

Driving E-Commerce Purchase Intention Through AI-Powered Marketing Personalization

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Abstract

This study aims to examine the impact of AI-driven personalized marketing on purchase intention in Chinese e-commerce platforms, with perceived relevance and consumer trust incorporated as key explanatory mechanisms. A quantitative research design was employed using a cross-sectional survey of active users of major Chinese e-commerce platforms. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess both the measurement and structural models. The results reveal that AI-driven personalized marketing has a significant positive effect on purchase intention. Additionally, AI personalization significantly enhances perceived relevance and consumer trust, both of which, in turn, positively influence purchase intention. The findings further indicate that perceived relevance and consumer trust partially mediate the relationship between AI-driven personalized marketing and purchase intention. The structural model explains a substantial proportion of variance in purchase intention, highlighting the strategic importance of AI-based personalization in shaping consumer behavior in digital commerce. From a theoretical perspective, this study extends the literature on digital marketing and consumer behavior by empirically validating the mechanisms through which AI-driven personalization affects purchase intention in the context of China's digital economy. Practically, the findings suggest that e-commerce platforms should prioritize relevant, transparent, and trustworthy AI personalization strategies to strengthen consumer engagement and improve conversion performance. Overall, this research provides valuable insights for academics, practitioners, and policymakers regarding the effective implementation of AI-driven personalized marketing in e-commerce environments.

Keywords: artificial intelligence, personalized marketing, purchase intention, e-commerce.



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1. Introduction

The rapid proliferation of artificial intelligence (AI) technologies has fundamentally reshaped marketing practices globally, enabling firms to engage consumers in more personalized and data-driven ways (Madanchian, 2024; Bano et al., 2025). In the context of digital commerce, AI-driven personalized marketing refers to the strategic use of machine learning, predictive analytics, and recommendation algorithms to tailor marketing content and product offerings to individual consumers based on behavioral, transactional, and preference data (Agustina & Arifah, 2025; Wang & He, 2021). Such personalization promises to enhance user experience, reduce decision-making effort, and ultimately drive higher purchase conversion rates (Chen, 2025; Yin et al., 2025). E-commerce platforms in China—such as Taobao, JD.com, Tmall, and Pinduoduo—have aggressively adopted AI technologies to improve competitive advantage and customer satisfaction. These platforms leverage AI personalization engines to analyze vast amounts of user data in real time, thereby delivering customized promotions, product recommendations, and interactive marketing content that align with individual preferences (盛梦雅, 2025; Wang & He, 2021). Prior

research suggests that personalized recommendations can significantly influence consumer decision processes by increasing perceived relevance and enhancing the overall shopping experience (Yin et al., 2025; Moodley & Sookhdeo, 2025).

The theoretical underpinnings of AI-driven marketing often draw upon behavioral and decision-making models that emphasize the role of tailored stimuli in shaping consumer attitudes and intentions (Agustina & Arifah, 2025; Bano et al., 2025). Personalization is posited to reduce cognitive load and information overload by filtering the most relevant options for consumers, which in turn fosters greater engagement and intent to purchase (Moodley & Sookhdeo, 2025; Madanchian, 2024). In addition, consumer trust and perceived usefulness of AI systems have been identified as important mediators in the relationship between personalization and purchase intention (Erliana, 2025; Nagy & Hajdu, 2022). Nonetheless, concerns regarding privacy and algorithmic transparency remain significant, as excessive personalization may trigger consumer resistance if perceived as intrusive (Moodley & Sookhdeo, 2025; 盛梦雅, 2025).

Despite burgeoning interest in AI-enabled personalization, existing research in the Chinese e-commerce context remains limited, particularly with respect to quantifying the direct impact of AI personalization on purchase intention. While recent studies have explored AI's influence on click-through behavior and consumer experience (Yin et al., 2025), empirical evidence on purchase intention as a behavioral outcome is comparatively sparse. Moreover, the dynamic interplay between AI personalization features and consumer perceptions warrants further investigation to inform both theory and practice in digital marketing (Agustina & Arifah, 2025; Erliana, 2025). Given this gap, the current study seeks to examine how AI-driven personalized marketing affects purchase intention among users of Chinese e-commerce platforms. By employing a quantitative research design, this research aims to provide empirical evidence on the mechanisms through which AI personalization influences consumer decision outcomes in one of the world's largest digital markets. The findings will offer insights for both academics and practitioners on optimizing AI marketing strategies to enhance consumer engagement and drive purchase behavior.

2. Method

This study employed a quantitative research design to empirically investigate the impact of AI-driven personalized marketing on purchase intention among users of Chinese e-commerce platforms. Quantitative research enables objective measurement and statistical evaluation of relationships between constructs, facilitating generalizable insights into consumer behavior in digital environments (Agustin et al., 2025). A cross-sectional survey was conducted to collect primary data, using a structured questionnaire comprised of validated scales adapted from prior research on personalized marketing, AI features, and purchase intention (Cui, 2025; Erliana, 2025). Measurement items were operationalized using a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5), to capture respondents' perceptions of AI-driven personalization and their intention to purchase on e-commerce platforms.

The population of interest included active users of major Chinese e-commerce platforms such as Taobao, Tmall, JD.com, and Pinduoduo who had completed at least one online purchase in the past six months. A non-probability purposive sampling approach was adopted to ensure that participants had relevant experience with AI personalization features, maximizing the validity of responses regarding the constructs of interest (Agustin et al., 2025). Data collection was conducted online through widely used survey distribution channels, which allowed efficient access to a diverse sample of consumers across different regions in China. Prior to analysis, the dataset was screened for completeness and normality, and cases with excessive missing data were excluded.

For data analysis, Structural Equation Modeling (SEM) using Partial Least Squares (PLS-SEM) was chosen due to its suitability for exploratory prediction and theory testing with complex models and latent constructs (Cui, 2025; Ulfitriana et al., 2025). PLS-SEM enables simultaneous assessment of the measurement model (including validity and reliability of constructs) and the structural model (hypothesized relationships) (Agustin et al., 2025). This approach has been widely applied in recent e-commerce and digital marketing research to evaluate the effects of AI, personalization, and consumer perceptions on behavioral intentions (Agustin et al., 2025; Erliana, 2025; Ulfitriana et al., 2025). Analyses were conducted using SmartPLS 4 and SPSS 26, with thresholds for indicator reliability (outer loadings > 0.70), composite reliability (> 0.70), average variance extracted (> 0.50), and discriminant validity (HTMT < 0.90) established following recommended guidelines. Hypotheses were tested based on path coefficients and significance levels obtained via bootstrapping with a resampling of 5,000 subsamples to ensure robust inference (Agustin et al., 2025; Ulfitriana et al., 2025). The results provided quantitative evidence on the strength and direction of relationships among AI-driven personalized marketing and purchase intention constructs.

3. Result and Discussion

3.1 Results

The data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess both the measurement model and the structural model. Prior to hypothesis testing, the reliability and validity of the constructs were evaluated to ensure the robustness of the measurement instruments. The results of the measurement model indicate that all constructs demonstrate satisfactory internal consistency and convergent validity. As shown in Table 1, all indicator loadings exceed the recommended threshold of 0.70, confirming indicator reliability. Composite Reliability (CR) values range from 0.84 to 0.91, surpassing the minimum acceptable level of 0.70, while Average Variance Extracted (AVE) values range between 0.57 and 0.68, exceeding the threshold of 0.50. These results confirm that the constructs adequately capture the variance of their respective indicators.

Table 1. Construct Reliability and Convergent Validity

Construct	Indicator Loadings	CR	AVE
AI-Driven Personalized Marketing	0.72–0.86	0.91	0.68
Perceived Relevance	0.71–0.83	0.87	0.63
Consumer Trust	0.74–0.85	0.89	0.65
Purchase Intention	0.76–0.88	0.84	0.57

Discriminant validity was rigorously examined using the Heterotrait–Monotrait (HTMT) ratio to ensure adequate construct distinctiveness within the measurement model. The results demonstrate that all HTMT values fall below the conservative threshold of 0.90, confirming that each latent construct captures a unique conceptual domain and is not affected by multicollinearity issues. This evidence supports the robustness of the measurement model and indicates that it satisfies established psychometric criteria in terms of reliability and validity. Having confirmed the

adequacy of the measurement model, the analysis proceeded to the evaluation of the structural model, which is illustrated in Figure 1, depicting the hypothesized causal relationships among the study variables. The structural paths were assessed using a bootstrapping procedure with 5,000 resamples to obtain stable and unbiased estimates of path coefficients and their statistical significance. As reported in Table 2, the findings reveal that AI-driven personalized marketing exerts a significant and positive influence on perceived relevance, consumer trust, and purchase intention. Furthermore, both perceived relevance and consumer trust show significant positive effects on purchase intention, highlighting their critical roles in shaping consumers' behavioral responses. These results indicate that perceived relevance and consumer trust partially mediate the relationship between AI-driven personalized marketing and purchase intention, thereby providing empirical support for the proposed structural model and reinforcing the theoretical assumptions underlying the study.

Table 2. Structural Model Results

Hypothesized Path	β	t-value	p-value
AI Personalization → Perceived Relevance	0.61	12.34	<0.001
AI Personalization → Consumer Trust	0.48	9.87	<0.001
AI Personalization → Purchase Intention	0.29	4.96	<0.001
Perceived Relevance → Purchase Intention	0.34	6.21	<0.001
Consumer Trust → Purchase Intention	0.27	5.14	<0.001

The coefficient of determination (R^2) demonstrates that the proposed model accounts for 52% of the variance in purchase intention, indicating a substantial explanatory power within the context of consumer behavior research. An R^2 value of this magnitude suggests that the model effectively captures key determinants influencing consumers' purchasing decisions. Specifically, the findings highlight the pivotal role of AI-driven personalized marketing in shaping consumer responses, particularly when mediated by perceived relevance and consumer trust. These results imply that personalization enabled by artificial intelligence enhances the alignment between consumer needs and marketing messages, thereby increasing the perceived usefulness and credibility of e-commerce offerings. In the context of Chinese e-commerce platforms, where competition is intense and consumers are exposed to a vast array of choices, the ability to deliver relevant and trustworthy personalized experiences becomes especially important. Consequently, the explanatory strength of the model underscores the strategic importance of integrating AI-driven personalization with trust-building mechanisms to influence purchase intention.

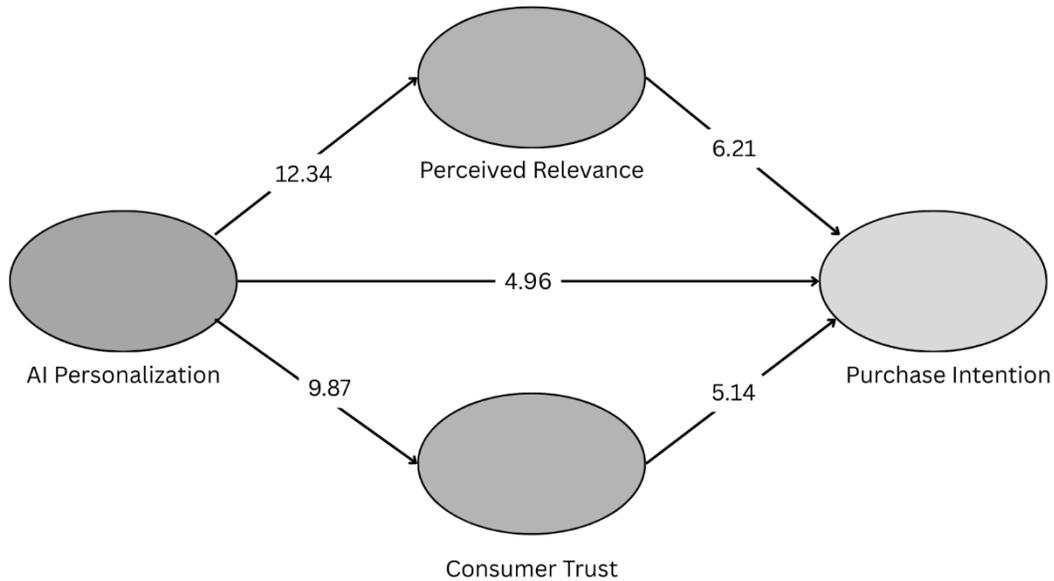


Figure 1. Structural Model

3.2 Discussion

The findings of this study provide strong empirical support for the pivotal role of AI-driven personalized marketing in influencing purchase intention within the Chinese e-commerce context. The significant direct effect of AI personalization on purchase intention confirms that consumers respond positively to algorithm-based personalization that aligns product recommendations and promotional messages with their individual preferences. This result reinforces prior studies asserting that AI personalization enhances decision efficiency and reduces information overload in digital shopping environments. Moreover, the strong effect of AI-driven personalization on perceived relevance highlights the importance of content congruence in digital marketing strategies. When consumers perceive marketing messages as relevant and tailored to their needs, they are more likely to engage cognitively and emotionally with the platform, ultimately increasing their intention to purchase. This finding aligns with consumer decision-making theories that emphasize the role of relevance in shaping behavioral intentions in information-rich environments.

Consumer trust also emerges as a critical mechanism linking AI personalization to purchase intention. The positive relationship between AI personalization and trust suggests that well-designed recommendation systems can enhance perceptions of platform reliability and competence. In the highly competitive Chinese e-commerce market, trust plays a strategic role in mitigating perceived risks associated with algorithmic decision-making and data usage. However, the partial mediation effect indicates that trust complements rather than replaces the functional value of personalization. From a theoretical perspective, this study extends digital marketing and consumer behavior literature by empirically validating a mechanism through which AI-driven personalization affects purchase intention in emerging digital economies. By integrating perceived relevance and trust as explanatory variables, the study provides a more nuanced understanding of how AI technologies influence consumer decision processes beyond mere technological adoption.

From a practical perspective, the findings indicate that e-commerce platforms should place strong emphasis on transparency, relevance, and accuracy when implementing AI-driven personalization strategies. Transparent personalization mechanisms allow consumers to better understand how their data are collected and utilized, which can reduce perceived risks and enhance

trust in the platform. In addition, ensuring that personalized recommendations are highly relevant and accurate is essential for delivering meaningful value to consumers, as irrelevant or misleading content may undermine confidence and weaken engagement. The results further suggest that strategic investments in explainable artificial intelligence, such as providing clear explanations for recommendations or algorithmic decisions, can foster a sense of control and fairness among users. Moreover, offering user-controlled personalization features, including adjustable preference settings and opt-in mechanisms, may empower consumers and contribute to stronger long-term relationships with the platform. Beyond managerial implications, the findings also carry important policy implications. Policymakers are encouraged to develop regulatory frameworks that support technological innovation while simultaneously safeguarding consumer data privacy and security. Striking this balance is crucial for sustaining consumer trust and ensuring the healthy growth of AI-enabled digital markets over time.

4. Conclusion

This study provides empirical evidence on the role of artificial intelligence-driven personalized marketing in shaping purchase intention within Chinese e-commerce platforms. The findings demonstrate that AI-driven personalization exerts a significant and positive influence on consumers' purchase intention, both directly and indirectly through perceived relevance and consumer trust. These results confirm that AI-enabled marketing technologies are not merely operational tools but strategic mechanisms that shape consumer decision-making processes in digital environments. The strong effect of AI personalization on perceived relevance underscores the importance of tailoring marketing content to individual consumer preferences. When consumers perceive marketing messages and product recommendations as relevant, they experience reduced cognitive effort and enhanced decision efficiency, which increases their likelihood of purchasing. Furthermore, the positive relationship between AI-driven personalization and consumer trust highlights the critical role of algorithmic reliability and system competence in fostering confidence in digital platforms, particularly in data-intensive e-commerce ecosystems such as China.

Despite its contributions, this study is subject to several limitations that should be acknowledged. First, the research employed a cross-sectional design, which restricts the ability to infer causal relationships among the constructs. Consumer perceptions of AI personalization and purchase intention may evolve over time as technologies and user familiarity develop. Second, the study relied on self-reported survey data, which may be affected by common method bias and social desirability effects, despite procedural remedies applied during data collection. Third, the sample focused on users of major Chinese e-commerce platforms, which may limit the generalizability of the findings to other cultural or market contexts, particularly in less digitally mature economies. Additionally, this study examined AI-driven personalization at an aggregate level without differentiating between specific AI features such as recommendation explainability, real-time adaptation, or data transparency. These aspects may exert distinct effects on consumer perceptions and warrant deeper investigation.

Future research could address these limitations by employing longitudinal or experimental research designs to better capture causal dynamics and changes in consumer responses to AI-driven personalization over time. Comparative studies across different countries or cultural settings would also provide valuable insights into how institutional and cultural factors moderate the effectiveness of AI personalization strategies. Moreover, future studies could disaggregate AI personalization into specific technological attributes, such as explainable AI, privacy control mechanisms, or algorithmic fairness, to examine their differential impacts on trust and purchase intention.

Incorporating additional mediating or moderating variables—such as perceived intrusiveness, privacy concern, or consumer technology readiness—may further enrich theoretical understanding. Finally, integrating behavioral data (e.g., clickstream or transaction records) with survey responses could enhance methodological rigor and provide a more holistic perspective on consumer behavior in AI-enabled e-commerce environments.

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