SUPPLIER SELECTION IN HEALTHCARE SECTOR

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ABSTRACT
Although supplier selection is a well-studied subject within the literature, its application in healthcare sector remains considerably untouched. This study aims at filling this gap. To do so, supplier selection criteria in healthcare sector were researched, a hierarchical structure specific to the sector was proposed, and the criteria within the model were prioritized by considering the evaluations of the managers of 6 well-known healthcare organizations in Istanbul, Turkey.
Keywords: Supplier Selection, Healthcare Sector, AHP.

1. INTRODUCTION
The healthcare sector is considerably different than other sectors having patient care as the most important objective. Nevertheless, survival of the healthcare organizations still depends on money, because of emerging severe competition.

One of the most vital objectives of purchasing departments is obtaining the inputs at the right cost in the right quantity with the right quality at the right time from the right source. Thus, companies must select the most appropriate suppliers, since it brings significant savings for the organization [1, 2, 3].

"The supplier selection process varies depending on the nature of the products and services to be procured. The selection process usually consists of a number of stages some of which do not apply to simple purchases. At each stage the number of potential suppliers is whittled down to end with the selection of what is hoped to be the most suitable that meets the requirements. Each company must first meet the order qualifiers. After that, the selection process goes on with evaluating the potential suppliers against order winners." [4]

This study aims at providing managers of healthcare institutions with a ready-to-use model to select the most appropriate suppliers. Because of the complex structure of the decision criteria, a hierarchical model is proposed. The priority weights of the criteria are calculated considering the evaluations of 8 experts from 6 well-known healthcare organizations in Istanbul, Turkey, by using Analytic Hierarchy Process (AHP).

2. METHODOLOGY
As mentioned before, the unique nature of the healthcare sector effects criteria structure and evaluation stages of supplier selection. After a thorough literature review about supplier selection, a draft model has been prepared. This model has been taken as the basis in the interviews with the purchasing managers of 6 well-known and largest (in terms of both revenue and patient numbers) hospitals in Istanbul. These interviews indicated that traditional supplier selection criteria proposed for several manufacturing industries in the literature need to be modified and specialized in order to reflect the diverse needs of healthcare sector.

Drawings of interviews include, but not limited to the items below:

- Healthcare sector is a relatively uncompetitive and consolidated environment in terms of manufacturers of critical equipment used in surgery operations,

- In terms of medicals, there are well known brands, which are also recommended by doctors, chosen without any selection process, and

- Other materials and equipment, which are not for medical use and not related with patients' care, procurement is done considering solely the cost.

Keeping these in mind, a criteria list has been populated to select and evaluate surgery equipment suppliers. Considering its extremely high priority, "Quality" has been identified as an order qualifier for this sector. Suppliers have to satisfy predetermined quality requirements to become eligible. Criteria and sub-criteria within the hierarchical model are then defined according to the interviews, which are done with the purchasing managers of the visited healthcare organizations in Istanbul. Definitions for proposed sub-criteria for supplier selection in the healthcare sector are given in Table 1.

Table1. Definitions of Sub – Criteria for Healthcare Supplier Selection

Criteria	Sub-Criterion	Definition
Cost	Total Cost	Overall cost of purchasing products from supplier, including product price, freight cost and custom duties.
Service	Delivery Schedule	Suitability of the supplier's proposed delivery schedule to the healthcare center's operational schedules.
	On-time Delivery	Shipping time and supplier's correspondence to the promised due dates.
	Response to Changes	The ability of the supplier to response to change based on the healthcare center's demand, price structure, order frequency and current business scenario.
	Technical Support	Technical support for the possible problems.
	Warranty Period	Length of the warranty period for supplied product.
Supplier's Profile	Customer Base	Supplier's references.
	Terms of Payments	Payment conditions that supplier proposed. Including payment dates and acceptance of the purchaser's payment conditions.
Risk	Geographic Location	Supplier's home country, and plant location (to consider the risk of natural diseases, etc.) should be taken into consideration.
	Political Stability	The political status of the supplier's country and its economical policies.
	Economy	Economic stability of the supplier's country (since it may effect the long time relationships, currency exchange rate, etc.).

An AHP model is built up with proposed criteria to select suppliers in healthcare sector. Suppliers will be selected after evaluation is made for each supplier against each sub-criterion.

AHP is the most popular method used in the literature. This method divides a complicated system under study into a hierarchical system of elements. Pair-wise comparisons are made of the elements of each hierarchy by means of a nominal scale. Then, comparisons are quantified to establish a comparison matrix, after which the eigenvector of the matrix is derived, signifying the comparative weights among various elements of a certain hierarchy. The eigenvalue is used to assess the strength of the consistency ratio of the comparative matrix and determine whether to accept the information [5]. If required, an overall ranking of the decision alternatives can follow. AHP provides decision makers with a way to transform subjective judgments into objective measures.

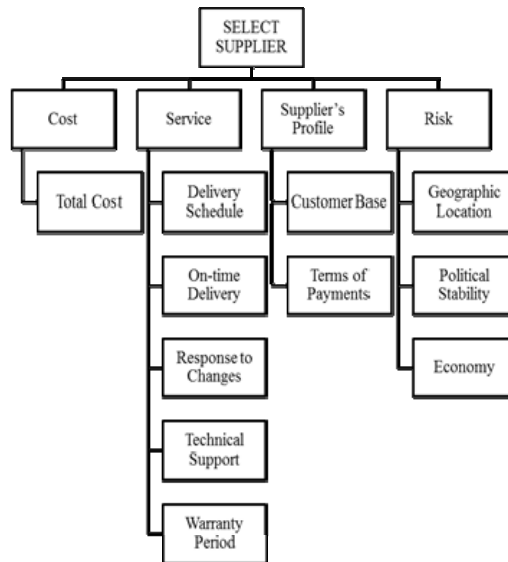The structure of the supplier selection criteria in healthcare sector is shown in Figure 1.

Figure 1. Hierarchical model for supplier selection criteria in healthcare sector.

3. FINDINGS AND RESULTS

First, the consistency ratio is calculated as 0.05. Since this value is less than 0.1, the evaluations are consistent. In the first stage, the evaluation was performed for four major criteria, given the judgments from the questionnaires. Service was found to be the most important factor, with a priority of 0.496, in selecting the best supplier. Supplier's profile is also a major factor with an importance priority of 0.293. Cost has a priority of 0.171 and Risk has a priority of 0.040. It means that service is the most important criterion. Potential suppliers must pay higher attention to service and its sub-criteria to be preferred.

All of the weights of the sub-criteria are shown in Figure 2.

4. CONCLUSION

In this research, one of the most popular research topics, supplier selection, is discussed in an untouched area of application, healthcare sector. One of the most distinctive characteristic of this sector is its unique nature compared to manufacturing and other service industries. Decisions cannot be made focusing solely on supply chain management concepts, but health and life of the customers in this sector should also be considered. Taking these into account, a new set of criteria is proposed in this study. These criteria were discussed with several managers from different healthcare organizations. Maybe the most interesting part of these discussions is the conclusion about the criterion "quality". It is conceived as a stand-alone order-qualifier criterion. It means that there is a threshold for quality. Potential suppliers performing under this threshold are directly eliminated

whereas others are found eligible for further selection. This process returned a final hierarchical supplier selection model specific to the given sector where "quality" resides somewhere in the very beginning, outside the model.
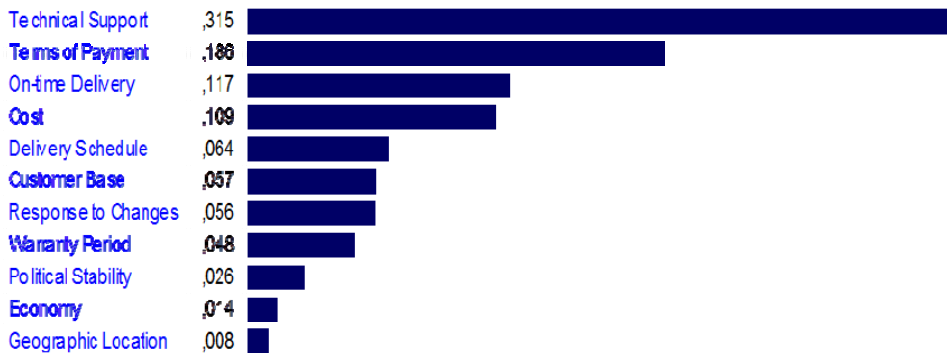

Figure 2. Weights of the sub-criteria.

8 experts from 6 healtcare organizations were surveyed to define the priority weights of the criteria and sub-criteria for supplier selection. The aggregate values for their evaluations taken as pairwise comparisons are fed to a software called Expert Choice.

The results show that, Technical Support, Terms of Payment, and Total Cost are three most important sub-criteria in the evaluation process. Because of the unique nature of the sector, the health services within a healthcare organization must be uninterrupted. It can be concluded that the significantly high importance of technical support is a result of this. This finding also presents a very important clue for the suppliers in healthcare sector to shape their future: "To create value for their customers, they must provide them with a very good technical support". Since there exists an extreme responsibility residing in healthcare organizations, they want to work with companies feeling themselves responsible as an integrative part of a cohesive whole.

For further research, the effects of the size, and the expertise area of the healthcare organization on the model can be researched.

5. REFERENCES

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