Suppliers Selection for Sazeh Gostar Saipa Co. Using a Combination Approach of Analytic Network Process and Goal Programming

Hassan Farsijani, Department of Industrial Management, University of Shahid – Beheshti, Tehran, Iran

Mohsen Shafiei Nikabadi, Department of Industrial Management, Faculty of Economics and Management, Semnan University, Semnan, Iran

Reza Malmir, Department of Technology Management, University of Shahid – Beheshti, Tehran, Iran

Fatemeh Shakhsian, Department of Business Administration, University of Payam-e Noor, Tehran, Iran

ABSTRACT

Strategic evaluation and supplier selection, or strategic supply, is a main subject of supply chain management. Strategic evaluation and supplier selection is a multi-criteria decision problem, considering both tangible and intangible criteria and organizations are seeking various and sometimes opposite objectives in purchasing from suppliers. As the increasing rivalry in Iran’s auto industry, producers and suppliers face several challenges. Sazeh Gostar Saipa Co., the main supplier of Saipa automobile maker firm, is not exempt of this norm. Top managers of the company believe that the best supplier selection for long-term cooperation is vital for the implementation of corporate strategies. In this paper, using decision technique of Analytic Network Process (ANP) and Base Overhead Cost Recovery (BOCR), 20 tangible and intangible operational and strategic criteria are considered in the supplier selection decision through a suggested methodology. Different organizations’ goals in purchasing from suppliers that are ranked in the previous stage are formulated to determine the amount of supply allocation to each supplier based on goals. The innovation aspect and main goal of the research are suggesting a methodology for selecting suppliers and determining the amount of allocated orders to them with combining ANP method, BOCR structure and goal programming in Sazeh Gostar Saipa Co.

Keywords: Analytic Network Process (ANP), Base Overhead Cost Recovery (BOCR), Goal Programming (GP), Strategic Evaluation, Suppliers Selection, Supply Chain Management

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1. INTRODUCTION

Every organization needs proper inputs to access the agreeable outputs such as producing goods, giving services or business activities. Organization input is one of the important options that effects on profit margin and life cycle of organization. Therefore supplier’s evaluations have special importance as a key factor through gaining appropriate inputs. Supplier selection has propounded as one of the strategic concepts in supply chain management and it is counted among basic responsibilities of management. Making decisions about supplier selection has an important role in logistic producing and management in factories. The selection of the most appropriate suppliers for cooperation is essential for firms to improve their competitive advantage. Many firms have this idea that supplier selection is one of the most important organization activities. Even though the research on supplier selection is abundant, the works usually only consider the critical success in the buyer-supplier relationship. However, the negative aspects of the buyer-supplier relationship must be considered (Lee, 2009).

Sazeh Gostar Saipa Co. is the first supplier of auto-pieces for Saipa Co. which has a supply chain with about 600 firms. Whereas Iran’s auto-industry is facing to an increasing competitive situation, close and long-term relation to suppliers is necessary for companies. Accordingly, the purpose and Innovation aspect of this paper is to present a comprehensive model which considers almost all long-term and short-term, negative and positive, operational or strategic criteria. Moreover, the possibility of determine the amount of order to each supplier according to all constraints is considered.

2. THE PROBLEM STATEMENT

It is noticeable that two kinds of problems exist in supplier selection problems; in type 1, supplier can provide all the needs of the organization. In type 2, a supplier can not to provide all needs of the organization on its own. As a result, management should decide to sort the suppliers and allocate the amount of orders based on desirability and preference. Thus, two questions must be answered in this kind of problem: first, which suppliers are the best, and second, how much should be bought from each supplier? (Erdogmus et al., 2008)

Two points are important in second kind of problem—that also included this research. What standards must be attended, what methods can be used to compare suppliers and finally how much the share of each supplier from amount of the order must be?

Furthermore, it should be noticed that supplier selection of the organization is a strategic decision and it has an effective role in supply chain and organization. Because of this strategic nature, supplier selection must be in the direction of organization’s strategy. But there is a question how to choose the proper supplier according to organization’s strategy in order to gaining the most opportunity and avoiding high costs and risks? Answering this question needs a systematic and complete evaluation. So, to reach the purpose, BOCR model can be used. This model has a completely systematic view, not only the short-term but also long-term targets are mentioned in the concept of this model. Also, positive and negative, tangible and intangible factors can be covered (Chao & Qing, 2007).

Therefore in this research, in order to evaluate and select the suppliers strategically, we are to answer the following question:

1. Which are the effective criteria to select proper suppliers in Saipa Co. according to BOCR model?
2. How is the importance of the final selected criteria?
3. How to weigh and prioritize the criteria to rate components’ suppliers?
4. Which combination of suppliers meets the components’ demand?

The Analytic Network Process (ANP) under Base Overhead Cost Recovery (BOCR) structure is used for selecting criteria and for
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