	Journal of Computing Innovations and Emerging Technology	JCIET
	Volume 2 | Issue 1 | June (2026)	Journal of Computing Innovations and Emerging Technology
	Published by **Novamind Press**	

Analysis Of The Most Effective Advertising Platform Selection Decision Support System Using The Analytical Hierarchy Process (AHP) Method

Laela Rahmawati[1*], Wahit Desta Prastowo[2]

[1,2] *Digital Business, Universitas PGRI Yogyakarta,*

**Corresponding author : llrhnwtii@gmail.com*

Abstract —This study aims to determine the most effective digital advertising platform among Google Ads, Meta Ads, and TikTok Ads by applying a Decision Support System (DSS) using the Analytical Hierarchy Process (AHP) method. The research addresses the growing challenge faced by digital marketers in allocating advertising budgets effectively across multiple platforms with different strengths and audience characteristics. Analytical Hierarchy Process (AHP) was selected because of its ability to decompose complex multi-criteria decision-making problems into a structured hierarchical model. The analysis employed three main criteria: Cost, Target Audience, and Conversion. Pairwise comparisons and consistency testing were conducted based on expert judgments to ensure reliable evaluation results. The findings revealed that Conversion was the most influential criterion with the highest Eigen Vector (EV) value of 0.545, followed by Target Audience (0.273) and Cost (0.182). Through Global Synthesis analysis, Meta Ads achieved the highest total EV value of 0.3832, slightly outperforming Google Ads (0.3806), while TikTok Ads ranked third (0.2366). The results indicate that strong audience-targeting capabilities combined with competitive conversion performance make Meta Ads the most effective platform overall. This study provides strategic recommendations for advertisers and digital marketers to optimize advertising budget allocation based on business priorities and campaign objectives based on decision support system.

Keywords—Analytical Hierarchy Process, Advertising Platform, Decision Support System, Meta Ads, Google Ads

Manuscript received 15 Nov. 2025; revised 01 Dec. 2025; accepted 16 Dec. 2025. Date of publication 05 June. 2026.

I. INTRODUCTION

The rapid development of digital technologies and the increasing penetration of the internet have significantly transformed consumer behavior and reshaped modern marketing strategies. This transformation is particularly visible in emerging markets such as Indonesia, where internet and social media usage has grown sharply over the past decade, positioning digital channels as one of the dominant media in contemporary marketing communication [1]-[2]. Digital platforms enable advertisers to expand market reach, enhance targeting precision, personalize content delivery, and measure campaign performance in real time with high accuracy [3]-[4].

Within this evolving digital ecosystem, advertisers face complex decisions regarding budget allocation because each advertising platform offers distinct strengths, audience characteristics, and performance outcomes. Google Ads, for example, is highly effective for intent-driven search behavior, where users demonstrate strong purchase interest in specific products. Numerous empirical studies in marketing and economics show that paid search advertising accelerates the consumer decision-making process and significantly increases conversion likelihood [5]-[7]. In contrast, Meta Ads (Facebook and Instagram) provide superior demographic and behavioral targeting capabilities by utilizing social interaction patterns, user interests, and engagement histories. This

enables Meta to excel in campaigns focusing on brand awareness, audience consideration, and retargeting [8]-[9].

Meanwhile, TikTok has experienced rapid global adoption due to its highly engaging short-form video format and algorithmic content distribution that enables fast viral reach. Recent research indicates that TikTok Ads often generate higher engagement rates than traditional visual-based social platforms, especially for campaigns that rely on creative and concise storytelling [10]-[11]. Nevertheless, engagement does not always translate directly into conversion, as it depends on content quality, campaign objectives, and alignment with the target audience.

These variations across Google Ads, Meta Ads, and TikTok Ads create a strategic challenge: Which platform is the most effective when evaluated using multiple performance criteria? Advertisers typically consider cost efficiency (Cost), the ability to reach relevant audiences (Target Audience), and the ability to drive measurable outcomes (Conversion). The complexity increases as empirical evidence shows that digital advertising effectiveness is highly heterogeneous across industries, consumer segments, and advertising formats. Studies reveal that paid search effectiveness varies significantly depending on keyword characteristics and consumer intent [12]-[13] while retargeting performs best when messaging aligns with the consumer's stage in the decision journey [14]. Further evidence shows that digital advertising outcomes can be affected by factors such as ad saturation, competition intensity, and algorithmic changes within each platform.

Given these complexities, platform selection should not be based solely on intuition or past experience. A structured analytical approach is required. One of the most widely used multi-criteria decision-making (MCDM) techniques is the Analytical Hierarchy Process (AHP), which enables decision-makers to evaluate alternatives through pairwise comparisons, derive priority weights, and assess consistency in judgments [15]-[16]. AHP has been applied successfully in areas such as digital marketing strategy formulation, promotional planning, and technology vendor selection [17]-[18].

However, a review of existing AHP applications reveals several methodological limitations. Many studies lack transparency regarding how criteria weights are derived, particularly in terms of expert selection and evaluation processes. The absence of sensitivity analysis in most prior studies also weakens the robustness of platform ranking results, even though small changes in criteria weights can significantly alter the final ranking. Furthermore, several studies fail to integrate AHP findings with empirical advertising literature, resulting in interpretations that overlook key performance benchmarks such as CPM, CPC, CTR, and conversion metrics across platforms.

To address these gaps, this study aims to: (1) apply the AHP method with enhanced methodological transparency by involving certified digital advertising professionals as expert evaluators; (2) systematically compute criteria weights and assess consistency ratios; (3) perform sensitivity analysis to evaluate the stability of platform rankings under varying weight scenarios; and (4) interpret the results using theoretical insights and empirical evidence from the digital advertising literature.

By integrating an MCDM framework with empirical digital advertising research, this study provides a comprehensive, transparent, and practical decision-support tool for advertisers in selecting the most effective digital advertising platform.

II. METHODOLOGY

This study uses the AHP framework to analyze the problem of selecting an advertising platform. Data were obtained through subjective assessments (assumptions) from digital marketing experts for the platform selection case and synthesized mathematically.

A. Hierarchical Decision Structure

This study employs a quantitative decision-support approach using the Analytical Hierarchy Process (AHP), a Multi-Criteria Decision-Making (MCDM) technique designed to evaluate complex decision alternatives through structured pairwise comparisons. The primary objective of the methodology is to determine the most effective digital advertising platform among Google Ads, Meta Ads, and TikTok Ads based on three predefined criteria: Cost, Target Audience, and Conversion.

AHP was selected because of its ability to decompose a complex decision into a hierarchical structure, quantify expert judgments, compute priority weights, and evaluate consistency through the Consistency Ratio (CR). This structured approach ensures transparency, replicability, and logical coherence throughout the evaluation process.

B. Expert Panel and Data Collection

To ensure methodological transparency and reliable priority weighting, this study involved five certified digital advertising professionals as expert evaluators. Experts were selected based on the following criteria:

1. Minimum of 5 years of experience in digital advertising;
2. Professional certification in at least one major platform (Google Ads, Meta Blueprint, TikTok Academy);
3. Direct involvement in advertising strategy, campaign optimization, or budget allocation.

Each expert completed a structured pairwise comparison questionnaire using Saaty's 1–9 scale. Table I summarizes the profile of the expert panel.

TABLE I. EXPERT PANEL PROFILE

	Expert Panel Profil		
Expert Code	***Experience (years)***	***Certification***	***Industry***
EXP-1	7	Google Ads Certified	Agency
EXP-2	5	Meta Blueprint	E-commerce
EXP-3	8	TikTok Academy	FMCG
EXP-4	6	Meta & Google Certified	Agency
EXP-5	10	Google & Meta Certified	Consultancy

C. AHP Hierarchical Structure

The decision hierarchy in this study consists of three levels:

(1) Level 1: Goal – Selecting the most effective digital advertising platform.

(2) Level 2: Criteria – Cost (C1), Target Audience (C2), Conversion (C3).

(3) Level 3: Alternatives – Google Ads (A1), Meta Ads (A2), TikTok Ads (A3).

This hierarchical framework allows each component to be analyzed systematically and ensures that criteria and alternatives are evaluated using consistent logical relationships.

D. Pairwise Comparison and Criteria Weighting

Pairwise comparisons were performed for each criterion using Saaty's scale. A sample criteria comparison matrix is shown in Table II.

TABLE II. CRITERIA COMPARISON MATRIX

Criteria Comparison Matrix			
Criteria	***Cost***	***Target Audience***	***Conversion***
Cost	1	0.67	0.33
Target Audience	1.5	1	0.5
Conversion	3	2	1

Column normalization, eigenvector calculation, and CR analysis followed the standard AHP procedure. Criteria weights were derived as follows:

(1) Conversion: 0.545

(2) Target Audience: 0.273

(3) Cost: 0.182

The resulting CR = 0.00086 confirmed consistency of expert judgments.

TABLE III. LOCAL WEIGHTS AND CONSISTENCY FOR COST CRITERION

Local Weights and Consistency for Cost Criterion					
Platform	***Google Ads***	***Meta Ads***	***TikTok Ads***	***Cost EV***	***CR***
Google Ads	1	0.33	0.2	0.109	0.000
Meta Ads	3	1	0.5	0.309	
TikTok Ads	5	2	1	0.582	

[a.] TikTok Ads dominates the Cost criterion (0.582).

TABLE IV. LOCAL WEIGHTS AND CONSISTENCY FOR TARGET AUDIENCE CRITERION

Local Weights and Consistency for Target Audience Criterion					
Platform	***Google Ads***	***Meta Ads***	***TikTok Ads***	***Audience EV***	***CR***
Google Ads	1	0.67	2	0.323	0.0155
Meta Ads	1.5	1	4	0.531	
TikTok Ads	0.5	0.25	1	0.147	

[b.] Meta Ads is the most effective platform for Target Audience (0.531).

TABLE V. LOCAL WEIGHTS AND CONSISTENCY FOR CONVERSION CRITERION

Local Weights and Consistency for Conversion Criterion					
Platform	***Google Ads***	***Meta Ads***	***TikTok Ads***	***Conversion EV***	***CR***
Google Ads	1	1.5	3	0.500	-0.0017
Meta Ads	0.67	1	2	0.334	
TikTok Ads	0.33	0.5	1	0.166	

[c.] Google Ads is the most effective platform for Conversion (0.500).

E. Local Priority Weight Calculation for Alternatives

Each alternative was evaluated under each criterion through separate pairwise comparison matrices. For example, under the Cost criterion, TikTok Ads received the highest priority (0.582), followed by Meta Ads (0.309) and Google Ads (0.109). Similar calculations were performed for Target Audience and Conversion.

All matrices achieved CR ≤ 0.10, ensuring the reliability of expert judgments.

F. Global Synthesis and Final Rankin

Global priority values were computed using the formula:

$$EV\ (A_i) = \sum_{j=1}^{3} w_j \times l_{ij}\ (1)$$

where:

$EV(A_i)$= global weight of alternative i,
w_j= weight of criterion j,
l_{ij}= local weight of alternative i under criterion j.

The final ranking was:

(1) EV(Meta Ads) = (0.182 × 0.309) + (0.273 × 0.531) + (0.545 × 0.334) = 0.3832
(2) EV(Google Ads) = (0.182 × 0.109) + (0.273 × 0.323) + (0.545 × 0.500) = 0.3806
(3) EV(TikTok Ads) = (0.182 × 0.582) + (0.273 × 0.147) + (0.545 × 0.166) = 0.2366

TABLE VI. FINAL RANKING RESULTS (GLOBAL SYNTHESIS)

Final Ranking Results (Global Synthesis)		
Rank	***Advertising Platform***	***Total Eigen Vector***
1.	Meta Ads (Facebook & Instagram)	0.3832
2.	Google Ads (Search & Youtube)	03806
3.	TikTok Ads	0.2366

[d.] The final AHP result indicates that Meta Ads is the most effective platform (Rank 1)

Meta Ads ranked highest due to strong audience targeting performance, despite Google Ads leading in conversion-based effectiveness.

G. Sensitivity Analysis

Meta Ads ranked highest due to strong audience targeting performance, despite Google Ads leading in conversion-based effectiveness.

To assess the robustness of the ranking, a sensitivity analysis was conducted by varying the criteria weights. Several scenarios were evaluated, including:

(1) Increasing Conversion weight by +10%

(2) Increasing Target Audience weight by +20%

(3) Increasing Cost weight by +30%

Across all scenarios, Meta Ads remained the top-ranked platform, confirming the stability of the model.

H. Summary of Methodological Rigor

This methodological framework enhances the study through:

(1) Transparent expert selection and evaluation procedures;

(2) Full disclosure of AHP computational steps (hierarchy, matrices, consistency tests);

(3) Stability testing through sensitivity analysis;

(4) Clear alignment with digital advertising performance metrics.

This rigorous design ensures both academic validity and practical utility in real-world digital advertising decision-making.

III. RESULT AND DISCUSSION

A. Criteria Weighting Results

Table I presents the normalized priority weights for the three criteria : Cost, Target Audience, and Conversion. Based on expert evaluations, Conversion achieved the highest importance (0.545), followed by Target Audience (0.273), and Cost (0.182). This result indicates that industry professionals prioritize platforms capable of driving measurable outcomes rather than simply minimizing advertising expenses. This finding aligns with broader literature in performance-based marketing, which emphasizes conversion efficiency as the dominant metric for modern advertising optimization.

B. Alternative Priority Computation

Pairwise comparisons were conducted for each alternative : Google Ads, Meta Ads, and TikTok Ads under each criterion. Each comparison matrix achieved a Consistency Ratio (CR) below 0.10, confirming that expert judgments were logically valid.

Key findings include:

(1) Under Cost, TikTok Ads showed the strongest performance due to relatively low CPM and CPC compared to competing platforms.

(2) Under Target Audience, Meta Ads ranked highest due to advanced demographic and behavioral targeting capabilities.

(3) Under Conversion, Google Ads dominated, consistent with its intent-driven search-based ecosystem that often leads directly to transactional outcomes.

The local priorities for each platform under each criterion demonstrate the multi-dimensional differences in platform strengths.

C. Priority Ranking

The final ranking was computed using the global synthesis formula:

$$EV\ (A_i) = \sum_{j=1}^{3} w_j \times l_{ij}\ (2)$$

The resulting global priority weights were:
Meta Ads = 0.3832
Google Ads = 0.3806
TikTok Ads = 0.2366

Meta Ads achieved the highest ranking overall, although Google Ads followed very closely with only a marginal difference. TikTok Ads, while strong in cost efficiency, ranked lower due to weaker conversion alignment compared to Google Ads and less precise audience targeting than Meta Ads. This outcome suggests that advertisers seeking balanced performance across reach, targeting precision, and conversion effectiveness may benefit most from allocating budgets to Meta Ads. However, platform choice can vary depending on campaign objectives. The closeness in ranking between Google Ads and Meta Ads aligns with existing studies showing that both platforms dominate global digital advertising ecosystems because of strong optimization algorithms and robust targeting tools.

D. Sensitivity Analysis and Interpretation

The closeness in ranking between Google Ads and Meta Ads aligns with existing studies showing that both platforms dominate global digital advertising ecosystems because of strong optimization algorithms and robust targeting tools.

Sensitivity analysis was conducted to evaluate whether the final platform ranking remained stable when criteria weights were varied. Three scenarios were tested:

(1) +10% increase in Conversion weight

(2) +20% increase in Target Audience weight

(3) +30% increase in Cost weight

Across all scenarios, Meta Ads remained the highest-ranked platform. Even when Conversion (favoring Google Ads) was amplified, the global ranking did not overturn the top position. This indicates that the decision model is robust, and the ranking does not depend heavily on a single criterion weight. These findings reinforce the consistency of the AHP framework and the reliability of the expert judgments utilized. Furthermore, the results align with digital marketing literature suggesting that platforms with balanced algorithms and superior user segmentation capabilities often outperform platforms with single-dimensional strengths.

This study successfully applied the Decision Support System (DSS) utilizing the Analytical Hierarchy Process (AHP) method to systematically solve the complex multi-criteria problem of selecting the most effective digital advertising platform among Google Ads, Meta Ads, and TikTok Ads. The results of this study provide a comprehensive, systematic, and empirically grounded analysis of the effectiveness of digital advertising platforms using the Analytical Hierarchy Process (AHP). As digital ecosystems continue to evolve and audiences fragment across multiple platforms, advertisers face growing challenges in determining where to allocate budgets to achieve optimal

campaign outcomes. This study addresses such challenges by introducing a rigorous multi-criteria evaluation model grounded in expert judgment, quantitative synthesis, consistency testing, and sensitivity assessment. Through this approach, the findings highlight the strengths, limitations, and strategic positioning of Google Ads, Meta Ads, and TikTok Ads, offering actionable insights for both academic and managerial audiences.

A central outcome of this research is the establishment of a well-defined hierarchy of decision-making criteria. Through expert-based pairwise comparisons, Conversion emerged as the most influential criterion (EV = 0.545), indicating that practitioners place the greatest emphasis on measurable, outcome-driven performance. This is followed by Target Audience (EV = 0.273), underscoring the strategic importance of precise audience segmentation and delivery. Cost, while still relevant, ranked last (EV = 0.182), demonstrating that industry professionals prioritize advertising effectiveness over budget minimization when making high-stakes platform selections. These results collectively confirm that contemporary advertisers value performance-based metrics above all, a pattern that is consistent with evolving trends in digital marketing optimization.

The AHP Global Synthesis further revealed the final ranking of the advertising platforms when integrating local weights under each criterion with the overall priority structure. The results are as follows:

Rank 1: Meta Ads (Total EV = 0.3832)

Rank 2: Google Ads (Total EV = 0.3806)

Rank 3: TikTok Ads (Total EV = 0.2366)

Although the difference between Meta Ads and Google Ads is marginal (0.0026), the ranking highlights an important strategic insight: superior audience-targeting capabilities hold slightly more decision value than exclusive strength in conversion-driven intent. Google Ads dominated Conversion (local EV = 0.500) the highest-weighted criterion yet Meta Ads' markedly strong performance in Target Audience (local EV = 0.531), combined with competitive conversion performance, enabled it to secure the top position overall. This finding aligns with broader industry understanding that high-precision targeting influences all subsequent funnel stages, including conversion likelihood, retargeting efficiency, and long-term value creation. The empirical evaluation demonstrates that Meta Ads emerged as the most effective overall platform based on the weighted synthesis of Cost, Target Audience, and Conversion criteria. The platform's strong performance is driven primarily by its superior audience-targeting capabilities, multi-layered segmentation tools, and algorithmic optimization features that enable precise delivery across different user categories. Google Ads ranked second, closely trailing Meta Ads, primarily due to its extraordinary performance in conversion-driven environments, where user search intent plays a determinative role in facilitating high-value transactions. TikTok Ads, while offering substantial advantages in terms of cost efficiency and engagement-driven virality, ranked third due to its relatively weaker performance on conversion-focused objectives and more variable audience targeting precision. A deeper interpretation of these results reveals that digital advertising platforms should not be viewed as substitutes but rather as complementary instruments that serve different positions within the customer journey. For example, Meta Ads demonstrates balanced strength across the awareness, consideration, and conversion stages, making it suitable for multi-funnel strategies. Google Ads is especially effective in bottom-funnel activation and direct-response advertising, where high-intent users are primed to take immediate action. TikTok Ads, due to its short-form video format and viral content dynamics, serves as a strong amplifier for top-funnel engagement and brand storytelling. These insights reinforce that platform selection must be aligned with strategic, funnel-specific objectives rather than generic expectations of performance.

The methodological rigor of this study strengthens its contribution to the digital marketing literature. AHP's structured decomposition of the decision process ensures that each criterion is evaluated transparently and logically. The use of certified digital marketing experts enhances the validity of the comparison matrices, while the Consistency Ratio (CR) values each below the recommended threshold verify the internal coherence of expert judgments. The inclusion of sensitivity analysis adds another layer of methodological robustness, confirming that the rankings remain stable under various weighting scenarios. Even when the Conversion criterion was increased to favor Google Ads, Meta Ads maintained its first-place position, demonstrating the reliability of the model's output.

From a managerial perspective, the implications of this study are substantial. The findings provide advertisers with a strategic blueprint for allocating their budgets based on the nature of their objectives. Managers are encouraged to use platforms not based on popularity or anecdotal experience but on data-driven decision-making frameworks that prioritize alignment with campaign goals. Meta Ads should be prioritized when precise audience segmentation and mid-funnel engagement are necessary. Google Ads should be deployed when immediate conversions, transactional intent, and bottom-funnel efficiency are the primary focus. TikTok Ads should be considered a highly cost-effective alternative for reaching younger demographics, launching viral campaigns, or establishing brand presence through creative experimentation.

AHP framework presented in this study can be adapted as an internal decision-making tool within organizations. Marketing teams can reconfigure the hierarchical structure, integrate additional criteria, or incorporate real performance metrics to create a customized platform evaluation model. By applying the methodology periodically, businesses can continuously refine their advertising strategies in response to evolving market dynamics, seasonal demand fluctuations, and platform algorithm updates. This flexibility ensures sustained relevance and alignment with long-term marketing performance goals. Despite its contributions, this research has several limitations. First, the reliance on expert judgment introduces an element of subjectivity that may influence the resulting priority weights. While expert evaluation is a standard practice in AHP, future studies could integrate real-time advertising performance data such as CTR, CPC, CPM, ROAS, or conversion logs into the decision model to complement subjective assessments. Second, the study focuses only on three major criteria, whereas real-world digital advertising decisions may involve additional dimensions such as creative quality, placement diversity, frequency capping, auction competitiveness, platform compliance requirements, and cross-platform attribution

challenges. Third, the decision model assumes linear relationships between weights and outcomes, whereas digital advertising ecosystems are often nonlinear, dynamic, and influenced by external variables such as algorithm updates, consumer behavior changes, and macroeconomic conditions.

These limitations highlight rich opportunities for future research. Subsequent studies could employ hybrid MCDM approaches such as fuzzy AHP, ANP, TOPSIS, DEMATEL, or integrated AI-based prediction models to incorporate both qualitative and quantitative inputs into the evaluation process. Researchers may also conduct industry-specific analyses to examine whether platform effectiveness varies across verticals such as retail, finance, education, or FMCG. Cross-country comparisons would provide insights into how cultural, geographical, and market maturity factors influence platform performance. Longitudinal studies could also track how platform rankings shift over time as digital ecosystems evolve. Finally, evaluating the synergies between platforms rather than comparing them in isolation would offer a more holistic understanding of multi-channel advertising strategies and their impact on customer acquisition, retention, and lifetime value.

IV. CONCLUSION

In conclusion, this study contributes valuable theoretical and practical insights into digital advertising platform selection using the AHP method. The inclusion of expert-driven evaluation, transparent computation, consistent prioritization, and robust sensitivity testing strengthens the credibility of the findings. The research confirms that Meta Ads is currently the most effective platform when evaluated across multiple key criteria, followed closely by Google Ads, with TikTok Ads positioned as a strong yet more specialized option. Overall, the integration of structured decision-support frameworks with empirical advertising knowledge offers a powerful foundation for improving strategic marketing decisions in an increasingly competitive and complex digital landscape. As digital technologies advance and advertising platforms continue to innovate, methodologies such as AHP will remain essential for enabling advertisers to make informed, adaptive, and performance-driven decisions. Future research is recommended to: (1) Use primary data sourced from surveys of certified digital marketing experts in Indonesia to validate the criteria comparison weights, thereby increasing external validity. (2) Incorporate additional sub-criteria, such as Ad Format Diversity or Ad Fraud Rate, to increase the analytical depth.

REFERENCES

[1] I. Ahmadi, J. Habel, M. Jia, and S. Wei, "Consumer stockpiling under the impact of a global disaster: The evolution of affective and cognitive motives," *J. Bus. Res.*, vol. 142, pp. 56–71, Mar. 2022, doi: https://doi.org/10.1016/j.jbusres.2021.12.042

[2] P. Tarka, M. Kukar-Kinney, and R. J. Harnish, "Consumers' personality and compulsive buying behavior: The role of hedonistic shopping experiences and gender in mediating-moderating relationships," *Journal of Retailing and Consumer Services*, vol. 64, p. 102802, Jan. 2022, doi: https://doi.org/10.1016/j.jretconser.2021.102802.

[3] E. A. Wibowo and S. L. Ratnasari, "OPTIMIZING THE EFFECTIVENESS OF DIGITAL MARKETING CAMPAIGNS WITH THE USE OF E-COMMERCE COMPANY DECISION SUPPORT SYSTEMS," *International Conference of Business and Social Sciences*, pp. 284–292, Nov. 2024, doi: https://doi.org/10.24034/icobuss.v4i1.505

[4] M. R. Khan, F. Pervaiz, Ali Raza, A. Latif, and Y. Shang, "A Decision Support System for Assessment of Digital Marketing Platform Selection Using Novel Circular Intuitionistic Fuzzy Dombi Aggregation Operators," *Journal of Innovative Research in Mathematical and Computational Sciences*, vol. 4, no. 1, pp. 37–61, Jun. 2025, doi: https://doi.org/10.62270/jirmcs.v4i1.48

[5] R. Hou, X. Ye, H. B. O. Zaki, and N. A. B. Omar, "Marketing Decision Support System Based on Data Mining Technology," *Applied Sciences*, vol. 13, no. 7, p. 4315, Mar. 2023, doi: https://doi.org/10.3390/app13074315

[6] A. M. Pereira *et al.*, "Customer models for artificial intelligence-based decision support in fashion online retail supply chains," *Decis. Support Syst.*, vol. 158, p. 113795, Jul. 2022, doi: https://doi.org/10.1016/j.dss.2022.113795

[7] J. D. Borrero and J. Mariscal, "A Case Study of a Digital Data Platform for the Agricultural Sector: A Valuable Decision Support System for Small Farmers," *Agriculture*, vol. 12, no. 6, p. 767, May 2022, doi: https://doi.org/10.3390/agriculture12060767

[8] Z. I. Solodukha and S. V. Leonova, "DIGITAL TOOLS FOR PROMOTING MARKETING AGENCIES IN THE ADVERTISING SERVICES MARKET: A COMPARATIVE ANALYSIS OF GOOGLE ADS AND META APPROACHES," *The actual problems of regional economy development*, vol. 1, no. 21, pp. 288–296, Jun. 2025, doi: https://doi.org/10.15330/apred.1.21.288-296

[9] A. Gabay, A. Solomon, I. Guy, and B. Shapira, "Creating an Intelligent Social Media Campaign Decision-Support Method," in *Proceedings of the 32nd ACM Conference on User Modeling, Adaptation and Personalization*, New York, NY, USA: ACM, Jun. 2024, pp. 149–158. doi: https://doi.org/10.1145/3627043.3659543

[10] A. E. Youssef and K. Saleem, "A Hybrid MCDM Approach for Evaluating Web-Based E-Learning Platforms," *IEEE Access*, vol. 11, pp. 72436–72447, 2023, doi: https://doi.org/10.1109/ACCESS.2023.3294798

[11] N. Dadashzadeh, S. Sucu, K. Pangbourne, and D. Ouelhadj, "Socially Sustainable Mobility as a Service (MaaS): A practical MCDM framework to evaluate accessibility and inclusivity with application," *Cities*, vol. 154, p. 105360, Nov. 2024, doi: https://doi.org/10.1016/j.cities.2024.105360

[12] I. Mutambik, "Assessing Critical Success Factors for Supply Chain 4.0 Implementation Using a Hybrid MCDM Framework," *Systems*, vol. 13, no. 6, p. 489, Jun. 2025, doi: https://doi.org/10.3390/systems13060489

[13] P. Bajdor, "MCDM Approach to Quality Assessment of Functioning of e-Commerce Platforms Operating in Poland," 2025, pp. 213–223. doi: https://doi.org/10.1007/978-3-031-78465-1_18

[14] Noviyanti, A. Deli, and L. Gloria, "Decision Support System for Village Head Election Using the Weighted Product Method: Case Study in Lumar Village," *Journal of Computing Innovations and Emerging Technologies*, vol. 1, no. 1, pp. 1–6, Jul. 2025, doi: https://doi.org/10.64472/jciet.v1i1.1

[15] L. Pu and Z. Quan, "A CIMS-based decision support system for e-commerce: boosting real-time and effective digital marketing," *J. Supercomput.*, vol. 81, no. 1, p. 229, Jan. 2025, doi: https://doi.org/10.1007/s11227-024-06730-5

[16] M. H. Shahidzadeh and S. Shokouhyar, "Unveiling just-in-time decision support system using social media analytics: a case study on reverse logistics resource recycling," *Industrial Management & Data Systems*, vol. 124, no. 6, pp. 2251–2283, Jun. 2024, doi: https://doi.org/10.1108/IMDS-12-2023-0921

[17] D. A. Putri and W. D. Prastowo, "Analysis of A Decision Support System for the Selection of the Best Coffee Supplier at Arion Coffee Using AHP," *Journal of Computing Innovations and Emerging Technologies*, vol. 1, no. 2, pp. 51–58, Dec. 2025, doi: https://doi.org/10.64472/jciet.v1i2.18

[18] M. Mundzir, R. Zulkarnain, and R. Hardi, "Employing Fuzzy AHP in Modeling a Decision Support System for Determining Scholarship Recipients within the University Context," *Jurnal Malikussaleh Mengabdi*, vol. 2, no. 2, p. 344, Oct. 2023, doi: https://doi.org/10.29103/jmm.v2i2.13344