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Integrating SWOT and AHP Approaches to Strengthen Strategic Planning in Malaysia's Food Delivery Industry

By

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ABSTRACT

The goal of this research is to combine the Analytical Hierarchy Process (AHP) with the SWOT analysis to provide a thorough strategic planning framework for food delivery services in Malaysia. Through the creation of practical solutions to address these concerns and enhance overall performance, this integrated approach seeks to give a thorough understanding of the internal and external factors driving the food delivery business in Malaysia. The most important factors that need to be addressed right away can be found by using the SWOT analysis to identify the main strengths, weaknesses, opportunities, and threats. The AHP will then assess and rank these factors according to their relative significance and effect on food delivery services.

Keywords: ecotourism, sustainability, bibliometric analysis

INTRODUCTION

Due to rising customer demand for convenience and a wide variety of eating alternatives, Malaysia's food delivery market has grown rapidly over the last ten years. To capitalize on this expanding market, industry leaders like Food Panda and Grab have rapidly extended their operations (Euromonitor International, 2023). Intense competition, high operating costs, and shifting consumer tastes are some of the obstacles the business faces despite its success. To maintain their competitive edge and keep up their current development trajectory, these businesses need to have effective strategic planning. A popular method for strategic planning is SWOT analysis, which provides a framework for assessing an organization's internal and external environments. According to Gurel and Tat (2017), the qualitative aspect of classic SWOT analysis might pose limitations, making it challenging to prioritize certain elements. Analytic Hierarchy Process (AHP) integration with SWOT analysis offers a more quantitative and organized method of decision-making to get over this restriction (Saaty, 2008). By integrating SWOT analysis and AHP, this study seeks to improve the strategic planning procedures used by food delivery businesses in Malaysia. The study's goal is to provide a solid foundation for making strategic decisions by identifying and ranking the major elements influencing the sector. According to Kangas et al. (2001) and Kurttila et al. (2000), the fusion of SWOT and AHP techniques has been effectively utilized in a number of sectors, yielding insightful information and practical plans. This integrated strategy will assist businesses such as Food Panda and Grab in improving their operational efficiency, adjusting their plans, and navigating the competitive environment in the context of Malaysian food delivery services.

SWOT ANALYSIS

A strategic planning tool, the SWOT analysis model divides these elements into a four-quadrant matrix to assist firms in identifying and assessing their external opportunities and threats as well as their internal strengths and weaknesses. Whereas opportunities and threats are caused by outside forces like market trends and competitive pressures, strengths and weaknesses are internal qualities like resources and talents. By offering a thorough framework for strategic decision-making, this model helps businesses take advantage of opportunities, strengthen their positions, solve their weaknesses, and reduce risks (Gürel & Tat, 2017). Figure 1 illustrates how an environment scan uses SWOT analysis.

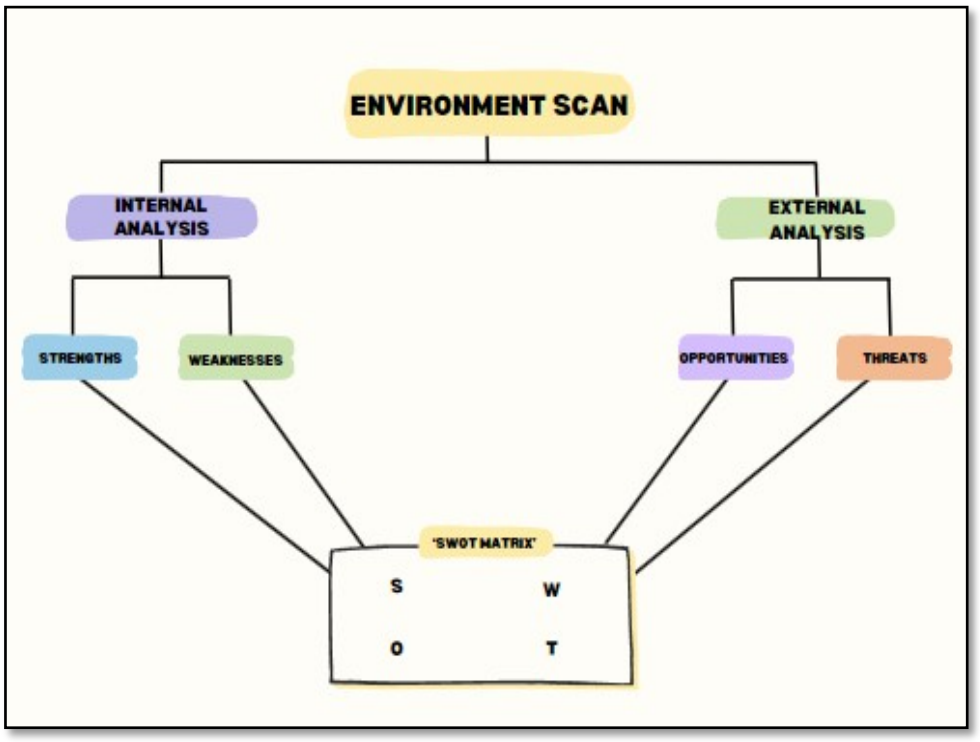

Figure 1: SWOT Analysis Framework

Analytic Hierarchy Process

In the 1970s, Thomas Saaty created the Analytic Hierarchy Process (AHP), a process for making decisions. It is an organized method for handling difficult choices by first dividing them into a hierarchy of requirements and options and then methodically evaluating and ranking each one according to pairwise comparisons. When applying AHP, decision-makers often use a scale from 1 to 9 to assign numerical values to express their preferences or assessments of the relative significance of certain criteria or alternatives. Decision-makers can then determine which solutions are the most advantageous by synthesizing these values using mathematical techniques to create priority ratings. In a variety of domains, such as business, engineering, and public policy, AHP offers a strict and transparent framework for decision-making (Saaty, 2008).

Numerical Values	Description	Explanation
1	Equal Importance of both elements	Two elements contribute equally
3	Moderate importance of one element over another	Experience and judgement 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 judgements	Used to compromise between two judgements

Table 1: Pairwise comparison scale

This table displays the Analytic Hierarchy Process (AHP) pairwise comparison scale for decision-making. With intermediate values (2, 4, 6, 8) used to represent compromise between adjacent judgments, the scale uses numerical values from 1 to 9 to quantify the relative importance of two items. As one element is prioritized above another, its value increases from 1 (equal significance) to 3 (moderate importance) to 9 (extreme importance). A systematic and uniform approach to assessing several criteria in decision analysis is ensured by the explanations that give context and show that higher values indicate a stronger judgment favoring one aspect considerably over another.

In this research, we prioritize the SWOT aspects using the Analytic Hierarchy Process (AHP). Prioritization is the process of establishing the relative relevance of the criteria once the problem has been broken down and the hierarchy has been created. Based on the predetermined criteria at the higher level, the criteria at each level are compared pairwise based on their relative levels of effect. In AHP, a standardized comparison scale with nine levels serves as the foundation for several pairwise comparison.

Let the collection of criteria be represented as C = {Cj | j = 1, 2,..., n}. An (n x n) evaluation matrix A may be used to describe the outcome of the pairwise comparison on n criteria. In this matrix, each element ij (i, j = 1, 2,..., n) represents the weight of the criterion as a ratio. An example of this pairwise comparison is provided by a square and reciprocal matrix.

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

For the final step, each matrix is normalized and be found the relative weights. The relative weights are given by the right eigenvector (max), as:

$$A_w = \lambda_{max}.w$$

The matrix A max = n is the result of perfect consistency in pairwise comparisons. In this particular case, any of A's rows or columns can be normalized to get weights. Note that consistency in the pairwise comparison evaluations is correlated with the quality of the AHP output. The consistency is defined by the relation between the entries of A: aij x ajk = aik. The Consistency Index (CI) can be calculated, using the following formula:

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

The assessments' level of consistency may be determined by utilizing the final consistency ratio (CR). According to Equation 4, the CR is determined by dividing the CI by the random index (RI).

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

The recognized top limit for CR is 0.1. In order to increase consistency, the assessment process must be repeated if the final consistency ratio is higher than this value.

n	1	2	3	4	5	6	7	8	9	10
RI	0,00	0,00	0,58	0,90	1,12	1,24	1,32	1,41	1,45	1,49

Table 2: Random Index

SWOT-AHP Model

In the SWOT-AHP framework, pairwise comparisons using eigenvalue calculations are utilized to prioritize assessment elements using the Analytical Hierarchy Process (AHP). Conventional SWOT analysis usually fails to clearly define the influence of each component on strategic options because it does not quantify each aspect's relevance (Kangas et al., 2001). Kurttila et al. (2000) state that the Analytic Hierarchy Process (AHP) facilitates a methodical way to ascertain the relative significance of criteria and to evaluate decision alternatives correspondingly by transforming the SWOT framework into a hierarchical structure.To measure and compare the strengths and weaknesses of each SWOT element in a methodical manner is the main goal of incorporating AHP into the SWOT framework (Kangas et al., 2001). Three crucial phases are included in the suggested procedure. As the foundation for the SWOT analysis, the first step in strategic planning is to identify important external (opportunities and threats) and internal (strengths and weaknesses) aspects. To ascertain the weights of each SWOT category, pairwise comparisons should be made. The relative priorities of each component inside the SWOT groupings are then determined using AHP. Next, multiply the local weights of the factors by the corresponding group weights to obtain the overall factor weight rank.

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METHODOLOGY AND APPLICATION

The primary goal of applying the Analytic Hierarchy Process (AHP) to the SWOT framework is to methodically evaluate the SWOT criteria and assign weights to them based on their relative importance. The three components of the AHP structure in this study are the aim to be attained by the decision, the SWOT groups, and the elements contained within each SWOT group (sub-criteria). The AHP structure is derived from the SWOT matrix. Fig. 2 displays the hierarchical depiction of the SWOT framework

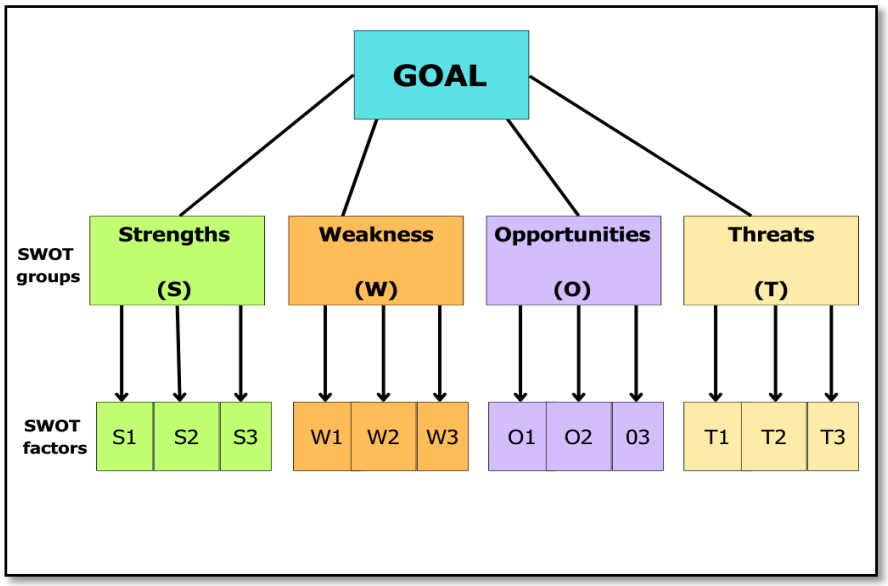

Figure 2: Hierarchical structure of the SWOT matrix

In this case study, a company that makes cooker hoods in Istanbul, Turkey, is the subject of a SWOT analysis that optimizes the AHP. Over 50 nations worldwide are typically recipients of the company's exports. Pairwise comparisons were conducted using a comparison scale, and the relative significance of each pair of SWOT criteria was measured. The vector weights or priorities for the groups and components under analysis might be determined using the aggregated matrix that was produced following the digitization of the SWOT frame using AHP.

We constructed a three-phase model consisting of establishing an initial job, adjusting components, and building an assessment model (Figure 1) in order to create a strategic management model based on SWOT-AHP. SWOT analysis is done first, followed by matrix structure. The SWOT matrix defines and incorporates the pertinent internal environment and elements.

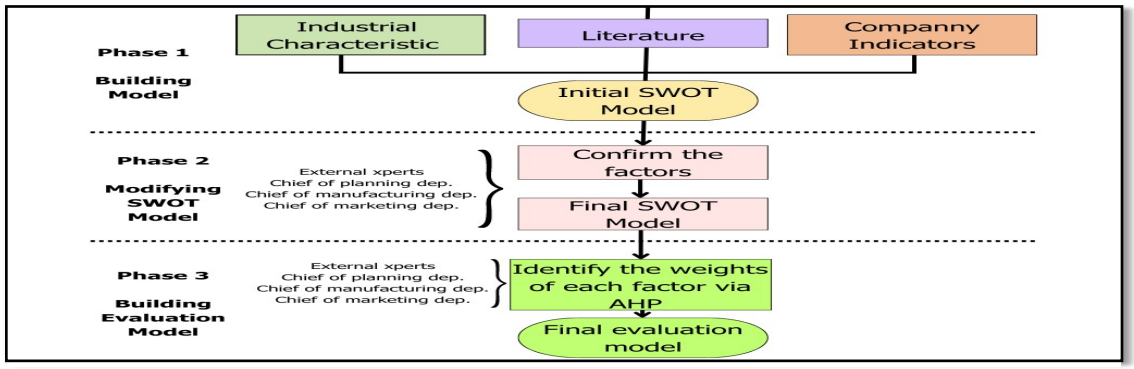

Figure 3: Phases of proposed methodology

Table 3: SWOT matrix

The SWOT matrix is subjected to AHP. First, using a Saaty's (1980) comparison scale ranging from 1 to 9, pairwise comparisons of the SWOT groups are done. Table 4 displays the comparing findings. Second, all of the SWOT groups are taken into consideration while comparing the aspects of SWOT matrices. Each pairwise comparison in the group of professionals handles the application. Three department managers from the company as well as the writers of this report made up the expert team.

SWOT Groups	**S**	**W**	**O**	**T**	**Importance Degrees of SWOT Groups**
Strengths (S)	1.000	2.000	4.000	7.000	0.515
Weakness (W)	0.500	1.000	2.000	5.000	0.279
Opportunities (O)	0.250	0.500	1.000	3.000	0.147
Threats (T)	0.140	0.200	0.333	1.00	0.059
CR= 1.0%					

Table 4: Pairwise comparisons of SWOT factors

The most crucial element in Malaysian food delivery services is strengths (importance degree: 0.515), which emphasizes the necessity to take use of internal advantages including convenience, technology integration, and restaurant alliances. This is shown in the pairwise comparison matrix for SWOT aspects. The necessity of tackling high operating expenses and quality control difficulties is shown by the following priority, weaknesses (0.279). Although less significant than internal variables, opportunities (0.147) have a considerable relevance and signal possible advantages from market expansion and service diversification. The least important risk is threats (0.059), suggesting that external hazards like market saturation and regulatory changes are not as urgent as they once were. This strategic emphasis emphasizes how important it is to build on strengths and minimize flaws in order to succeed.

Strengths	**S1**	**S2**	**S3**	**S4**	**S5**	**Importance Degrees**
(S1) Convenience and Accessibility	1.000	2.000	3.000	4.000	9.000	0.421
(S2) Wide Range of Choices	0.500	1.000	2.000	4.000	6.000	0.275
(S3) Technological Integration	0.333	0.500	1.00	2.000	7.000	0.170
(S4) Partnerships with Restaurants,	0.250	0.250	0.500	1.000	5.000	0.101
(S5) Customer Loyalty Programs	0.110	0.170	0.140	0.200	1.00	0.033
CR = 4.0%						

Table 5: Comparison Matrix of Strengths Group

"Convenience and Accessibility" (S1) is the most important strength with a significance degree of 0.421, indicating that it should be the key emphasis for leveraging competitive advantage, according to the comparison matrix for the strengths group in food delivery services, as revealed in Table 5. With a 0.275 significance degree, "Wide Range of Choices" (S2) is the next most important factor, highlighting the importance of providing clients with several options. Its function in improving service efficiency is shown by the moderate importance degree of 0.170 for "Technological Integration" (S3). The significance degrees of "Customer Loyalty Programs" (S5) and "Partnerships with Restaurants" (S4) are lower than those of convenience and choice, indicating that although these areas are good, they are not as important. Coupled comparisons are dependable and constant when the consistency ratio (CR) reaches 4.0%.

Weakness	W1	W2	W3	W4	W5	Importance Degrees
(W1) High Operational Costs	1.000	2.000	4.000	7.000	9.000	0.470
(W2) Quality Control Issues	0.500	1.000	2.000	4.000	8.000	0.275
(W3) Dependence on Internet and Technology	0.250	0.500	1.00	3.000	6.000	0.158
(W4) Limited Coverage Areas	0.140	0.250	0.330	1.000	5.000	0.080
(W5) High Competition	0.110	0.120	0.170	0.200	1.00	0.033
CR = 5.0%						

Table 6: Comparison Weakness of Strengths Group

According to the comparison matrix, the most essential weakness in food delivery services is "High Operational Costs" (W1), with a significance degree of 0.470. This suggests that controlling and lowering operational costs is crucial for strategic progress. The second major worry, "Quality Control Issues" (W2), has a significance degree of 0.275, emphasizing the necessity of strict quality management procedures. The moderate significance degree of 0.158 for "Dependence on Internet and Technology" (W3) indicates that, although necessary, dependence on technology carries a significant danger. With relevance ratings of 0.080 and 0.033, respectively, "Limited Coverage Areas" (W4) and "High Competition" (W5) are less important flaws that nonetheless require correction. The consistency ratio (CR) of 3.65% indicates that a good level of consistency in the pairwise comparison are reliable and consistent.

Opportunities	O1	O2	O3	O4	O5	Importance Degrees
(O1) Expansion to New Markets	1.000	2.000	5.000	7.000	9.000	0.474
(O2) Diversification of Services	0.500	1.000	2.000	8.000	9.000	0.297
(O3) Sustainability Initiatives	0.200	0.500	1.00	3.000	6.000	0.143
(O4) Technological Advancements	0.140	0.120	0.330	1.000	2.000	0.052
(O5) Strategic Partnerships	0.110	0.110	0.170	0.500	1.000	0.033
CR = 3.6%						

Table 7: Comparison Opportunities of Strengths Group

Expanding market presence need to be the main strategic priority, as shown by the comparison matrix for opportunities in food delivery services, which ranks "Expansion to New Markets" (O1) as the most significant opportunity with a significance degree of 0.474. "Diversification of Services" (O2) comes next, with a significance of 0.297, suggesting that providing a greater variety of services is also essential for expansion. The name "Sustainability Initiatives" (O3) indicates the growing significance of sustainable practices, with a modest importance degree of 0.143. "Strategic Partnerships" (O5) and "Technological Advancements" (O4) have significance degrees that are lower than those of market expansion and service diversification, indicating that although these possibilities are good, they are not as important. Pairwise comparisons are deemed dependable and consistent based on their consistency ratio (CR) of 3.6%.

Threats	**T1**	**T2**	**T3**	**T4**	**T5**	**Importance Degrees**
(T1) Regulatory Changes	1.000	2.000	4.000	8.000	9.000	0.479
(T2) Economic Fluctuations	0.500	1.000	2.000	4.000	6.000	0.249
(T3) Health and Safety Concerns	0.250	0.500	1.00	4.000	6.000	0.170
(T4) Technological Disruptions	0.120	0.250	0.250	1.000	4.000	0.070
(T5) Market Saturation	0.110	0.170	0.170	0.250	1.000	0.033
CR = 5.5%						

Table 8: Comparison Threats of Strengths Group

"Regulatory Changes" (T1) is the most serious threat in the food delivery services comparison matrix, with a significance degree of 0.479, highlighting the crucial influence of regulatory changes on the sector. "Economic Fluctuations" (T2) comes next, showing how susceptible the sector is to changes in the economy with a degree of 0.249. "Health and Safety Concerns" (T3) has a moderate importance degree of 0.170, indicating the continuous significance of upholding elevated standards for health and safety. The risks of "market saturation" (T5) and "technological disruptions" (T4) are rated as less serious, with degrees of 0.070 and 0.033, respectively. This suggests that although these problems exist, they are not as urgent as regulatory and economic ones. Consistency and reliability are indicated by the paired comparisons' consistency ratio (CR) of 5.5%.

SWOT Groups	Group Priority	Swot Factors	Factor Priority within the Group	Overal Priority of Factor
Strengths	0.515	**Convenience and Accessibility**	**0.421**	**0.217**
		Wide Range of Choices	0.275	0.142
		Technological Integration	0.170	0.088
		Partnerships with Restaurants,	0.101	0.052
		Customer Loyalty Programs	0.033	0.017
Weakness	0.279	**High Operational Costs**	**0.470**	**0.131**
		Quality Control Issues	0.275	0.077
		Dependence on Internet and Technology	0.158	0.044
		Limited Coverage Areas	0.080	0.022
		High Competition	0.033	0.009
Opportunities	0.147	**Expansion to New Markets**	**0.474**	**0.225**
		Diversification of Services	0.297	0.044
		Sustainability Initiatives	0.143	0.021
		Technological Advancements	0.052	0.008
		Strategic Partnerships	0.033	0.005
Threats	0.059	**Regulatory Changes**	**0.479**	**0.028**
		Economic Fluctuations	0.249	0.015
		Health and Safety Concerns	0.170	0.010
		Technological Disruptions	0.070	0.004
		Market Saturation	0.033	0.002

Table 9. Overall Priority Scores of SWOT Factors.

The AHP analysis results indicate that rising living standarts and increasing modern buildings are the most important issues considering a cooker hoods manufacture's internal and external environments.

CONCLUSION

In this study, we have combined SWOT and AHP methodologies to identify important strategic determinants for manufacturing firms. The results display each SWOT group priority in the following order: Possibilities (14.7%), Weaknesses (27.9%), Strengths (group weight 51.5%), and Threats (5.9%). "Rising living standards and increasing modern buildings" from the Opportunities group is the most significant aspect in the SWOT analysis, according to the analysis. With an overall importance score of 0.225, this issue is the most crucial one to take into account. Additional important variables are prioritized as follows: Convenience and accessibility (21.7%), regulatory changes (2.8%), high operational costs (13.1%), and expansion into new markets (22.5%). A management strategy or support for a crucial decision might be built using the SWOT elements' assessed priorities. The outcomes might be utilized to create a group of suitable strategy options for the company. Future studies might enhance the analysis of instances containing uncertainty more successfully by combining the fuzzy logic framework with the AHP approach. Additionally, any multi-criteria decision-making method can be used in place of the AHP, and the outcomes can be contrasted.

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