

A Study on Procurement Management of Supplier's Selection and Evaluation for a Group

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Abstract. A group belongs to the chemical manufacturing industry. This paper will be based on the management status of supplier A group purchasing in supplier management, combined with relevant theoretical knowledge, make a comprehensive analysis of the existing problems, solutions and rational design, to improve the supplier management efficiency, improve supplier quality, ensure the production of material supply, improve the timeliness and accuracy of the company the existing supplier management status. At the same time, help the group to establish a scientific and reasonable supplier evaluation system, with a case study, elaborated on how to evaluate and select the best supplier, and its strategic cooperation, to solve the actual problems for enterprises. Finally, I hope this paper has certain reference value to the related enterprises in the industry.

Introduction

In the process of purchasing, the concept of purchasing management system is changing greatly, and the level of purchasing operation has become the decisive factor to strengthen the core competitive power of enterprise. Practice has proved that to achieve a profit margin of one percentage point is very difficult, especially in the sales segment, but can be relatively easy to implement the purchase process now, is expected to strive for a larger profit margins. As the procurement cost of crude oil accounted for about 80% of the total cost, when the procurement of crude oil prices as low as \$0.1 a barrel, the production capacity of 250 thousand tons/month refinery per month can save cost about 1 million 350 thousand Yuan, so to improve the procurement and supply chain management level, is the cradle of profit.

The relationship between petrochemical enterprises and suppliers: the relationship between petrochemical enterprises and suppliers is only a contractual interest relationship, not a mutual trust relationship. According to the different requirements of supply and demand, it will lead to the privatization of information, no sharing and the lack of timely response to customer needs.

In the process of purchasing issues: (1) procurement period or the delivery time is too long; (2) complex document work and unreasonable treatment process; (3) the lag of procurement management and supplier management; (4) the existing procurement activities only as in the past attention to personal affairs, ignoring the professional product design, supplier the innovation ability of participation and contribution; (5) purchasing personnel directly responsible for a wide range of materials, creating opportunities for corruption.

This paper will be based on the current situation of procurement management in A group, with the knowledge of purchasing management theory I study related working experience in chemical materials department and school, to make a more comprehensive analysis of the existing problems, solutions and reasonable design, in order to improve the efficiency of purchasing management, improve supplier quality, ensure the production of materials the supply of timeliness and accuracy, improve the company's existing procurement management status. At the same time, the use of quantitative and qualitative methods, the establishment of supplier evaluation system is scientific and reasonable, combining with the case and describes how to evaluate and choose the best supplier and partner for the enterprise to solve real problems.

Theoretical Basis

The section headings are in boldface capital and lowercase letters. Second level headings are typed as part of the succeeding paragraph (like the subsection heading of this paragraph).

The selection and evaluation of suppliers is a multi-criteria decision-making process, which is often affected by many factors in practical work. So far, many scholars and professionals, both at home and abroad on the supplier's technology and method of selection and evaluation of many, their research has already formed some mature theories and methods, there are generally three types: qualitative analysis, quantitative analysis, qualitative and quantitative method. In practice, purchasing managers are often a combination of qualitative and quantitative methods. The hair in the selection and evaluation of suppliers, procurement staff is often based on past experience of cooperation with suppliers and determine the relationship between personal subjective factors, occupy a large proportion, so the qualitative method is very limited in scope of application. The method of visual judgment, index method belongs to qualitative method.

Many decision-making methods at home and abroad, combined with the operating characteristics of our company, top leaders instructed the method of evaluation should be easy to understand, easy to operate, easy to spread, according to the requirements of leadership, evaluation methods of the weighted index evaluation method: analysis of the basic principle and the level of the same method, but the calculation is relatively simple method is to use a series of the paired comparison matrix to distinguish between priorities and performance evaluation of supplier performance rating, superior. This method firstly for performance measurement (W_y), and then the weight of each performance dimension for each supplier score (performance x_y), finally, using the following formula can be obtained for each supplier performance score. The formula is:

The total value of $x = \sum_{y=1}^n \text{performance } x_y \times W_y$

Format: x =supplier x , y =performance dimension, performance x_y =supplier $x \pm$ performance dimension y score

W is the distribution of the weight of performance dimensions for y , including: score $x = \sum_{y=1}^n \text{performance } W_y = 1$

If there are three A, B and C suppliers, now to evaluate their performance in XY, according to the principle of weighted index evaluation system, first for the standard weight, weight and price should be equal to 1, such as $W_{price}=0.3$, $W_{quality}=0.4$ $W_{quality}=0.3$. The weighted index evaluation coefficient scale, the scale of the program is: 5= is good, 4= better, 3= general, 2= poor, 1=very bad.

Analysis of Purchasing Status of a Group

With the rapid development of enterprises and the increasingly fierce market competition, enterprises put forward higher management requirements. Therefore, a group established the procurement management center in 2012, which is responsible for dealing with the procurement of the group's central molecular Corporation, and the procurement business has become the top priority. However, the traditional purchasing model has been unable to meet the needs of enterprise development by the A group: More than companies, suppliers, purchasing business is frequent and complex; the entire process of procurement and bidding, manual operation, efficiency is too low; the process of purchasing and bidding is difficult to track and query; lack of effective supplier database management and evaluation of supply situation management; the old purchasing operation environment is not integrated with the existing office system of A group, the data information is difficult to share, and the communication cost is too high; More than 5 major procurement management problems based on the general management of A group hopes to help the construction of information system, help Xianglutenglong change bidding work, change the bidding management, bidding procurement innovation system, improve the efficiency of purchasing management. After many visits, exchange of demonstration, and after bidding strict selection, the final A group decision and China electronic procurement system leader a mining through cooperation, electronic procurement system construction in A group (A group own electronic procurement bidding platform "), released in April

2012 and set up a group procurement center. However, the use of electronic tendering platform has not completely changed the efficiency of procurement.

Design and Implementation of Supplier Selection and Evaluation Plan

Selection and Evaluation

To determine the supplier evaluation index is the most important step and evaluation of supplier evaluation, according to the actual situation of group procurement, in order to make this set of supplier selection and evaluation system of the Department's approval, meeting with department members and leaders, decided to design the following four aspects: quality assurance ability, ability to offer delivery capability customer service and service ability. These four indicators set as an index, each level indicators, two indicators and the establishment of the corresponding index system, it can establish the supplier selection and evaluation form as shown in table 1 four first level indexes and 8 level two indexes. The meaning or formula of these two level indicators is shown in table 1.

Table 1. A group supplier selection and evaluation index system.

Target layer	Evaluating indicator		Meaning or formula
	First level index	Two level index	
Supplier selection and evaluation index system	Quality assurance capability	Product return rate	Product return rate = return times * 100% / delivery times
	Bidding Ability	Non quoted rate	No bid rate = non quoted times / total number of inquiries
		High rate of quotation	High price ratio = offer high number / total number of actual price (the first quotation / purchase price will more than 20% identified as high)
		Failure rate	Failure rate = the number of unsuccessful bids / the total number of actual bids
	Delivery capability	Delay rate	Delay rate = delay times / total order times
		Short crossing rate	Short delivery rate = short delivery times / total order times
	After-sales service ability	Default times	Cancellation of contract or order
		Service quality	Service complaint

Scoring Criteria for Selection and Evaluation

Standard for evaluation of supplier selection and evaluation after optimization, should follow the two basic principles, the first is as much as possible to achieve the objective evaluation, reduce subjective components, second evaluation criteria to be simple and easy to operate, even non-professionals for a short period of training to master, so we follow the above two principles to set the standard for evaluation, for each of the two level index is 10 points to, separately from the quality assurance ability, offer the ability to list, delivery, customer service capacity of four first class indexes are evaluation criteria of the two indicators of the corresponding table 2 is the quality assurance ability evaluation standard. The gradient of grading is 10, 8, 5, 3, 2, 0.

The weight is a form of quantitative evaluation of various factors, the relative importance of the overall measure of the magnitude of the things, in the multi index comprehensive evaluation, weight plays a decisive role in determining the weight calculation method has many kinds, according to the calculation of the original data when the weight of different sources, can be divided into two categories, one is the subjective evaluation, the original data is mainly based on the obtained by experts' subjective judgment and experience, such as the ancient forest method, Delphi method, AHP, etc.. Another objective assignment method, the original data with each index is formed in the evaluation of the actual data units, such as the difference method, principal component analysis method. According to the characteristics of the selection and evaluation of the suppliers of the

chemical materials department of a group, the opinions of the department leaders are adopted, and the expert judgment method is adopted to determine the weight of each index.

According to the weight determined by the above method, the weight matrix of the target layer of the two level index can be determined. We use similar methods to derive the weights of supplier selection and evaluation, as shown in table 2 The associated weights and purchaser supplier selection and evaluation of the purchase of materials to achieve the goals of supply, the supply target depends on the priority in purchasing the material properties and the influence of materials on the company, according to the above of Chemical Materials Department of the procurement of goods and materials are of strategic analysis, the material positioning is also to be included in the weight setting. According to different types of material analysis, selection and evaluation of different focus settings, and set different weights.

Table 2. Supplier selection and evaluation weighting table for all types of materials.

Serial number	First level index	Total Weight	Two level index	weight		
				Regular supplier	Bottleneck supplier	Strategic supplier
1	Quality assurance capability	30%	Product return rate	30%	30%	30%
2	Bidding Ability	10%	Non quoted rate	5%	10%	10%
		20%	High rate of quotation	20%	15%	10%
		10%	Failure rate	5%	10%	10%
3	Delivery capability	15%	Delay rate	10%	15%	15%
		15%	Short crossing rate	10%	15%	15%

Selection and Evaluation Model

In the supplier selection and evaluation of the project, the quality of our team to ensure suppliers to evaluate four aspects of ability, the ability to offer delivery ability and service ability, customer service, and formulate the corresponding standard for evaluation. According to the principle of weighting index evaluation system and the weight of supplier selection and evaluation determined by expert judgment method, we can get the score of each evaluated supplier:

A supplier selection and evaluation total score = quality evaluation score X quality ability + pricing ability evaluation score X Bidding Ability weight + delivery evaluation score X delivery capacity weight. The mathematical model of a group supplier selection and evaluation is as follows:

$$X_j = \sum x_j \times W_j = x_q \times W_q + x_p \times W_p + x_y \times W_y$$

Here we have a A group of Chemical Materials Department of X Y and Z, three key suppliers as an example to illustrate the application of the supplier selection and evaluation of the optimized model, table 3 is the selection and evaluation of X, Y and Z three key suppliers.

Table 3. Selection and evaluation of three key suppliers of X, Y and Z.

Serial number	First level index	Two level index	weight coefficient	Supplier X score		Supplier Y score		Supplier Z score	
				Score	Composite score	Score	Composite score	Score	Composite score
1	Quality assurance capability	Return rate	30%	10	3	8	2.4	9	2.7
2	Bidding Ability	Non quoted rate	10%	5	0.5	4	0.4	3	0.3
		High rate of quotation	20%	6	1.2	5	1	4	0.8
		Failure rate	10%	2	0.2	2	0.2	1	0.1
3	Delivery capability	Delay rate	15%	8	1.2	6	0.9	2	0.3
		Short crossing rate	15%	8	1.2	8	1.2	8	1.2
The total score				36	7.3	33	6.1	27	4.4

As can be seen from table 4, X, Y and Z three suppliers in quality assurance capabilities vary little, the ability to quote the gap has been opened, the delivery capacity, supplier Z has obvious weakness, so sum up

Supplier X is superior to suppliers Y and Z in all respects, which is the reason why supplier X wins in this evaluation.

Table 4. Supplier selection and evaluation results of Chemical Materials Department of A group.

Evaluation result	SupplierX	SupplierY	SupplierZ
Scoring	7.3	6.1	4.4
Rating	Good supplier	Qualified supplier	Bad supplier
Take steps	Maintain regular purchases	Maintain regular purchases	eliminate

Summary

The research done in this paper is to solve the practical problems of enterprises by applying relevant theories and practice. The measures and plans in this paper not only have practical significance for improving and improving the purchasing management level of A group, but also provide reference and reference for other similar enterprises. After a period of study, this paper obtained the preliminary theoretical results, and practice verification, but due to the time limit, the amount of data is limited, and my limitations, and needs further study on some problems in supplier selection and evaluation. With the rapid changes in the global economy and development, in order to reduce the purchase cost of the whole group, a group, more resources will tend to global sourcing, supplier selection and evaluation of how to make new adapt to this trend, still needs further study in practical work. In addition, how to make use of selection and evaluation to more effectively influence and deal with the relationship between suppliers, and provide more effective basis for the development of supply chain management strategy, should be further studied in the work.

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