The Assessment of Library System and Management using MCDM Techniques

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Abstracts: This study investigated the the Concept of library as a system and the library management, it also discussed the concept of MCDM, the MCDM techniques, relevant of MCDM techniques in the library System. It also describes the challenges faced by Library professionals regarding the adoption and uses of MCDM Techniques in the libraries. An observational study has been conducted among the professional staff of the library to collect the relevant data., During the observation a brief interviewed was consisted among the library professionals. The Findings shows that, the majority of professionals are satisfied to implement MCDM techniques in the libraries decision making but some major issues like lack of latest equipment, lack of supervision, maintenance cost, lack of technical help, lack of funds are needed to address immediately to improve system and service. The article will guide decision makers in the planning of library Administration and also can develop the understanding regarding MCDM Techniques among professionals.

Keywords:
Library System, Library management, MCDM, MCDM Techniques

Introduction

A system is a set of connected parts/components forming a complex whole. It contains entities, namely, men, machines and materials. These entities are integrated to serve definite purpose and objectives. The system components are inter-related, inter-dependent and have effect on each other as a whole. Thus a library is also a system and its various sections/divisions are its components. The primary objective of any library system is to collect, store, organize, retrieve and make available the information sources to the information users. According to Henry Fayol, (2021). A library, as a system, is a subsystem of some super-system (an organization in any field, whether education, research or social service). It has its own subsystems, such as, acquisition system, circulation system, administration system, etc

Library Management

Library Management is the adaptation of the principles and techniques of management to the library situation. It includes decision making and getting the work done by others. The five fundamental management functions are: Planning, Organizing, Staffing, Leading and Controlling. Libraries have an important role to play in facilitating access to information for learning, education and training. It is a known fact that a well-managed library is a successful library. The library management means efficient and effective management of material (information sources), machinery, men (human resource), technology and money to meet the objectives of the library. Thus, librarian as manager performs all the functions of manager/administrator. Henry Fayol, (2021). Henry also expounded the principles and practices of management in their modern context. Fayol devoted his attention to the study of managerial activities, and identified the basic and universally applicable five functions (applicable to library management also), such as, Planning, Organizing, Commanding, Coordinating and Controlling.

Elements of Library Management

Elements of Management In 2017, social scientists Luther Gulick and L. Urwick described seven "major activities and duties of any chief executive". Since then, the acronym POSDCORB is used to describe the 7 functions of managers referred to as the 'Elements of Management'. The acronym POSDCORB stands for: Planning, Organizing, Staffing, Directing, Coordinating, Reporting, and Budgeting. Planning Planning is working out in broad outline the activities that need to be done and the methods for doing them to accomplish the purpose set for the organization. Organizing Organizing is the establishment of the formal structure of authority through which various sections or divisions of the organization are arranged, defined and coordinated for the defined objective. Staffing Staffing is the whole personnel function of bringing in and training the staff and maintaining favorable conditions of work. Directing Directing is the continuous task of making decisions and embodying them in specific and general order. It involves giving instructions by the top personnel and serving as the leader of the library. Coordinating Coordinating is the all-important duty of interrelating the various aspects of work in an organization.

Administration & Finance Section of the Library

The purpose of the Administration Section is to promote those activities which relate to library administration and management issues in general. The section is intended to serve the needs of library staff especially whose who supervise other staff. It helps manage operations of other sections of the library. In large libraries, the administration and finance section are two different sections. But in small and medium sized libraries, these are handled within one section. The Administration and Finance Section maintains the record of policy decisions, rules and regulations, guidelines and norms for working. This section maintains the records of office files, diary and dispatch, library budget proposals, budgetary allocations, accounts of library expenditure, stock registers, and such other purposeful records. It helps in taking care of library building, furniture, equipments, water and electricity fittings, and such sundry matters

An overview on MCDM

Part of the history of the Multiple Criteria Decision Making, the International Society on Multiple Criteria Decision Making, and related activities from Profs. Ralph E. Steuer and Stan Zionts (with assists from Murat Köksalan, Kaisa Miettinen and Jyrki

Wallenius). The earliest known reference relating to Multiple Criteria Decision Making can be traced to Benjamin Franklin (1706 1790), who allegedly had a simple paper system for deciding important issues. Take a sheet of paper. On one side, write the arguments in favor of a decision; on the other side, write the arguments against. Strike out arguments on each side of the paper that are relatively of equal importance. When all the arguments on one side are struck out, the side which has the remaining arguments is the side of the argument that should be supported. Supposedly Franklin used this in making important decisions.

The Concept of MCDM

MCDM means "Multiple Criteria Decision Making" is a generic term for all methods that exist for helping people make decisions according to their preferences, in cases where there is more than one conflicting criterion (Ho, 2008. (2008). Integrated analytic hierarchy process and its applications–a literature review.

MCDM Techniques

Application of multi-criteria decision-making (MCDM) theory is the use of computational methods that incorporate several criteria and order of preference in evaluating and selecting the best option among many alternatives based on the desired outcome. MCDM technique combines alternative's performance across numerous, contradicting, qualitative and/or quantitative criteria and results in a solution requiring a consensus. Knowledge garnered from many fields, including behavioral decision theory, computer technology, economics, information systems and mathematics is used. Since the 1960s, many MCDM techniques and approaches have been developed, proposed and implemented successfully in many application areas. Shen L, Olfa, (2019).Suggested that, the objective of MCDM is not to suggest the best decision, but to aid decision makers in selecting shortlisted alternatives or a single alternative that fulfills their requirements and is in line with their preferences. knowledge of MCDM methods and an appropriate understanding of the perspectives of DM themselves (players who are involved in decision process) are essential for efficient and effective DM. There are several MCDM methods available such as the analytical hierarchical process (AHP), the analytical network process (ANP), TOPSIS, data envelopment analysis (DEA) and fuzzy decision-making. MCDM has been one of the fastest growing problem areas in many disciplines. Over the past decade, many researchers have applied these methods in the field of industrial engineering, particularly in SCM, in making decisions. All the methods are equally capable of making decisions under uncertainty, and each one has its own advantages

The Relevant of MCDM Techniques in Library system and management

According Chen-Yi et a,l (2007) assessed the following areas to considered as the relevance of MCDM techniques in the library system, management and administration:

1. The task of Acquisition and selection of libraries materials is challenging because many Libraries and numerous conflicting decision criteria are involved in the decision-making process. To select the most suitable material for specific application in diverse field the use of MCDM methods such as VIKOR, PROMETHE and TOPSIS have been reported in the literature. The tools have been applied individually and in combination with one another in solving material selection problem.
2. In many literature a number of authors have applied MCDM methods without combining it with other VIKOR methods in resolving problem of material selection in different field. compared the performance of the MCDM and regret theory based VIKOR methods in the selection of material for the design of a flywheel. The authors applied decision criteria such as fatigue limit, fracture toughness, fragment ability and price per unit mass to select the best alternative material for the flywheel. The authors carried out a comparative study because very few researches have been performed in the past to ascertain performance of the MCDM techniques as opposed to majority of works in the literature based on the use of MCDM methods in analyzing materials selection problems.
3. MCDM method without combining it with other techniques in addressing material selection problem in diverse field have been reported in the many literature. In order to select optimum material for solar plate collector to save the financial cost of electricity in the libraries. The authors choose the MCDM techniques because of its relatively easy in analyzing both quantitative and qualitative data in the decision-making process.
4. The aggregation of two or more MCDM methods referred to as the hybrid method have been proposed by many authors in the literature for analyzing material selection problems in diverse areas.Such as subjects analysis in the libraries, provision of security pages, provision of Reference assistance, libraries budget, planing and implementation.

Challenges Associated with MCDM Techniques in Library administration

Fathia Sghayer e-tail, (2020). Assessed that, Based on the previous review of the different MCDM methodologies and fuzzy approaches, as well as the hybrid methods that have been covered in the literature, the model design used in this research is provided by the following steps:

1. Process chart design for the model incorporating MCDM techniques
2. Criteria selection which is used for pairwise comparison by the experts and matrices development
3. Different maintenance strategies and policies that are covered in the literature using MCDMs in order to develop the alternatives for the process of materials selection

Conclusion

According to a novel hybrid Multi Criteria Decision Making (MCDM), DEMATEL is a flexible and effective decision making method. DEMATEL approach is based on the values of a review algorithm with emphasize on compromise solution in hybrid decision making methods as well as criteria interrelationship studies. For designers and decision makers for making strong decision in every field of management including academic services such as library services, this approach of MCDM Techniques is very helpful.

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