



Artificial Intelligence and Digital Marketing Performance: A Systematic Review

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Abstract

Background: The evolution of digital technology has transformed how companies market products and interact with consumers, particularly through digital platforms. Intensifying competition has encouraged businesses to use technologies that support more targeted and measurable marketing activities. Artificial intelligence (AI) is one of the technologies increasingly applied in this area.

Objective: This study synthesizes how AI is utilized in digital marketing, identifies the performance indicators reported in the literature, and examines the factors that enable or constrain its effectiveness, with particular attention to its relevance to online marketplace contexts.

Method: A systematic review was conducted using 17 peer-reviewed articles retrieved from the Scopus database.

Results: The reviewed literature identifies four main forms of AI utilization: prediction and targeting, personalization and user experience, customer relationship management and data integration, and segmentation and strategic capability enhancement. Digital marketing performance is assessed through behavioral and conversion indicators, experience and relational indicators, and market and financial indicators. The literature also identifies data quality, organizational capabilities, and strategic clarity as enabling factors, while algorithmic bias, privacy concerns, limited transparency, and inadequate governance constitute important constraints.

Conclusion: AI has the potential to support improvements in digital marketing performance, but the reported outcomes depend on the implementation context, organizational capabilities, data quality, and governance practices. This review contributes an integrated conceptual mapping of AI utilization, performance indicators, and enabling and constraining factors relevant to digital marketing and online marketplace research.

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INTRODUCTION

The evolution of artificial intelligence (AI) in digital marketing has fundamentally transformed how organizations understand, reach, and engage consumers in the digital environment. This transformation extends beyond a mere technological shift; it represents a strategic evolution that integrates predictive capabilities, personalization, segmentation, channel optimization, customer analytics, and performance evaluation into more measurable marketing practices. At the global level, the rapid growth of online marketplace platforms such as e-commerce sites where digital promotions, algorithmic recommendations, product rankings, consumer reviews, sponsored advertisements, and purchasing decisions converge has intensified

competition and driven businesses to leverage advanced technologies for enhancing digital marketing effectiveness. Huang (2022) demonstrates that big data and machine learning serve as tools for improving marketing strategies through user segmentation, content personalization, and channel integration. Choi and Choi (2023) show that machine learning can predict direct marketing responses, thereby making campaigns more targeted and efficient. Chinakidzwa and Phiri (2020) and Krisnanto et al. (2023) emphasize that digital technology does not automatically yield market advantages, as outcomes are heavily determined by an organization's digital marketing capabilities. Paşcalău et al. (2024) reveal that customer relationship orientation and CRM technologies are closely linked to customer satisfaction, market effectiveness, and profitability. Yasa et al. (2024) further demonstrate that digital strategies generate value only when embedded within a sound business strategy. A broader body of literature Gallego et al. (2024), Kaponis et al. (2025), Ullal et al. (2021), Yaiprasert and Hidayanto. (2023), Zaki et al. (2025), Peng, (2022), Miklosik and Evans (2020); Saura(2021), Volkmar et al. (2022), Akter et al. (2022) and Mrad and Hnich (2024) expands this understanding to encompass areas including literature mapping, systematic reviews, customer analytics, attribution modeling, recommendation systems, user experience, governance, and algorithmic bias. Collectively, these studies indicate that AI in digital marketing has evolved into a sociotechnical system operating through data, models, strategies, consumer experiences, and ethical governance.

Despite the growing body of literature, prior research reveals three significant gaps that necessitate a more focused synthesis. First, studies have spanned diverse and fragmented contexts (ranging from education, traditional SMEs, direct marketing, food delivery, and online donations to social media marketing and B2C e-commerce attribution modeling) resulting in a rich but scattered body of work that has not consistently centered on online marketplace consumers as a distinct analytical subject. Second, definitions and measurements of 'digital marketing performance' lack uniformity across studies. Some emphasize campaign response prediction accuracy, others highlight customer satisfaction and loyalty, some assess engagement and retention, while others prioritize profitability, market share, and sales growth. This inconsistency has rendered 'digital marketing performance' an umbrella term obscuring fundamentally different outcome levels. Third, there is insufficient integration between performance enhancement discussions and critical concerns such as ethics, privacy, fairness, algorithmic opacity, and bias. Research by Akter et al. (2022), Kaponis et al. (2025), and Volkmar et al. (2022) demonstrates that AI effectiveness relies heavily on model design, governance, system trust, and bias risk management, confirming that performance improvement is never automatic. These gaps underscore the urgency of this research: it is no longer sufficient to merely reiterate that AI benefits digital marketing. Instead, it is necessary to explain more specifically how AI is utilized, which indicators assess its impact, and what factors act as enablers, barriers, or boundary conditions for its effectiveness.

The novelty of this study lies in the integrative synthesis developed from the current review, which connects three dimensions: forms of AI utilization, digital marketing performance indicators, and enabling or constraining factors. Unlike previous studies that generally examine these dimensions separately, this review organizes the scattered findings into a unified conceptual mapping. The first objective is to identify the forms of AI application reported in the literature, including prediction and targeting, personalization and user experience, CRM and data integration, and segmentation and strategic capability enhancement. The second objective is to classify the indicators used to assess digital marketing performance into behavioral and conversion, experience and relational, and market and financial outcomes. The third objective is to examine the conditions associated with AI effectiveness, including data quality, analytical and digital marketing capabilities, strategic clarity, customer relationship orientation, privacy, fairness, transparency, and algorithmic bias. Although this framework is relevant to online marketplaces, the reviewed studies cover multiple digital marketing contexts; therefore, its relevance to online marketplace consumers should be interpreted as a conceptual orientation rather than as marketplace-specific empirical evidence.

Based on these gaps, three research questions were formulated. First, how is AI utilized to enhance digital marketing performance as described in the scholarly literature? Second, which digital marketing performance indicators are most frequently used in the literature to assess AI's impact? Third, what conceptual factors are identified in the literature as enablers, barriers, or

boundary conditions affecting the effectiveness of AI in digital marketing? These questions are logically interconnected: the form of AI utilization explains its operational mechanisms, performance indicators explain how its impact is measured, and conceptual factors explain why outcomes may vary across contexts. It is important to note that although this systematic review synthesizes literature across multiple domains, the analysis is oriented toward understanding these relationships within the broader ecosystem of online marketplace consumers, acknowledging that not all reviewed studies focus exclusively on this context.

METHOD

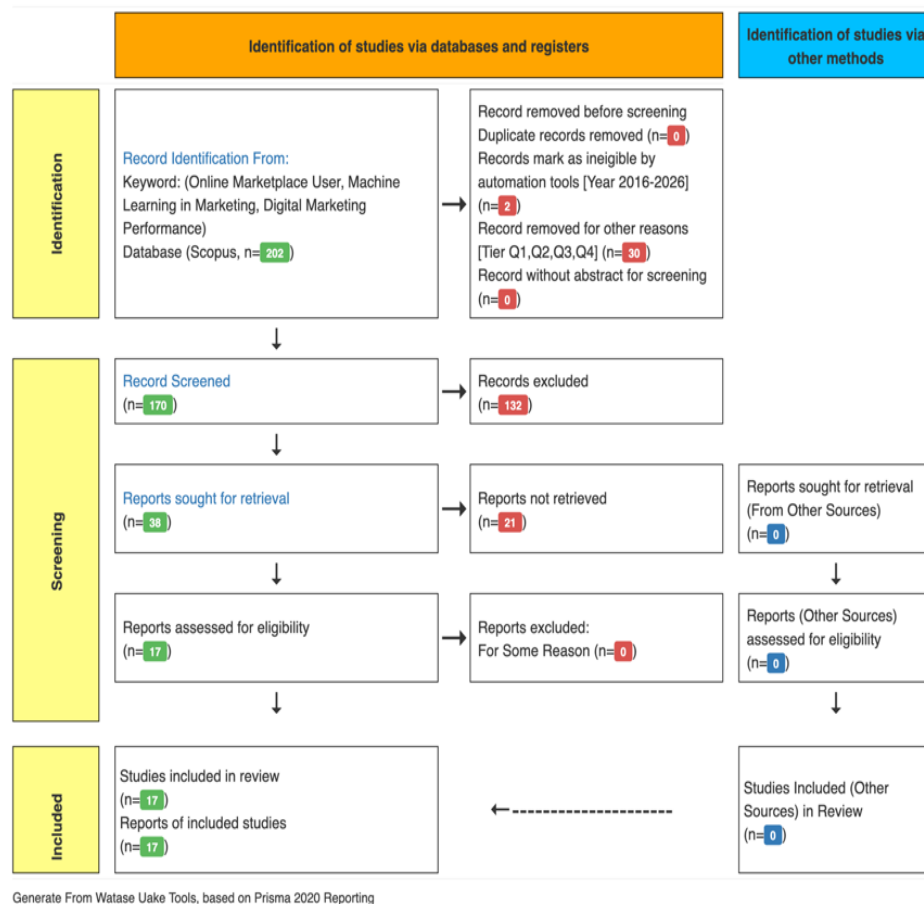


Figure 1. PRISMA diagram

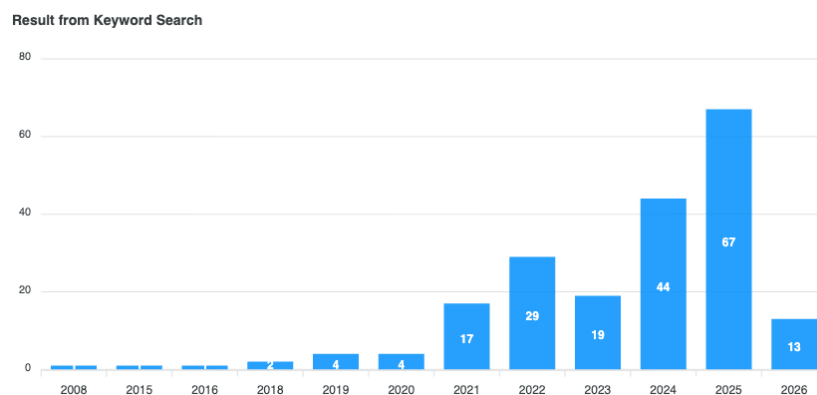


Figure 2. Keyword Search Results

This study employed a systematic review design following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines (Page et al., 2021, 2022). Scientific articles serve as the unit of analysis, as the research focuses on mapping, comparing, and synthesizing existing findings regarding the use of artificial intelligence (AI) to enhance digital

marketing performance. This design was selected because the field of AI in digital marketing has expanded significantly yet remains fragmented across contexts, performance indicators, and determinants of effectiveness. The final sample comprises 17 studies selected through a multi-stage screening process.

The search was conducted on July 15, 2026, using the Scopus database. The initial search used the following Boolean query in the title, abstract, and keyword fields: TITLE-ABS-KEY(("artificial intelligence" OR "machine learning" OR "deep learning") AND ("digital marketing" OR "online marketing" OR "e-marketing") AND ("marketplace" OR "e-commerce" OR "online consumer" OR "digital consumer")). The search yielded 202 records. The publication-year criterion of 2016–2026 was subsequently applied during pre-screening, resulting in the exclusion of two records published before 2016. The search terms represented three main conceptual clusters: online marketplace users, machine learning in marketing, and digital marketing performance.

The inclusion criteria were: (1) peer-reviewed journal articles or conference proceedings indexed in Scopus; (2) publications from 2016 to 2026; (3) articles written in English; (4) studies addressing AI or machine learning in digital marketing contexts; and (5) empirical studies, systematic reviews, or conceptual studies with an identifiable methodology. The exclusion criteria were: (1) duplicate records; (2) records without accessible abstracts; (3) studies outside the specified publication period; (4) studies focusing exclusively on non-marketing AI applications; and (5) reports for which the full text could not be retrieved. During pre-screening, no duplicate records were identified, two records were excluded based on the publication-year criterion, and 30 records were excluded because their journal sources did not meet the stated Scopus Q1–Q4 criterion. Of the 170 records screened by title and abstract, 132 were excluded because they did not align sufficiently with the research focus. Full texts were sought for 38 reports, of which 21 could not be retrieved. Consequently, 17 studies proceeded to eligibility assessment and were included in the final synthesis. The unavailability of 21 full-text reports is recognized as a potential source of retrieval bias.

The data collection followed the PRISMA flow: identification (202 records), pre-screening (170 records after removing 2 via timeframe filter and 30 via journal quality criteria), screening (38 records after excluding 132 based on title-abstract review), retrieval (17 reports obtained from 38 sought; 21 inaccessible), eligibility (17 reports assessed with no further exclusions), and inclusion (17 studies in the final corpus). The research instruments consist of an article selection protocol verifying relevance to AI utilization in digital marketing performance, and a data extraction sheet recording article details, publication year, study context, forms of AI utilization, performance indicators, facilitating and hindering factors, and key findings aligned with the three research questions.

The data analysis employed qualitative content analysis and thematic synthesis. Each article was read in full, and information relevant to the three research questions was extracted using the data extraction sheet. The extracted information was grouped according to semantic similarity to establish thematic categories. For RQ1, the analysis identified four categories of AI utilization: prediction and targeting, personalization and user experience, CRM and data integration, and segmentation and strategic capabilities. For RQ2, the performance indicators were organized into behavioral and conversion, experience and relational, and market and financial outcomes. For RQ3, the extracted factors were classified into data quality, analytical and digital marketing capabilities, customer relationship orientation, strategic clarity, governance, privacy, fairness, and algorithmic bias. Coding consistency was maintained through iterative comparison between the initial codes and the original article texts. Codes were revised when categories overlapped or did not adequately represent the extracted evidence. A cross-study comparison was subsequently conducted to identify dominant, minor, consistent, and contradictory findings, followed by a narrative synthesis integrating the results across the reviewed studies.

RESULTS AND DISCUSSION

Result

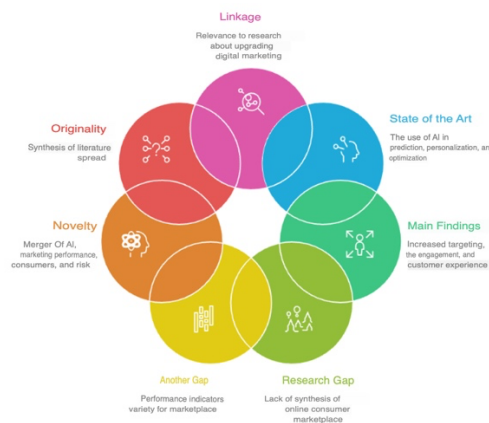


Figure 3. Comprehensive Overview of AI-Based Digital Marketing

This systematic review comprises 17 articles selected through a multi-stage PRISMA process. The reviewed studies originate from diverse geographical contexts including China, Indonesia, Zimbabwe, Romania, India, Saudi Arabia, Taiwan, and the MENA region, alongside international systematic reviews. The articles were published between 2020 and 2025 and employ varied methodologies, including case studies, SEM-PLS, decision trees, logistic regression, Bayesian networks, mixed methods, Delphi studies, and thematic analysis. Regarding RQ1 (forms of AI utilization), the synthesis reveals that AI in digital marketing is primarily employed for: (a) prediction and targeting including direct marketing response prediction, behavioral pattern interpretation, conversion probability calculation, and digital channel attribution Huang (2022), Choi and Choi (2023), Peng (2022); Mrad and Hnich (2024), Miklosik and Evans (2020), Saura (2021); (b) personalization and user experience encompassing recommendation systems, personalization engines, adaptive user interfaces, chatbots, and sentiment analysis Kaponis et al. (2025), Yaiprasert and Hidayanto, (2023), Zaki et al. (2025); Yaiprasert and Hidayanto (2023) (c) CRM and data integration covering task automation, customer behavior analysis, experience personalization, and anticipation of customer needs Paşcalău et al. (2024) Gallego et al. (2024) ; and (d) segmentation and strategic capabilities utilizing clustering algorithms and ensemble learning to map user segments with greater precision (Hsu et al., 2022; Ullal et al., 2021).

Regarding RQ2 (performance indicators), the synthesis reveals that digital marketing performance indicators used in the literature fall into three distinct outcome layers. At the behavioral/conversion level, indicators include direct marketing response, prediction model accuracy, conversion probability, click tendency, and purchase intention (Choi & Choi, 2023; Mrad & Hnich, 2024; Zaki et al., 2025). At the experience/relational level, indicators encompass customer satisfaction, brand admiration, engagement, user experience, customer retention, and relationship quality (Kaponis et al., 2025; Paşcalău et al., 2024; Zaki et al., 2025). At the market/financial level, indicators include market effectiveness, market profitability, sales growth, market share, revenue, and sustainable business performance (Paşcalău et al., 2024; Yasa et al., 2024). This three-layer classification constitutes a key finding of this review, demonstrating that 'digital marketing performance' is not a singular construct but a multidimensional outcome that must be disaggregated to accurately assess AI's impact.

Regarding RQ3 (enabling and constraining factors), the synthesis identifies two categories of factors affecting AI effectiveness in digital marketing. Enabling factors include: data quality and integration Paşcalău et al. (2024), Saura (2021), Miklosik and Evans (2020), analytics and digital marketing capabilities Chinakidzwa and Phiri (2020); Krisnanto et al. (2023), customer relationship orientation Paşcalău et al. (2024), leadership capability and strategic clarity Chinakidzwa and Phiri (2020) and Yasa et al. (2024), and environmental orientation embedded within culturally specific business strategies (Yasa et al., 2024). Constraining factors and boundary conditions include: algorithmic bias across design, contextual, and application dimensions Akter et al. (2022), data privacy concerns and the need for governance and explainable AI Kaponis et al. (2025), organizational culture and low managerial tolerance for AI

errors Volkmar et al. (2022), and the finding that not all digital orientations or capabilities directly translate into final market outcomes (Chinakidzwa & Phiri, 2020; Yasa et al., 2024). These constraining factors demonstrate that AI implementation in digital marketing is accompanied by risks that must be managed simultaneously with performance optimization efforts.

A comprehensive synthesis of the extracted data thus reveals four interconnected groups of findings across the 17 articles. The first group encompasses AI as a tool for prediction, targeting, and marketing decision optimization. The second group covers AI applications for personalization, user experience management, CRM, and segmentation. The third group maps digital marketing performance indicators across behavioral/conversion, experience/relational, and market/financial outcome layers. The fourth group addresses enabling and constraining factors including data quality, organizational capabilities, strategic clarity, governance, privacy, and algorithmic bias. These findings span diverse contexts including educational enterprises, direct marketing, organizational CRM, social media marketing, food delivery, online donations, and B2C e-commerce, employing methodologies ranging from quantitative surveys and SEM-PLS to systematic reviews and Bayesian networks.

Discussion

The findings of this study indicate that the use of AI in digital marketing cannot be understood as a single phenomenon but rather as a series of interconnected mechanisms operating through data, prediction, personalization, strategy, and customer relationship management. The reviewed literature consistently demonstrates a shift from intuition-based marketing toward data-driven approaches leveraging big data, machine learning, and digital analytics. This shift has significant theoretical implications, as it positions AI not merely as a technological innovation but as a probabilistic mechanism that can improve promotion allocation, targeting, and estimation of consumer response opportunities. However, this effectiveness always emerges through specific organizational conditions, consumer behavioral dynamics, and the quality of system design, rather than automatically from the technology itself.

Regarding RQ1, the dominant form of AI utilization identified in this synthesis is prediction, targeting, and optimization of marketing decisions. This finding is consistent with the broader trajectory of marketing automation literature, where the primary value of AI lies in reducing decision uncertainty (Davenport et al., 2020; Kumar et al., 2019; Labib, 2024). The present synthesis extends this understanding by demonstrating that prediction capabilities span multiple functional areas from direct marketing response estimation to real-time conversion probability calculation and multi-touch attribution modeling. Equally significant are the personalization, segmentation, and customer relationship management applications, which position AI as both a targeting instrument and a relational infrastructure that shapes consumer experiences and maintains relationship continuity. This is particularly relevant for online marketplace environments, where algorithmic recommendations, product rankings, and personalized promotions are foundational mechanisms.

Regarding RQ2, the variation in performance indicators demonstrates that digital marketing performance is represented at several outcome levels in the reviewed literature. At the behavioral and conversion level, the studies assess indicators such as clicks, campaign responses, prediction accuracy, purchase intention, and conversion probability. At the experience and relational level, the reported indicators include user experience, engagement, customer retention, satisfaction, brand admiration, and relationship quality. At the market and financial level, the indicators include market effectiveness, profitability, sales growth, market share, revenue, and sustainable business performance. This three-layer classification provides conceptual clarity by showing that digital marketing performance should not be treated as a single outcome. In practice, the classification also suggests that evaluations of AI-supported marketing should consider multiple indicators because changes in engagement or personalization quality do not necessarily correspond directly to changes in profitability.

Regarding RQ3, the reviewed literature indicates that the effectiveness of AI-supported digital marketing depends on organizational and technical conditions, including data quality, analytical capabilities, customer relationship orientation, strategic clarity, and leadership. These findings show that access to AI technology alone does not ensure improved marketing outcomes. The literature also identifies algorithmic bias, privacy concerns, limited transparency, inadequate

governance, and low organizational tolerance for AI errors as important constraints. The synthesis therefore highlights a tension between performance optimization and algorithmic risk management. Its contribution lies in integrating these dimensions within one conceptual framework, demonstrating that discussions of AI-supported marketing performance should also consider ethics, privacy, fairness, transparency, and governance.

The theoretical implications of this study are fourfold. First, AI in digital marketing should be understood within a framework that transcends technological determinism, recognizing that marketing outcomes are mediated by strategy, capabilities, user experience, and context. Second, the study disentangles three conceptual levels often conflated in the literature: forms of AI utilization, performance indicators, and conditions determining effectiveness. Third, research on AI in digital marketing should integrate the technical-predictive, behavioral-experiential, and ethical-governance dimensions simultaneously. Fourth, online marketplaces warrant treatment as a distinct analytical context due to their unique algorithmic competition dynamics, rather than as an extension of general e-commerce or social media marketing. Practically, these findings imply that marketplace operators should deploy AI not merely to add features but to formulate more precise data-driven marketing decisions. For digital marketers, AI's targeting and personalization capabilities remain beneficial only when supported by quality data, clear strategy, and organizational capacity. For managers, the findings serve as a caution that challenges often lie in organizational culture, governance, and the tendency to view AI as a universal solution.

Several limitations of this study must be acknowledged and considered when interpreting the conclusions. First, the reviewed literature spans diverse contexts (education, direct marketing, SMEs, food delivery, online donations, social media marketing, and B2C e-commerce) and not all studies position online marketplace consumers as their primary subject. The synthesis is therefore oriented toward this context rather than exclusively derived from it. Second, 'digital marketing performance' is not consistently measured across studies, limiting direct comparisons. Third, some studies emphasize technical model performance without exploring consumer experiences, while others focus on behavior without situating findings within marketplace environments. Fourth, methodological limitations in the primary studies (including cross-sectional designs, small samples, single-context settings, and simulated data) constrain the generalizability of the synthesized findings. Fifth, the 21 articles that could not be retrieved during the full-text retrieval stage represent a potential retrieval bias. These limitations are acknowledged not to diminish the study's contribution but to define the boundaries within which its findings should be interpreted.

CONCLUSION

This systematic review addressed three interconnected questions regarding AI utilization in digital marketing. First, AI is utilized through four primary mechanisms: prediction and targeting, personalization and user experience, CRM and data integration, and segmentation and strategic capability enhancement. Second, digital marketing performance indicators operate across three distinct outcome layers: behavioral/conversion (response rates, conversion probability, purchase intention), experience/relational (satisfaction, engagement, retention, relationship quality), and market/financial (market effectiveness, profitability, sales growth). Third, AI effectiveness is enabled by data quality, analytical capabilities, customer orientation, and strategic clarity, while constrained by algorithmic bias, privacy concerns, lack of transparency, and inadequate governance. A central conclusion is that AI has the potential to contribute to improving digital marketing performance, but its outcomes are contingent upon the implementation context rather than automatic.

This study contributes to the literature by organizing fragmented findings into an integrated framework encompassing AI utilization, digital marketing performance indicators, and enabling and constraining conditions. The three-layer classification of behavioral and conversion, experience and relational, and market and financial outcomes provides a clearer basis for interpreting digital marketing performance. Because the reviewed studies cover diverse contexts and are not exclusively focused on online marketplace consumers, the proposed framework requires further empirical validation in marketplace settings. Future research should examine online marketplace consumers directly, test the relationships proposed in the framework, integrate technical model performance with consumer behavioral evidence, and investigate

fairness, transparency, explainable AI, privacy, and governance in AI-supported digital marketing.

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AUTHOR CONTRIBUTION STATEMENT

Septiandi Putra, as the sole author, was responsible for the conceptualization, methodology, literature search and selection, data extraction and synthesis, formal analysis, visualization, preparation of the original manuscript, review and editing, and final approval of the manuscript.

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