

Determining Strategic Locations for a Mobile Coffee Business at Obbel Coffee Boyolali Using the Analytical Hierarchy Process (AHP)

Syifa Fitriani*, Farid Nur Arifin, Choirul Bariyah

Universitas Ahmad Dahlan, Indonesia

email: syifa.fitriani@uad.ac.id

Article Info :

Received:

20/05/26

Revised:

15/06/26

Accepted:

30/06/26

ABSTRACT

The increase in the number of micro, small, and medium enterprises (MSMEs) in the coffee sector has led business owners to adopt expansion strategies in order to improve their competitiveness and broaden their market reach. One expansion strategy that Obbel Coffee Boyolali, Indonesia, is the expansion of its mobile coffee outlet services. Making the right choice of operating location is a vital one since it requires the consideration of several factors and can be affected by personal judgments. The purpose of this study was to identify the most appropriate location for the operational expansion of Obbel Coffee by means of the Analytical Hierarchy Process (AHP). A quantitative approach using a case study method was applied. Data were gathered through interviews and pairwise comparison questionnaires from three people who have relevant knowledge and experience of Obbel Coffee's operations. The AHP process included identifying and assigning weights to five location-selection criteria: crowd density, accessibility, target-consumer suitability, competition intensity, and location safety and convenience, and then assessing three possible locations on the basis of these criteria. The results indicate that crowd density had the highest priority weight (0.249), followed by target-consumer suitability (0.159) and location safety and convenience (0.152). Of the alternative locations, A1 obtained the highest total priority score (0.291), A2 came second with a score of 0.281, and A3 had the lowest at 0.227. As a result, A1 was found to be the most suitable location for Obbel Coffee's expansion. In practice, the findings give Obbel Coffee a basis grounded in evidence when choosing an expansion site, enabling it to focus on areas with high levels of customer activity and appropriate target consumers, and thus lessen its dependence on subjective location choices. More generally, the study shows that AHP can function as a systematic and transparent decision-support tool for MSMEs when making location decisions and aiding business expansion.

Keywords : Analytical Hierarchy Process, Location Selection, Mobile Coffee Outlet



©2026 Authors.. This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.
(<https://creativecommons.org/licenses/by-nc/4.0/>)

INTRODUCTION

The coffee business has become one of the growing sectors within Indonesia's food and beverage industry and provides considerable opportunities for micro, small, and medium enterprises (MSMEs). The increasing popularity of coffee consumption has contributed to the emergence of various coffee business models, including conventional coffee shops, small-scale coffee stalls, and mobile coffee businesses. The development of coffee businesses has also intensified competition among entrepreneurs, requiring business owners to consider not only product quality and price but also market accessibility and strategic business location [1]. In the context of coffee shops, consumer characteristics and purchasing behavior may also be associated with the distance between consumers and the coffee shop, indicating the relevance of location in attracting potential customers [2].

One business model that has emerged in response to these market opportunities is the *mobile* coffee business, which uses a bicycle cart as a means of selling coffee. Compared with conventional coffee shops, this model provides greater flexibility in determining selling locations and enables business owners to approach potential customers directly. Mobile businesses can target locations with high pedestrian activity, traffic flows, residential concentrations, educational facilities, offices, and other activity centers. Previous research on microbusinesses and local franchises has demonstrated that strategic selling locations are closely related to factors such as traffic conditions, population concentration, accessibility, visibility, and service coverage [3]. Therefore, although mobility provides operational flexibility, selecting an appropriate selling location remains an important strategic decision for mobile coffee businesses.

Location is an important component of business development because it affects the ability of a business to reach potential customers and operate efficiently. An inappropriate location may reduce customer accessibility, limit market coverage, increase competition, and negatively affect business performance. Research on small and medium enterprises has shown that business location should be considered carefully because location decisions are related to operational performance, customer accessibility, and the potential market that can be served [4]. In addition, previous studies have demonstrated that location characteristics such as accessibility, facilities, population density, competitors, and rental costs can influence the suitability of a business location [3], [5].

Obbel Coffee is an MSME in Boyolali that operates a coffee business using bicycle carts. As part of its business development strategy, Obbel Coffee plans to establish a new bicycle-cart outlet at an additional location. The establishment of a new outlet is expected to expand market coverage and increase sales potential. However, determining the appropriate location cannot rely solely on the owner's intuition or subjective considerations. An inappropriate location may result in low customer traffic, limited sales potential, increased competition, and operational inefficiencies [6]. Therefore, location selection needs to be supported by a systematic analytical approach that can evaluate several potential locations based on relevant and measurable criteria.

The selection of a coffee outlet location represents a multicriteria decision-making problem because several factors need to be considered simultaneously. These factors may include population or customer density, compatibility with target consumers, accessibility, competition, availability of selling space, visibility, safety, parking availability, and other supporting facilities. In the coffee shop context, previous research has identified population, income, location area, competitor density, location position, visibility, traffic patterns, parking areas, internet connectivity, and construction plans as relevant criteria in determining the suitability of a coffee shop location [7]. Other research on coffee shop location selection has considered rental costs, building conditions, clean water availability, accessibility, distance to offices, internet connectivity, and electricity availability as decision criteria [8].

The importance of accessibility and supporting facilities is also supported by empirical research on coffee shop consumers. Accessibility and facilities have been identified as factors associated with consumer satisfaction in coffee shop businesses, indicating that a strategically accessible location and adequate supporting facilities can contribute to the attractiveness of a coffee business [9]. In addition, research examining the spatial distribution of coffee shops has shown that coffee shops tend to be located in areas with relatively better accessibility and closer proximity to population concentrations [10]. These findings reinforce the argument that location selection for a coffee business should consider both market characteristics and spatial accessibility.

The multidimensional nature of business location selection makes subjective decision-making potentially problematic. Business owners may possess valuable experiential knowledge regarding customer behavior, competition, and local market conditions; however, relying solely on intuition may make it difficult to compare several alternatives consistently. Previous research on MSME location selection has identified the problem of subjectivity in determining an ideal business location and proposed the Analytical Hierarchy Process (AHP) as a multicriteria approach to systematically evaluate alternative locations [11]. Similarly, AHP-based decision support systems have been applied to MSME service-business location selection by considering rental costs, renovation requirements, clean water, electricity, road access, parking space, population density, competitors, and supplier proximity [5].

The Analytical Hierarchy Process is appropriate for location-selection problems because it allows a complex decision problem to be decomposed into a hierarchical structure consisting of objectives, criteria, and alternatives. Through pairwise comparisons, AHP determines the relative importance of each criterion and subsequently calculates the priority of each alternative. The method is particularly useful when a decision involves both quantitative and qualitative considerations. In addition, AHP incorporates a consistency assessment that enables decision makers to evaluate the consistency of their judgments. Its application in MSME location selection has demonstrated that AHP can be used to accommodate different perspectives and criteria in identifying the most appropriate business location [11].

Previous studies have specifically demonstrated the applicability of AHP to coffee shop location selection. Fauzi et al. developed a coffee shop location-selection approach using AHP and evaluated seven criteria, namely rental price, building condition, clean water availability, accessibility, distance to offices, internet connectivity, and electricity availability. The study produced a ranking of

alternative locations based on their global priority weights [8], [9]. Aini et al. subsequently applied a Fuzzy AHP approach to coffee shop location selection and considered population, income, location area, competitor density, location position, visibility, traffic patterns, parking areas, internet connectivity, and construction plans [7]. These studies demonstrate that AHP-based methods can provide a structured framework for addressing location-selection problems in the coffee business.

Previous studies have examined the location choice for coffee shops and MSMEs, but the majority of them have focused on conventional fixed-location businesses or on general MSME locations. There is very little research available on the location-selection problem of a mobile coffee business that uses bicycle carts, particularly at the MSME level in a regional market such as Boyolali. The mobile coffee business is different from a traditional coffee shop in that it has to take into account mobility and flexibility when deciding where to sell. Because of this, factors like customer concentration, accessibility, competition, safety, the availability of selling space, and compatibility with the mobile operating model all require special consideration. Given this, the subject offers a valuable research opportunity since the location decision for a mobile coffee business cannot be approached in the same way as that for a conventional coffee shop.

Even though the AHP method is becoming more and more common when it comes to choosing business locations, there is still a practical and methodological gap concerning mobile coffee businesses that use bicycle carts. Different from conventional coffee shops, mobile coffee businesses do not require a fixed site and can therefore adjust their selling points according to customer activity, accessibility, and local market conditions. If ordinary location criteria for coffee shops are applied without taking into account the particular features of a mobile business, this could result in less appropriate recommendations. In order to address this gap, the current study creates an AHP-based location selection framework that is adapted to a mobile coffee business at the MSME level, using Obbel Coffee in Boyolali as an example. The study is necessary in order to provide a systematic decision-making process to assist in planned business expansion rather than depending primarily on managerial intuition. By including factors such as crowd density, accessibility, target-consumer suitability, competition intensity, and location safety and convenience, the study aims to present a location evaluation that is better suited to the operational and market characteristics of a mobile coffee business.

When these factors are taken into consideration, the current study aims to determine the most suitable location for a new Obbel Coffee outlet in Boyolali by means of the AHP. This will involve identifying the criteria that are relevant to location selection, determining the relative importance of each criterion, and then evaluating the various location options in light of the hierarchy that has been developed. The study has two contributions. On the one hand, it provides a practical decision-support framework for Obbel Coffee by giving an evidence-based recommendation regarding the choice of a location for a new mobile coffee outlet, thus decreasing reliance on subjective judgment. On the other hand, it contributes to the existing literature on multicriteria decision-making for MSMEs by applying AHP not just to traditional fixed-location businesses but also to mobile coffee businesses that use bicycle carts. The results are also expected to function as a practical analytical reference for other small-scale food and beverage businesses that are facing similar location-selection and expansion decisions.

METHOD

This study employed a quantitative approach using a case study design. The quantitative approach was used to measure the relative importance of the criteria and the preferences toward alternative locations through numerical data obtained from pairwise comparisons. A case study design was adopted because the research specifically focused on the location selection problem for a new outlet of Obbel Coffee, an MSME located in Boyolali, Indonesia. The *Analytical Hierarchy Process* (AHP) was employed as a multicriteria decision-making approach to determine the priority of alternative locations based on a set of relevant criteria [12]. Through pairwise comparisons, AHP determines the relative weight of each criterion and establishes the priority of alternatives based on their overall preferences [13]. The application of AHP is particularly relevant to location selection because it enables multiple criteria with different levels of importance to be integrated into a single decision-making framework.

The study was conducted in January 2025 in Boyolali, Central Java, Indonesia. The research object was Obbel Coffee, with a specific focus on selecting potential locations for a new outlet operating

under a bicycle-cart coffee-selling concept. Alternative locations were identified based on preliminary observations and the business owner's considerations regarding market potential and the characteristics of the surrounding areas.

The research was conducted through several stages. The first stage involved identifying the research problem and establishing the research objective based on the need to expand the Obbel Coffee outlet. The second stage involved identifying the criteria for location selection through a literature review, field observations, and interviews with relevant parties. The third stage involved identifying and determining the alternative locations to be evaluated.

The identified criteria and alternatives were subsequently structured into an AHP hierarchy consisting of three levels: the objective at the first level, the criteria at the second level, and the alternative locations at the third level. After the hierarchy was established, data were collected using a pairwise comparison questionnaire to determine the relative importance of the criteria and the preference of each alternative with respect to each criterion.

The pairwise comparison data were then processed using the AHP method to obtain the priority weights of the criteria and the priority scores of the alternative locations. The final stage involved testing the consistency of the assessments and ranking the alternative locations based on their overall priority scores.

The respondents were selected using purposive sampling based on their knowledge, experience, and involvement in the operational and business development activities of Obbel Coffee. Three respondents participated in the pairwise comparison assessment. They were considered capable of providing informed judgments regarding the importance of the location-selection criteria and the suitability of the alternative locations. The pairwise comparison questionnaire was administered to each respondent separately using the fundamental AHP scale of relative importance. Each respondent compared the criteria and the alternative locations with respect to each criterion. The individual judgments were subsequently aggregated to obtain a combined pairwise comparison matrix before calculating the priority weights. The geometric mean was used to aggregate the judgments from the three respondents, as it is appropriate for combining individual pairwise comparison judgments in group AHP. The resulting aggregated matrix was then normalized to derive the priority vectors, followed by consistency testing using the Consistency Index (CI) and Consistency Ratio (CR).

RESULTS AND DISCUSSION

The objective of this study is to determine the best location for the development of a bicycle-cart coffee outlet of Obbel Coffee through a systematic and measurable decision-making process. In accordance with the stages of the *Analytical Hierarchy Process* (AHP) method, the study begins by developing a hierarchical structure consisting of the objective, criteria, and alternative locations, as presented in Figure 1. The AHP method is employed to determine the relative weights of each criterion and prioritize the alternative locations based on the established considerations [14], [15].

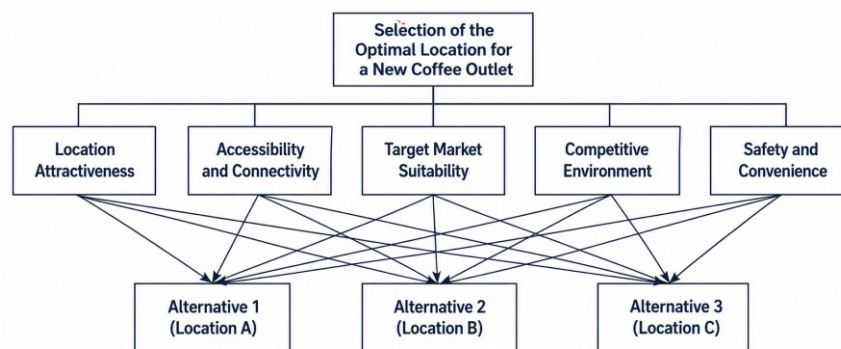


Figure 1. Hierarchy Structure

Considering the operational characteristics of the bicycle-cart coffee business and the environmental conditions surrounding potential locations, the owner of Obbel Coffee identified five main criteria for location selection: crowd level (K1), accessibility (K2), target customer suitability

(K3), level of competition (K4), and location safety and convenience (K5). These criteria are described as follows.

1. Crowd Level (K1)
Crowd level is an important factor because sales of a bicycle-cart coffee business are strongly influenced by the number and intensity of people's activities around the location. Locations with high levels of pedestrian and community activity provide greater opportunities to attract potential customers and encourage spontaneous purchases, thereby potentially increasing sales volume.
2. Accessibility (K2)
Accessibility refers to the ease with which a location can be reached by customers and the ease of mobility for the bicycle cart during business operations. A location with good accessibility can facilitate customer access to the product while also supporting the smooth operation of the business.
3. Target Customer Suitability (K3)
Target customer suitability refers to the degree of alignment between the characteristics of consumers in a particular location and the target market of Obbel Coffee. Locations with a high concentration of students, university students, or active workers are considered to have greater market potential because their characteristics are relatively compatible with the *take-away* coffee concept offered by the business.
4. Level of Competition (K4)
The level of competition reflects the presence and intensity of similar businesses surrounding each alternative location. The presence of competitors may affect a business's ability to attract and retain customers. Therefore, locations with relatively lower levels of competition may provide greater market opportunities. However, the presence of competitors should also be considered as an indicator of potential market demand.
5. Location Safety and Convenience (K5)
Location safety and convenience are related to the environmental conditions in which the business operates, both for sellers and customers. A safe and comfortable location can create a supportive environment for purchasing activities and business operations. Safety is also considered one of the basic human needs in Maslow's hierarchy of needs; therefore, a safe and comfortable environment represents an important consideration in determining the most appropriate business location.

The results of the consistency test indicate the consistency ratio values obtained for each respondent, as presented in Table 1. The pairwise comparison matrices were considered consistent, as the Consistency Ratio (CR) values for all respondents were below the acceptable threshold of 0.10 (10%).

Table 1. Consistency Ratio

Value	N1	N2	N3
λ_{max}	5,21	5,18	5,24
CI	0.0525	0.0450	0.0600
CR	0.0469	0.0402	0.0536

The priority vector for the five criteria is normalized such that the sum of the priority weights equals 1, as follows: $K1 + K2 + K3 + K4 + K5 = 1$. To ensure the consistency of the judgments in the pairwise comparison matrix, a consistency test was conducted. Based on the calculation results, the maximum eigenvalue (λ_{max}) was obtained as follows:

$$\lambda_{max} = 5.16$$

The Consistency Index (CI) was calculated using the following Equation (1).

$$\begin{aligned} CI &= (\lambda_{max} - n) / (n - 1) \\ CI &= (5.16 - 5) / (5 - 1) \\ CI &= 0.041 \end{aligned} \tag{1}$$

The Consistency Ratio (CR) was then calculated using a Random Index (RI) value of 1.12 for a matrix of order 5 in Equation (2).

$$\begin{aligned} CR &= CI / RI \\ CR &= 0.041 / 1.12 \\ CR &= 0.0369 \end{aligned} \quad (2)$$

The resulting CR value of 0.0369 (3.69%) is lower than the acceptable threshold of 0.10 (10%). Therefore, the pairwise comparison matrix is considered consistent and can be used for the subsequent analysis.

The application of the *Analytical Hierarchy Process* (AHP) yielded the priority weights of the criteria employed in selecting the optimal location for the Obbel Coffee bicycle-cart outlet. The results indicate that crowd density (K1) represents the most influential criterion, with a priority weight of 0.249. This finding suggests that the intensity of human activity within and around a prospective location constitutes the primary consideration in determining location suitability. The relatively high priority assigned to crowd density reflects the operational characteristics of a mobile *take-away* coffee business, in which a high volume of pedestrian and vehicular activity may increase consumer exposure and consequently create greater opportunities for spontaneous purchases [16], [17].

The target-consumer suitability (K3) criterion ranks second, with a priority weight of 0.159, followed by location safety and convenience (K5), with a weight of 0.152. These results indicate that location attractiveness cannot be assessed solely on the basis of population or activity density; rather, the characteristics of consumers present at the location must correspond to the intended target market. A highly crowded location may not necessarily represent an optimal business location if the consumers within the area have limited relevance to the products offered. Furthermore, safety and convenience constitute important supporting factors because they may influence consumers' willingness to approach, purchase from, and revisit the outlet, while simultaneously ensuring the feasibility of daily business operations.

In contrast, accessibility (K2) and competition intensity (K4) obtained comparatively lower priority weights of 0.138 and 0.100, respectively. Although these criteria remain relevant to the decision-making process, their lower weights indicate that they exert comparatively less influence on location selection than crowd density, target-consumer suitability, and safety and convenience. The relatively limited importance of accessibility may be attributed to the inherent mobility of the bicycle-cart business model, which enables the operator to relocate or adjust the selling point in response to variations in consumer traffic and market conditions. Similarly, competition intensity may not constitute a critical constraint when the selected location provides adequate market potential and sufficient consumer demand [18].

The synthesis of the alternative priorities demonstrates that alternative A1 achieved the highest global priority score of 0.291, followed by A2 (0.281) and A3 (0.227). The superior performance of A1 is particularly attributable to its performance on the crowd density and target-consumer suitability criteria, which represent two of the most important criteria within the decision hierarchy. The combination of these attributes resulted in A1 attaining the highest aggregated priority among the evaluated alternatives. Therefore, A1 was identified as the most preferable location alternative for the development of the Obbel Coffee bicycle-cart outlet.

Overall, the findings demonstrate the applicability of AHP in structuring and resolving a multi-criteria location selection problem. By incorporating the relative importance of heterogeneous criteria and systematically evaluating competing alternatives, AHP provides a transparent framework for establishing location priorities. This approach is particularly relevant for MSMEs, where location decisions are often constrained by limited financial resources, operational flexibility, and uncertainty regarding market conditions. Accordingly, the findings provide both a practical recommendation for Obbel Coffee and empirical support for the use of AHP as a systematic, transparent, and data-driven decision-support method for MSME location selection [12].

CONCLUSION

The application of the Analytical Hierarchy Process (AHP) method in this study successfully addressed the challenge of selecting an expansion site for Obbel Coffee's mobile outlet by simultaneously considering various market and operational aspects within a single decision-making framework. The analysis identified alternative A1 as the optimal choice, indicating that this location offers the most favorable combination of conditions for Obbel Coffee's mobile business model, particularly regarding potential customer activity levels and alignment with the target consumer base.

These findings provide a more quantifiable basis for Obbel Coffee to prioritize location A1 in its expansion plans, moving beyond reliance solely on managerial intuition. Furthermore, the AHP results can serve as a future reference when evaluating potential new sales points, especially in light of changes in customer activity, consumer characteristics, safety levels, accessibility, or the competitive landscape surrounding a location. Thus, the study's contribution extends beyond merely identifying the single best location; it demonstrates how a structured multi-criteria approach can facilitate site evaluation and expansion planning for mobile coffee MSMEs.

However, there are certain limitations to consider. The assessment involved only three respondents selected purposively based on their understanding of Obbel Coffee's operations, and the case study was confined to a single MSME in Boyolali. Consequently, the results cannot be directly generalized to other coffee businesses, different regions, or mobile MSMEs with distinct market and operational characteristics. Future research should involve a larger, more diverse group of respondents and apply the same framework to multiple mobile coffee MSMEs across various locations. Additionally, future studies could conduct longitudinal evaluations, comparing AHP-derived location priorities with actual sales data, customer traffic, and operational performance once the location becomes operational. Combining AHP with spatial analysis or other multi-criteria methods is also worth considering to strengthen the validity of future site selection decisions.

REFERENCES

- [1] R. A. Mughni, "Marketing Mix Dan Perilaku Konsumen Kedai Kopi Di Kecamatan Majalaya," *Mimb. Agribisnis J. Pemikir. Masy. Ilmiah Berwawasan Agribisnis*, 2023, <https://doi.org/10.25157/ma.v9i1.8973>.
- [2] S. H. Kholifah, N. Rusti, and K. M. Nur, "Pengaruh Kualitas Pelayanan, Lokasi, Dan Harga Terhadap Kepuasan Konsumen (Study Kasus Coffee Shop Kopi Pelarian)," *J. Javanica*, vol. 2, no. 2, pp. 114–124, Dec. 2023, <https://doi.org/10.57203/javanica.v2i2.2023.114-124>.
- [3] S. Wagistina, D. R. Syafitri, J. S. Lestari, K. H. Amanatinismi, D. Setiawan, and S. Ramadhani, "Service Area Network Analysis for Location Planning of Microbusiness and Local Franchise in Urban Area: A Case Study in Malang City, East Java Province, Indonesia," *Economies*, vol. 10, no. 5, p. 103, Apr. 2022, <https://doi.org/10.3390/economies10050103>.
- [4] T. Theodora, W. Septiani, and T. S. Dewayana, "Multi criteria decision making to determine the location of Via Laundry's branch," *Oper. Excell. J. Appl. Ind. Eng.*, vol. 16, no. 1, p. 25, Jun. 2024, <https://doi.org/10.22441/oe.2024.v16.i1.099>.
- [5] D. Diana, S. O. Kunang, and I. Seprina, "Sistem Pendukung Keputusan Pemilihan Lokasi Usaha Jasa Umkm Menerapkan Analytical Hierarchy Process –Weighted Product Method," *J. Ilm. Matrik*, vol. 22, no. 2, pp. 224–231, Aug. 2020, <https://doi.org/10.33557/jurnalmatrik.v22i2.1005>.
- [6] M. R. Ristyawan, "Geographic Information System Proposes Determination Of Business Location Feasibility: Case Study Small Business Culinary In Pontianak," *J. Manaj. Bisnis*, vol. 9, no. 1, 2018, <https://doi.org/10.18196/mb.9153>.
- [7] Q. Aini, Z. Zulfiandri, and N. Cholis, "Fuzzy Analytical Hierarchy Process: Pendekatan dalam Sistem Pendukung Keputusan Lokasi Coffee Shop," *InfoTekJar: Jurnal Nasional Informatika dan Teknologi Jaringan*. 2022. <https://doi.org/10.30743/infotekjar.v6i2.4924>
- [8] A. Fauzi, N. Indriyani, and A. Bayu Hasta Yanto, "Selection of Coffee Shop Business Locations Using the Analytical Hierarchy Process Method," *J. Teknol. dan Open Source*, vol. 4, no. 2, pp. 133–140, Dec. 2021, <https://doi.org/10.36378/jtos.v4i2.1771>.
- [9] M. Valerina R. and R. Adysholihah F., "Pengaruh Aksesibilitas dan Fasilitas terhadap Kepuasan Konsumen Halsean Coffee & Resto," *Int. J. Adm. Bus. Organ.*, vol. 3, no. 2, pp. 52–60, Sep. 2022, <https://doi.org/10.61242/ijabo.22.210>.
- [10] S. M. Sophian and H. Muttaqin, "Pola Sebaran Kafe di Kota Banjarmasin: Tinjauan Analisis Teori Lokasi," *JIEP J. Ilmu Ekon. dan Pembangunan*, 2023, <https://doi.org/10.20527/jiep.v6i2.11077>.

- [11] I. B. Komang, K. Adhiarta, W. Witanti, and P. N. Sabrina, "Pemilihan Lokasi Awal Usaha Bagi Usaha Mikro Kecil Dan Menengah Dengan Metode Analytical Hierarchy Process," *J. Inf. Technol.*, vol. 3, no. 2, pp. 43–46, Aug. 2021, <https://doi.org/10.47292/joint.v3i2.63>.
- [12] A. Ishizaka and A. Labib, "Review of the main developments in the analytic hierarchy process," *Expert Syst. Appl.*, 2011, <https://doi.org/10.1016/j.eswa.2011.04.143>
- [13] T. L. Saaty, "Decision making with the analytic hierarchy process," 2008.
- [14] A. Kumar and S. Pant, "Analytical hierarchy process for sustainable agriculture: An overview," *MethodsX*. 2023, <https://doi.org/10.1016/j.mex.2022.101954>.
- [15] S. Alwedyan, "Optimal location selection of a casual-dining restaurant using a multi-criteria decision-making (MCDM) approach," *Int. Rev. Spat. Plan. and Sustainable Development*, 2024, https://doi.org/10.14246/irspsd.12.1_156.
- [16] B. Chairina, T. Mesra, M. Belen, W. Alfian, F. R. Simanjuntak, and R. Pratama, "Penentuan Pemilihan Lokasi Usaha Terbaik Menggunakan Metode AHP dan TOPSIS," *J. Tek. Ind. Terintegrasi*, vol. 9, no. 1, pp. 932–940, Jan. 2026, <https://doi.org/10.31004/jutin.v9i1.54259>.
- [17] L. Isyriyah, R. Maulidi, and A. Z. S. A. Fandi, "Sistem Pendukung Keputusan Penentuan Lokasi Usaha Kuliner Menggunakan Metode Analytic Hierarchy Process (AHP) dan Technique for Others Reference by Similarity to Idealsolution (TOPSIS)," *J. Teknol. dan Manaj. Inform.*, vol. 10, no. 2, pp. 176–186, Dec. 2024, <https://doi.org/10.26905/jtmi.v10i2.14791>.
- [18] T. L. Saaty and L. G. Vargas, "Decision Making with the Analytic Network Process." *Economic, Political, Social and Technological Applications with Benefits, Opportunities, Costs and Risk*, New York: Springer, 2013. <https://doi.org/10.1007/0-387-33987-6>