Research on the Brand Recognition of Industrial Products Based on the Roles in Purchasing Center

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ABSTRACT

The article is based on the analysis of purchasing decision-making members in the purchasing center. It summarizes and analyzes the factors that affect the three levels of purchasing decision according to the different positions of members and the differences among different purchasing stages. The roles of the purchasing center are divided into management, expert layer and information layer. A sample survey was conducted on the purchasing staffs of the shipbuilding industry in the industrial sector or persons with the purchasing experience. The structural equation model was used to analyze and verify the data of the survey. The results show that: the persons who are in different roles have different concepts of brand recognition. Managers are more concerned about the factors in enterprise-level; the experts mainly care about the quality and price of products and third-party certification; information collectors need to be considered all the factors.

KEYWORDS
Purchasing center division; brand recognition; industrial products

INTRODUCTION

With the rapid development of commodity economy, market competition is more and more intense, and the brand has more impacts on purchasing behaviors. In the field of consumer goods, the establishment and maintenance of a strong brand become an important marketing strategy. In view of the differences between industrial products and consumer goods, the idea of building consumer brands can be applied to the field of industrial products or not, and the brand mean the same or different in the field of industrial products as consumer goods will be researched. In the B2B market, there are no essential differences between the products offered by the same industry supplier, but the buyers will continue to prefer a business, and what factors are at work? In order to answer questions above, we must know that an important breakthrough point is to make out the brand recognition of customers, that is, what is the focus of customers in the B2B purchase process.

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LITERATURE REVIEW

Brand recognition theory

On the connotation of "Cognition", most people agree with the interpretation of philosophy and cognitive psychology. The cognitive point of view of philosophy can be understood as the reflection of the object and the relationship of objective things, that is, the subjective reflection of objective things in the human brain. The cognitive point of view from the perspective of information generated by the process of knowledge and study, people's subjective cognition is to identify and recognize things by virtue of certain specific pieces of information.[1] From the perspective of two disciplines, it can be seen that both agree that the people's cognition includes descriptions of things and the evaluation of things.

David A. Aaker (1991)[2] proposed the concept of brand recognition. It is the consumer's understanding of the brand, recognition and the degree of grasping. Keller (1993)[3] puts forward the concept of brand recognition from the perspective of associative network memory model in psychology, and puts forward the analysis model of brand cognitive dimension structure systematically. He believes that the brand knowledge connects the brand node in the consumer’s memory with others. Later, Keller (2003) [4] also revised the definition of brand recognition. It is the consumer’s knowledge about the brand information in their memory. Recognized by most scholars, Keller believes that brand recognition is the source of brand equity. Domestic scholars. Yang Weiwen and Liu Xin (2010)[5] once defined the brand recognition as a framework made of a series of intertwined and formed network from the perspective of cognitive psychology, which is related to the consumer’s memory of the brand description and evaluation of related information. Lu Hongliang (2015)[6] believed that brand recognition refers to the customer’s ability of identifying the brand under different conditions, which reflects customer’s degree of recognition and familiarity with the brand on behalf of the memory of the past brand marketing efforts in the minds of customers.

In general, the consumer's brand recognition process can be understood as the process of information acceptance, information processing and information output. Consumers first search the outside world for external stimuli actively and accept external stimuli passively with their memory. After getting some certain information, they recognize and learn in the psychological black box, produce emotional tendencies, form their own views and evaluation on products or service, and ultimately stimulate the motivation of purchase and succeed in selling products. The main content of this paper is to clarify what the business – buyer’s views and evaluation on products or service or corporate brand after the external stimulus and active search for information from the outside world. Therefore, the brand recognition which is studied in this article is the formation of the brand knowledge when consumers are in the process of receiving information and information processing.

Purchasing center and classification

Cyert [7] first proposed the concept of "purchasing center" in 1956, and then some scholars began to study the purchasing center for the impact of business decision-making. Webster and Wind (1972) [8] proposed the classic purchasing center member role model (Webster-Wind model). The enterprise purchasing center members are
divided into five roles, namely, users, influencers, buyers, decision makers and gatekeepers. Kotler and Keller (2006)[9] then added two roles, sponsors and grantors.

In recent years, Chinese scholars have conducted in-depth research on the relationship between purchasing center members and enterprise purchasing decision-making. Li Guihua (2007)[10] proposed a Chinese-style enterprise purchase behavior model based on the characteristics of Chinese enterprises’ purchasing behavior. It is believed that the procurement center is composed of expert strength, legitimacy force, manager power, information power, network theory, interpersonal trust, and communication force. Lu Hongliang (2010)[11] revised the W-W model to build a Chinese enterprise purchasing decision-making model. According to the staff’s functions, the purchasing center is divided into decision-making power, expert strength, information strength.

This study draws lessons from Lu Hongliang's division of purchasing center, and completes the divisions of roles in purchasing center according to the stage of procurement - investigation stage, evaluation stage and decision stage. The survey phase corresponds to the information layer; the evaluation phase corresponds to the expert layer; the decision-making stage corresponds to the management level. In accordance with the corresponding relationship, this purchasing center is composed of the managers, experts, information collectors.

RESEARCH ON THE COGNITIVE FACTORS OF INDUSTRIAL BRAND RECOGNITION UNDER THE DIVISION OF ROLES IN PURCHASING CENTER

According to the previous literature research, this paper analyzes the factors influencing the brand recognition from the three aspects: products, service and corporate image, and sums up six factors: product quality, product price, product supply ability, service, enterprise reputation and the third party certification. Industrial procurement is a complex process involving more people and different roles with different emphasis. Customers choose products based on factors that customers consider as important. The purchasing center is composed of management, expert layer and information layer. Its brand recognition will be affected by the influence of some aspects such as positions and ages. Therefore, the article makes the following assumptions.

Management assumptions

Management is generally the decision makers of the purchasing center who have the power to decide what to buy. What they care about is the maximization of product interests and cost performance ratio, as well as coordination between various departments. In terms of controlling cost, resource procurement in the industrial sector focuses more on the integrated value of products than conventional procurement. The combined value is reflected in price, quality, technical and supply capacity. So ensuring a reasonable price, high-end technology, product quality and product supply capacity has more influences on the brand recognition of managers. In the process of selling industrial products, sales staff is difficult to get in touch with the final decision-making staff of the company's procurement, so the pre-sale services have minimal
impact on managers. However, the industrial products are things which will be used for a long time, and managers should take the company's overall long-term interests into account, so after-sales service is more influential. Management must have a higher level of control, so they will be more concerned about the enterprise level issues among which corporate reputation is a noteworthy area because it is directly related to the competitiveness of the enterprise in the market and the customer's minds. Hall (1992)[12] even argues that intangible assets such as company reputation, third-party certification, etc., will become the point of view of the competitive advantage in terms of tangible property and tangible assets of competitors.

H1: The supplier's price of products has a negative impact on the brand recognition of management
H2: The supplier's quality of products has a positive impact on the brand recognition of management
H3: The supplier's capacity of supply has a positive impact on the brand recognition of management
H4: The supplier's service has a positive impact on the brand recognition of management
H5: The corporate reputation of the supplier has a positive impact on the brand recognition of management
H6: The supplier's third-party certification has a positive impact on the brand recognition of management

Expert layer assumptions

When a firm purchases a product that is highly valuable and plays an important role in the production process, the decision maker has a higher risk perception. Technical experts have professional knowledge, so decision makers tend to take advice from technical experts to reduce the degree of risk perception, and make scientific decisions.[13] The experts play a major role in the procurement evaluation phase, check and take responsibility for the technical aspects of products, focusing on the reliability, technology and effect of products, as well as have the right of recommendation and veto in terms of technology. The leadership of supplier's technical, is the reflection of quality and reliability of the embodiment, and also conducive to enhance the competitiveness of enterprises. So the quality of the product greatly affects the brand recognition of the experts. Services include technical support, emergency services, etc., and industrial products are long-term products, more or less, there will be some problems in the process of use which need technical experts to solve. If the supplier provides timely technical support and problem solving service, then the technical experts will save a lot of time and economic costs. Technical experts pay more attention to products and technical issues. If the supplier has a certification of the quality inspection report from a national authority or allows customers to experience the actual use of products, it will help get the favor of buyers. As for experiencing products, experts are the most qualified to do it. So the third party certification will have a positive impact on the brand recognition of experts. In the field of industrial products, there will often be products and technical exchange meetings, etc., in this case, the experts will evaluate and communicate about the supplier's products. Then the reputation of the enterprise will also have an impact on the technical profession. So this article assumes that:
H1: The supplier's price of products has a negative impact on the brand recognition of the experts
H2: The supplier's quality of products has a positive impact on the brand recognition of the experts
H3: The supplier's availability of products has a positive impact on the brand recognition of the experts
H4: The supplier's service has a positive impact on the brand recognition of the experts
H5: The supplier's corporate reputation has a positive impact on the brand recognition of the experts
H6: The supplier's third-party certification has a positive impact on the brand recognition of the experts

Information layer assumptions

Information layer is the unit between the purchase center and the outside of the information exchange, which provides information for enterprises to collect, store and process various information related to the purchase and to pass the business requirements and expectations to the supplier, and at the same time sends feedback about products and service to the supplier. The purchaser of the information layer is the person who arranges the specific implementation of the procurement. It may be a person, may also be a group. They draw up tender criteria and collect information to completely understand in accordance with the procurement requirements, so the procurement staffs not only focus on requirements of products, but also pay attention to service and the supplier's own business problems in order to have a comprehensive understanding of suppliers. Therefore, this study assumes that:

H1: The supplier's price of products has a negative impact on the brand recognition of the buyer's information layer
H2: The supplier's quality of products has a positive impact on the brand recognition of the buyer's information layer
H3: The supplier's availability of products has a positive impact on the brand recognition of the buyer's information layer
H4: The supplier's service has a positive impact on the brand recognition of the buyer's information layer
H5: The supplier's corporate reputation has a positive impact on the brand recognition of the buyer's information layer
H6: The supplier's third-party certification has a positive impact on the brand price of the buyer's information layer

EMPIRICAL ANALYSIS (RESEARCH DESIGN)

Research methods and data collection

This study first carefully reads the literature, finds the appropriate measurement items, and then communicates with the paper instructor in a timely manner. After mentor review, listen to the proposed changes to form a preliminary scale. In this study, the measurement methods and items of each variable are mostly modified on
In this study, six influencing variables and one outcome variable were measured. The questionnaire involves in 27 initial questions, and the main part of the questionnaire was designed by using the 5-point scale of the Likert scale method.

In order to improve the effectiveness of the measurement scale, we conducted a pre-survey in the form of a questionnaire, and distributed 60 initial questionnaires to the purchasers of industrial enterprises on June 20th, 2017, among which 43 valid questionnaires were collected with the efficiency of 71.6%. According to the sample data, we tested by SPSS17.0 software. According to the Cronbach coefficient value > 0.7, the factor load was less than 0.3 on each factor, the item was deleted from the two items in the service and 1 item in the reputation, modify and form a formal questionnaire. The official questionnaire was conducted from July 15th to June 31st, 2017, and the survey was conducted for those who had industrial procurement experience or members of procurement department in the shipbuilding industry. In the end, 450 questionnaires were distributed, and 416 questionnaires were retrieved. There are 408 valid questionnaires, with a total recovery rate of 92% and a total effective rate of 90%, indicating that the recovery rate and efficiency were ideal, and the next data analysis could be carried out.

The results of the study

Reliability and validity analysis

The reliability of the data is tested by the commonly used reliability test method "Cronbach’s \( \alpha \)" coefficient, and the construction validity of the data is tested by analyzing data in SPSS 17.0 software. After testing, the reliability index of each measurement index is between 0.7816 and 0.9510. When KMO is 0.835, it is suitable for factor analysis, and Bartlett sphericity test F value of the significance of the level is 0.000. The results of factor analysis show that the load of each factor is above 0.3, and the path coefficients are conspicuous, indicating that the questionnaire data has good reliability and validity.

The results of model adaptation

After the operation and the correction of the model, the models of the three levels all meet the adaptation standards. As can be seen from Table 1, CMIN, DF of the three levels are less than 3, RMSEA are less than 0.08, AGFI, IFI, NFI, CFI are higher than 0.9, indicating that the overall fit of the models is good.

<table>
<thead>
<tr>
<th>Adaptation index</th>
<th>Adaptation criteria</th>
<th>Model of managers</th>
<th>Model of Experts</th>
<th>Model of Information layer</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMIN/DF</td>
<td>&lt;3</td>
<td>2.587</td>
<td>2.873</td>
<td>2.911</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt;0.08</td>
<td>0.069</td>
<td>0.075</td>
<td>0.077</td>
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<tr>
<td>AGFI</td>
<td>&gt;0.90</td>
<td>0.924</td>
<td>0.901</td>
<td>0.944</td>
</tr>
<tr>
<td>IFI</td>
<td>&gt;0.90</td>
<td>0.973</td>
<td>0.922</td>
<td>0.936</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt;0.90</td>
<td>0.959</td>
<td>0.907</td>
<td>0.902</td>
</tr>
<tr>
<td>NFI</td>
<td>&gt;0.90</td>
<td>0.957</td>
<td>0.918</td>
<td>0.943</td>
</tr>
</tbody>
</table>

Path analysis
In the path coefficient diagram of management, except the price of the brand recognition path coefficient \( (\gamma = -0.19) \), and supply capacity of the brand recognition path coefficient \( (\gamma = 0.13) \) did not reach a conspicuous level, the other paths all meet this level. Among them, the quality to the brand recognition \( (\gamma = 0.55) \), the service to the brand recognition \( (\gamma = 0.47) \) has reached a conspicuous factor in the path coefficient of 0.01. \( (\gamma = 0.63) \), the path coefficient of the third party certification to brand recognition \( (\gamma = 0.37) \) reached a conspicuous level of 0.001, indicating that the relationship between these variables is very conspicuous.

In the path coefficient diagram of the expert layer, except the path coefficient diagram of reputation to the brand \( (\gamma = 0.15) \) and the path coefficient diagram of supply capacity to brand recognition \( (\gamma = 0.11) \) did not reach the conspicuous level, the other paths all reached the conspicuous Level. Among them, the service to the brand recognition \( (\gamma = 0.47) \) has a conspicuous level of 0.01. \( (\gamma = 0.39) \), the path coefficient diagram of the third-party certification to brand recognition \( (\gamma = 0.51) \) reached a conspicuous level of 0.001, Indicating that the relationship between these variables is very conspicuous.

![Path Coefficient Diagram of Management](image1)

Note: When \( P <0.05 \), with *said; when \( P <0.01 \), with ** said; when \( P <0.001 \), with *** said.

Figure 1. The path coefficient diagram of management.

![Path Coefficient Diagram of Expert Layer](image2)

Note: When \( P <0.05 \), with *said; when \( P <0.01 \), with ** said; when \( P <0.001 \), with *** said

Figure 2. The path coefficient diagram of the expert layer.
In the path coefficient diagram of the information layer, the path coefficient diagram of the reputation to the brand recognition ($\gamma = 0.29$) reached a conspicuous level of 0.05; the supply capacity to brand recognition ($\gamma = 0.23$), service to brand recognition ($\gamma = 0.33$), third-party certification to the brand recognition ($\gamma = 0.32$) reached a conspicuous level of 0.01. ($\gamma = -0.48$), and the quality of products to brand recognition ($\gamma = 0.45$) reached a conspicuous level of 0.001, indicating that the relationship between the two variables is conspicuous.

CONCLUSION

Conclusions on management

Reputation and third-party certification have the greatest impact on the brand recognition of the management. The reason may be that the management is at a high level in the enterprise, and they will also deal with the issue in terms of the company's overall interests. Third-party certification and reputation are factors based on the whole company, so the management will pay more attention. The quality and service of products also show a strong impact on the brand recognition of the management, indicating that no matter to people at which level in the company, the quality of products is the basis, as well as the essential supporting services. Price and supply capacity have little impact on the brand recognition of the management. The reason may be that companies have made clear demands about the price of products which they need to buy, thus there is no need considering the price again. The supply capacity of products is the issue on which the information layer focuses. These basic issues will have been resolved before the management makes decisions, so you do not need to consider it.

Conclusions on Expert layer

Quality and third-party certification have the greatest impact on the brand recognition of the expert layer, and the price has an important and negative impact on the expert layer. The expert layer plays a major role in the evaluation phase of
procurement, whose primary responsibility is to evaluate the products and to negotiate the price. The reason why price has an impact on the expert layer may be that the experts will measure if the price and the technology are consistent in the process of verifying the quality and technology of products. Service has less impact on the brand recognition of the expert layer because the service includes after-sales service, and industrial products is a long-term use of the product which will inevitably has some problems requiring to be solved by technical experts. If suppliers have services with good technology support, they will help reduce the burden. Reputation and supply capacity have a minimal impact on the expert layer, so you can not consider.

**Conclusions on information layer**

The assumptions on factors which Influence the brand recognition of the information layer are all true, among which the quality and the price of products have the greatest effects. The quality of products conducts positive effects while the price of products has negative effects. Supply capacity, service and third-party certification is the second most important factor information layer values. The impact of corporate reputation on the information layer is the smallest, but it also reached a conspicuous level of 0.05, indicating that it has practical influences on the brand recognition of the information layer. All factors have effects on the brand recognition of the information layer, probably because the information layer is the initial stage of procurement, and its main responsibility is to collect information and set standards. Therefore you need having a comprehensive understanding of the supplier and all the factors which have influences should be considered.

**REFERENCES**