Identification of Selection Criteria for Suppliers of Raw Materials in the Supply Chain of the Kavir Steel Complex

Mohsen Ghobadi*[1]

[1]*Wollongong university-Australia, Master of engineering management*

Abstract **- selection of supplier is a major issue in the supply chain, so that manufacturers spend 60 percent of their time on raw materials. Implementation and components. In addition, 70% of production costs are related to the purchase of goods and services. Therefore, selecting and determining the most suitable supplier is an important issue in the supply chain. One of the problems of the Kavir Steel Industry And the purpose of this research is to solve this problem in the industry, which is possible through library studies and field study in the industry through the questionnaire .In this project, we have tried to evaluate the 20 selected components, which will determine at the end of the project what are the most important factors in the Kavir steel complex.**

Key Words*: Supply Chain - Raw Materials Suppliers - Kavir Steel Complex, Company Efficiency*

1. Introduction

"Supply Chain" is a set of factors that create added value in the economy. Failure in this chain to create added value in a macroeconomic perspective [1]. Although initially referred to as the "supply chain" with a grand look, the focus will be on further clarifying the concept of the chain and its impact on business. In the two decades of the 60s and 70s, organizations were working to increase their competitive ability to produce standardized and improved internal processes, produce better quality and cost less. At that time, the prevailing thinking was that robust engineering and design, as well as coherent production operations, were prerequisites for market demands and thus more market share. For this reason, organizations were doing their utmost to increase efficiency. In the 1980s, with the increasing diversity of customer-facing patterns, organizations increasingly became more interested in increasing the flexibility of product lines and developing new products to meet the needs of customers. In the 1990s, along with improvements in production processes and reengineering patterns, many industry executives found that to keep up with the market, only improving internal processes and flexibility in the company's capabilities is not enough, but suppliers of components and materials should also Produce the best quality and lowest cost, and product distributors should also be closely associated with the market development policies of the manufacturer. With such an approach, the supply chain management and management approaches have come to fruition. On the other hand, with the rapid development of information technology in recent years and its widespread use in supply chain management, many key chain management activities are under way with new methods. Unlike some management reforms that have different definitions. The supply chain is viewed by all the conceptual managers. The supply chain includes all businesses and entities that directly or indirectly provide final customer satisfaction. Contrary to what most people have in mind, intermediary elements in management are not considered to be unnecessary and harmful. The supply chain does not just include manufacturers, but also, in addition to the manufacturers, all the factors that supply, sell, transport, store and provide the raw materials needed by the factories, and also include sellers and distributors of the finished product [2]. Clearly, by eliminating or diminishing the role of each of these factors, the supply chain has not worked properly, and not only will that chain of work remain open, but will also disrupt the activity of the rest of the circles. The organization should evaluate and select suppliers based on their ability to provide a product that meets the organization's requirements. The criteria for

selection, evaluation and re-evaluation should be determined [3]. The records of the results of the evaluations and any necessary measures arising from the evaluation should be kept. This purchase information should describe the product that is being purchased and, as the case may be, include:

A. Requirements for product approval, procedures, processes and equipment

B. Requirements for Personnel Eligibility

C. Requirements for the quality management system

The organization must be sure of its adequacy before issuing the specified requirements for the purchase to the supplier. Verification of purchased product (Clause 7.4.3 of Iran Standard - ISO 9001, 2009).The organization should determine and enforce other inspections or other activities to ensure that the product meets the requirements specified for the purchase. Whenever an organization or its customer intends to carry out certification at locations under the authority of the supplier, the organization must indicate the arrangements for approval and discarding the product in the purchase information [4].

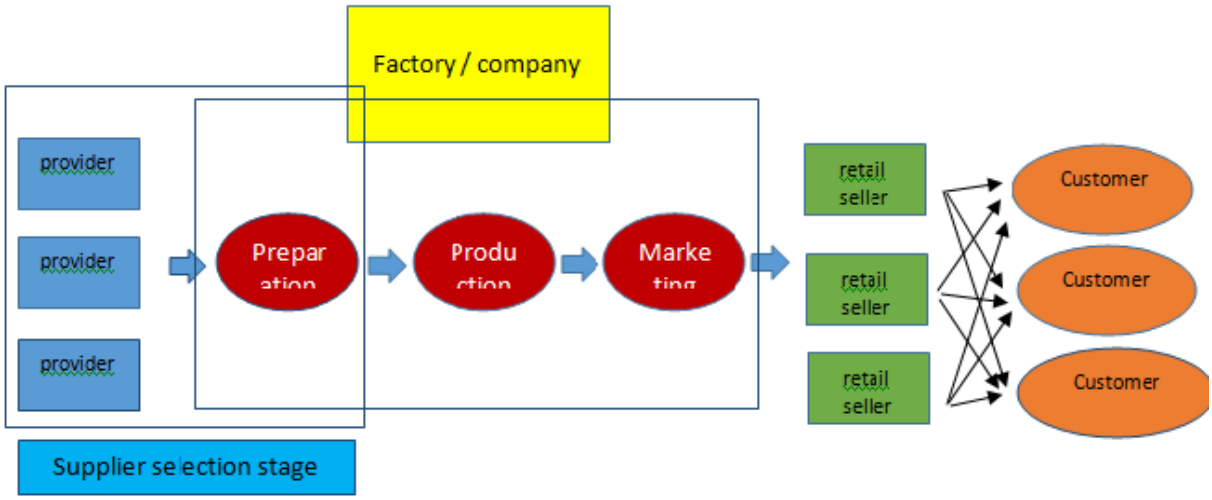

Fig. 1. Concept of supplier selection stage

Given the large number of suppliers of raw materials and the choice of suppliers among suppliers, it is a matter of great difficulty and high risk that the project has tried to find a suitable solution for this selection, so that it can be a good model for this process. Made The problem is identifying factors for choosing the supplier of raw materials suitable for the KWP plant, which should use library research and field research. The present research seeks to answer the following questions:

1. What is the factor of communication in selecting suppliers of raw materials?

2. What is the quality factor in selecting suppliers of raw materials?

3. What is the importance of financial factor in selecting suppliers of raw materials?

4. How much does the service agent matter in selecting suppliers of raw materials?

In the next section of the research, the literature has been studied. Then the research plan is expressed and in the last section the conclusions of the research are presented [5].

2. Research Literature

Supply chain management is the coordination of the production, inventory, location and transportation of the participants in a supply chain, to achieve the best combination of responsiveness and efficiency for market success.

A set of methods used to integrate efficiently and efficiently suppliers, manufacturers, warehouses, and vendors in such a way that, in order to minimize system costs and meet service needs, goods are

delivered to the correct number at the right place at the right time and To be distributed. The objectives of supply chain management can be considered as follows:

- Reducing costs or reducing inventories, increasing customer accountability, improving supply chain communication, reducing production cycle times, and improving coordination.

- The three main factors that led the managers to follow the supply chain management seriously:

- Information Revolution

- Demand for customers to buy products and services at a lower cost, better delivery of more modern technology and longer life, which ultimately led to increased competition among manufacturers and consumers.

- The need to create a new structure in inter-organizational relationships

Today, the number of components of modern industrial products has grown to such an extent that the supply of these components and the management of their suppliers has become a major problem for the manufacturing companies, and furthermore, since each of these parts must first be carefully designed and then made. And available to the final installer, the coordination and management of this important thing is overwhelming [6]. In order to solve this problem, Henry Ford suggested in 1950 that it would be best if a lot of pieces made and manufactured inside it were provided by foreign suppliers. By providing a detailed map to the piece makers, the contract is signed by the lowest bidder and this contract is not over a year. After that, when he encountered economic problems, he saw the best way to break suppliers by terminating the contract. In the mid-1980s, when mass production was not cost-effective, companies such as GM and Chrysler reduced their domestic suppliers. The reason was that Japan's success in their supply systems was low wages for outsourcing companies. They learned from experience that the manner in which the Japanese adopted (now known as pure purity) has been stealing from them. In this way, the Japanese choose the supplier of all their components from the start, and in this case, the choice of supplier is no longer the only price criterion. But also a selection criterion, a history of collaboration, and a past that exists from the supplier's performance. In short, today, the tendency of most major corporations to move around the world is similar to that of the Japanese management approach. In other words, they seem to have chosen this method as the most efficient way to manage suppliers. With regard to practical experiences and academic studies on how to optimize supplier management, two different models have emerged:

A) The bullying model: A traditional approach that supports the theory of reducing dependency on suppliers, which leads to the maximum bargaining power. The main application of this model is in the purchasing strategy of buyer companies to maintain suppliers along with avoiding any accruals against them. In describing the model, which has been accepted in the United States as the most effective and efficient supplier management approach, Michael Porter states, "The purpose of purchasing activity is to find mechanisms for balancing or eliminating resource supplies. Buying a piece of goods can be handed over to various suppliers in order to improve the bargaining power of the company.

B) Collaborative model: A new approach in which trusted parties rely on each other and, in fact, invest enormously in terms of engagement by enriching the level of information they share. This, in turn, will reduce costs, improve quality and accelerate product development. It needs to be explained that the success of Japanese companies is due to the establishment and maintenance of relationships with suppliers in the form of such a strategy. As previously mentioned, usually the buyer companies divide them into two groups in order to manage their suppliers [7]. The first group includes suppliers that provide essential but non-strategic components, and the second group includes suppliers that provide strategic components. In the vocabulary term, the suppliers of the first group, the independent suppliers and the suppliers of the second group, are affiliated suppliers. In general, two major approaches have been used in the history of supplier selection, one of which is decision analysis using MCDM approaches (multi-criteria decision models), and the other is the

use of mathematical programming that follows the articles in this field. Both approaches are checked. Gabala was the first scholar in 1974 to apply math planning to select an author in a real case. He used complex integer programming to minimize the total price of the items assigned to each supplier. He also developed a mixed-integer one-goal integral planning program to minimize purchasing, inventory and shipping costs by considering several items, multiple time periods, quality, delivery, and capacity. In 1997, O'Brien and Ghodsipour created a decision support system to reduce the number of suppliers based on the supply-side optimization strategy. They used a hierarchical analysis process with integrated integer programming and limited supplier capacity and budget constraints and buyer quality. Also, in another study in 1998, they introduced a hybrid model of AHP (hierarchy analysis process) and program Provides a linear approach to help managers in choosing a supplier, which takes into account both quantitative and qualitative factors in the purchasing activity [8-10]. Then, in 2001, developed a multi-objective nonlinear model taking into account inventory control costs and supplier selection and budget and capacity constraints, and introduced qualitative standards in their modeling. presented a method for modeling and solving the choice of supplier that has three stages: a) defining selection criteria and weighting them; b) using fuzzy TOPSIS and verbal data for ranking suppliers; And c) sensitivity analysis of the model by changing the weight of the criteria. Shemshadi and his colleagues also solved the fuzzy multi-objective decision making model for choosing the supplier using the Vikor method. Other multi-criteria decision-making methods used in choosing suppliers are the application of utility theory and the compatibility-based mathematical model. By reviewing the literature on the choice of supplier, it is clear that most models have been developed to minimize costs, and limitations such as budget and delivery times are also present in some modeling, but the real issue in supply choices It has a significant role to play in discussing the quality of the product, which has been neglected, and only in some multi-dimensional decision making models using descriptive data. In this paper, an approach to simultaneously optimize the choice of provider and quality control issues is provided, in which quality criteria are also considered along with quantitative criteria. Also, in order to determine the weight of the criteria, in addition to experts, Shannon's entropy method was also used, and then the results of the two methods were combined and unified, and finally, using one of the SMADM models, suppliers were ranked based on these general criteria. A lot of research has been done on supply chain management

3. Research plan

The statistical population of this research is all the people of the Kavir Steel Complex, which are active in the raw material suppliers sector, with 12 of them selected. The questionnaire is based on the Likert spectrum. 20 agents were questioned in 4 communication, qualitative, financial and service groups. The following factors have been gained through library studies

1. How to deal
2. Communication system
3. The history of working relationships
4. Dealer's attitude with the organization
5. Geographic location
6. Perception and feeling of special circumstances
7. Technical capability
8. Quality of service
9. Compatibility with the buyer's process
10. Environmental cleanliness11. Quality uniformity
12. Position among competitors13. Suggested price
14. Financial stability
15. Warranty
16. After-sales service
17. Training aid
18. Production capability
19. on time delivery
20. Ability to store and store

4. Analysis of research variables

The table below shows the different criteria used by the researchers in selecting the supplier:

Table 1. Selection criteria for researchers

Wing	Lin & chang	Chen	Pi & low	Tam & tummala	Weber et al1992 [2]	Ellram 1990	Shipley 1985	Evans 1980	Dickson 1966	selection criteria
			*		*	*	*	*	*	Price
		*	*	*	*	*	*	*	*	Product quality
*			*		*	*	*	*	*	Timely delivery
									*	Warranty
				*					*	after sales services
				*						Technical capability
			*						*	How to deal
						*				the quality of service
									*	Educational Aid
*				*	*				*	Past performance
		*			*				*	Financial stability
					*				*	Location
									*	Working relationships
	*	*								Close relationships
									*	Management and organization
	*	*								Ability to solve issues
	*								*	Communication system
		*								Customer Response
					*				*	Technical capability
					*				*	Production capability
									*	Packing capability
									*	Operation control
									*	Past business amount
*	*			*	*				*	Fame and position in the industry
									*	Recreate
									*	Perception and feeling
									*	Business endeavors
					*				*	Ability to maintain
*										Market size

The factors listed are divided into four groups below

1. Communication
2. Qualitative
3. Financial
4. Service

Based on the results, the relationship with 26.71% and the quality factor with 29.45% and the financial factor with 11.98% and service agent with 31.84% points. The information received from the questionnaire is as follows:

Table2. Detail percentages of factors

percent	Components	Factors
16.66	How to deal	communicational
14.10	Communication system	
17.94	history of working relationships	
16.66	seller's dealings with the organization	
14.10	geographical location	
20.51	Understanding and feeling special circumstances	
16.60	Technical capability	Qualitative
23.25	the quality of service	
13.95	Compatibility with the buyer's process	
10.46	Environmental cleanliness	
13.95	Uniformity of quality	
19.76	Position among competitors	
48.57	Proposed price	Financial
51.42	Financial stability	
18.27	Guarantee	Services
20.43	after sales services	
12.90	Educational Aid	
17.20	Production capability	
19.35	Timely delivery	
11.82	Ability to store and store	

5. Conclusion

In this research, using the background of the research and interviewing experts, the factors influencing the selection of suppliers of raw materials of the Kayer-Reza Steel Complex were selected by a total of 20 agents. By setting up a questionnaire, these 20 factors were evaluated by experts. The 9 most important factors Factors influencing the selection of raw material suppliers were identified. Because of the importance of the qualitative factor, we will address this broader explanation: The quality has been defined in many ways, including the criteria for being good, quality, matching with customer demands, and so on. The quality of the goods purchased is very important to the organization, and in some cases it is vital. The quality of the goods purchased on the one hand in the production of the final product and its appropriateness is effective for the customers of the organization, and on the other hand, it achieves more satisfaction with its possible use in the organization. Therefore, the good quality of the purchased materials and goods has a direct impact on the efficiency of the organization. The quality of a product is determined by product characteristics and its compliance with consumer expectations and compliance with predetermined standards, and since customer expectations and generally human judgment depends on several factors, which is the same It makes the interpretation and interpretation of the subject matter a relative and tangible aspect. A product that may be introduced in terms of a quality customer may, in the eyes of another customer, be a regular product or even a low-quality product because the expectations and demands of these two customers are different. Due to the importance of buying quality goods for customers and for the organization, organizations are trying to identify the various types of quality products they need and try to purchase and receive good quality goods. Of course, quality is relative and therefore the best product is not always the most suitable option for the company. In order to provide a single definition of the quality of goods, various organizations around the world have been formed that attempt to determine the desirable level of quality of goods as commodity standards. Standards have different types and are categorized in

multiple fields. Some standards are limited to a specific organization, and others are applied at the national, regional and international levels. Some standards are mandatory and all manufacturers are required to comply with them, while others are optional and encouraging. In order to control the provisions of the contract and receipt of goods with predetermined specifications, the goods are subjected to quantitative and qualitative inspections that determine the extent and conditions of these inspections for the type of work and relationships between the buyer and seller and other factors. In some cases, all goods are inspected, while some shipments are either superficially checked or checked for a number of total shipments (sample of cargo). The task of standardizing and verifying the quality of goods in Iran is by the Organization for Standard and Industrial Research of Iran, which is one of the active members of the International Organization for Standardization (ISO). The realization of the optimal purchase in the organization requires the use of a set of principles and orders that are named after the requirements of successful purchasing management [11].

Some of these requirements and principles are:

1. Ensuring the continuous flow of materials and goods into the organization: As a very fundamental principle, it should be emphasized that, under no circumstances, the organization should not be faced with a shortage of goods and equipment. This emphasis is due to the high cost that the lack of or lack of goods and materials will result in the organization. Some of these costs include the following:

- Lost opportunity costs

- Decrease our creditor due to lack of timely delivery of customer orders

- Reduce the efficiency of the organization due to incomplete capacity operation

Accordingly, organizations are planning to ensure the regular flow of goods to the organization.

2. Avoiding the excessive accumulation of inventory of goods and materials in Anbar: High emphasis on the above principle does not mean accumulation of surplus goods of the organization, but it should be done through accurate estimates and the selection of reliable sources, in addition to timely supply of goods, from the accumulation of goods in The organization's warehouses and costs associated with it, such as the recession of capital, damage to products, maintenance costs, etc., were also prevented.

3. Establishing appropriate relationships with qualified suppliers and trying to maintain them: To reduce some costs, including the costs of finding new suppliers and ensuring their performance, enjoying the benefits of permanent contact with a vendor, such as receiving Discounts, mutual trust, etc., must try to find long-term relationships with the appropriate supplier.

4. Finding alternative sources and not relying on a specific customer: Having ongoing relationships with suppliers means not communicating with an offer or and not making all purchases from a source, but the organization must avoid purchasing from a supplier to avoid being severely dependent on it. Two or more vendors, and so-called all options on the table. "

5. Acquire knowledge of the market trends and developments: information about different suppliers and the conditions and possibilities of each of them, technology in the market and its changes, prices and fluctuations in local, national and international markets and similar items. One of the essential elements for maintaining the competitive position of the organization.

6. Co-operation and coordination with other parts of the organization: Having a system attitude for purchasing managers is inevitable, since the unit purchasing activities require the support and support of other units and, on the other hand, affect the performance of other units of the institution and the overall performance of the organization. Therefore, it is very effective to communicate continuously with other parts of the organization and the ongoing flow of information between the purchasing department and other units in the success of the purchase.

7. Prioritizing effective factors in purchasing and avoiding one-dimensional thinking in buying: Choosing a source of goods should not only emphasize a particular factor, such as quality or price, but should prioritize effective factors, optimally combine these factors in Considered. It should be

noted that this prioritization is different for different organizations or even for a particular organization in different times and for different products.

8. Appropriate recruiting and training of staff: Compliance with the above and their proper implementation and achievement of the desired goals may only be carried out if committed, trained and trained personnel is available, and if this is not the case, the accuracy of other factors We will not aim at the goals, therefore selecting and recruiting people who have a professional and ethical merit for this job is an important issue that should be seriously pursued by management.

9. Employee motivation: Due to the difficulty and special sensitivity of the occupation, there must be incentives for employees in this sector to provide incentives such as compensation, rewards, promotion, etc.

10. Control of purchasing activities: Due to the importance and effective role that the procurement process and its proper implementation on the overall performance of the company, these activities should be reasonably monitored by the management of the organization.

Procurement management as a sub system in the composition of the overall organization of the organization plays a role like the role of the heart in the existing body system because the purchasers and suppliers of raw materials, by supplying the required body of the organization, make blood in the body of the organization, why If the materials and supplies are not provided to consumer units at the right time and at the right time, the organization's turnover, especially the manufacturing and industrial organizations, is interrupted. Procurement management is a "set of activities, including the procurement and provision of the goods and services required by the organization at the time of the desired quality and reasonable price, maintenance and care in the warehouses and their timely delivery to the applicant units in accordance with the laws and regulations governing Organization". In this way, it can be assumed that the success of various manufacturing and commercial organizations is to a large extent dependent on the proper performance of the logistics management tasks. In order to understand the importance of logistics management, it is sufficient to note that the purchase unit budget in many organizations accounts for between 30% and 50% of the total budget of that organization, and most of its working capital is spent on the purchase of goods (including Equipment, parts, machinery.

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