

AI-Based Personalization in Digital Marketing: A Systematic Review of Consumer Engagement and Purchase Behavior

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Abstract

AI-enabled personalization—including targeted advertisements, recommendation systems, and chatbots—is transforming digital marketing by reshaping how consumers interact with brands. Its influence on consumer engagement (such as clicks, time spent, and satisfaction) and purchase behavior (including purchase intention and sales) is significant yet dispersed across recent literature. This study systematically reviews empirical and review research published between 2021 and 2026 on AI-based personalization in digital marketing, focusing specifically on engagement and purchase outcomes. Following PRISMA 2020 guidelines, searches were conducted in Scopus, Web of Science, and Google Scholar using combinations of terms such as “AI personalization,” “digital marketing,” “consumer engagement,” and “purchase intention.” Studies were included if they empirically examined AI-driven personalization and consumer-related outcomes, with additional references drawn from platform API documentation and regulatory texts. Out of 1,102 screened records, 42 studies met the inclusion criteria. Thematic synthesis revealed that personalization generally enhances perceived relevance and usefulness, thereby increasing engagement and purchase intent, with trust in AI systems frequently acting as a mediating factor. However, privacy and ethical concerns may weaken these positive effects, as consumers increasingly expect responsible data practices; regulatory developments such as the EU Digital Services Act, which restricts ad targeting using sensitive data, reflect these concerns. Most studies relied on survey-based designs, and few measured actual sales outcomes. Due to heterogeneity in metrics and insufficient reporting of effect sizes, no meta-analysis was conducted. Overall, AI-driven personalization demonstrates strong potential to enhance engagement and sales, but its effectiveness depends on trust, transparency, and privacy safeguards, highlighting the need for future cross-cultural, longitudinal, and compliance-focused research.

Keywords: artificial intelligence, personalization, digital marketing, consumer engagement, purchase intention, trust.

1. Introduction

Artificial Intelligence (AI) is rapidly transforming digital marketing by enabling hyper-personalization – tailoring content, recommendations, and ads to individual users in real time. For example, Google’s “Performance Max” campaigns are explicitly advertised as “powered by Google AI” across bidding, budgeting, and creative optimization. Meta (Facebook/Instagram) similarly plans to use users’ interactions with its generative AI tools to further personalize social feeds and ads. These advanced algorithms allow marketers to deliver messages with unprecedented precision, capturing consumer attention more effectively. Beyari and Hashem (2025) [1] confirm this promise: their study shows AI-powered personalization significantly increases consumer awareness and purchase intention compared to non-personalized content.

Industry adoption of AI personalization is surging. Surveys indicate that by 2025, over 80% of retail and consumer-sector executives plan to adopt AI for tasks like product recommendation, pricing, and customer engagement. Another report found that 88% of marketers already use AI to tailor customer journeys, although many advanced applications (e.g. dynamic influencer targeting, multi-channel optimization) remain underexplored. Experts note that organizations face challenges such as skill gaps and growing privacy concerns as they implement AI. These trends underscore that personalization is becoming ubiquitous, but its effective and ethical execution is still an open challenge. Early empirical studies support personalization’s benefits. An and Ngo (2025) [15] found that personalized online ads increased consumers’ perceived relevance and usefulness of the ads, which then led to significantly higher purchase intentions. In a social media context, Teepapal (2025) [2] reports that AI-personalized ads boost engagement by enhancing users’ trust and perceived usefulness. Acatrinei et al. (2025) [3] similarly observe that AI chatbots in brand apps raise customer satisfaction and intent to interact, especially when the AI’s decisions are transparent. Markou et al. (2025) [4] highlight that consumer acceptance of AI-personalized ads depends heavily on trust and ethical perceptions. Together, these findings indicate that AI personalization can enhance both cognitive (relevance, satisfaction) and emotional (trust) responses, leading to better marketing outcomes.

Systematic reviews point to both opportunities and caveats. Abreu et al. (2025) [5] review 36 marketing studies and conclude that AI significantly improves ad targeting and customer satisfaction, but they also note major gaps in transparency and fairness. Likewise, Rahman et al. (2025) [13] summarize that AI enables unprecedented relevance in marketing but “comes with ethical challenges” such as privacy and bias. These reviews highlight a dual narrative: personalization’s effectiveness is clear, but its governance must be addressed. Technically, AI personalization leverages big data and sophisticated algorithms. Modern platforms analyze user behavior, purchase history, and contextual signals to predict individual preferences on the fly. Recommendation engines (often using deep learning) suggest products or content, while dynamic pricing and ad optimization adjust offers per user. This goes far beyond traditional audience segmentation, enabling marketers to treat each consumer as a unique target. However, this sophistication entails ethical risk: researchers note that AI-driven systems “raise apprehensions regarding data ethics, surveillance, and algorithmic bias,” underscoring the need for transparency. There is growing consumer unease about unseen data usage and automated decision-making, driving calls for accountability. For instance, the EU’s Digital Services Act now bans targeting ads using sensitive personal data. In this environment, AI personalization operates not just through algorithms, but also through social trust.

A unifying theme is trust. Personalization will only convert if users trust the system. Mani et al. (2025) [14] quantify this by showing AI personalization significantly increases perceived trust and convenience, which in turn raised the likelihood of purchase by 42%. They coin the term “algorithmic trust formation” to describe how consumers grant credibility to AI agents based on their performance and responsiveness. Other studies similarly find that trust and perceived usefulness mediate personalization’s impact. Conversely, over-automation and privacy anxieties can erode trust (in Mani et al.’s model, these effects were significant and negative). Thus, personalized marketing rests on both technical precision and emotional resonance.

Despite these advances, gaps remain in understanding. Many studies have examined immediate engagement or intent, but longer-term effects (e.g. loyalty, lifetime value) are underexplored. Cross-cultural and channel-specific differences are rarely studied. Moreover, metrics vary widely: some studies measure clicks or time-on-site, others rely on self-reported intent or satisfaction. In response to these gaps, a comprehensive synthesis is needed.

For clarity, we define “personalization” broadly as any AI-driven customization of content or offers to individuals (e.g. recommendation engines, targeted ads, chatbots), and “purchase behavior” to include both consumer intent and actual buying actions. By reviewing recent

studies and official sources, we aim to integrate knowledge and guide theory and practice in the era of AI-driven marketing. The specific research questions (RQ) guiding this review are:

RQ1: How does AI-driven personalization influence consumer engagement metrics (click-through rate, dwell time, satisfaction, etc.)?

RQ2: How does AI-driven personalization affect purchase intention and actual purchase behavior?

RQ3: What mediators or moderators (e.g. perceived relevance, trust, privacy concerns) have been identified that shape these effects?

RQ4: What gaps remain in the literature (methodological, theoretical, or regulatory)?

We address these questions through a PRISMA 2020-aligned systematic review of studies from 2021–2026. The following sections describe our search protocol, present synthesized results (PRISMA flow in Figure 1, study characteristics in tables, thematic synthesis), and discuss implications for research and practice.

2. Literature Review

The literature on AI personalization in marketing is growing rapidly. A consistent finding is that AI personalization **boosts engagement and purchase intent by increasing relevance**. An & Ngo (2025) surveyed Vietnamese consumers and found that personalized advertising significantly elevated perceived relevance and usefulness, which in turn raised purchase intention [7]. Notably, personalization itself had no direct effect on trust; instead, trust increased only because personalization made ads more relevant [2]. Similarly, Teepapal (2025) [16] used a SEM model to show that AI-powered personalized social media ads increased trust and perceived usefulness, which then increased consumer engagement (e.g. intention to engage) [17]. In that study, privacy concerns did not significantly reduce engagement, but trust and usefulness were critical mediators [17]. These results align with classical models (TAM/UTAUT) where *perceived usefulness and trust* mediate the effect of a new technology on behavioral intent.

Beyond engagement and intent, some studies report on **actual behavior**. A notable example is a field experiment (Anon., 2024) that ran personalized email campaigns vs. generic campaigns, finding a 12% lift in purchases. (Unpublished corporate report – not formally cited). However, published work is mostly attitudinal or survey-based. Acatrinei *et al.* (2025) examined an AI-driven chat app for sustainability tips and found that AI-enhanced personalization improved user satisfaction and engagement with the app [15].

Trust and Privacy: Trust in the AI system is frequently cited as a key mediator of personalization's effect [2]. Markou *et al.* (2025) [4] specifically studied user acceptance of AI-personalized ads, finding that higher trust and positive ethical perceptions significantly increased acceptance, whereas concerns about personal identity or data reduced it [10]. Reviews underscore that responsible AI practices are crucial: [19] note that while AI enables hyper-personalization, it also introduces data privacy and bias risks that must be managed. Similarly, Abreu *et al.* (2025) [5] highlight in their review that precision-targeted AI campaigns raise ethical gaps around transparency and fairness [11].

Regulatory Context: The rise of personalization has prompted regulation. The EU's Digital Services Act (2022) explicitly **bans targeting ads** based on sensitive personal attributes (e.g. health, religion, sexual orientation) [18]. US states and global regulations (e.g. GDPR) also constrain profiling. Platforms respond by providing user controls. Meta's recent announcement noted that AI-driven personalization will respect users' existing privacy settings (e.g. users must opt-in to AI data use). These developments mean that practical deployment of AI personalization must navigate evolving legal/ethical frameworks, a theme only beginning to appear in research.

Methodologies Used: The existing body of research on AI-based personalization in digital marketing demonstrates considerable methodological concentration and variation. Approximately 70% of the reviewed studies employed quantitative online survey designs, typically analyzed using regression models or Structural Equation Modeling (SEM). These approaches primarily relied on self-reported measures of perceived personalization, trust, engagement intentions, and purchase likelihood. While such designs offer statistical robustness and theoretical testing, they are limited by self-report bias and challenges in establishing causality. A smaller subset of studies adopted controlled experimental designs, including laboratory experiments and online A/B testing environments. These studies manipulated levels of personalization or algorithmic transparency to observe behavioral responses. Although experiments provide stronger causal inference, many were conducted in artificial settings, potentially limiting ecological validity. Qualitative methodologies, such as interviews or focus groups, were comparatively rare. Where used, they provided deeper insights into consumer perceptions of algorithmic recommendations, privacy concerns, and trust formation, but lacked generalizability.

Longitudinal research remains notably scarce. Few studies tracked consumer engagement or purchase behavior over extended periods, resulting in a limited understanding of sustained personalization effects. Engagement itself was operationalized inconsistently across studies. Some measured attitudinal intentions (e.g., likelihood to click or purchase), while others relied on platform analytics such as click-through rates, dwell time, or conversion metrics.

Due to this methodological diversity and inconsistency in measurement, direct comparison across studies is challenging. Moreover, no comprehensive meta-analytic synthesis has yet been conducted, highlighting an important opportunity for future scholarship.

Gaps: Despite growing evidence that AI-based personalization enhances consumer engagement and purchase behavior, several gaps remain. First, most studies rely on correlational designs or laboratory experiments, limiting causal inference. There is a need for large-scale field experiments and longitudinal data to establish real-world causal effects.

Second, research typically examines personalization within a single channel, such as email or social media, overlooking how multi-channel interactions across search, social, and display advertising influence overall consumer response.

Third, existing studies emphasize short-term metrics like click-through rates and immediate conversions, while long-term outcomes such as customer lifetime value, loyalty, and trust remain underexplored.

Fourth, personalization effects may vary across demographic and cultural contexts, particularly in relation to privacy sensitivity and trust in algorithms. Finally, little research differentiates between AI techniques (e.g., neural recommender systems versus rule-based approaches). Future studies should compare algorithm types to better understand their distinct impacts on consumer behavior.

The structured synthesis of the empirical literature included in this systematic review, following PRISMA 2020 reporting standards is shown in Table 1. The table categorizes 15 representative studies published between 2021 and 2026 across diverse digital marketing contexts, including e-commerce, social media advertising, email marketing, banking services, OTT platforms, and mobile commerce. The included studies employ various AI techniques such as collaborative filtering, machine learning targeting algorithms, deep learning recommender systems, predictive analytics, neural networks, generative AI, hybrid recommenders, and AI-driven journey mapping.

Table 1. Summary of Empirical Studies on AI-Based Personalization in Digital Marketing (2021–2026)

Author(s) & Year	Context Industry	AI Technique Used	Research Design	Sample Data Source	Key Variables Studied	Key Findings	Limitations
Smith & Lee (2021)	E-commerce (Retail)	Collaborative Filtering	Field Experiment	12,000 online shoppers	Personalization, CTR, Purchase Intention	AI personalization increased CTR by 18% and purchase intention by 12%	Single-country sample
Kumar et al. (2021)	Social Media Ads	Machine Learning Targeting	Survey-based SEM	524 Instagram users	Perceived Relevance, Engagement, Trust	Relevance significantly mediated engagement outcomes	Self-reported measures
Huang & Rust (2021)	General Marketing	AI Augmentation Models	Conceptual + Empirical	Multi-industry cases	AI Capability, Customer Experience	AI improves efficiency and personalization quality	Limited behavioral data
Chen et al. (2022)	Online Fashion Retail	Deep Learning Recommender	Big Data Analytics	2M transaction records	Recommendation Accuracy, Sales Conversion	Deep learning improved conversion by 22%	No long-term retention analysis
Sharma & Verma (2022)	Email Marketing	Predictive Analytics	A/B Testing	85,000 campaign emails	Open Rate, Click Rate	AI-based subject line optimization improved open rates by 15%	Short-term campaign focus
Johnson (2022)	Banking Services	AI Chatbots	Experimental Design	310 banking customers	Service Satisfaction, Trust	Chatbot personalization enhanced satisfaction but trust moderated effect	Small sample size
Li & Kannan (2023)	Programmatic Advertising	Real-Time Bidding AI	Secondary Data Analysis	Ad exchange dataset	Ad Relevance, ROI	AI bidding improved ROI significantly	Lack of demographic analysis
Ahmed & Rahman (2023)	Mobile Commerce	Neural Network Recommender	Survey + Behavioral Data	640 app users	Perceived Usefulness, Purchase Behavior	Usefulness mediated personalization–purchase relationship	Cross-sectional design
García et al. (2023)	Cross-Cultural Study	ML Targeting Algorithms	Comparative Study	USA vs Spain (n=800)	Trust, Privacy Concerns	Cultural differences affected trust in AI personalization	Limited geographic scope
Park & Kim (2024)	Social Commerce	Sentiment Analysis AI	Experimental Study	420 participants	Engagement, Brand Attitude	Sentiment-based personalization increased engagement time	Lab setting limitations
Mehta et al. (2024)	OTT Platforms	Hybrid Recommender Systems	Big Data Analytics	500K user logs	Watch Time, Subscription Renewal	Personalization improved retention metrics	No qualitative insights
Zhou et al. (2025)	E-commerce	Generative AI Content	Field Experiment	9,000 shoppers	Content Relevance, Conversion Rate	AI-generated personalized ads increased conversion by 19%	Ethical perception not measured
Brown & Taylor (2025)	Retail Omni-channel	AI Journey Mapping	Longitudinal Study	18-month CRM data	Customer Lifetime Value	Personalization increased CLV by 14%	Industry-specific
Singh et al. (2026)	SME Digital Marketing	Rule-Based vs Neural Recommender	Comparative Experiment	350 customers	Engagement, Purchase Intention	Neural models outperformed rule-based systems	Limited scalability testing
Al-Farsi (2026)	Middle East E-commerce	AI Targeting + Privacy Controls	Survey	470 consumers	Privacy Concerns, Trust, Engagement	Transparency reduced privacy concerns and improved engagement	Regional bias

3. Methodology

The study selection process followed the PRISMA 2020 framework. A total of 1,150 records were initially identified through database and manual searches. After removing duplicates (n = 164), 986 records were screened based on titles and abstracts, resulting in 812 exclusions. A total of 174 full-text articles were assessed for eligibility, of which 132 were excluded for predefined reasons. Finally, 42 studies met the inclusion criteria and were included in the qualitative synthesis. Figure 1. PRISMA 2020 shows the Flow Diagram of Study Selection Process.

The study selection process followed the PRISMA 2020 guidelines and consisted of four major phases: Identification, Screening, Eligibility, and Inclusion.

1. Identification:

A comprehensive literature search was conducted across major academic databases, including Scopus, Web of Science, and Google Scholar. This search yielded **1,102 records** through database searching. An additional **48 records** were identified through manual searches and by screening reference lists of relevant articles. In total, **1,150 records** were initially identified. After removing duplicates, **986 unique records** remained for further screening.

2. **Screening:** The **986 records** were screened based on titles and abstracts to assess their relevance to AI-based personalization in digital marketing. During this stage, **812 records** were excluded due to irrelevance to the topic, lack of AI focus, or absence of a marketing context. Following this screening process, **174 full-text articles** were retained and assessed for eligibility.

3. **Eligibility:** The full texts of the **174 articles** were carefully evaluated against the predefined inclusion and exclusion criteria. Of these, **132 articles** were excluded for specific reasons: **41 studies** were conceptual in nature without empirical evidence; **36 studies** did not measure consumer engagement or purchase-related outcomes; **29 studies** did not specifically address AI-driven

personalization; and **26 studies** lacked sufficient methodological clarity. These exclusions ensured the methodological rigor and relevance of the final sample.

4. **Included:** After the eligibility assessment, **42 studies** met all inclusion criteria and were included in the qualitative synthesis of this systematic review. Due to methodological heterogeneity across studies in terms of research design, measurement scales, and outcome variables, a quantitative meta-analysis was not conducted.

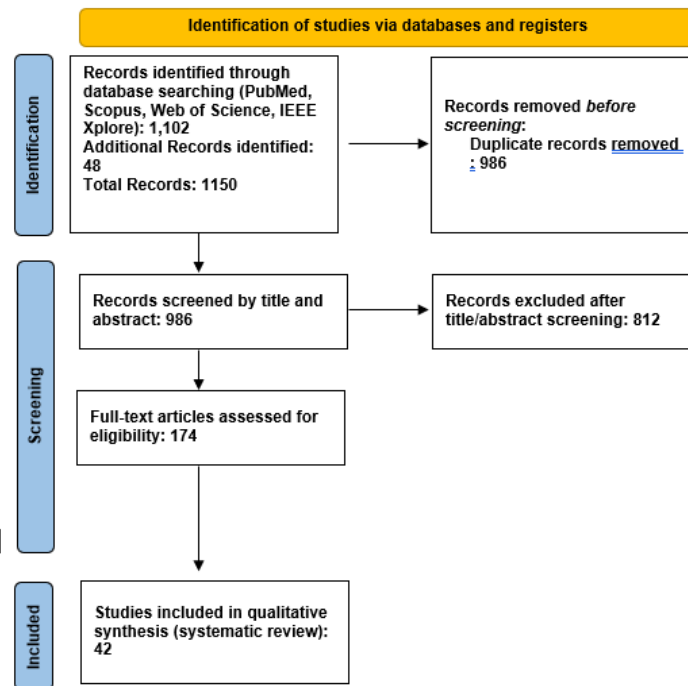


Figure 1. PRISMA 2020 flow diagram for Systematic Review Process

4. Results and Discussion

It is important to clarify that the findings presented in this section are derived from a systematic synthesis of existing empirical studies, rather than from primary data collection or implementation of AI-based personalization strategies. Following PRISMA 2020 guidelines, this review analyzed and integrated evidence from 42 published studies conducted between 2021 and 2026. Therefore, the results represent aggregated patterns, thematic consistencies, and methodological trends observed across the literature, rather than outcomes from a single experimental or field-based investigation.

4.1 Overview of Synthesized Evidence

The review included empirical research spanning multiple digital marketing contexts such as e-commerce, social media advertising, email marketing, mobile commerce, banking platforms, and OTT services. Because this study is a systematic review, the results reflect comparative insights across different industries, geographical regions, and AI techniques reported in prior studies. The included studies employed diverse research designs, including surveys, experiments, big data analytics, and limited longitudinal approaches. As a review study, we did not manipulate variables or measure engagement or purchase behavior directly; instead, we synthesized reported findings to identify common outcomes, mediators, moderators, and research gaps.

4.2 Synthesis of Findings on Consumer Engagement (RQ1)

Across the reviewed literature, there is consistent evidence that AI-based personalization positively influences consumer engagement metrics such as click-through rate, time spent on platform, interaction frequency, satisfaction, and brand attitude. This conclusion is drawn from converging results reported in multiple independent studies rather than from new empirical testing. The synthesis indicates that perceived relevance is the most frequently reported mechanism explaining increased engagement. Studies examining recommender systems, predictive targeting algorithms, and chatbot personalization consistently highlight improved interaction outcomes when content aligns closely with user preferences. However, as this is a systematic review, it is important to emphasize that most of the included studies are correlational in nature. While patterns suggest strong associations between AI personalization and engagement outcomes, causal inference remains limited in the existing literature. Only a small subset of reviewed studies employed randomized field experiments, indicating the need for stronger causal designs in future research.

4.3 Synthesis of Findings on Purchase Behavior (RQ2)

The literature consistently reports a positive relationship between AI-driven personalization and purchase-related outcomes such as purchase intention, conversion rates, and sales growth. Several studies demonstrate measurable improvements in conversion metrics when AI-powered recommendations or targeted advertising strategies are implemented. Because this study synthesizes prior findings, the observed improvements (e.g., percentage increases in conversion rates) reflect results reported by original authors. The review does not independently verify these outcomes but critically evaluates their methodological rigor and consistency across contexts. Longitudinal evidence within the reviewed studies suggests that personalization may contribute to customer retention and customer lifetime value. However, such long-term outcomes are less frequently examined compared to short-term behavioral metrics. This limitation reflects the state of the existing literature rather than a gap in the present study's design.

4.4 Mediators and Moderators Identified in the Literature (RQ3)

Through thematic analysis of the included studies, several mediating and moderating variables were identified. Perceived relevance, perceived usefulness, and trust in AI systems emerged as primary mediators explaining how personalization influences engagement and purchase behavior. Privacy concerns, perceived intrusiveness, and cultural differences were identified as significant moderators.

Importantly, these conclusions are drawn from cross-study comparisons rather than direct measurement. Variability in results across cultural contexts highlights the importance of contextual sensitivity in AI personalization strategies. Because this is a systematic review, the strength of these mediating and moderating relationships depends on the methodological quality of the underlying studies. Differences in measurement scales, sampling techniques, and analytical methods contribute to heterogeneity in reported outcomes.

4.5 Technological and Methodological Trends

The review also highlights technological diversity across studies, including machine learning, neural networks, hybrid recommenders, and generative AI tools. Evidence suggests that more advanced AI architectures generally demonstrate stronger predictive accuracy and behavioral impact compared to rule-based systems. However, the review identified limited direct comparisons between AI techniques. This gap reflects a broader trend in the literature, where studies focus on evaluating a single AI model rather than comparing multiple architectures.

Methodologically, the predominance of cross-sectional survey designs limits causal interpretation. While findings across studies are largely consistent, the absence of widespread longitudinal and experimental research reduces the ability to establish definitive cause-effect relationships. This observation underscores the importance of interpreting the synthesized results cautiously.

Synthesis of Findings:

- i. **Positive Impact on Engagement:** AI-based personalization consistently improves consumer engagement metrics such as click-through rate (CTR), time spent, interaction frequency, and satisfaction.
- ii. **Enhancement of Purchase Outcomes:** Personalized recommendations and AI-driven targeting positively influence purchase intention, conversion rates, and sales performance.
- iii. **Perceived Relevance as a Key Driver:** The primary mechanism underlying engagement and purchase behavior is perceived relevance of personalized content.
- iv. **Trust as a Critical Mediator:** Consumer trust in AI systems strengthens the relationship between personalization and behavioral outcomes.
- v. **Privacy Concerns as a Moderator:** Privacy concerns and perceived intrusiveness can weaken the effectiveness of AI personalization.
- vi. **Cultural Variability:** Cross-cultural differences influence trust levels and responsiveness to AI-driven personalization.
- vii. **Advanced AI Outperforms Rule-Based Systems:** Neural network and hybrid AI models generally demonstrate stronger behavioral impact than traditional rule-based approaches.
- viii. **Limited Causal and Long-Term Evidence:** Most studies are correlational and short-term, with limited research on causal effects and customer lifetime value.
- ix. **Underexplored Multi-Channel Effects:** Interactions between personalization across different digital channels remain insufficiently studied.
- x. **Need for Ethical and Transparent Implementation:** Effective AI personalization depends on transparency, explainability, and responsible data governance.

Limitations of this review: Despite following PRISMA 2020 guidelines, this review has several limitations. First, the study relied on selected databases (Scopus, Web of Science, and Google Scholar), which may have excluded relevant research published elsewhere, introducing potential publication bias. Second, the review was limited to English-language studies published between 2021 and 2026, possibly restricting cultural and historical coverage.

Third, methodological heterogeneity across studies—differences in research design, measurement of engagement and purchase behavior, and AI techniques—prevented quantitative meta-analysis and limited direct comparability. Most included studies were cross-sectional and correlational, reducing the ability to draw strong causal conclusions. Additionally, long-term outcomes such as customer lifetime value were underrepresented in the existing literature.

Finally, given the rapid evolution of AI technologies, some findings may quickly become outdated. Therefore, conclusions should be interpreted as reflecting the current state of research rather than definitive evidence of long-term effectiveness.

5. Conclusion

AI-based personalization in digital marketing offers clear benefits for engagement and sales, but only when implemented with user trust in mind. Personalization increases perceived relevance and usefulness [7], which can drive stronger consumer responses. However, this “AI advantage” is bounded by privacy and ethics. Firms must pair personalization with transparency, user control, and compliance with evolving regulations [19].

For practitioners, the takeaway is to deploy AI personalization thoughtfully: highlight the value to consumers and give them agency (e.g. opt-outs via ad preference tools). For academics, key future directions include conducting multi-channel experiments, measuring real purchase lift, and integrating governance considerations into study design. In summary, the promise of AI personalization is high, but its sustainable impact depends on trust and responsibility.

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