Chapter 38
B-School Selection by Fuzzy TOPSIS and AHP

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ABSTRACT

Rapid liberalization of education sector in India has resulted in increased competition. As a result, we have witnessed rapid rise in number of management institutes. The student's evaluation about an institute/college is based on multiple criteria. Realizing the need a focused review on the literature was made to understand the subject. The review highlighted that conventional methods for B-school evaluation are inadequate for dealing with the imprecise, uncertain or vague nature of linguistic assessment. To overcome this difficulty, due to MCDM problem, Fuzzy multi-criteria decision-making methods are proposed. The aim of this study is to use fuzzy technique for order preference by similarity to ideal solution (TOPSIS) and Analytical Hierarchal process (AHP) methods for the selection of better B-school. The proposed methods have been applied to a B-School selection problem of the students of NCR and results are presented. This chapter contributes to previous researches by adding a new avenue, where the MCDM technique can be useful. The selection of an institution for getting a professional degree is a very tough task for the students and as well as for their guardians. This method can help them to find a better solution by providing a quantitative framework.

INTRODUCTION

In this competitive environment parents are very much concerned about B school selection after the completion of graduation of their wards. This study is intense on the best business school selection in NCR region in India. Liberalization and development of NCR region become the primary factors for the

rapid growth of institutions (government and private) providing business education. This rapid growth of institution had opened an opportunity for students/parents to get B-education but also gave birth to a problem of selection of best B school. It has also been seen and observed that these institutions are running various courses without establishing a proper infrastructure and arranging other facilities. At these instant many candidates seeking admission in business school are puzzled for making decision of their admission to best business school. For the sake of this students and parents should concentrate on some points while taking decision of school selection resembling – where they are having good campus interview, library facilities, management, quality of teachers, research facility, discipline etc. Multi criteria decision making (MCDM) approach provides a better idea to students as well as their parents for the selection of business school. Analytical hierarchal process (AHP) is the method for pair wise comparison developed by Saaty (1980 and 1983) is very useful to compare the different criterions and the alternative for selection of best Business School. Hwang and Yoon (1981) developed Technique for order preference by similarity to the ideal solution. TOPSIS is based on the idea that the chosen alternative should have the shortest distance from the positive ideal solution and on the other side the farthest distance of the negative ideal solution. In this work Fuzzy TOPSIS and AHP Methodology is used which is a combined methodology of AHP and TOPSIS for defining the different weights of different criteria and calculate the overall ranking of the business institutions. To handle the vagueness and uncertainty of human judgment, above said two methods of MCDM has been used to produce the better result.

BACKGROUND

In this paper researcher used two step method consists of Fuzzy TOPSIS as well as AHP. At the first step AHP is used for weights calculations of the characteristics as well as the overall weights of the business school in each characteristic. After calculating the weights with AHP method, at the second step Fuzzy TOPSIS method applied to check the result of AHP and Fuzzy TOPSIS. The following steps are used, with the help of a case.

ANALYTICAL HIERARCHY PROCESS (AHP)

The Analytical Hierarchy Process is most widely used and one of the best multi-criteria decision making MCDM approach. The first reference for AHP has been found from 1972 (Saaty, 1972). After that method has been precisely described in 1977 (Saaty, 1977).

The method of AHP has been evolved from various past studies. The use of paired (pair-wise) comparison, the core of AHP, instead of direct allocation of weights has been used by several researchers (Thurstone, 1927, Yokoyama, 1921). A major feature of AHP, the formulation of criteria hierarchy was first proposed and applied by Miller (1966, 1969 & 1970). The 1-9 point scale based on psychological observations (Fechner 1860, Stevens, 1957). The number of items in each level is inspired by (Miller, 1956). AHP has been widely used technique since its introduction shown in table 1.

Several researchers have compiled the AHP success stories (Forman & Gass, 2001, Golden *et* al., 1989, Ho, 2008, Kumar & Vaidya, 2006, Liberatore & Nydick, 2008, Omkarprasad & Sushil, 2006, Saaty & Forman, 1992, Shim, 1989, Sipahi & Timor, 2010, Vargas, 1990, Zahedi, 1986).

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