

Strategic Analysis Using SWOT-AHP: Beach Tourism in Sabah, Malaysia

By

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Abstract

The popularity of beach tourism in Sabah has increased after the COVID-19 pandemic ended, this study aims to analyze what factors should be taken seriously to boost the competitiveness of the beach tourism industry in Sabah. Strategic analysis of beach tourism in Sabah, Malaysia, by utilizing the SWOT (Strengths, Weaknesses, Opportunities, and Threats) framework in combination with the Analytic Hierarchy Process (AHP). This is a descriptive research design. The problem itself contains many SWOT criteria, which have been reviewed in three phases with the assistance of industry external experts and AHP guidelines. This study introduces a hybrid SWOT-AHP strategic analysis in this area. The influencing elements have been assessed and rated to determine the most important factors on which the industry should focus.

Keywords: SWOT, AHP, Strategic analysis, SWOT-AHP, Beach tourism

INTRODUCTION

Sabah is a Malaysian state renowned for its breathtaking natural beauty and diverse ecosystems. One of its most popular tourist attractions is the magnificent beaches, which provide a variety of activities (OutbackVenture, 2023). Sabah's most popular beaches are Tanjung Aru Beach, Mabul Island, Tip of Borneo Beach, and others. People have also nominated Tanjung Aru Beach as one of the world's best sunset spots. It has a significant economic and cultural impact on Sabah. Despite its advantages, issues such as tourism competition and environmental problems exist. This study uses the SWOT-AHP framework to systematically assess and prioritise factors influencing Sabah beach tourism. By combining qualitative and quantitative methodologies, this study hopes to provide practical insights to improve the sector's sustainability and competitiveness, ensuring Sabah's status as a major beach tourism destination.

SWOT AND AHP MODEL

SWOT Analysis

SWOT stands for Strengths, Weaknesses, Opportunities, and Threats. The first two factors (strengths and weaknesses) are related to internal organizational factors, while opportunities and threats cover a wider context or environment in which the entity operates. The organisation has control over internal elements, but not over external ones. One of the most popular techniques for managing is SWOT analysis, which managers utilise as a tool for developing strategies. frequently employed as a tool to analyse both external and internal elements in order to develop a methodical strategy and provide assistance in addressing the issue. The most crucial elements for the future of enterprises are those that are both internal and external. These are referred regarded as strategic elements, and the SWOT matrix shows them. The formulation and implementation of a strategy that produces a positive interaction between the internal and external forces is the aim of the strategic planning process, of which the SWOT analysis is one of the preliminary stages. Figure 1 illustrates how SWOT analysis fits into an environment.

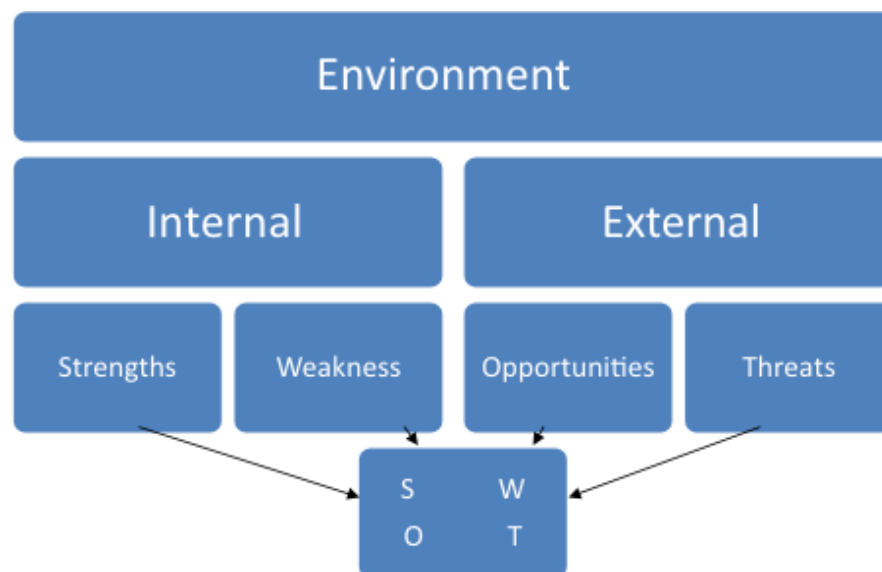


Figure 1: SWOT analysis framework

Analytic Hierarchy Process

The Analytical Hierarchy Process (AHP) is a known method used for decision making that considers factors. It helps in alternatives based on the importance of different criteria. AHP allows for structuring the problem and comparing pairs of components within a hierarchy. By the end of the process a mathematical model is developed by assigning weights, to all parts of the hierarchy. AHP addresses decision making problems by defining goals, criteria and options assessing criteria on a scale from 1 to 9 pairing alternatives and establishing priorities for alternatives. Through AHP ranked alternatives and weight coefficients for criteria are determined based on objectives. The approach effectively identifies decision making inconsistencies by monitoring them throughout the process. The results provide indications that support decision justifications. Saaty introduced the AHP technique in 1977 as it has become widely popular, for addressing criteria decisions in scenarios.

Table 1: Pairwise comparison scale

Numerical values	Description	Explanation
1	Equal importance of both elements	Two elements contribute equally
3	Moderate importance of one element over another	Experience and judgment favour one element over another
5	Strong importance of one element over another	An element is strongly favoured
7	Very importance of one element over another	An element is very strongly dominant
9	Extreme importance of one element over another	An element is favoured by at least on order of magnitude
2, 4, 6, 8	Intermediate values between two adjacent judgments	Used to compromise between two judgments

The AHP technique is based on three guiding concepts: first, the structure of the model; second, a comparative evaluation of the alternatives and/or criteria; and third, a synthesis of the priorities. AHP has been extensively used in the literature to address a variety of decision-making-related issues. A decision issue is set up hierarchically in the first step. AHP initially deconstructs a complex multicriteria decision-making problem into a hierarchy of related decision elements (criteria, decision alternatives). The Analytic Hierarchy Process (AHP) groups the objectives, selection criteria, and choices into a hierarchical structure resembling a family tree. The three levels of a minimal hierarchy are as follows: the top level represents the problem's aim, while the middle level is guided by several criteria. The alternatives, which comprise the lowest level, are made up of possibilities.

The AHP is utilised in this study to prioritise the SWOT elements. After the problem is broken down and a hierarchy is created, the process of prioritising criteria is initiated in order to ascertain their respective levels of significance. Based on the predetermined criteria in the higher level, the criteria in each level are compared pairwise based on their respective levels of

influence. Multiple pairwise comparisons in AHP are predicated on a nine-level standardised comparison scale.

Let $C = \{C_j \mid j = 1, 2, \dots, n\}$ be the set of criteria. The result of the pairwise comparison on n criteria can be summarized in an $(n \times n)$ evaluation matrix A in which every element a_{ij} ($i, j = 1, 2, \dots, n$) is the quotient of weights of the criteria. This pairwise comparison can be shown by a square and reciprocal matrix.

$$A = (a_{ij})_{n \times n} = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \dots & a_{nn} \end{bmatrix}$$

The final step is normalising each matrix and determining their relative weights. The largest eigenvalue is represented by the right eigenvector (w), which gives the relative weights in the following manner:

$$A_w = \lambda_{\max} \cdot W$$

Assuming perfect consistency in the pairwise comparisons, matrix A has rank 1 and $\lambda_{\max} = n$. In this instance, normalising any of A 's rows or columns will yield weights. It should be noted that there is a correlation between the quality of the AHP output and the consistency of the pairwise comparison judgments. The relationship between A : $a_{ij} \times a_{jk} = a_{ik}$ defines consistency. The Consistency Index (CI) may be calculated using the formula below:

$$CI = \frac{\lambda_{\max} - n}{n - 1}$$

One can determine whether the evaluations are sufficiently consistent by looking at the final consistency ratio (CR). As seen as below, the CR is computed as the ratio of the CI and the random index (RI).

$$CR = \frac{CI}{RI}$$

The recognised upper bound for CR is 0.1. To increase consistency, the review process needs to be repeated if the final consistency ratio is higher than this threshold.

SWOT-AHP Model

The SWOT-AHP model combines two strategic analytical techniques: Analytic Hierarchy Process (AHP) and Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. SWOT analysis enables a company to examine both internal and external issues, whereas AHP is a methodical decision-making approach. In this study, the AHP structure was derived from the SWOT matrix and separated into three components (Devi Cipta Anggraini, 2018). The stages model was developed to establish a SWOT-AHP-based strategic management model. First, we identified the SWOT using SWOT analysis, and then we identified relevant external and internal environments. Second, change factors, and third, design an evaluation model. (Figure 3) (Arica dwi susanto, 2019).

METHODOLOGY AND APPLICATION

The primary objective behind using the AHP within the SWOT framework is to carefully evaluate the SWOT variables and make them comparable in terms of weightiness. The three portions of the AHP structure in this study are (a) the decision's objective, (b) the SWOT groups, and (c) the factors (sub-criteria) that are contained inside each SWOT group. The AHP structure is generated from the SWOT matrix. The SWOT framework is represented hierarchically in Figure 2.

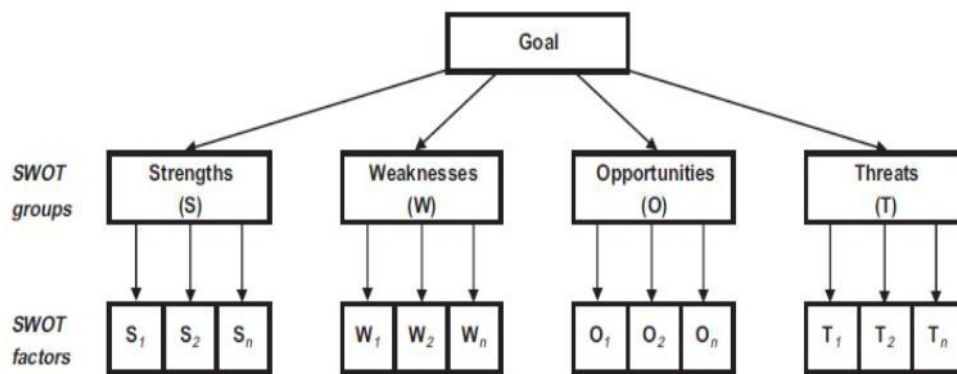


Figure 2: Hierarchical structure of the SWOT matrix

In the case study that follows, the beach tourist sector in Sabah, Malaysia, is examined using an upgraded AHP based on SWOT analysis. A literature research and secondary data analysis were conducted to identify and assess the SWOT. To create a strategic management model based on the SWOT-AHP framework, we constructed the model in three stages: building model, modifying SWOT model, and building evaluation model (Figure 3). Initially, a matrix is developed and a SWOT analysis is conducted. The SWOT matrix defines and includes the important internal environment and features.

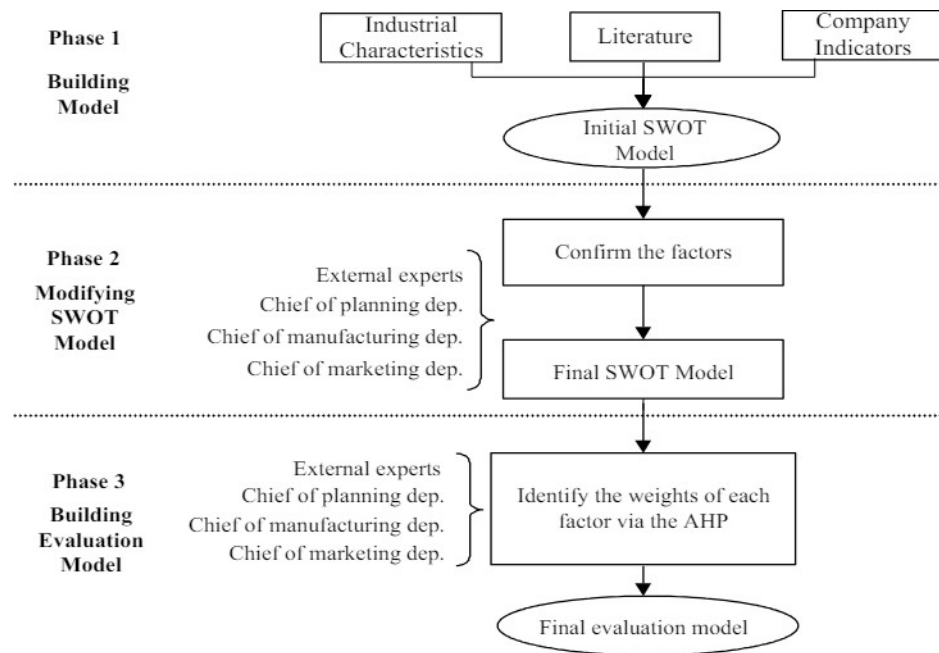


Figure 3: Phases of the suggested approach

Table 2: SWOT Matrix

Strengths (S)	Weaknesses (W)
(S1) Diverse Marine Biodiversity (Saleem et al., 2020) (S2) Cultural Heritage (Burgess & Borges, 2018) (S3) Adventure Activities (Ross et al., 2017) (S4) Protected Areas (World Wildlife Fund, 2021) (S5) Tourism Infrastructure	(W1) Accessibility Challenges (Asian Development Bank, 2017) (W2) Waste Management Issues (The Star, 2020) (W3) Seasonal Weather Patterns (Sabah Tourism Board, 2020) (W4) Infrastructure Maintenance (Aziz et al., 2020) (W5) Limited Product Development (UNDP, 2020)
Opportunities (O)	Threats (T)
(O1) Sustainable Tourism Practices (Dinu et al., 2019) (O2) Digital Marketing (Gan & Frederick, 2016) (O3) Diversification of Tourism Products (Sabah Tourism Board, 2021) (O4) Government Support (Ministry of Tourism, Arts and Culture Malaysia, 2020) (O5) Collaborative Partnerships (Samsuddin et al., 2019)	(T1) Climate Change (Ross et al., 2017) (T2) Competition Regional Destinations (Gan & Frederick, 2016) (T3) Political Instability (Burgess & Borges, 2018) (T4) Over-Tourism (Rasdi et al., 2021) (T5) Natural Disasters (Ghazali et al., 2018)

SWOT matrix is subjected to an AHP. Using a Saaty's (1980) comparison scale ranging from 1 to 9, pairwise comparisons of the SWOT groups are first conducted. Table 3 displays the outcomes of the comparison. Second, the aspects of SWOT matrices are compared with each SWOT group in mind. The expert team in the application completes all pairwise comparisons. Three beach tourism experts from the industry and the authors of this study made up the expert team.

Table 3: Pairwise comparisons of SWOT factors

SWOT Groups	S	W	O	T	Importance percentages of SWOT Groups
Strengths (S)	1	0.14	0.20	0.11	3.9%
Weaknesses (W)	7.00	1	3.00	0.33	25.3%
Opportunities (O)	5.00	0.33	1	0.14	11.4%
Threats (T)	9.00	3.00	7.00	1	59.4%
CR = 7.5%					

Table 4: Comparison Matrix of Strengths Group

Strengths	S1	S2	S3	S4	S5	Importance percentages
(S1) Diverse Marine Biodiversity	1	0.20	0.25	0.25	3.00	8.7%
(S2) Cultural Heritage	5.00	1	1.00	1.00	4.00	29.0%
(S3) Adventure Activities	4.00	1.00	1	2.00	6.00	33.8%
(S4) Protected Areas	4.00	1.00	0.50	1	3.00	23.0%
(S5) Tourism Infrastructure	0.33	0.25	0.17	0.33	1	5.5%
CR = 5.0%						

Table 5: Comparison Matrix of Weaknesses Group

Weaknesses	S1	S2	S3	S4	S5	Importance percentages
(W1) Accessibility Challenges	1	0.11	0.50	3.00	3.00	10.0%
(W2) Waste Management Issues	9.00	1	6.00	7.00	8.00	62.3%
(W3) Seasonal Weather	2.00	0.17	1	5.00	6.00	18.5%
(W4) Infrastructure Maintenance	0.33	0.14	0.20	1	1.00	4.7%
(W5) Limited Product Development	0.33	0.12	0.17	1.00	1	4.4%
CR =7.2%						

Table 6: Comparison Matrix of Opportunities Group

Opportunities	S1	S2	S3	S4	S5	Importance percentages
(O1) Sustainable Tourism Practices	1	2.00	7.00	1.00	6.00	35.4%
(O2) Digital Marketing	0.50	1	6.00	0.50	1.00	17.1%
(O3) Diversification of Tourism Products	0.14	0.17	1	0.17	1.00	5.0%
(O4) Government Support	1.00	2.00	6.00	1	6.00	34.5%
(O5) Collaborative Partnerships	0.17	1.00	1.00	0.17	1	7.9%
CR = 6.1%						

Table 7: Comparison Matrix of Threats Group

Threats	S1	S2	S3	S4	S5	Importance percentages
(T1) Climate Change	1	0.50	7.00	6.00	5.00	31.3%
(T2) Competition Regional Destinations	2.00	1	9.00	8.00	7.00	49.2%
(T3) Political Instability	0.14	0.11	1	1.00	0.25	3.9%
(T4) Over-Tourism	0.17	0.12	1.00	1	0.20	4.1%
(T5) Natural Disasters	0.20	0.14	4.00	5.00	1	11.5%
CR = 6.6%						

Lastly, the SWOT components' total priority scores are determined. In Table 7, overall priorities are displayed.

Table 8: Overall Priority Scores of SWOT Factors

Swot Group	Group Priority	Swot Factors	Factor Priority within the Group	Overall Priority of Factor
Strengths	3.9%	Diverse Marine Biodiversity	8.7%	1.6%
		Cultural Heritage	29.0%	2.6%
		Adventure Activities	33.8%	3.1%

Weaknesses	25.3%	Protected Areas	23.0%	2.0%
		Tourism Infrastructure	5.5%	1.5%
		Accessibility Challenges	10.0%	2.3%
		Waste Management Issues	62.3%	14.8%
		Seasonal Weather Patterns	18.5%	6.6%
		Infrastructure Maintenance	4.7%	0.9%
		Limited Product Development	4.4%	1.1%
Opportunities	11.4%	Sustainable Tourism Practices	35.4%	8.5%
		Digital Marketing	17.1%	4.9%
		Diversification of Tourism Products	5.0%	2.2%
		Government Support	34.5%	8.9%
		Collaborative Partnerships	7.9%	3.8%
Threats	59.4%	Climate	31.3%	9.0%
		Competition Regional Destinations	49.2%	19.4%
		Political Instability	3.9%	0.9%
		Over-Tourism	4.1%	1.0%
		Natural Disasters	11.5%	4.8%

The results of the AHP analysis show that, when taking into account the internal and external surroundings of beach tourism, competing regional destinations are the most significant difficulties.

CONCLUSION

In this article, we use a combination of SWOT and AHP approaches to identify crucial strategic components for the beach tourism industry. The results indicate the priority rating of each SWOT group as follows: Threats (59.4%), Weaknesses (25.3%), Opportunities (11.4%), and Strengths (3.9%). The study indicates that "competition regional destinations" from the threats group is the most significant SWOT component. This issue, which has an overall priority value of 19.4%, is the most crucial one to take into account. Prioritising waste management issues (14.8%), government support (8.9%), sustainable tourism practices (8.5%), and adventure activities (3.1%) are other noteworthy reasons. A management strategy or support for a crucial decision could be built using the SWOT elements' assessed priorities. The findings of this study can also be utilised to provide a list of suitable strategy choices for an organisation. Future studies could enhance the AHP method's use of a fuzzy logic framework to analyse ambiguous scenarios more successfully. Moreover, the AHP can be

substituted with any multi-criteria decision-making method, and the outcomes can be contrasted.

LIMITATION

There are a few limitations to the SWOT-AHP method's strategic study of beach tourism in Sabah, Malaysia. First off, in contrast to a multi-method approach, the study only uses the Analytic Hierarchy Process (AHP) to assess the strategic factors, which may limit the breadth and depth of findings. Second, because the focus is limited to Malaysia's Sabah area, it may miss more general regional or worldwide trends and factors that could have an impact on the beach tourist sector. Finally, the study is limited to the beach tourist industry, leaving out other pertinent tourism subsectors or business ventures that might have an influence on the broader strategic planning process. These drawbacks imply that, even while the SWOT-AHP method offers insightful information, a more comprehensive and varied approach could be required for an all-encompassing strategic analysis.

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