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Strategic Adaptation in Travel Agencies: Integrating MARA with SWOT for Uncertainty Navigation

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Abstract: In the realm of managerial decision-making, particularly within the last few decades, the process has emerged as a formidable challenge. This paper focuses on strategic decision-making, crucial in determining organizational success or failure amidst prevailing uncertainties. To address this, the Matrix Approach to Robustness Analysis (MARA), a recent innovation, is integrated with the established Strengths-Weaknesses-Opportunities-Threats (SWOT) matrix. This integration aims to deliver robust outcomes in strategic planning for travel agencies. The methodology involves a comprehensive analysis of internal and external factors pertinent to a travel agency, applying the analytical rigor of the SWOT matrix. Subsequent to this analysis, a series of strategies are formulated. Central to this study is the identification of key environmental indicators, as perceived by stakeholders, which influence strategic outcomes. Through these indicators, various future scenarios are constructed, culminating in nineteen plausible scenarios. Each strategy, totalling twelve, is then evaluated against these scenarios to ascertain the conditions under which they are most effective, resulting in a performance matrix. The final phase involves calculating the robustness analysis scores for each strategy under two different assessment conditions: rigorous and lenient. These scores provide a basis for strategy prioritization in both scenarios. The analysis reveals that the strategy of expanding new pilgrimage tours holds the greatest promise, while the employment of relatives within the agency is deemed least effective. This study contributes to the field by offering a structured methodology for travel agencies to navigate uncertain environments, using a combination of MARA and SWOT. The findings underscore the importance of scenario-based strategic planning and robustness analysis in enhancing decision-making processes.

Keywords: Decision-making; Strategy selection; Uncertainty; Strengths-Weaknesses-Opportunities-Threats (SWOT); Robustness analysis; Problem structuring method

1 Introduction

In the current global landscape, organizations and social institutions confront a complex milieu, both within their internal structures and in the external environment. It has been observed that the business environment has undergone significant transformations, necessitating the evolution and adaptation of organizations [1]. The capacity of these entities to adapt effectively to environmental changes has become a critical factor for their survival and prosperity. Embracing change as an integral component of the modern business paradigm is essential for organizational success [2].

Effective management of organizations now requires a holistic and systemic approach. This approach must encompass a comprehensive understanding of the factors influencing organizational performance, enabling strategies that address the impacts of both internal and external elements. Such a strategic approach is vital for exerting influence and control over these factors [3].

In contrast to previous eras, where organizational decisions were predominantly driven by customer needs and shareholder profitability, the contemporary competitive landscape demands a focus on satisfying a broader spectrum of stakeholder groups. This shift is crucial for organizational growth and survival [4]. The balancing act between satisfying the immediate and long-term demands of both internal and external stakeholders has become a cornerstone for management in ensuring organizational survival [5]. Sustainable survival and growth, especially in the face of

challenges such as declining demand, reduced investment activity, currency fluctuations, and other unpredictable economic conditions, are paramount for economic success across industries [6].

However, during economic recessions, sustainable growth may impede a company's development, potentially leading to reduced shareholder income and, frequently, bankruptcy [7]. The aviation industry, a critical sector within the tourism and transportation domain, exemplifies these challenges. Operating in an intensely competitive environment, airlines must engage in prudent decision-making to ensure their sustainability and continued existence [8].

Conventional strategic decision-making in organizations has often relied on the assumption that future events can be predicted accurately, thus guiding their strategic direction [9]. This approach, however, has demonstrated limitations, particularly in its tendency to overlook or underestimate the inherent uncertainties of the business environment [10]. The premise that future events are predictable with a high degree of certainty, based on the efficacy of an organization's strategic analysis, has been increasingly challenged. In reality, business environment changes are frequently unpredictable, leading to potential missed opportunities or unanticipated challenges [11].

The global market for products and services experiences continuous fluctuations, with organizations gaining a competitive advantage by detecting market imbalances before their competitors. This advantage enables them to introduce new offerings, adjust their value propositions, and capitalize on emerging opportunities [12]. Traditional strategic analysis methods have shown diminished effectiveness in such dynamic market conditions. Analysts are now required to adopt novel approaches for assessing market conditions and environmental uncertainties [13]. This involves recognizing and evaluating the impact of external factors, including market trends, competitors, and technological advancements, to inform decision-making processes.

To navigate this uncertainty, various methods and models have been developed, both within strategic and non-strategic domains [14]. Some scholars have focused on enhancing classical strategy selection models, such as Quantitative Strategic Planning Matrix (QSPM) and SWOT analysis, under conditions of uncertainty [15]. Another category of models includes the multi-criteria decision-making approach, which offers a more nuanced evaluation [16].

SWOT analysis, in particular, serves as a fundamental tool for organizations to assess their internal and external environments amidst uncertainties. It systematically evaluates an organization's strengths, weaknesses, opportunities, and threats, aiding in the identification of both internal and external factors that can influence success [17]. Opportunities often refer to favorable external factors and the potential to address gaps or launch new initiatives, while threats encompass external challenges to organizational success. Importantly, opportunities and threats may also arise internally. Strengths are internal attributes that facilitate goal achievement, whereas weaknesses are internal elements that could limit or impede growth. Thus, SWOT analysis provides a comprehensive framework for organizations to evaluate their internal and external landscapes.

SWOT analysis, recognized extensively in strategic planning literature, has been widely employed to assess an organization's position and strategize accordingly [18]. Despite its extensive application across diverse fields, the literature has often been too generalized or overly field-specific, thereby lacking a comprehensive perspective on its utilization [10]. Another tool frequently used in strategic decision-making is the QSPM, which assists in evaluating strategic options and their relative appeal. The QSPM is designed to assess the feasibility and sustainability of strategies within the context of organizational and environmental conditions [19]. Effective role planning across various managerial levels is imperative for organizational success.

A significant challenge in decision-making, particularly in uncertain environments, is the difficulty in accurately forecasting future conditions [20]. This challenge is addressed by evaluating internal preferences for future options while maintaining the flexibility to select them. It involves assessing different potential outcomes for each decision, ensuring that choices remain viable over time. It is widely acknowledged that classical strategic planning approaches are insufficient in addressing uncertainties [21].

Robustness analysis, particularly valuable in highly uncertain scenarios, falls under the Interpretive paradigm and is a part of soft operations research. This method is pertinent in addressing management and organizational issues, especially where human factors are significant [22]. It is employed to evaluate the long-term implications of decisions made under uncertain conditions. The process necessitates implementing and assessing successive decisions to confirm their durability. This analysis involves the development of future scenarios, a profound understanding of the problem, and the factors influencing outcomes [23]. It includes creating multiple potential future scenarios and evaluating their impact on the organization or management issue. Techniques such as scenario writing and Futurology are instrumental in identifying possible futures and their probable outcomes based on current situations. Robustness analysis then assists in identifying stable factors across scenarios and understanding their primary influences, thereby facilitating decision-making under uncertainty [24].

In this study, the integration of SWOT analysis and robustness analysis is explored for strategy selection. Initially, potential strategies are identified using SWOT analysis, which are then prioritized through robustness analysis. The subsequent sections of this study demonstrate the application of this integrated approach in a case study.

2 Literature Review

Arulmozhi et al. [25] explored the factors influencing the growth of medical tourism in India through a SWOT analysis. Primary data were collected from 372 medical tourists, predominantly from countries such as Bangladesh, Bhutan, Nepal, Maldives, Afghanistan, Pakistan, and Sri Lanka. Respondents were randomly selected and surveyed using a seven-point scaling technique to gather their opinions and feedback. The study underscored the significance of analyzing hospital performance and other determinants for medical tourists. It posited that India's leadership in global medical tourism hinges on enhancing foreign policies related to medical visas and treatment processes.

In another study, Tanriverdi and Kucukyilmaz [26] investigated the experiences of airlines with cooperative strategies. Interviews with five senior managers using a semi-structured approach revealed the crucial role of cooperative strategies for airlines' survival in the industry. The study suggested that competition boards should offer guidance on methods that are advantageous for airlines.

Mustika and Aditya [27] focused on the tourism village of Kampong Tajor, aiming to identify its SWOT and to develop strategies for tourism development. Their empirical analysis highlighted the vulnerability of rural areas to the influx of tourists and emphasized the necessity for policies to enhance their advantages, minimize weaknesses, address threats, and capitalize on opportunities. The study recommended leveraging comparative advantages to bolster the tourism sector in the region.

Barati et al. [28] conducted a study to devise a composite method for strategizing and selecting developmental approaches for rural cooperatives. This research integrated SWOT analysis, the TOWS matrix, and the Analytical Network Process (ANP). Input was solicited from experts, including 10 CEOs of rural cooperatives and senior personnel from the central organization of rural cooperatives, using a brainstorming technique to analyze the external and internal environments of these entities. Subsequent to identifying key SWOT factors, a TOWS matrix was constructed to generate strategic alternatives, which were later prioritized using the ANP. The study unearthed 19 crucial strategic factors, such as deficiencies in management knowledge and the ability to enhance value and supply chains. Furthermore, 11 strategic alternatives were identified, including public policy implementation, technical and financial service provision, and the facilitation of input procurement, supply, and value chain development. The hybrid approach was posited as beneficial for decision-makers and managers in adopting optimal strategies and alternatives for the development of rural cooperatives.

In their research, Dimić et al. [29] introduced a strategic transportation management model. Employing SWOT analysis, the study evaluated impacting factors to formulate a sustainable transportation strategy. The strategic options were developed through SWOT analysis, and the optimal selection was achieved using ANP based on the Decision-Making Trial and Evaluation Laboratory (DEMATEL) method. The Serbian Oil Industry (NIS) implemented this model in the production and transportation of oil derivatives. The findings demonstrated the model's successful application in profit-oriented organizations and its utility in strategy formulation based on scientific principles, thereby creating conditions conducive to the successful execution of sustainable strategies.

Yang's study [30] focused on developing an appropriate logistics strategy for Hangzhou Airport. The research highlighted the airport's logistical weaknesses and threats, suggesting the need to capitalize on opportunities to enhance airport logistics, including accelerating infrastructure construction, strengthening the information system, and forming strategic alliances. These findings offer practical guidance for the logistics development of Hangzhou Airport.

3 Methodology

The methodology of this research commences with the assembly of a matrix encapsulating internal strengths and weaknesses, along with external opportunities and threats, as perceived by research experts. It is imperative to focus on the most critical factors in this matrix to ensure that the derived strategies adequately reflect the influence of each factor. The MARA facilitates this process, as it does not impose any constraints on the computational aspect, allowing for an expansion in the number of strategies without hindrance [31].

The second stage involves the alignment of internal strengths with external opportunities and threats, leading to the formulation of SO_i and ST_i strategies (where i=1,2,...,n). Similarly, the matching of internal weaknesses with external opportunities and threats results in the identification of WO_i and WT_i strategies. This stage is characterized by the absence of limitations on the number of strategies that can be formulated.

In the third stage, the most salient indicators related to environmental factors, encompassing political, economic, social, technological, environmental, and legal aspects, are listed. These indicators, which significantly impact the business and the implementation of organizational strategies and decisions, are prioritized based on their importance, with decision-makers selecting the most crucial indicators from each category.

The fourth stage requires the problem owners to ascertain the possible states for all selected indicators from the preceding stage. For each indicator, a minimum of two states should be envisaged. The number of future scenarios is determined by the product of the different states of these indicators. For instance, if an indicator such as political

relations has two states (peace and war), and another indicator like national currency value has three states (increase, robustness, and decrease), the total number of future scenarios would be calculated accordingly (18 = 2 × 3 × 3).

In the fifth stage, future scenarios undergo a refinement process, where implausible scenarios are eliminated. This refinement is conducted from two perspectives: firstly, by excluding states of indicators deemed unlikely to occur, and secondly, by removing scenarios with contradictory states of indicators. For instance, if it is established that an increase in the national currency value is improbable during the planning period, this state is excluded, reducing the number of future scenarios (12 = 2 × 3 × 2).

$$S = \begin{pmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 2 & 2 & 2 & 2 & 2 & 2 \\ 2 & 2 & 2 & 3 & 3 & 3 & 2 & 2 & 2 & 3 & 3 & 3 \\ 1 & 2 & 3 & 1 & 2 & 3 & 1 & 2 & 3 & 1 & 2 & 3 \end{pmatrix}$$

In the methodology, rows of the matrix represent indicators, while columns depict future scenarios. For instance, the first column (Scenario 1) illustrates a future characterized by peace, stability in national currency value, and high access to global markets. Scenarios combining mutually exclusive states, such as political conditions of war with high access to global markets, are identified as implausible and thus excluded. Consequently, after eliminating scenarios 7 and 10, twelve scenarios are retained for analysis.

The sixth step involves delineating the conditions under which each strategy performs effectively, represented in a performance matrix (P).

$$P = \begin{pmatrix} 1 & 2 & 2 & 2 \\ 2 & 2 & 3 & 3 \\ 1 & 2 & 1 & 3 \end{pmatrix}$$

In this matrix, columns are allocated to strategies, and rows to different states of indicators. For example, the first column (Strategy 1) indicates optimal performance under conditions of peace, stable national currency value, and high access to global markets.

The final phase of this methodology involves a critical alignment of the Scenario (S) and Performance (P) matrices to ascertain the robustness score for each strategy. The process entails a meticulous comparison of each strategy's respective column in matrix P against the columns of matrix S. In this context, every instance where a strategy aligns with a scenario is awarded a positive point. For illustrative purposes, the robustness of the first strategy is evaluated by juxtaposing its column in matrix P with each column in matrix S. For example, in the first scenario, if all criteria match, the performance score for strategy 1 is determined as 3. Conversely, in scenarios where there are fewer matches, as in the second scenario, the performance score may be lower. This assessment is systematically conducted across all scenarios.

Upon completion of these comparisons, the robustness score for each strategy is calculated as the sum of its performance across the spectrum of scenarios. This robustness score is a crucial metric, reflecting the strategy's overall effectiveness and adaptability in various hypothetical situations. Subsequently, strategies are prioritized based on their robustness scores, presented in a descending order, illustrating their relative strength and feasibility in diverse future conditions.

4 Case Study

The initial phase of implementing the proposed approach involved establishing a team to participate in the strategy selection process. This team included the CEO and technical director of Q-Parvaz Travel Agency. An introduction to the approach was provided, followed by a systematic progression through the specified steps.

The primary stage of this approach entailed the identification of potential strategies for the organization. Given the absence of a formal strategic document at Q-Parvaz Travel Agency, semi-structured interviews were conducted with the agency's owners. These interviews facilitated the identification of the agency's strengths and weaknesses, as documented in Table 1, and the external threats and opportunities, as noted in Table 2. The SWOT matrix was then derived from these identified elements in Table 3, leading to the formulation of twelve potential strategies for the travel agency, outlined in Table 4.

In the subsequent phase of scenario development, the agency's owners identified critical indicators impacting the business environment. For this purpose, environmental factors were assessed using an expert scoring method according to Table 5, where indicators were assigned scores based on their impact: 'no impact' (0 point), 'low impact' (1 point), and 'high impact' (2 points).

In this study, experts identified the most critical environmental indicators impacting Q-Parvaz Travel Agency: diplomatic relations and political robustness (political index), inflation rate and exchange rate fluctuations (economic index), market size potential (social index), and government regulations (legal index). Following this identification, Table 6 delineates various states of each selected indicator as determined by the owners.

Table 1. Analytical matrix of internal factors of the Q-Parvaz Travel Agency

S_1 : A robust presence of young male workers. S_2 : Staff proficiency in English is well-established. S_3 : Adherence to customer values by employees is observed. S_4 : A diverse portfolio of tourism services is offered. S_5 : Optimal financing of the agency is maintained. S_6 : The agency's location is strategically convenient. S_7 : A strong marketing team is in place. S_8 : Adequate hardware and software infrastructure is available.	**Strengths**
W_1 : Employee retention in the long term is challenging. W_2 : The current salary system lacks motivational aspects. W_3 : A high error rate is noted due to the rapid employment of new staff. W_4 : Environmental advertising exhibits weaknesses.	**Weaknesses**

Table 2. Analytical matrix of external factors of the Q-Parvaz Travel Agency

O_1 : Enhanced political relations with Persian Gulf countries are anticipated O_2 : .Cancellation of political visas with select countries is underway O_3 : Financial challenges faced by partner agencies present opportunities O_4 : Access to affordable facilities through agency account circulation is feasible O_5 : The cost-effectiveness of medical services in the country, in comparison to Persian Gulf countries, is noted O_6 : The utilization of government company airplanes for organizational missions is observed O_7 : Customer loyalty is established	**Opportunities**
T_1 : The foreign exchange market is experiencing extreme fluctuations T_2 : A rise in the number of travel agencies and new competitors is noted T_3 : Air ticket prices are high compared to other transport options T_4 : Prescriptive pricing of ticket rates is a concern T_5 : Rapid recruitment of expert employees by competitors is observed T_6. Obsolescence in the civil aviation fleet is noted T_7 : A decrease in the desire for tourism trips due to socio-economic challenges is observed T_8 : The suspension of the JCPOA agreement poses a threat	**Threats**

Table 3. SWOT matrix of the Q-Parvaz Travel Agency

	Strengths (S)
Weaknesses (W) W_1 : Challenges in long-term employee retention are identified. W_2 : The absence of a motivational salary system is observed. W_3 : A high error rate due to rapid employment of new staff is reported. W_4 : Inadequate environmental advertising is recognized.	S_1 : An adequate number of young male workers is maintained. S_2 : Proficiency in English among the staff is sufficient. S_3 : Adherence to customer values by employees is noted. S_4 : A diverse range of tourism services is offered. S_5 : The agency benefits from optimal financing. S_6 : The location of the agency is strategically convenient. S_7 : A robust marketing team is in operation. S8: The agency is equipped with sufficient hardware and software infrastructure.

	SO strategy S_5O_6 : Contracting with government organizations by leveraging optimal financing and airplane use by government companies. S_4O_4 : Introduction of installment tourism tours, combining diverse tourism services with banking network facilities. S_2O_1 : Creation of counters at airports, hotels, and medical centers, utilizing staff's English proficiency and improving political relations. S_5O_3 : Branch development through new openings and agency integration, supported by optimal financing and partner agency challenges. S_5O_1 : Establishment of new pilgrimage tours, capitalizing on optimal financing and improved political relations.	**Opportunities (O)** O_1 : Improvement in political relations with Persian Gulf countries is underway. O_2 : Cancellation of political visas with certain countries is in progress. O_3 : Financial challenges of partner agencies offer strategic opportunities. O_4 : Potential for receiving affordable facilities through account circulation is noted. O_5 : Comparative affordability of medical services in relation to Persian Gulf countries is observed. O_6 : Use of government company airplanes for organizational missions is identified. O_7 : Established customer loyalty is recognized.
WO strategy W_2O_4 : Employee retention enhancement by offering low-cost banking facilities, addressing the motivational salary system gap. W_4O_7 : Customer retention through the creation of virtual network communication channels, mitigating poor environmental advertising.		
	ST strategy S_5T_5 : Increasing expert staff salaries to counteract competitor recruitment and socio-economic challenges. S_5T_7 : Implementation of affordable one-day installment tours, addressing economic concerns and civil aviation fleet issues. S_4T_6 : Conducting rail and road tours, leveraging diverse tourism services and addressing civil aviation fleet wear.	**Threats(T)** T_1 : Extreme fluctuations in exchange rates are noted. T_2 : An increase in tourism interest due to socio-economic challenges is observed. T_8 : The suspension of the JCPOA agreement poses potential risks.
WT strategy W_1T_5 : Recruitment of relatives in the agency, addressing the high error rate and rapid recruitment of expert employees by competitors.		

Table 4. Strategy formulation for the Q-Parvaz Travel Agency

Title	Row
A_1 : Contracts with government agencies are being established.	1
A_2 : Introduction of installment tourism tours linked to banking networks is planned.	2
A_3 : Establishment of counters at airport terminals, hotels, and medical centers is in progress.	3
A_4 : Expansion through the creation of new agency branches is underway.	4
A_5 : Initiatives for new pilgrimage tours are being developed.	5
A_6 : Retention strategies for competent employees involve providing affordable banking facilities.	6
A_7 : Customer engagement through virtual network communication channels is being enhanced.	7
A_8 : Salary increments for expert employees are being considered.	8
A_9 : Implementation of cost-effective one-day installment tours is planned.	9
A_{10} : Conducting tours via rail and road transport is being explored.	10
A_{11} : Recruitment strategies include employing relatives within the agency.	11
A_{12} : Integration with other agencies for collaborative growth is being pursued.	12

Given these states, a total of 144 future scenarios (2×2×3×3×2×2) were initially considered. To design more feasible future scenarios, the agency's owners conducted a refinement process over a five-year perspective. This process involved two steps: 1) Elimination of states deemed unlikely to occur, and 2) Removal of scenarios with contradictory states. Expert analysis facilitated the refinement of possible scenario states, as outlined in Table 7.

Following the initial scenario development, implausible scenarios were systematically eliminated, resulting in a reduction of the total scenarios to 32 (1×2×2×2×2×2×2), forming the preliminary matrix S.

$$S = \begin{bmatrix} 1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&2&2&2&2&2&2&2&2&2&2&2&2&2&2&2&2 \\ 1&1&1&1&1&1&1&1&2&2&2&2&2&2&2&2&1&1&1&1&1&1&1&1&2&2&2&2&2&2&2&2 \\ 1&1&1&1&2&2&2&2&1&1&1&1&2&2&2&2&1&1&1&1&2&2&2&2&1&1&1&1&2&2&2&2 \\ 1&2&2&2&1&1&2&2&1&1&2&2&1&1&2&2&1&1&2&2&1&1&2&2&1&1&2&2&1&1&2&2 \\ 1&1&1&2&1&2&1&2&1&2&1&2&1&2&1&2&1&2&1&2&1&2&1&2&1&2&1&2&1&2&1&2 \\ 1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1&1 \end{bmatrix}.$$

Table 5. Environmental impact analysis based on owner perspectives for the Q-Parvaz Travel Agency

Impact Assessment as Perceived by Agency Owners	Variable	
0	Political participation of society	Political
0	Political structure and government type	
1	Relationships between government and private sector	
0	Protest centers against the government	
2	Diplomatic relations with other countries	
1	Investment Attraction Laws	
0	Voter participation rate	
2	Political robustness	
1	Investment security status	
0	Influence of pressure groups	
2	Inflation	Economic
0	Economic growth rate	
0	Access to raw material markets	
0	GDP trends	
2	Exchange rate fluctuations	
0	Unemployment rate	
1	Currency value fluctuations	
0	Disposable income levels	
2	Potential market size	Social
1	Immigration rate	
1	Work attitudes	
1	Human development level	
0	Lifestyle changes	
0	Population age distribution	
0	Job expectations	
0	Energy usage trends	
0	Influence of interest groups	
0	Organizational social responsibility	
0	Product substitution	Technologically
0	Research and development expenditure	
0	Information technology	
1	Automation	
1	Technology change pace	
1	Collaborative technologies	
1	Industrial technology levels	
1	E-commerce	
1	Political-economic decision-making process	Legal
1	Government intervention diversity and level in economy and business	
2	Government regulations	
1	Antitrust laws	
0	Local customary laws	
0	Tax laws	
0	Foreign trade regulations	
1	Social security laws	
1	Laws related to employment and career promotion	
0	Import restrictions	
0	Air quality and pollution status	Environmental
0	Environmental effects	
0	Society's environmental perspective	

An exemplar scenario from the first column of matrix S envisages a future where diplomatic relations with other countries are not only maintained but also improved. In this scenario, political robustness within the country is sustained, inflation rates remain stable, exchange rate fluctuations are minimal, market size experiences growth, and a facilitation in regulatory frameworks is observed. Through a rigorous refinement process, scenarios deemed infeasible by the agency's owners were excluded, culminating in the extraction of matrix S comprising 19 distinct

scenarios.

$$S = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 2 & 2 & 1 & 1 & 1 & 1 & 1 & 1 & 2 & 2 & 2 & 2 \\ 1 & 1 & 1 & 1 & 2 & 2 & 2 & 1 & 1 & 1 & 1 & 1 & 1 & 2 & 2 & 1 & 1 & 2 & 2 \\ 1 & 1 & 2 & 2 & 1 & 1 & 2 & 1 & 1 & 2 & 1 & 1 & 2 & 1 & 2 & 1 & 2 & 1 & 2 \\ 1 & 2 & 1 & 2 & 1 & 2 & 2 & 1 & 2 & 2 & 1 & 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \end{bmatrix}.$$

Subsequently, the agency's owners were requested to evaluate each of the 12 strategies against these scenarios within a performance matrix (denoted as matrix P). Each strategy's effectiveness was assessed in the context of the defined scenarios.

$$P = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & - & 2 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 2 & 2 \\ 1 & 2 & 1 & 1 & 1 & 2 & 1 & 2 & 2 & 2 & 1 & 2 \\ 2 & 2 & 1 & 1 & 1 & 2 & 1 & 2 & 2 & 2 & 1 & 2 \\ 2 & 2 & 1 & 1 & 2 & 1 & 2 & 1 & 2 & 2 & 2 & 2 \\ 1 & 1 & 1 & 1 & 1 & 1 & 2 & 1 & 2 & 2 & 2 & 2 \end{bmatrix}.$$

Table 6. Different states of environmental selection indicators

State			Indicator
Escalation of tension (2)		Maintenance and improvement (1)	Diplomatic relations with other countries
InRobustness (2)		Robustness (1)	Political Robustness
Decrease (3)	Increase (2)	Maintaining the status (1)	Inflation
Decrease (3)	Increase (2)	Maintaining the status (1)	Exchange rate fluctuations
Decrease (2)		Increase (1)	Potential market size
Facilitation (2)		Tightening of rules (1)	Government regulations

Table 7. Refined scenarios based on owner perspectives for five years

State	Indicator
Maintenance and improvement (1)	Diplomatic relations with other countries
Escalation of tension (2)	
Robustness (1)	Political robustness
InRobustness (2)	
Maintaining the status (1)	Inflation
Increase (2)	
Maintaining the status (1)	Exchange rate fluctuations
Increase (2)	
Increase (1)	Potential market size
Decrease (2)	
Facilitation (1)	Government regulations

The final stage involved a comparative analysis between matrices S and P to calculate the robustness scores of the strategies. To ascertain the robustness of each strategy, a corresponding column in matrix P was matched against columns in matrix S (scenarios). Positive scores were allocated for each strategy under specific conditions within this matching process. This scoring was conducted in two distinct modes: rigorous and lenient. The outcomes of this analysis are presented in Table 8.

4.1 Rigorous Mode

In the rigorous mode of analysis, Table 8 illustrates the matching of the scenario matrix (S) with the performance matrix (P) for Q-Parvaz Travel Agency. Each column in Table 8 corresponds to a specific scenario, while each row represents the performance of a strategy within that scenario. The strategies were assessed for their robustness across various environmental conditions, with each match between the scenario and the strategy's performance earning a positive score.

Table 8. Matching S and P matrix in rigorous mode

Strategy	Scenario																		
	19	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
1	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	**2**	**4**	**3**	**4**	**3**	**5**	**4**	**3**	**5**	**4**	**3**	**5**	**4**	**3**	**6**	**5**	**5**	**4**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	1	1	0	0	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0
2	1	0	1	0	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	4	**3**	**3**	**2**	**5**	**4**	**4**	**3**	**2**	**4**	**3**	**2**	**6**	**5**	**4**	**5**	**4**	**4**	**3**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
3	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1
	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	**2**	**2**	**3**	**2**	**3**	**3**	**4**	**5**	**3**	**4**	**5**	**3**	**4**	**5**	**4**	**5**	**5**	**6**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
4	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1
	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	**2**	**2**	**3**	**2**	**3**	**3**	**4**	**5**	**3**	**4**	**5**	**3**	**4**	**5**	**4**	**5**	**5**	**6**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
5	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	**3**	**3**	**4**	**3**	**4**	**4**	**5**	**4**	**4**	**5**	**4**	**4**	**5**	**4**	**5**	**4**	**6**	**5**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0
6	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0
	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	**2**	**2**	**1**	**4**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**5**	**4**	**5**	**4**	**5**	**3**	**4**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
7	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	**2**	**2**	**3**	**2**	**3**	**3**	**4**	**3**	**3**	**4**	**3**	**3**	**4**	**3**	**4**	**3**	**5**	**4**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0
8	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0

Strategy	Scenario																		
	19	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	**2**	**2**	**1**	**4**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**5**	**4**	**5**	**4**	**5**	**3**	**4**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0
9	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	**2**	**2**	**1**	**4**	**3**	**3**	**2**	**1**	**3**	**2**	**1**	**5**	**4**	**3**	**4**	**3**	**3**	**2**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0
10	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	**2**	**2**	**1**	**4**	**3**	**3**	**2**	**1**	**3**	**2**	**1**	**5**	**4**	**3**	**4**	**3**	**3**	**2**
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
11	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	**3**	**3**	**4**	**1**	**2**	**2**	**3**	**2**	**3**	**4**	**3**	**1**	**2**	**1**	**2**	**1**	**3**	**2**
	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
	1	1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0
12	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5	**4**	**4**	**3**	**4**	**3**	**3**	**2**	**1**	**3**	**2**	**1**	**3**	**2**	**1**	**2**	**1**	**1**	**0**

This rigorous scoring approach provided a detailed and stringent evaluation of each strategy's effectiveness in different potential future states. The strategies were then ranked based on their cumulative scores across all scenarios, offering a comprehensive view of their viability in varying conditions.

Table 9. Strategy scores in diverse scenarios in rigorous mode

Strategy	Score Strategy in the Scenario																			The Final Score
	19	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**of the Strategy**
1	0	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1	1	1	**12**
2	1	0	0	0	1	1	1	0	0	1	0	0	1	1	1	1	1	1	0	**11**
3	0	0	0	0	0	0	0	1	1	0	1	1	0	1	1	1	1	1	1	**10**
4	0	0	0	0	0	0	0	1	1	0	1	1	0	1	1	1	1	1	1	**10**
5	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**15**
6	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	1	0	1	**7**
7	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1	1	**6**
8	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	1	0	1	**7**
9	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	0	0	**4**
10	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	0	0	**4**
11	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**2**
12	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**

In the rigorous evaluation mode, the final scores of each strategy across different scenarios were color-coded in red at the end of each strategy row. In this mode, scores ranging from 0 to 3 were assigned a value of 0, and scores

between 4 and 6 were assigned a value of 1. This led to the formulation of Table 9, which presents the final scores of strategies in various scenarios under rigorous conditions.

Following this, the robustness scores of the 12 strategies in rigorous mode were calculated based on the 19 scenarios. These scores were visualized in Figure 1.

Based on the robustness balance depicted in Figure 1, the strategies were prioritized, leading to the development of Table 10. This table presents the prioritization of strategies based on their robustness balance in rigorous mode.

4.2 Lenient Mode

In the lenient mode of the analysis, Table 11 displays the matching of the scenario matrix (S) with the performance matrix (P) for the strategies of Q-Parvaz Travel Agency.

In the lenient evaluation mode, the final scores of strategies in diverse scenarios were marked in red at the end of each strategy row. Scores ranging from 0 to 2 were assigned a value of 0, and scores from 3 to 6 were allocated a value of 1. This scoring methodology led to the formation of Table 12, representing the final scores of strategies in various scenarios under lenient conditions.

Following the assessment, the robustness scores of the 12 strategies were calculated based on their performance across the 19 scenarios in the lenient mode. These scores were visualized in Figure 2 .

The prioritization of strategies in the lenient mode, based on the robustness balance, is outlined in Table 13. This prioritization offered a strategic guide for the agency, highlighting the most adaptable strategies in diverse and less stringent conditions.

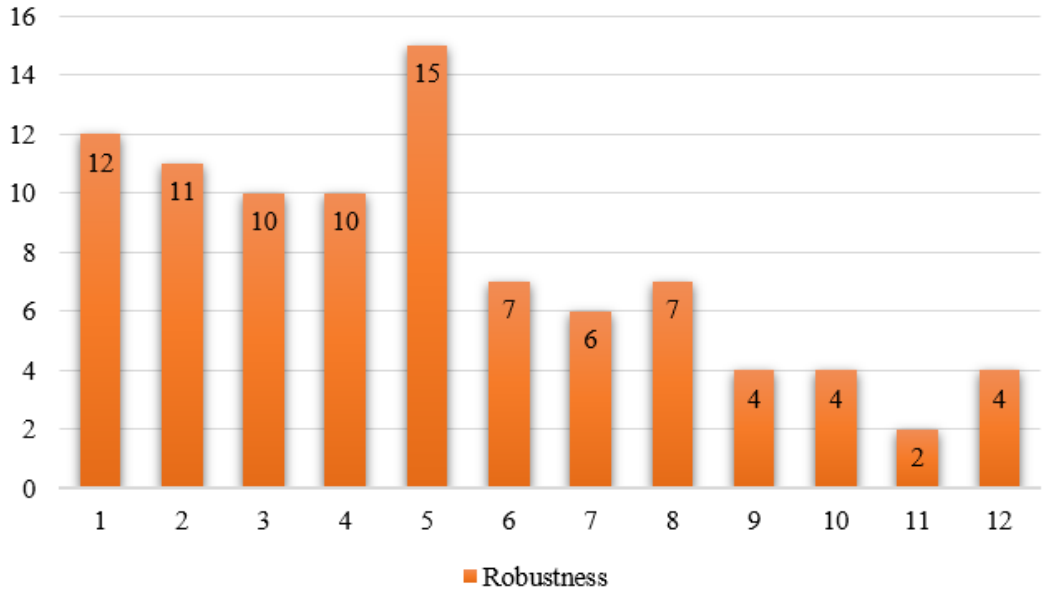

Figure 1. Robustness balance of strategies in different scenarios in rigorous mode

Table 10. Strategies prioritization based on robustness balance in rigorous mode

Strategy	Priority
Establishment of new pilgrimage tours	1
Contracts with government agencies	2
Introduction of installment tourism tours via banking networks	3
• Creation of counters at airport terminals, hotels, and medical centers • Expansion via new branches	4
• Offering substantial banking facilities to retain competent employees • Increasing salaries of expert staff	5
Enhancement of customer engagement through virtual networks	6
• Implementing cost-effective one-day tours • Conducting rail and road tours • Integration with other agencies	7
Recruitment of relatives in the agency	8

Table 11. Matching of S and P matrix in lenient mode

Strategy	Scenario																		
	19	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
1	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	**2**	**4**	**3**	**4**	**3**	**5**	**4**	**3**	**5**	**4**	**3**	**5**	**4**	**3**	**6**	**5**	**5**	**4**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0
2	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	4	**3**	**3**	**2**	**5**	**4**	**4**	**3**	**2**	**4**	**3**	**2**	**6**	**5**	**4**	**5**	**4**	**4**	**3**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
3	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1
	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	**2**	**2**	**3**	**2**	**3**	**3**	**4**	**5**	**3**	**4**	**5**	**3**	**4**	**3**	**4**	**5**	**5**	**6**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
4	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1
	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	**2**	**2**	**3**	**2**	**3**	**3**	**4**	**5**	**3**	**4**	**5**	**3**	**4**	**5**	**4**	**5**	**3**	**6**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
5	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	**3**	**3**	**4**	**3**	**4**	**4**	**5**	**4**	**4**	**5**	**4**	**4**	**5**	**4**	**5**	**4**	**6**	**5**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0
	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0
	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	**2**	**2**	**1**	**4**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**5**	**4**	**5**	**4**	**5**	**3**	**4**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
7	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	**2**	**2**	**3**	**2**	**3**	**3**	**4**	**3**	**3**	**4**	**3**	**3**	**4**	**3**	**4**	**3**	**5**	**4**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0
8	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0

Strategy	Scenario																		
	19	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	**2**	**2**	**1**	**4**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**5**	**4**	**5**	**4**	**5**	**3**	**4**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0
9	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	**2**	**2**	**1**	**4**	**3**	**3**	**2**	**1**	**3**	**2**	**1**	**5**	**4**	**3**	**4**	**3**	**3**	**2**
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	1	1	1	1	1	o	0	0	1	1	1	1	1	1	1
	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0
10	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	**2**	**2**	**1**	**4**	**3**	**3**	**2**	**1**	**3**	**2**	**1**	**5**	**4**	**3**	**4**	**3**	**3**	**2**
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
11	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	**3**	**3**	**4**	**1**	**2**	**2**	**3**	**2**	**3**	**4**	**3**	**1**	**2**	**1**	**2**	**1**	**3**	**2**
	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
	1	1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0
12	1	0	1	0	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0
	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	1	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5	**4**	**4**	**3**	**4**	**3**	**3**	**2**	**1**	**3**	**2**	**1**	**3**	**2**	**1**	**2**	**1**	**1**	**0**

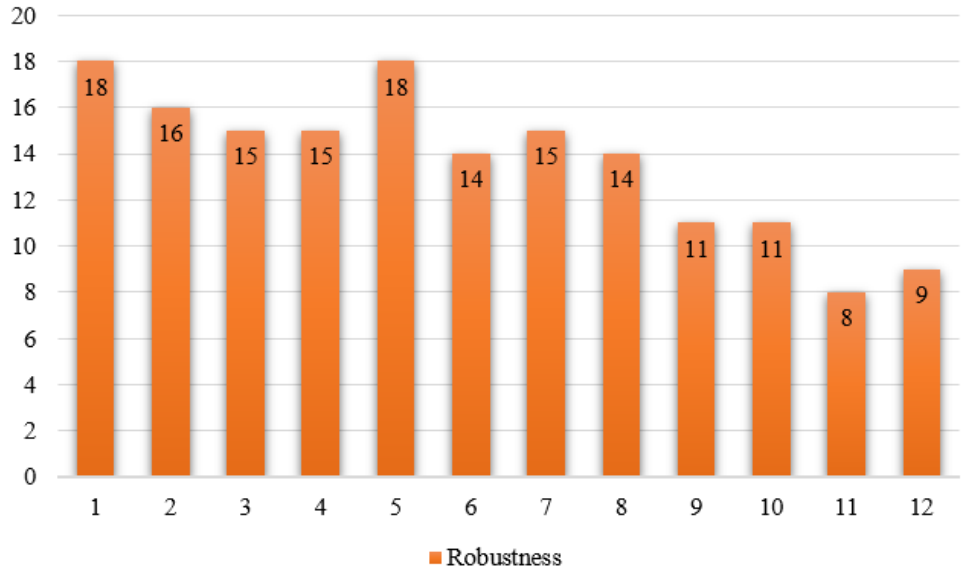

Figure 2. Robustness balance of strategies in different scenarios in lenient mode

Table 12. Final scores of strategies in different scenarios in lenient mode

Strategy	Score Strategy in the Scenario																		The Final Score
	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	of the Strategy
1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**18**
2	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	**16**
3	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**15**
4	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**15**
5	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**18**
6	1	0	0	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	**14**
7	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**15**
8	1	0	0	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	**14**
9	1	0	0	0	1	1	1	0	0	1	0	0	1	1	1	1	1	1	0	**11**
10	1	0	0	0	1	1	1	0	0	1	0	0	1	1	1	1	1	1	0	**11**
11	0	1	1	1	0	0	0	1	0	1	1	1	0	0	0	0	0	1	0	**8**
12	1	1	1	1	1	1	1	0	0	1	0	0	1	0	0	0	0	0	0	**9**

Table 13. Strategy prioritization based on robustness balance in lenient mode

Strategy	Priority
• Contracts with government agencies • Establishment of new pilgrimage tours	1
Introduction of installment tourism tours via banking networks	2
• Creation ofc ounters ata irportt ,erminalsh otels, andm edicalcenters • Expansion via new branches • Enhancement of customer engagement through virtual networks	3
• Offering substantial banking facilities to retain competent employees • Increasing salaries of expert staff	4
• Implementing cost-effective one-day tours • Conducting rail and road tours	5
Integration with other agencies	6
Recruitment of relatives in the agency	8

5 Conclusions

This study integrated two established approaches to address uncertainty in strategy selection, applying this combined methodology in a case study.

In the initial phase of the study, matrices encapsulating internal strengths and weaknesses, along with external opportunities and threats, were compiled based on the inputs from the problem owners, as delineated in Table 1 and Table 2. This was followed by aligning the identified strengths with environmental opportunities and threats, leading to the formulation of potential strategies, as documented in the SWOT matrix (Table 3 and Table 4). Subsequently, the study employed the PESTEL (i.e. political, economic, social, technological, environmental, and legal) analysis framework to evaluate critical environmental factors influencing business operations and the efficacy of organizational strategies. This assessment, guided by the problem owners' perspectives, involved an expert scoring method, where impacts were categorized as no impact (0), low impact (1), and high impact (2), as presented in Table 5. Among the array of indicators, several were identified as paramount due to their significant impact on the research context. These included diplomatic relations with other countries and political robustness (categorized under the political index), inflation rate and exchange rate fluctuations (economic index), market size potential (social index), and government regulations (legal index).

In a subsequent step, the owners delineated various potential states for each selected indicator, as outlined in Table 6. Based on these predetermined states, a total of 144 future scenarios were initially considered (2×2×3×3×2×2). To enhance the feasibility of these future scenarios, a refinement process was undertaken, focusing on two aspects: the elimination of states deemed implausible and the removal of scenarios with contradictory indicator states. Through expert analysis, the refined and plausible states of these scenarios were predicted and cataloged in Table 7.

Following the initial stage of scenario reduction, the number of potential scenarios was first narrowed down to 32 and eventually refined to 19, culminating in the formation of matrix S. The owners were then engaged to ascertain the conditions under which each of the 12 strategies demonstrated optimal performance, leading to the development of the performance matrix, denoted as matrix P.

The pivotal step involved the alignment of matrices S and P to calculate the robustness scores of the strategies. This process entailed matching each strategy's corresponding column in matrix P with the scenarios in matrix S. A positive point was allocated to a strategy for each effective match, with the final robustness score of each strategy being the cumulative total of its performance across all scenarios. This evaluation was conducted in two modes, i.e. rigorous and lenient, as determined by the problem owners, with the results presented in Table 8, Table 9, Table 10, Table 11, Table 12. In the lenient mode, scores ranging from 0 to 2 were assigned a value of 0, while scores between 3 and 6 received a value of 1. Conversely, in the rigorous mode, scores from 0 to 3 were allocated a value of 0, and those between 4 and 6 were assigned a value of 1. The culmination of this research was the prioritization of strategies based on their robustness scores. This prioritization, depicted in Figure 1, Figure 2 and Table 10, Table 13, was presented in both rigorous and lenient modes, ordered from the highest to the lowest priority.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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