Using Multicriteria Futuristic Fuzzy Decision Hierarchy in SWOT Analysis: An Application in Tourism Industry

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ABSTRACT

In this paper, a quantitative multicriteria futuristic fuzzy decision hierarchy (MFFDH)-based SWOT (strengths, weaknesses, opportunities and threats) analysis has been carried out to determine priorities among significant factors related to tourism’s internal and external environment. In MFFDH model, the fuzzy logic is combined with analytic hierarchy process (AHP) to overcome the uncertainty in decision making process. The utilization of MFFDH with SWOT yields analytically determined priorities for the factors included in SWOT analysis and makes them more commensurable. The hybrid method has been applied in connection with a case study on tourism industry in Agra (India) and result indicates that the factors related to tourism’s internal environment (strengths and weaknesses) are relatively more important than external factors (opportunities and threats). In addition, strengths group turned out to have the highest priorities while threats group have the lowest priorities.

Keywords: Analytic Hierarchy Process, Fuzzy Logic, Hybrid Method, Multicriteria Futuristic Fuzzy Decision Hierarchy (MFFDH), SWOT Analysis, Tourism

INTRODUCTION

The travel and tourism is one of the dynamic, competitive and fastest-growing industries globally. It has been recognized as an important economic development tool generating revenue and employment for nation’s economies (Goeldner & Ritchie, 2003). Naisbitt (1994) emphasized the importance of tourism sector by stating that the world economy in the 21st century will be dominated by three sectors: information technology, telecommunication, and tourism.

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The evaluation of internal and external factors that affect the development of tourism is very important for viability and improvement of this sector. The descriptive assessment of internal strengths and weaknesses, as well as external opportunities and threats, takes place on the basis of a well-known technique, called SWOT analysis (Houben, Lenie & Vanhoof, 1999). This technique identifies and summarizes all relevant factors that may affect the organization’s future, which are referred to as strategic factors but does not provide an analytical means to determine the relative importance of the factors, or the ability to access the appropriateness of decision alternatives based on these factors (Kangas, Kurttila, Kajanus & Kangas, 2003).

In order to eliminate the weaknesses in measurement and evaluation process of SWOT analysis, this technique needs to be utilized with multi-criteria decision making techniques which perform pairwise comparisons between factors in order to prioritize them. In this paper, a quantitative MFFDH-based SWOT analysis has been carried out to determine priorities among internal and external factors of tourism industry in Agra, a historic city in northern region of India. This study aims to help policy makers not only to realize important factors of destination, but also provide an analytical tool for developing effective strategies to improve the overall performance of these factors.

RESEARCH METHODS

SWOT Analysis

In order to stay effective and successful in the marketplace, every organization has to be aware of internal and external forces which could impact their success or failure (Lee & Walsh, 2011). SWOT analysis is a commonly used tool for analyzing organization’s internal and external environment in order to attain a systematic approach and support for decision situation (Kangas et al., 2003; Kurttila, Pesonen, Kangas & Kajanus, 2000; Sorensen, Vidal & Engstrom, 2004). It provides a convenient and promising way of conducting a situational assessment and allows a focus group to identify the strengths, weaknesses, opportunities, and threats in adopting a particular strategy.

In general, SWOT is a list of statements with description of the present and future trend of internal and external environment. The expressions of individual factors are general and brief which describes subjective views. SWOT analysis is applied over a wide range of application areas, including agriculture (Wah & Merican, 2009), environment (Lozano & Valles, 2007), healthcare (Cicea, Busu & Armeanu, 2011), marketing (Novicevic, Harvey, Autry & Bond, 2004) and general management (Jackson, Joshi & Erhardt, 2003); a detailed review may also be found in (Ghazinoory, Abdi & Azadegan-Mehr, 2011). The literature review of conventional SWOT analysis reveals that the importance of criteria (factors) is not quantified to provide the effect of each criterion on the proposed strategy (Chang & Huang, 2006; Masozera, Alavalapati, Jacobson & Shrestha, 2006) and therefore needs to be utilized with other multicriteria decision making techniques. There has appeared integration of SWOT with other scientific techniques especially multicriteria decision-making and quantifying techniques (Kurttila et al., 2000; Yuksel & Dagdeviren, 2007; Hatami-Marbini & Saati, 2009; Tavana & Yousefpoor, 2012; Ebonzo & Liu, 2013) to make it more operational.

Analytic Hierarchy Process (AHP)

AHP, developed by Saaty (1980), is a multicriteria decision-making technique which addresses how to determine the relative importance of a set of criteria in a decision problem. This measure-
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