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Article

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Abstract: The purpose of this article is to present a proposal to call a tourist destination a magical town using a multi-criteria approach. To this end, its application is approached as a real multi-criteria classification problem with the use of the ELECTRE III method and is built from the components, considered from the importance they represent for the agents involved in the tourism sector, which contemplates the tourism supply, demand and management, infrastructure, services, natural and cultural resources, economic benefits and social impact. The results obtained with the use of this approach allowed us to evaluate and compare the tourist destinations that wish to be recognized under this nomination. In conclusion, the ELECTRE method turned out to be a success, since it allows us to explain and understand the competitive order of the tourist destinations under study. For future work, this procedure could be used to identify which factors are most important or attractive to decision makers.

Keywords: magical towns; tourist product; multicriteria; Electre III

1. Introduction

One of the strategies proposed by Mexican Secretary of Tourism (Sectur) is to promote "expressive ways of establishing and developing physical, intellectual, moral and emotional values, therefore, tourism cannot be static, tourism as an economic and social activity must respond to the movements, changes and demands requested by human beings" [1], among the approaches the Magical Towns (MT) is highlighted, tourism program that it was created in 2001 [2].

[3] point out that, based on the MT, the aim is to support typical towns with cultural tourist attractions of great uniqueness, and thus promote the conservation and improvement of their urban image and identity. In this sense, defines [1] "a MT as a locality that has symbolic attributes, legends, stories, transcendent facts, daily life, in short, magic that emanates in each of its sociocultural manifestations, and that today means a great opportunity for tourist use".

In view of the discourse of competitiveness that permeates tourism activity at a global level, a pilot program was undertaken from the federal level to identify the factors of competitiveness in various destinations in Mexico, including the magical towns. In this sense, it is highlighted that, even though in some states of the country they made their proposals in the Competitiveness Agendas, they highlighted the potential of the Magical Towns as triggers of tourist activity, this strategy did not have a transversal character for the entire federation, being exclusive to those destinations that had such attractions within their inventory.

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A bibliometric analysis of the scientific production about MT found the research was approached from the perspective of cultural aspects, public policy, local development and sustainable tourism, and sustainable development [2]. Together with other elements such as tourist infrastructure, events, additional tourist services and accessibility, they represent elements that need to be studied and understood in a framework of competitiveness between tourist destinations [4].

Another study estimated the perspective used by the visitor to choose a certain PM in the northwest region of Mexico based on attributes such as the visitor's profile, the experience of the services, their perception, their satisfaction and the expenditure incurred during their stay. stay, found that the visitor's probabilities of choosing a tourist destination vary depending on the specificities of the site [5].

Given this range of multiple characteristics, a methodology is necessary that allows the analysis and comparison of different tourist destinations called magical towns. Above all because to obtain the designation of a magical town it must be the result of the planned intervention and strategies embodied by a group of local actors or intervening social agents [5].

Given this range of multiple characteristics, a methodology is [6]. For example, in the context of the tourism business, these experts or decision makers may share different perspectives without much difference in relation to the causes and effects of a destination's competitiveness; one study found that the greatest difference in opinion was identified in the evaluation of the relationship between environmental commitment and tourism demand [7]. In this way, the ELECTRE III method is suggested to solve the problem of assigning the MT badge through the multi-criteria decision-making process.

This document is organized as follows: in the next section, a review of the literature is carried out, where some relevant studies on the use of multicriteria methods are presented. Next, the methodological proposal to be developed for the ADPM is made. To continue, an empirical application of the proposed approach to the ADPM is briefly presented. Finally, the conclusions and challenges of the research are discussed.

1.1. Literature Review: Analysis of Magical Towns with the Multi-Criteria Analysis Method

In recent years, different countries have considered tourism as one of their main economic activities [8]. Due to this relevance, competition among tourist destinations around the world has increased [9].

According to [10], for this reason, recreation venues need more flexible approaches to be able to compete with other destinations. On the one hand, they seek to implement new technologies to be more innovative [11] and on the other, they strive to promote more competitive entertainment venues [12].

Therefore, in 2001 the MT was created in Mexico, whose purpose is to promote the economic development of localities through tourism, with the aim of raising levels of well-being, maintaining and increasing employment and promoting investment [13].

Regarding studies of magical towns with Multicriteria Analysis for Decision Making (MCDA) methods, [14], carried out an empirical analysis of the competitiveness of the cities of Sinaloa, Mexico, with this method of ordering. [15] developed the application of a multi-criteria approach to compare economic sectors: the case of the State of Sinaloa, Mexico.

That is why multi-criteria analysis for decision-making in recent decades has become a relevant support for theoretical and practical evolution in decision science [16]. For example, Salvador et al., (2024), presented a literature review on a multi-criteria decision model called ELimination and Choice Expressing REALity based on ELECTRE, to locate studies linked to decision-making in provider selection, finding frequent and hybrid use, since it has been merged with other methods such as AHP and TOPSIS.

For their part, [17], developed a multi-criteria model based on the FITradeoff method for the classification of problems applied in Brazilian textile companies to establish an evaluation in terms of technological maturity for industry 4.0. In another study, a hierarchical order was calculated to plan the electrification of 8 rural communities in Mexico, using a combination of the AHP method

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with discrete commitment programming, allowing criteria related to budget constraints to be resolved [18].

Thus, taking into consideration the breadth and variety of the indicators they use to measure the magical towns used, it is evident that the decisions faced by tourism planners often include variables that are difficult to measure directly, and even if all the variables can be measured accurately there are still serious problems that arise in obtaining numerical measures of relative importance of the variables decision according to [19].

2. Materials and Methods

This methodological proposal is made to assign the distinctive of magical town, it is intended to be a decision process of multiple attributes. The method is based on ELECTRE III. A series of alternatives are proposed for the established criteria, where each normalized indicator is multiplied by the relative importance assigned directly by the decision-maker followed by the sum of the products for all the criteria [20]. The process consists of the following stages:

Step 1

Identification of alternatives: A matrix of the set of alternatives is constructed. $|A|=\{a_1,a_2,\ldots,a_j,\ldots a_m\}|A|=m$ [20].

Normalization process of the variables: This procedure tends to ensure that the normalized scale covers the interval between 0 and 1 of the values to be rescaled [21], as follows:

$$Vn(a_i)=\frac{x(a_i)\text{-}Min}{Max\text{-}Min} \quad (1)$$

where:

Vn(a_i)= normalized value

x(a_i) = value of indicator *i*.

Min = minimum value of indicator *i*.

Max = maximum value of indicator *i*.

Assignment of weights for individual indicators through the comparison matrix consists of constructing a pairwise comparison matrix *(nxn)* of variables. [22].

Determination of weights for criteria through personal construction theory. Where, is the relative importance coefficient attached to the criterion w_jg_j, proposed by [23].

Step 2

Scale of measurement and characterization of the criteria: for each criterion, a series of indicators are proposed on a group of destinations, from these, a set of criteria is calculated. Each where is a combination of originals by the weight for each criterion $(c_j)(x_1,x_2,\ldots,x_n)(a_i)(C_1,C_2,\ldots,C_n)(C_j)(j=1,\ldots,n)x_1,x_2,\ldots,x_n(W_j)$ [20], that is:

$$C_j(a_i) = (w_j * x_j(a_i) + (w_2 * x_2(a_2) + \cdots + (w_n * x_n(a_n) \quad (2)$$

The construction of the performance matrix is built with the decision criteria with which the tourist destinations will be evaluated (m alternatives).

Step 3

Determination of indifference and preference parameters. With the use of thresholds, the ELECTRE method seeks to construct an outranking relationship S. ASB it means that there are good reasons to consider that "*a is at least as good as b*" or "*a is not worse than b*" [24].

Principle of agreement: the first step is to develop a measure of agreement $C(a,b)$, for each pair of alternatives (majority principle), which defines an outranking relationship [24] as follows:

$$c(a,b)=\frac{1}{W}\sum_{j=1}^{n} c_j(a,b) \quad (3)$$

where:

$$W=\sum_{j=1}^{n} w_j \quad (4)$$

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The principle of discordance: it is called the veto threshold. The veto threshold v_j and allows the possibility of being rejected aSb in its entirety – respect for minority principles – [25], is calculated as:

$$d_j(a,b)=\begin{cases} 0, \\ 1. \\ \dfrac{g_j(b)-g_j(a)-p_j}{v_j-p_j} \end{cases} \quad (5)$$

$$If\ g_j(a)+p_j \geq g_j(b)$$

$$If\ g_j(a)+v_j \leq g_j(b)\ ,\quad j=1,2,\ldots,jn$$

Calculation of the credibility matrix: this phase corresponds to the construction of the model; it is the combination of the matrix of agreement and discordance and creates a credibility index that evaluates the strength of the statement that "a is at least as good as b". Degree of credibility for each peer is defined as:

$$S(a,b)=\begin{cases} C(a,b), & if \quad d_j(a,b) \leq C(a,b) \quad \forall j \\ C(a,b)\prod\limits_{j\in J(a,b)} \dfrac{1-d_j(a,b)}{1-C(a,b)} \end{cases} \quad (6)$$

3. Results

Considering the stages previously indicated in the methodological proposal. A multicriteria ranking problem is presented with the aim of finding one of the reasons with which any tourist destination Ai can be considered better or, at least, as good as another tourist destination *Aj* for each of the decision criteria under consideration [24].

In the process of decision support, there is a continuous flow of activities between the different stages, but in any of them, there may be a return to a previous phase. If the Decision Making (DM) is not satisfied with the result at any stage, it can return to any step and redo it. Considering the characteristic of the problem, a procedure used to measure the potential development of a tourist destination is the application of a multicriteria decision-making model. Therefore, the problem is to make a comparison between the municipalities of Sinaloa, Mexico, which could be recognized as magical towns formulated as a ranking problem in order of ascending insecurity.

For this case study in which 4 Mexican tourist destinations will be analyzed (see Table 1). In terms of coverage or temporal delimitation, this study will analyze data generated as of 2023.

Table 1. Alternative Potentials.

Alternative	Municipality
A1	Sinaloa de Leyva
A2	Elota
A3	Concordia
A4	Escuinapa

Source: Own elaboration.

On the other hand, this section focuses attention on the construction of the set of decision criteria. Same as the values of the variables, whose values were obtained from the National Statistical Directory of Economic Units, 2023, from the National Institute of Geography and Information Statistics (INEGI) and from [13].

Subsequently, the decision criteria for the ordering of the tourist destinations were defined, as well as their method of calculation. The family of criteria is shown in summary form in the Table 2. Each criterion is defined and produces a marginal evaluation that describes the performance of each one of the destinations as decision alternatives.

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Table 2. Criteria.

Criteria	Concept
C1	General related to destination
C2	Tourist demand
C3	Touristic offer
C4	Tourist management
C5	Infrastructure
C6	Services
C7	Natural and cultural resources
C8	Professionalization
C9	Water
C10	Waste
C11	Economic benefits of tourism
C12	Social impact

Source: Own elaboration.

After preparing the data collected from the National Institute of Statistics and Geography [26] of the Statistical Yearbook of the State of Sinaloa, and according to the values resulting from the weighted sum of the individual indicators, the composite indicators are obtained (Table 3).

Table 3. Collected data.

Criteria	A1	A2	A3
C1	17.32	3.19	6.36
C2	4.83	2.65	2.40
C3	18.79	7.40	10.62
C4	13.08	0.96	5.95
C5	10.39	1.91	3.82
C6	2.90	1.59	1.44
C7	11.27	4.44	6.37
C8	7.85	0.57	3.57
C9	9.39	3.70	5.31
C10	6.54	0.48	2.97
C11	4.70	1.85	2.66
C12	3.27	0.24	1.49

Source: Own elaboration.

According to the ELECTRE III methodology [27], the following weights, indifference and preference thresholds options associated with each criterion are considered. In this problem the DMs are not considered the use of the veto threshold, according to the proposal of [23] Was not suggested any specific relationship between the values q and p. Regarding the veto threshold v, it was suggested that the veto in this study is not an important factor for decision criteria, since there are not many contradictions in the crime incidence among the objects of study.

The weights, direction, preference and indifferences are shown in Table 4. The result allows us to exploit the relation of fuzzy outranking to obtain an ordering of alternatives of decreasing preferences.

Table 4. Collected data.

Concept	Weights	Direction	Preference	Indifference
C1	6.3	Maximize	10	2
C2	8.8	Maximize	3	1
C3	10.0	Maximize	12	4

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C4	8.7	Maximize	7	0.1
C5	11.3	Maximize	6	0.5
C6	10.0	Maximize	1	0.5
C7	15.0	Maximize	7	1
C8	7.5	Maximize	5	0.1
C9	6.2	Maximize	7	1.2
C10	5.0	Minimize	4	0.1
C11	6.2	Maximize	3	0.8
C12	5.0	Maximize	1.5	0.1

Source: Own elaboration.

In accordance with the above, with the information provided, was constructed the integration model of preferences of the alternatives as a valued overclassification relationship. For this purpose, the principle of concordance and discordance was used as conceived in ELECTRE III. Once the model is obtained the next step corresponds to the exploitation of the valued overclassification relationship using the multiobjective algorithm and a procedure to derive a ranking to present a recommendation in the form of a ranking [28].

This result results in a succession in order of decreasing preference, generating in this way the following recommendation for the decision maker:

The result obtained suggests the final classification in descending order, where locality A1 stands out as the destination that has the greatest and best conditions to be named a Magical Town, while localities A2, A4 and A3 have a lower rating (Figure 1).

A1 > A2 > A4 > A3

Figure 1. Recommendations to the decision maker. Source: Own elaboration.

Finally, it should be noted that this application to designate a locality as PM can be used, considering that in this study the selection of criteria for its measurement using the ELECTRE III method provides effective information for decision-making, allowing a comprehensive evaluation for this type of application.

5. Discussion

This study established the criteria to evaluate four municipalities such as Sinaloa de Leyva, Elota, Concordia and Escuinapa. The objective is to present a methodological proposal to name a tourist destination as a Magical Town through a multi-criteria approach. To this end, the Electre III method was used, with which the model was constituted from the components that are manifested in aspects such as language, social institutions, popular culture, family relationships, art, and literature, as described by [29].

The study turned out to be relevant since it allowed the identification of the potentialities that the municipality has for its tourism development. In addition, the attributes that the region has can be used to design strategies to promote tourism were identified.

The results obtained with this methodology allowed the destination A1 to be placed in the first position, since it had a better evaluation in typical dances, tourism as a factor of development, in celebrations belonging to the locality and music. For destination A2, typical dances, festivities or festivals of the town and predominant religion stand out. In the case of A4, it obtained a low evaluation in the perception of the tourist, in the crafts, art and manufactures, as well as the attractions for the tourist and A3 was below in the typical food, the perception of tourism and the characteristics of the municipality.

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Finally, [30] focuses on popular culture and music as differentiating and attractive elements for tourists, which could be an opportunity for these municipalities, who could focus on promoting and developing their cultural and musical heritage.

6. Conclusions

Currently, awarding the magic village distinction under a multicriteria approach facilitates directing research from two approaches: on the one hand, promoting the competitiveness of these destinations, and on the other, motivating the use of the ELECTRE III method in conditions of subjectivity in its measurement.

The results of the investigation -which resulted from the analysis of 4 tourist destinations in Sinaloa, Mexico- derived in a decreasing order in which it highlighted those presented in the Figure 1. The following was found: the tourist destination of Sinaloa consistently excels in the first position, in the second position they were located Escuinapa, Concordia and Elota.

In this way, the proposal made to grant this distinction allowed to generate empirical evidence of its applicability in this type of problem, by incorporating the use of evolutionary techniques. In this case, using the ELECTRE-III method, which allows modeling the preferences of the decision-maker, where these preferences can be expressed in the form of an overclassification relationship.

As for the analysis of the destinations, in conditions of uncertainty, there is where no complications, since we are working with information generated in an objective way, expressed in hard data [25]. Yet, one of the main features in the sector is uncertainty, and as a result, the handling of the model becomes more complicated. The ELECTRE method is a success in this regard, given that it allows to explain and understand the competitive order of the tourist destinations in the study. For future works, this procedure could be used to assess more tourism destinations, and with a bigger sample, identify which factors are the most important or attractive for tourists.

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