents n = 123)

Attribute	No. of respondents	Percent	Rank
1. Authority or power of participants	27	21.95	1
2. Expertise of participants	25	20.33	2
3. Expectation of participants	20	16.26	3
4. Familiarity of participants	17	13.82	4
5. Objective of participants	12	9.76	5
6. Education of participants	10	8.13	6
7. Number of participants	7	5.69	7
8. Job function of participants	5	4.07	8

Production Managers (Sample respondents n = 75)

Attribute	No. of respondents	Percent	Rank
1. Education of participants	19	25.33	1
2. Authority or power of participants	13	17.33	2
3. Expertise of participants	13	17.33	3
4. Expectation of participants	12	16	4
5. Familiarity of participants	9	12	5
6. Job function of participants	7	9.33	6
7. Objective of participants	6	8 7	
8. Number of participants	4	5.33	8

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.

(3) **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.

Purchasing Managers (Sample respondents n = 123)

Attribute	No. of respondents	Percent	Rank
1. Buying experience of buying firm	33	26.83	1
2. Level of technology of buying firm	19	15.45	2
3. Profitability of buying firm	19	15.45	3
4. Structure of buying firm	17	13.82	4
5. Corporate culture of buying firm	13	10.57	5
6. Size of buying firm	9	7.32	6
7. Purchasing strategy of buying firm	8	6.51	7
8. Policy of buying firm	5	4.07	8

Production Managers (Sample respondents n = 75)

Attribute	No. of respondents	Percent	Rank
1. Level of technology of buying firm	19	25.33	1
2. Buying experience of buying firm	17	22.67	2
3. Profitability of buying firm	14	18.67	3
4. Structure of buying firm	7	9.33	4
5. Policy of buying firm	6	8	5
6. Corporate culture of buying firm	5	6.67	6
7. Purchasing strategy of buying firm	5	6.67	7
8. Size of buying firm	2	2.67	8

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.

(4) **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.

Purchasing Managers (Sample respondents n = 123)

Attribute	No. of respondents	Percent	Rank
1. Newness of the purchase	29	23.58	1
2. Time pressure	20	16.26	2
3. Importance of purchasing	19	15.45	3
4. Complexity of purchase	15	12.2	4
5. Change in technology	15	12.2	5
6. Purchase uncertainty	13	10.57	6
7. Product type	12	9.76	7

Production Managers (Sample respondents n = 75)

Attribute	No. of respondents	Percent	Rank
1. Newness of purchase	18	24	1
2. Importance of purchase	13	17.33	2
3. Complexity of purchase	12	16	3
4. Change in technology	11	14.67	4
5. Time pressure	8	10.67	5
6. Purchase uncertainty	7	9.33	6
7. Product type	6	8	7

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.

(5) **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.

Purchasing Managers (Sample respondents n = 123)

Attribute	No. of respondents	Percent	Rank
1. Price of product	25	20.33	1
2. Ability of the supplier to meet buyer's specifications	16	13.01	2
3. Delivery time	14	11.38	3
4. Terms of the seller's proposal	14	11.38	4
5. After-sales service	13	10.57	5
6. Quality of product	11	8.94	6
7. Supplier's ability to manage production	8	6.5 7	
8. Supplier's ability to meet required demand	7	5.69	8
9. Supplier's factory size and location	7	5.69	9
10.Management style of supplier	6	4.88	10
11.Image of supplier	2	1.63	11

Production Managers (Sample respondents n = 75)

Attribute	No. of respondents	Percent	Rank
1. After-sales service	14	18.69	1
2. Price of product	13	17.33	2
3. Delivery time	13	17.33	3
4. Quality of product	8	10.67	4
5. Supplier's ability to required demand	7	9.33	5
6. Terms of seller's proposal	5	6.67	6
7. Supplier's factory size and location	4	5.33	7
8. Image of supplier	4	5.33	8
9. Ability of the supplier to meet buyer's specifications	3	4	9
10.Management style of supplier	2	2.67	10
11.Supplier's ability to manage production	2	2.67	11

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.

(6) **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.

Purchasing Managers (Sample respondents n = 123)

Attribute	No. of respondents	Percent	Rank
1. Trust between buyer and seller	35	28.46	1
2. Buyer's loyalty to supplier	26	21.14	2
3. Commitment to each other	20	16.26	3
4. Familiarity between buyer and seller	16	13.01	4
5. Seller's past behavior	14	11.38	5
6. Level of dependence	12	9.76	6

Production Managers (Sample respondents n = 75)

Attribute	No. of respondents	Percent	Rank
1. Buyer's loyalty to supplier	18	14.63	1
2. Trust between buyer and seller	16	21.33	2
3. Seller's past behavior	16	21.33	3
4. Commitment to each other	13	17.33	4
5. Familiarity between buyer and seller	7	9.33	5
6. Level of dependence	5	6.67	6

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

Purchasing Managers (Sample respondents n = 123)

Attribute	No. of respondents	Percent	Rank
1. Product information	9	22.5	1
2. Financial status of the selling firm	7	17.5	2
3. Fast communication	6	15	3
4. Trial Products	6	15	4
5. Speed in product delivery	4	10	5
6. Technical support	3	7.5	6
7. Sincerity of salesperson	3	7.5	7
8. Product development	2	5	8
Total respondents	**40**	**100**	

Production Managers (Sample respondents n = 75)

Attribute	No. of respondents	Percent	Rank
1. Product information	5	20.83	1
2. Financial status of the selling firm	4	16.67	2
3. Fast communication	4	16.67	3
4. Trial products	3	12.5	4
5. Speed in product delivery	3	12.5	5
6. Technical support	2	8.33	6
7. Product development	2	8.33	7
8. Sincerity of salesperson	1	4.17	8
Total respondents	**24**	**100**	

Some attributes were excluded as they were the same as those in the six 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

Purchasing Managers (Sample respondents n = 123)

Attribute	No. of respondents	Percent	Rank
1. Product quality	22	28.94	1
2. Price	21	27.63	2
3. After-sales service	16	21.05	3
4. Delivery time	10	13.16	4
5. Product information	7	9.21	5
Total respondents	**76**	**100**	

Production Managers (Sample respondents n = 75)

Attribute	No. of respondents	Percent	Rank
1. Product quality	15	31.25	1
2. After-sales service	11	22.92	2
3. Price	8	16.67	3
4. Product information	8	16.67	4
5. Delivery time	6	12.5	5
Total respondents	**48**	**100**	

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

Purchasing Managers (Sample respondents n = 123)

Attribute	No. of respondents	Percent	Rank
1. Purchasing	85	32.57	1
2. Top management	80	30.65	2
3. Production	67	25.67	3
4. Finance	21	8.05	4
5. Other departments	8	3.07	5
Total scores	**261**	**100**	

Production Managers (Sample respondents n = 75)

Attribute	No. of respondents	Percent	Rank
1. Purchasing	64	32.16	1
2. Top management	64	32.16	2
3. Production	44	22.11	3
4. Finance	23	11.56	4
5. Other departments	4	2.01	5
Total scores	**199**	**100**	

- Each respondent could choose more than one department in this question.

The findings for this question are surprising in that 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

Purchasing Managers (Sample respondents n = 123)

Attribute	No. of respondents	Percent	Rank
1. Top management	50	41.67	1
2. Purchasing	43	35.83	2
3. Production	16	13.33	3
4. Finance	6	5	4
5. Other departments	5	4.17	5
Total respondents	**120**	**100**	

Production Managers (Sample respondents n = 75)

Attribute	No. of respondents	Percent	Rank
1. Top management	37	50	1
2. Purchasing	24	32.43	2
3. Production	7	9.46	3
4. Finance	3	4.05	4
5. Other departments	3	4.05	5
Total respondents	**74**	**100**	

The results, 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.

DATA ANALYSIS AND EXAMINATION OF RESEARCH QUESTIONS

The respondents were asked to respond to the survey questionnaire in a hypothetical situation that their firms wanted to purchase a new product/ part/component which they had never bought before. This new-buy situation was chosen because it is the one that requires more information, consideration and time than the rebuy or modified rebuy situations. Furthermore, the survey questionnaire was designed to make it convenient to fill out within a short time. In general, the major findings indicate that both purchasing and production managers gave high rankings to similar attributes of the same factors, the departments mostly involved in supplier selection, and five departments most influential in supplier selection decisions. All 198 respon-

dents provided feedback on all the questions in Sections 1 and 2 and most of the questions in Section 3, making the results reliable and valid for the research purpose.

The three research questions are now discussed.

(1) **Examining Research Question 1**

- What factors affect the supplier selection decisions in the purchasing process of the companies in the automotive industry as perceived by their purchasing and production managers?

The results reveal that the factors were also perceived by purchasing and production managers in automotive firms to be relevant for supplier selection in their firms as all 198 respondents ranked the attributes of each factor according to their relative importance as described in the survey instrument's instructions. Specifically, the five most important attributes that were perceived to influence supplier selection by purchasing and production managers are ranked as follows:

Purchasing Managers

Attribute	Percent	Rank
Product quality	28.94	1
Price	27.63	2
After-sales service	21.05	3
Delivery time	13.16	4
Product information	9.21	5

Production Managers

Attribute	Percent	Rank
Product quality	31.25	1
After-sales service	22.92	2
Price	16.67	3
Product information	16.67	4
Delivery time	12.5	5

It is noteworthy that both purchasing and production managers made similar rankings of the same factors. That is, product quality, price, after-sales service, delivery time, and product information, were ranked as the five most important by both purchasing and production managers. The results are in line with previous research studies (Matthyssens and Faes, 1985; Mummalaneni *et al.*, 1996; Patton, 1997).

(2) **Examining Research Question 2**

- Which departments are involved in and which one has the most influence in supplier selection decisions?

The departments that respondents identified as most involved in supplier selection are demonstrated next.

Production Managers

Attribute	Percent	Rank
1. Purchasing	32.57	1
2. Top management	30.65	2
3. Production	25.67	3
4. Finance	8.05	4
5. Other departments	3.07	5

Production Managers

Attribute	Percent	Rank
1. Purchasing	32.16	1
2. Top management	32.16	2
3. Production	22.11	3
4. Finance	11.56	4
5. Other departments	2.01	5

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).

As regards the departments that respondents identified as most influential in supplier selection, they are ranked as shown next.

Production Managers

Attribute	Percent	Rank
1. Top management	41.67	1
2. Purchasing	35.83	2
3. Production	13.33	3
4. Finance	5	4
5. Other departments	4.17	5

Production Managers

Attribute	Percent	Rank
1. Top management	50	1
2. Purchasing	32.43	2
3. Production	9.46	3
4. Finance	4.05	4
5. Other departments	4.05	5

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

(3) **Examining Research Question 3**

- Is the proposed model of supplier selection appropriate for Thai automotive companies and how it should be adjusted?

The proposed research model of supplier selection (Figure 3) appears to be relevant for the automotive firms in the industry as all 198 respondents filled out almost all sections of the survey questionnaire.

Issues for Consideration

- Because of the increasing importance of the automotive industry in Thailand, it is suggested that personnel involved in organizational buying of auto firms should possess higher experience and education so as to improve the competitiveness of this industry. This is in accordance with the policy in the Master Plan of the Thai Automotive Industry 2006-2010 to upgrade personnel's skills and knowledge.
- More empirical and applied research on organizational buying, composition and relative influence of buying center members, supplier selection attributes in automotive firms in Thailand is encouraged. Better understanding of these topics can help increase the automotive firms' competitiveness in Thailand and enable them to effectively compete with other Asian firms.

Limitations of the Research

This study is probably the first empirical research that examines factors pertaining to supplier selection in the Thai automotive industry. Therefore, there are some limitations inherent in this research. This part will describe some major limitations of the study.

First, the population of the study was 518 member firms of Thailand Automotive Institute, which consisted of 43 car manufacturing firms and 475 auto-parts producing firms. The member firms were different in terms of numbers of employees, sales and revenue, products. The purchasing and production managers in 350 sample firms were the units of analysis and were asked for their views on the factors that they perceived as affecting supplier selection decisions.

Second, the survey instrument was mainly designed to provide relative attribute importance rankings of the six factors, the ranking of departments mostly involved in supplier selection and the most influential department in supplier selection decisions of the respondents' firms. Therefore, causal relationships between the six factors and their attributes and the supplier selection decisions could not be examined.

IMPLICATIONS AND RECOMMENDATIONS

The purpose of the research was to investigate how the six factors and attributes affected supplier selection decisions of 518 automotive firms in Thailand as perceived by their purchasing and production managers. The 198 firms that participated in this study by returning the survey questionnaires varied in some aspects such as size, sales and revenue, and types of product. The response rate of 28% is considered satisfactory. Based on the results of the study, some implications and recommendations can be drawn from the results.

Implications for Researchers

One way to conduct further research is to adjust the questions in the survey questionnaire to examine causal relationships between dependent and independent variables. 5-point Likert scales can also be utilized. Furthermore, more sophisticated techniques, such as regression and multidimensional scaling, should be applied to test the six factors by including other persons in the sample firms such as engineering, quality control, and top executives.

Other variables such as intervening and mediating variables, such as information control and buying center members' participation, should be included in the model to investigate further how these variables will affect the results. Moreover, the hypothetical situation used in this study was a new buy that normally requires more time to search for relevant information and people involved in making supplier selection decisions. Other situations such as modified rebuys or routine rebuys should also be examined.

In addition, other stages of the buying process from need identification to supplier performance evaluation should be studied. Finally, more studies should be undertaken to investigate

the organizational purchase and supplier selection process in the automotive industry and other industries and apply useful results to improve the purchasing and supplier selection process.

Implications for Practitioners

For the buying firms, the six factors and attributes should be included in the list of selection criteria for supplier selection. The levels of significance of these factors and their attributes are dependent on the buying situation, purchase type, and buying stage of each firm.

Buying firms should also give strategic priority to establishing and maintaining good relationships with their suppliers, as the results of this study and other research in Asia (Mummalaneni et al., 1996) revealed that Japanese car manufacturers maintain a network of suppliers that provide cost and production advantage to them. Even the big western auto firms such as General Motors are promoting good relationships with their selected suppliers (Pappal, 2003). This is due to the fact that qualified suppliers with good performance are key to their smooth operations, so their strategy is to have productive supply chain partners and customer relationships.

As for the supplying firms, they should pay special attention to the most important attributes that were perceived by both purchasing and production managers since these two groups were given the second and third rankings only after the top management in terms of their involvement and influence in supplier selection decisions. Special attention should be paid to members of the buying center who can exert most influence in making decisions. This can be achieved by making cordial relationships with them on a regular basis as Thai people normally appreciate and regard good personal relationship and trust as important factors when making decisions, especially the ones requiring large budgets.

CONCLUSIONS

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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