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The AHP-TOPSIS based DSS for selecting suppliers of information resources

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Abstract:
The main aim of the study was to determine the possible attach a DSS as a sub-system to Voyager, based on MCDM techniques for selecting suppliers of information resources as a part of the acquisition library system. Voyager is a library management system. The host organization in this study was the Victoria University of Wellington (VUW), Wellington, NZ. The MCDM methods were used as the research method. The population of the study included the system developers, subject librarians, managers, and decision-makers in the acquisition section in the libraries of VUW. Data collection tools included a review of literature, government documents and reports, questionnaires, evaluation forms, and interviews. For analyzing data used AHP and TOPSIS techniques and Inferential and descriptive statistics. Mind mapper, Excel, Expert Choice, TOPSIS, and other software employed in this research. The results of the study show which criteria are the best criteria for selecting

information resources suppliers. The study produced a ranking of suppliers for the libraries. Also, it is shown that Voyager can use the recommended DSS as a sub-system to the main system. It is concluded that the priority for information resource selection criteria in VUW, is "End-Price". It also concluded that the first grade for suppliers in VUW belongs to Oxford. Reviewing the research background, it seems that so far, no research has been done on the use of multi-criteria decision-making techniques for selecting information resource suppliers and selecting information sources. This research has been done to help library professionals and librarians in choosing the best collection and choosing the best resource suppliers. The studied techniques and methods help to design and implement a system that supports the decision-making in the selection of information sources and the selection of suppliers of information resources. This system can be used as an extension to the library system.

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Contents

I. Introduction

Decision-making plays a very important role in the management of an organization. Managing an organization is a network of decisions in various organizational matters. In decision-making, the best option must be chosen from among the various options. Managers have different circumstances when making decisions, and the decisions that are made by managers are different. In this situation, there are different alternatives for decision making and they need to use specialized techniques and methods for decision making. These techniques and methods help them to make the best decision. Before making a final decision, all available options should be evaluated, and their advantages and disadvantages identified. This is one of the important tasks of management. Decision support systems were created to assist managers in the decision-making process. In addition to analyzing information, decision support systems participate in decision making. But their participation is only a matter of cooperation and support. The decision-making role is ultimately the responsibility of managers. Decision support systems are interactive systems developed to improve the decision-making process. These systems, through a simple user interface and the presentation of data and various reports of data, increase the awareness and insight of managers in choosing the final decision. It should be noted that many data are inaccurate and ambiguous, and in most cases, reasoning, inference, control, and decision-making are done in conditions of uncertainty. To solve this problem, the fuzzy theory is proposed to help make decisions in conditions of uncertainty. Fuzzy management

science designs models that can process qualitative information intelligently. Using fuzzy logic, human knowledge, experience, and judgment can be used alongside various data-based decision models. This method tries to provide complete applied answers to solve problems. Using multi-criteria decision-making techniques (MCDM), a set of different options can be evaluated based on expert judgment. These techniques include various methods and tools, each designed for a specific purpose. In general, multi-criteria decision-making techniques include four basic elements: main purpose, specific objectives, criteria, and alternatives. In library management, the use of multi-criteria decision-making techniques to assist administrators in problem-solving is a reliable method. Today, there are various systems for managing the library, and it is necessary to have a subsystem of decision support in these systems. One of these systems is Voyager. This system is an integrated library system that is used by many libraries around the world. One of the users of this system is the Library of Congress. Many universities, museums, information centers, and scientific resources use this system. Voyager by Endeavor Information Systems Inc. Which was merged into the Ex Libris Group in December 2006, was developed [1] & [2]. Library systems have different capabilities in retrieving information. The management of these systems also has different capabilities [3]. Decision Support Systems In library systems in different departments can support managers when making decisions. One of these cases is deciding on the selection of information resource providers and the selection of information resources required for the organization covered. Managers need to update knowing whether library resource vendors meet their information needs. Are the services and goods of these suppliers within the framework of the goals of the library and the development plan of the information resources collection? On delivery of materials and the financial front, there are different questions, when considering the materials offered and of their special services, and for ordering procedures, there are more questions. Also, we need to know about their customer service and relationship. How well do they handle problems? The main problem in this study arises from the decision-making problem in the selection of suppliers of information resources in the libraries and information centers. To solve this problem, MCDM techniques and technologies can be used. The study's main aim was to determine the possible attach a DSS as a sub-system to Voyager, based on MCDM techniques for selecting suppliers of information resources. Notably, Voyager is a library management system. The host libraries in this study were at the VUW. The specific objectives are included as the following: 1.

To determine the criteria for selecting suppliers of information sources in these libraries.

2.
To Determine the suppliers of information resources and present the decision model in selecting the suppliers in VUW libraries based on the set criteria.

3.
To prioritize the criteria for selecting suppliers of information sources using the AHP technique in these libraries.

4.

To rank the suppliers of information resources using TOPSIS in these libraries.

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