Chapter 30
Supplier Selection in the Healthcare Sector:
A Multi-Criteria Proposal

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ABSTRACT

Supplier selection is a common practice in industrial sector and is usually conducted by engineers and administrators. However, in the healthcare sector, supplier selection is less commonly studied. This chapter proposes a methodology that simplifies the selection of suppliers in hospitals. As case study, the authors propose an example in which they evaluate six potential suppliers as alternatives with five attributes. The proposed methodology integrates the nominal group technique (NGT) to weight the attributes and dimensional analysis to estimate an index of similarity to an ideal supplier. This index of similarity is obtained from the best nominal values of the attributes. This methodology can be easily applied; it is intuitive and friendly to inexpert users, since the evaluation can be performed using a traditional

spreadsheet. Also, the proposal allows for the simultaneous evaluation of multiple attributes and can be used by hospital administrators themselves, which prevents hospitals from hiring external services.

INTRODUCTION

In current globalized markets, final products are complex and diverse, since their components are usually processed in different countries, assembled in other a finally, distributed to customer in other. In such cases, supply chains play a crucial role in reducing costs, since in some special products, up to 70% of costs derive from its transport and logistics, where no value is added (Alikhani, Torabi, & Altay, 2019; Gosling, Purvis, & Naim, 2010). Under this scenario, hospitals establish their headquarters in strategic regions that allow them to reduce costs while still benefiting from a physical proximity to customers. Therefore, a potential location for a given hospital must always consider both the supply chain and suppliers' locations as important variables, as additional to customers for it service (Fu, 2019; Kim & Chai, 2017).

Every supply chain starts with the selection of its providers, who supply the necessary raw materials and services. Supplier for a hospital includes drugs supply, instruments and surgical equipment, cleaning and disinfection services, laundries, energy and other. Managers in hospitals must focus in integrate all those suppliers for offer a better health to customers and the relationship with them must be very close for reduce uncertainty (Imran, Kang, & Babar Ramzan, 2018).

Nowadays, many studies address the supplier selection process and identify the attributes that are to be considered, the techniques to be used, and the methodological procedures to be followed. In such works, we can successfully identify which activities and aspects must be taken into account when selecting suppliers in the industrial sector (Igarashi, de Boer, & Michelsen, 2015). Unfortunately, the healthcare sector is usually neglected, yet research has shown that clinics and hospitals struggle to appropriately select their suppliers. This problem aggravates when it compromises the health of patients (Hu & Dong, 2019; Qiaohai & Schwarz, 2011).

Currently there are several papers reporting the supplier selection problem and its importance for supplier chain in a company. For example, Yu, Shao, Wang, and Zhang (2019) report a case study using multicriteria techniques and integrate the sustainability concept for green supplier, Lo, Liou, Wang, and Tsai (2018) offer a method that integrates sustainability and green concepts, Su and Chen (2018) reports the case for uncertainty management in a supplier selection process, among others. It is easy to see that the sustainability in procurement is currently a constant.

Related to supplier evaluation and selection techniques, these can be simple or combined, depending on their complexity level, the technique is simple if there is used a unique technique or combined if two or more techniques are used. Also, they can be categorized into economic, analytic, and strategic techniques, being economic techniques and analytic techniques the most popular (Wetzstein, Hartmann, Benton jr, & Hohenstein, 2016). The economic techniques refer to traditional and common practice in industry and others sector and the most representatives are the internal rate of return (IRR), equivalent annual cost, payback return period, net present value, among others. These techniques are reductionist and exclude from the analysis qualitative information related to the alternatives and they are focused only to financial aspects (Grzybowska & Kovács, 2017).

The analytic techniques can integrate quantitative and qualitative information from alternatives and the most common techniques include the analytic hierarchy process (AHP), linear and integer programming,

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