

AI-Enabled Marketing Capabilities and Consumer Response in Malaysian E-Commerce

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ABSTRACT

Artificial intelligence (AI) has become an essential capability in modern e-commerce marketing, enabling platforms to personalize recommendations, automate customer interactions, and optimize marketing communications. While AI-driven marketing improves shopping efficiency and relevance, it may also raise privacy concerns that influence consumers' perceptions and behavioural responses. This study proposes a conceptual framework to examine how perceived AI-enabled marketing capabilities influence consumer responses in Malaysian e-commerce platforms. Drawing on the Stimulus-Organism-Response (S-O-R) framework, the model conceptualizes perceived AI marketing capability as a stimulus that shapes internal consumer evaluations, including trust, perceived value, and perceived intrusiveness. These psychological mechanisms represent organism states that influence consumers' behavioural responses, operationalized through purchase intention toward e-commerce platforms. The proposed framework integrates both positive and negative consumer perceptions associated with AI-driven personalization. Trust and perceived value represent favourable cognitive evaluations that strengthen consumer acceptance of AI marketing technologies, whereas perceived intrusiveness captures potential privacy concerns that may weaken consumer response. This study outlines a measurement instrument and proposes using Structural Equation Modeling (SEM) to empirically test the relationships among the constructs. By synthesizing fragmented findings in AI marketing literature, this research contributes a theoretically grounded framework for understanding consumer responses to AI-enabled marketing in emerging digital markets such as Malaysia.

Keywords: *AI marketing; e-commerce; trust; privacy; value; intrusiveness.*

How to Cite

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INTRODUCTION

Artificial intelligence (AI) has become a central technological capability in contemporary e-commerce marketing, reshaping how platforms engage consumers, personalize content, and automate service interactions. Recommendation systems, dynamic pricing algorithms, personalized promotions, and conversational agents (chatbots) are now embedded into online shopping environments to enhance relevance, efficiency, and customer engagement. These AI-enabled marketing tools allow platforms to process massive volumes of behavioural data and infer individual preferences, facilitating personalized experiences that influence consumer choice and decision-making (Markou, 2024). As a result, AI-driven personalization has emerged as a critical strategic capability for online businesses seeking a competitive advantage in digital marketplaces.

From a consumer behaviour perspective, AI-enabled marketing offers substantial benefits. Machine-learning-based recommendation systems reduce information overload and search costs by curating product assortments tailored to individual tastes. Empirical evidence suggests that accurate and contextually relevant recommendations increase consumer engagement, click-through rates, and purchase intentions (Sri.D et al., 2025). Similarly, AI-powered chatbots and automated service tools improve responsiveness and service efficiency, contributing to perceived convenience and satisfaction (Markou, 2024). These functional advantages position AI marketing as a mechanism for enhancing perceived value and improving overall shopping experience.

However, the expansion of AI-driven personalization introduces renewed complexity into the psychological dynamics of online shopping. While personalization can feel helpful and efficient, it can also feel intrusive. Highly tailored recommendations often rely on deep consumer data profiling, processed through opaque algorithmic systems that most users do not understand. When consumers perceive that platforms “know too much” about them or use personal data without sufficient transparency, privacy concerns and discomfort may be triggered. Prior research describes this tension as the personalization–privacy paradox, in which the same AI system that enhances relevance and usefulness also raises anxiety, distrust, and perceived loss of control (Markou, 2024).

Despite the growing importance of AI-enabled marketing, existing research remains fragmented and lacks an integrated theoretical framework that explains both positive and negative consumer responses. Many studies examine isolated tools (e.g., chatbots or recommendation systems) or focus on singular outcomes such as purchase intention or engagement. Fewer studies integrate multiple psychological mechanisms—including trust, perceived value, and perceived intrusiveness—into a unified framework that explains both positive and negative consumer responses to AI marketing (Markou, 2024). This fragmentation limits theoretical accumulation and weakens the field’s ability to explain contradictory empirical findings across different contexts.

The need for an integrated, theoretically grounded model is particularly salient in emerging e-commerce markets such as Malaysia. Malaysia has experienced rapid growth in online shopping due to high smartphone penetration, widespread internet access, and the expansion of platform-based marketplaces such as Shopee, Lazada, and TikTok Shop. These platforms increasingly deploy AI technologies to personalize recommendations, automate promotions, and enhance customer service. Recent Malaysian-focused studies highlight both the opportunities and challenges associated with AI adoption in e-commerce, emphasizing the role of trust, personalization quality, and privacy concerns in shaping consumer purchase intentions (Abdullah et al., 2024). Despite these developments, the Malaysian context remains under-represented in mainstream AI marketing research, which is dominated by Western and East Asian samples.

To explain consumer responses to AI-enabled marketing holistically, this study adopts the Stimulus–Organism–Response (S-O-R) theoretical framework. The S-O-R perspective posits that environmental stimuli influence internal organism states, which in turn shape behavioral responses. In digital commerce research, S-O-R has been widely applied to model how website features, personalization cues, and technological affordances influence trust, perceived usefulness, emotions, and behavioural intentions. In the context of AI marketing, perceived AI marketing capabilities function as stimuli that shape internal consumer states such as trust, perceived value, and perceived intrusiveness, which subsequently influence attitudes toward AI-enabled marketing and purchase intentions.

Within this framework, positive psychological pathways operate through trust and perceived value. When consumers believe a platform uses AI competently and responsibly, trust strengthens, increasing acceptance of personalized recommendations and automated services (Markou, 2024). Likewise, when AI features save time, improve relevance, and speed up decisions, consumers perceive higher value, fostering favourable attitudes toward AI marketing (Khuong et al., 2025). At the same time, negative pathways operate through perceived intrusiveness and privacy concern. As personalization becomes more precise and pervasive, consumers may feel monitored or uncomfortable with data-driven targeting, which can erode trust and weaken acceptance of AI marketing (Markou, 2024).

This study contributes to the literature in three key ways. First, it develops an integrated conceptual framework grounded in the Stimulus–Organism–Response (S-O-R) paradigm to explain consumer responses to AI-enabled marketing, addressing the fragmentation in prior research that has largely examined isolated technological features or single outcome variables. By linking AI-enabled marketing capabilities (stimulus) with internal psychological evaluations and behavioural outcomes, the study provides a more holistic explanation of consumer decision-making in digital environments.

Second, the study advances theoretical understanding by simultaneously incorporating both enabling and inhibiting psychological mechanisms. Specifically, trust and perceived value represent positive cognitive pathways that enhance consumer acceptance of AI-driven marketing, while perceived intrusiveness captures the negative effects associated with privacy concerns and perceived over-personalization. This dual-path perspective provides a more balanced and realistic understanding of how consumers respond to AI-enabled marketing technologies.

Third, the research extends existing literature by contextualizing AI-enabled marketing within the Malaysian e-commerce environment, an emerging digital market that remains underexplored in mainstream AI marketing studies. By focusing on Malaysia, this study contributes context-specific insights into how AI-driven personalization operates in rapidly growing online marketplaces, thereby enhancing the generalizability and practical relevance of AI marketing research beyond Western-centric settings.

In summary, AI-enabled marketing presents both promise and risk. While personalized recommendations and automated service tools enhance consumer experience and business performance, they also raise psychological concerns about privacy, transparency, and trust. To address this complexity, a comprehensive, theoretically grounded framework is needed to explain how consumers interpret and respond to AI-driven marketing practices. Accordingly, this study proposes a conceptual framework and hypotheses to empirically examine these relationships within the Malaysian e-commerce context. This study therefore proposes a conceptual framework and hypotheses to empirically examine these relationships.

Research Objectives

1. To examine the influence of perceived AI-enabled marketing capability on trust, perceived value, and perceived intrusiveness among consumers of Malaysian e-commerce platforms.
2. To examine the effects of trust, perceived value, and perceived intrusiveness on consumers' attitudes toward AI-enabled marketing in Malaysian e-commerce platforms.
3. To examine the effect of consumers' attitudes toward AI-enabled marketing on purchase intention in Malaysian e-commerce platforms.
4. To examine the mediating roles of trust, perceived value, perceived intrusiveness, and attitude toward AI-enabled marketing in the relationship between perceived AI-enabled marketing capability and purchase intention.

LITERATURE REVIEW

Consumer Response in E-Commerce

Recent research demonstrates that AI-enabled marketing significantly influences consumer responses across cognitive, affective, and behavioral dimensions in e-commerce contexts. Using the Stimulus-Organism-Response (S-O-R) model, studies show that AI applications such as recommendation engines, chatbots, and personalization systems act as stimuli triggering internal psychological responses, including trust, perceived value, and ease of use, ultimately leading to behavioral outcomes like purchase intention and brand loyalty (Amitabh Avinash et al., 2025).

In AI-enabled marketing, consumer response is the outcome variable that reflects how consumers react cognitively, affectively, and behaviorally to marketing stimuli deployed by e-commerce platforms. Prior studies conceptualize consumer response through constructs such as attitude toward the platform, purchase intention, and continued usage intention. In online retail environments, researchers often operationalize consumer response as purchase intention, which captures the likelihood that consumers will engage in transactional behavior after exposure to personalized marketing stimuli.

In AI-driven e-commerce settings, consumer responses are shaped not only by traditional marketing cues but also by algorithmic features such as personalized recommendations, automated interactions, and data-driven targeting. These features influence consumers' perceptions of usefulness, relevance, and risk, which ultimately determine their behavioral intentions. Accordingly, this study treats consumer response, measured through purchase intention and attitudinal evaluation, as the dependent variable that reflects the effectiveness of AI-enabled marketing strategies in Malaysian e-commerce platforms.

AI-Enabled Marketing Capabilities

Within the Stimulus–Organism–Response (S-O-R) framework adopted in this study, AI-enabled marketing capability is conceptualized as the sole independent variable — the external, platform-level stimulus that initiates the entire causal process. It reflects consumers' perceptions of how e-commerce platforms deploy artificial intelligence to personalize content, automate interactions, and optimize marketing communications, and it originates from the platform's technological and strategic choices rather than any internal psychological state of the consumer (Mitra Madanchian, 2024). In this sense, AI-enabled marketing capability is exogenous to the model: it is not predicted or explained by any other construct within the conceptual framework, but instead functions as the triggering condition from which all subsequent consumer evaluations and behavioral outcomes flow (Zhao Kexin, Poh-Chuin Teo, 2023).

This positioning aligns with the broader logic of S-O-R theory, in which stimuli are environmental or situational inputs—features of the setting itself—that consumers encounter and then interpret through internal cognitive and affective processes. Here, AI-enabled marketing capability plays that role directly: when platforms deploy recommendation systems, predictive analytics, targeted promotions, or AI-powered customer service tools, these features become observable, platform-controlled stimuli to which consumers are exposed before forming any evaluative judgment (Mitra Madanchian, 2024). The strength, accuracy, and perceived helpfulness of this capability then determine the intensity and direction of the internal responses examined in Section 2.3—namely trust, perceived value, and perceived intrusiveness—which in turn shape attitude and, ultimately, purchase intention. Accordingly, this study treats AI-enabled marketing capability as the single independent variable, distinct from the mediating (organism-level) constructs and the dependent (response-level) construct that follow.

Trust in AI-Enabled E-Commerce Platforms

Trust plays a critical role in online commerce because consumers must rely on digital platforms to handle transactions and personal data responsibly (Gefen et al., 2003; Pavlou, 2003). Trust reflects consumers' confidence in an e-commerce platform's ability, integrity, and benevolence, particularly regarding AI-driven decision-making and data-use practices. In

AI-enabled marketing contexts, trust encompasses both institutional trust in the platform and algorithmic trust in automated systems that generate recommendations and personalized content.

Consumers tend to develop trust when they believe that AI systems operate reliably, transparently, and in their best interest. Conversely, uncertainty about how algorithms use personal data or make decisions can undermine trust and weaken consumer response. Prior studies consistently identify trust as a critical antecedent of purchase intention in online environments. Therefore, trust is conceptualized as a key independent variable influencing consumer response to AI-enabled marketing in Malaysian e-commerce platforms.

Perceived Value of AI-Enabled Marketing

Recent research demonstrates that AI-enabled marketing significantly enhances perceived customer value through multiple mechanisms. Massoudi et al. (2025) found that AI marketing practices, including personalized recommendations and predictive analytics, directly influence customer loyalty, with perceived value serving as a crucial mediating factor between AI marketing and customer loyalty outcomes.

Perceived value refers to consumers' overall assessment of the benefits gained from AI-enabled marketing relative to the costs incurred, such as time, effort, or psychological discomfort. In e-commerce settings, AI-driven personalization can enhance perceived value by improving shopping convenience, increasing relevance, and facilitating better product discovery.

When AI-enabled features reduce search effort and enhance decision quality, consumers are more likely to perceive higher value from the platform. This perceived value strengthens positive evaluations and increases purchase intention. As such, perceived value is treated as an independent variable that mediates the relationship between AI marketing capabilities and consumer response.

Perceived Intrusiveness of AI-Enabled Marketing

Research on AI-enabled marketing reveals significant consumer concerns about intrusiveness and privacy that negatively impact adoption and trust. Ghabban et al. (2025) found that social influence negatively affects behavioral intention toward AI marketing, with consumers perceiving it as potentially intrusive, while ethical concerns and trust deficits emerge as major adoption barriers. Although personalized marketing improves relevance, extensive data collection and profiling may trigger privacy concerns and perceptions of intrusiveness among consumers (Aguirre et al., 2016). Perceived intrusiveness refers to the extent to which consumers feel that AI-driven personalization and targeted marketing violate their privacy or personal boundaries. While personalization can enhance relevance, excessive or opaque data-driven targeting may trigger discomfort, privacy concerns, and psychological resistance. In AI-enabled e-commerce, consumers may perceive marketing efforts as intrusive when they feel monitored, over-profiled, or manipulated by algorithmic systems. Such perceptions can generate negative emotional reactions and reduce trust, ultimately weakening purchase intention. Therefore, perceived intrusiveness is included as an independent variable that captures the potential negative impact of AI-enabled marketing on consumer response.

Mediating Variables

Within the Stimulus–Organism–Response (S-O-R) framework, mediating variables represent the internal psychological states through which environmental stimuli influence behavioral responses. In the context of AI-enabled marketing, the technological capabilities of e-commerce platforms act as external stimuli, while consumers' cognitive and emotional evaluations of these technologies shape their behavioral outcomes. These internal evaluations are conceptualized as mediating variables because they explain how and why perceived AI marketing capabilities influence consumer attitudes and purchase intentions.

Saba et al. (2024) confirmed AI marketing's significant impact on purchase intentions, identifying hedonic and utility values as important mediating factors that make AI interactions engaging and pleasurable for consumers. AI-driven personalization, recommendation systems, automated promotions, and conversational agents introduce new forms of interaction between consumers and digital platforms. However, consumers do not respond directly to these technological

features. Instead, they interpret these features through psychological mechanisms such as trust, perceived value, and perceived intrusiveness. These internal responses subsequently influence consumers' attitudes toward AI-enabled marketing and their intention to purchase products through the platform.

Trust in AI-Enabled E-Commerce Platforms

Trust plays a critical role in online commerce because consumers must rely on digital platforms to handle transactions and personal data responsibly (Gefen et al., 2003; Pavlou, 2003). Trust reflects consumers' confidence in an e-commerce platform's ability, integrity, and benevolence, particularly regarding AI-driven decision-making and data-use practices. In AI-enabled marketing contexts, trust encompasses both institutional trust in the platform and algorithmic trust in automated systems that generate recommendations and personalized content. Consumers tend to develop trust when they believe that AI systems operate reliably, transparently, and in their best interest. Conversely, uncertainty about how algorithms use personal data or make decisions can undermine trust and weaken consumer response.

Recent research demonstrates that AI-powered personalization significantly enhances consumer trust, satisfaction, and purchase intent in digital marketing contexts. Sipos (2025) found through structural equation modeling with 473 respondents that AI-based personalization improves both trust and satisfaction, with satisfaction mediating the relationship with purchase intent. Trust represents consumers' confidence in the platform's reliability, integrity, and responsible use of personal data. When AI-driven systems provide relevant recommendations and perform consistently, consumers are more likely to trust both the platform and the algorithmic processes underlying personalization. Trust reduces perceived risk and uncertainty in online transactions, which is particularly important in digital environments where consumers cannot physically evaluate products or directly interact with sellers.

Prior studies consistently identify trust as a critical antecedent of purchase intention in online environments. Therefore, trust is conceptualized as a key mediating variable linking perceived AI-enabled marketing capability to consumer response in Malaysian e-commerce platforms.

Perceived Value of AI-Enabled Marketing

Recent research demonstrates that AI-enabled marketing significantly enhances perceived customer value through multiple mechanisms. Massoudi et al. (2025) found that AI marketing practices, including personalized recommendations and predictive analytics, directly influence customer loyalty, with perceived value serving as a crucial mediating factor between AI marketing and customer loyalty outcomes.

Perceived value refers to consumers' overall assessment of the benefits gained from AI-enabled marketing relative to the costs incurred, such as time, effort, or psychological discomfort. In e-commerce settings, AI-driven personalization can enhance perceived value by improving shopping convenience, increasing relevance, and facilitating better product discovery. AI-driven marketing technologies can also enhance perceived value by reducing search costs, improving product discovery, and providing personalized recommendations aligned with consumers' preferences. When AI systems successfully deliver convenience, efficiency, and relevance, consumers perceive greater utility in the shopping experience, which can strengthen favorable evaluations of the platform.

When AI-enabled features reduce search effort and enhance decision quality, consumers are more likely to perceive higher value from the platform. This perceived value strengthens positive evaluations and increases purchase intention. As such, perceived value is treated as a mediating variable that explains the relationship between AI marketing capability and consumer response.

Perceived Intrusiveness of AI-Enabled Marketing

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major adoption barriers. Although personalized marketing improves relevance, extensive data collection and profiling may trigger privacy concerns and perceptions of intrusiveness among consumers (Aguirre et al., 2016).

Perceived intrusiveness refers to the extent to which consumers feel that AI-driven personalization and targeted marketing violate their privacy or personal boundaries. While personalization can enhance relevance, excessive or opaque data-driven targeting may trigger discomfort, privacy concerns, and psychological resistance. In AI-enabled e-commerce, consumers may perceive marketing efforts as intrusive when they feel monitored, over-profiled, or manipulated by algorithmic systems. AI-driven personalization often relies on extensive behavioral data collection, which can trigger privacy concerns and a sense of loss of control. When consumers perceive marketing practices as intrusive, their emotional response may shift from appreciation to suspicion or resistance, which can generate negative emotional reactions, reduce trust, and ultimately weaken purchase intention.

Therefore, perceived intrusiveness is included as a mediating variable that captures the potential negative pathway through which AI-enabled marketing capability influences consumer response.

Attitude Toward AI-Enabled Marketing

In addition to these cognitive evaluations, consumer attitude toward AI-enabled marketing functions as an integrative psychological construct that reflects both cognitive assessments and emotional reactions to AI-driven marketing practices. Attitude captures consumers' overall favorable or unfavorable evaluation of the use of artificial intelligence in e-commerce marketing. Positive attitudes toward AI marketing are expected to translate into stronger behavioral intentions, including a higher likelihood of acting on personalized recommendations and completing purchases on the platform.

These psychological mechanisms do not operate independently. Instead, they collectively shape consumers' overall evaluation of AI-enabled marketing practices. Trust and perceived value represent positive cognitive pathways that facilitate acceptance of AI marketing, while perceived intrusiveness represents a countervailing pathway that may weaken consumer acceptance. Attitude toward AI-enabled marketing integrates these upstream evaluations into a single overall judgment that subsequently predicts behavioral outcomes.

Therefore, within the proposed conceptual model, trust, perceived value, perceived intrusiveness, and attitude toward AI-enabled marketing are conceptualized as mediating variables that explain how perceived AI marketing capabilities influence consumers' purchase intentions. These mediators collectively represent the internal organism states that link technological stimuli to behavioral outcomes in the S-O-R framework.

Hypotheses Development

Based on the Stimulus–Organism–Response (S-O-R) framework, perceived AI-enabled marketing capabilities are expected to influence consumers' internal psychological evaluations, which subsequently shape their behavioural responses in e-commerce platforms.

Perceived AI-enabled marketing capability represents the stimulus that initiates consumers' evaluation processes. When AI-driven personalization and automated marketing tools provide relevant recommendations and efficient service interactions, consumers are more likely to develop trust in the platform and perceive greater value in the shopping experience.

H1: AI-enabled marketing capability has a positive effect on trust in e-commerce platforms.

H2: AI-enabled marketing capability has a positive effect on the perceived value of AI-enabled marketing.

However, highly personalized recommendations and data-driven targeting may also create perceptions of excessive monitoring or privacy invasion.

H3: AI-enabled marketing capability has a positive effect on perceived intrusiveness.

These psychological evaluations influence consumers' overall attitude toward AI-enabled marketing. Trust and perceived value are expected to strengthen favourable evaluations, while perceived intrusiveness may generate negative attitudes toward AI-driven marketing practices.

H4: Trust positively influences consumers' attitude toward AI-enabled marketing.

H5: Perceived value positively influences consumers' attitude toward AI-enabled marketing.

H6: Perceived intrusiveness negatively influences consumers' attitude toward AI-enabled marketing.

Finally, consumer attitude toward AI-enabled marketing is expected to shape behavioural responses in the form of purchase intention on e-commerce platforms.

H7: Attitude toward AI-enabled marketing positively influences purchase intention

Conceptual Framework Summary

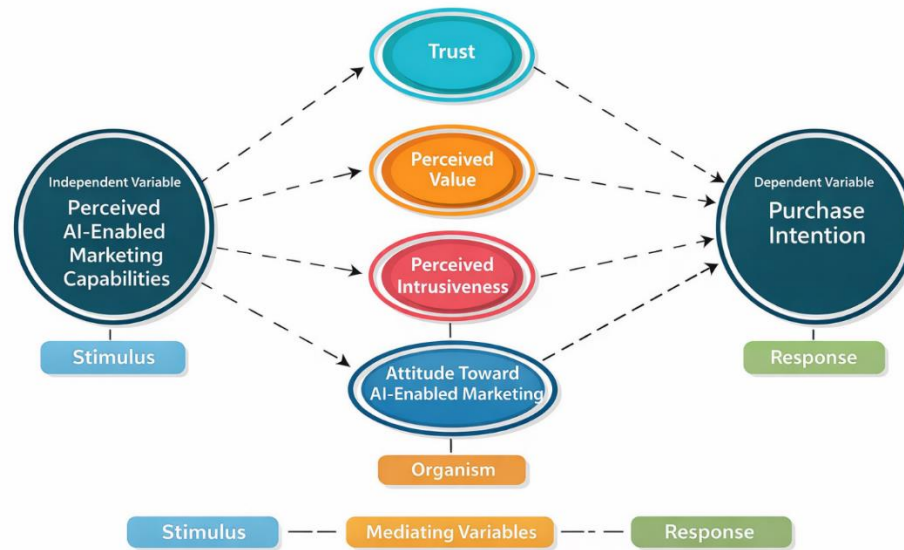
Based on the Stimulus–Organism–Response (S-O-R) theoretical framework, this study proposes a conceptual model explaining how perceived AI-enabled marketing capabilities influence consumer purchase intention in Malaysian e-commerce platforms. Within this framework, perceived AI marketing capability functions as the stimulus that initiates consumer evaluation processes. These stimuli influence internal psychological states, including trust, perceived value, and perceived intrusiveness, which represent the organism component of the model.

Trust reflects consumers' confidence in the reliability and integrity of the e-commerce platform and its AI-driven systems. Perceived value represents consumers' evaluation of the benefits gained from AI-enabled marketing, such as improved convenience, efficiency, and relevance of recommendations. In contrast, perceived intrusiveness captures potential privacy concerns and psychological discomfort associated with extensive data-driven personalization.

These internal evaluations influence consumers' overall attitude toward AI-enabled marketing, which subsequently shapes their behavioural responses. In this study, consumer response is operationalized through purchase intention toward e-commerce platforms. Figure 1 illustrates the study's conceptual framework.

Figure 1

Conceptual framework of AI-enabled marketing capabilities and consumer response



METHODOLOGY

Research Design

This study adopts a quantitative research approach using a cross-sectional survey design to examine the relationships between AI-enabled marketing capability, trust, perceived value, perceived intrusiveness, and consumer response in Malaysian e-commerce platforms. A survey method is appropriate for capturing consumers' perceptions and evaluations of AI-driven marketing practices. The collected data will be analysed using Structural Equation Modeling (SEM), which allows simultaneous examination of multiple relationships among latent constructs and provides a robust assessment of both direct and indirect effects within the proposed conceptual framework. SmartPLS or AMOS will be used for analysis.

The questionnaire consisted of multiple items adapted from validated scales to measure AI-enabled marketing capability, trust, perceived value, perceived intrusiveness, attitude toward AI marketing, and purchase intention. All items were measured using a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7).

Because this study relies on a single, self-reported, cross-sectional survey instrument to measure all constructs, common method bias (CMB) may threaten the validity of the observed relationships. To mitigate this risk at the design stage, the study incorporated several procedural remedies. First, respondent anonymity and confidentiality were assured throughout the survey, and participation was entirely voluntary, reducing respondents' motivation to answer in a socially desirable or consistent manner. Second, predictor variables (AI-enabled marketing capability) and criterion variables (trust, perceived value, perceived intrusiveness, attitude, and purchase intention) were presented in psychologically and visually separated sections of the questionnaire, reducing the likelihood that respondents could infer the hypothesized relationships among constructs while completing the survey. Third, measurement items were reviewed for clarity and simplicity to minimize ambiguity, avoiding vague or double-barreled wording that could introduce systematic response bias.

Population and Sample

The target population consists of Malaysian consumers who have experience shopping on e-commerce platforms that utilize AI-enabled marketing features such as personalized recommendations, targeted promotions, and automated customer service tools.

Respondents must:

- a) be at least 18 years old,
- b) have prior experience with online shopping in Malaysia,
- c) have been exposed to AI-driven personalization on e-commerce platforms.

Sampling Technique: As no complete sampling frame exists for Malaysian consumers who meet the above criteria, probability sampling is not practically feasible for this study. Accordingly, this study adopts purposive (judgmental) sampling, in which respondents are deliberately selected based on their fulfilment of the eligibility criteria stated above, combined with convenience sampling for actual recruitment through online survey distribution channels (e.g., social media platforms, online consumer communities, and e-commerce user forums). This approach is widely used in consumer behaviour and PLS-SEM research where the population of interest is large, dispersed, and lacks an accessible sampling frame (Golzar et al., 2022).

Sample Size: The minimum required sample size for this study was determined using two complementary approaches. First, following Krejcie and Morgan's (1970) table for determining sample size for a given population, a minimum of approximately 384–385 respondents is required for a large or unknown population at a 95% confidence level and 5% margin of error. Second, this target was cross-checked against PLS-SEM-specific guidance: applying the ten-times rule to the structural model, the construct with the largest number of predictor paths is Attitude toward AI-Enabled Marketing, which receives three incoming paths (H4, H5, H6), yielding a minimum threshold of 30 respondents — a benchmark the targeted sample substantially exceeds. Given that the ten-times rule has been criticized for underestimating power requirements in models with modest path coefficients (Kock & Hadaya, 2018), the larger Krejcie and Morgan-based target of 385 was adopted as the study's minimum sample size, with additional responses collected where possible to account for incomplete or invalid questionnaires.

Variables and Measurement

This study measures all constructs using multi-item scales adapted from established studies in e-commerce, artificial intelligence marketing, and online consumer behaviour research. The measurement items were slightly modified to suit the context of AI-enabled marketing in Malaysian e-commerce platforms. All items are measured using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The constructs include perceived AI-enabled marketing capability, trust, perceived value, perceived intrusiveness, attitude toward AI-enabled marketing, and purchase intention. Using multiple indicators for each construct helps ensure reliability and validity in structural equation modelling (SEM) analysis.

AI-Enabled Marketing Capability

AI-enabled marketing capability reflects consumers' perceptions of how effectively e-commerce platforms utilize artificial intelligence technologies to personalize content, automate interactions, and optimize marketing communications. These capabilities show up in features such as recommendation systems, targeted promotions, and AI-powered customer service tools, which aim to improve the relevance and efficiency of the online shopping experience. When consumers perceive AI-driven features as accurate, helpful, and reliable, they are more likely to trust the platform's ability to deliver meaningful, timely recommendations. This positive evaluation not only enhances the platform's perceived usefulness but also reduces uncertainty associated with automated decision-making processes. As a result, consumers are more inclined to trust both the platform and its underlying algorithmic systems, which ultimately facilitates greater acceptance of AI-enabled marketing practices.

Trust

Trust refers to consumers' confidence in an e-commerce platform's reliability, integrity, and competence in handling transactions and personal data. In the context of AI-enabled marketing, trust also reflects consumers' belief that algorithm-driven recommendations and automated systems operate in their best interest. Trust is a critical determinant of consumer behaviour in online environments, particularly when transactions occur without direct physical interaction. When

consumers trust the platform and its AI-driven systems, they are more likely to rely on personalized recommendations and feel comfortable making online purchases. In this study, trust is measured using four items that capture consumers' perceptions of reliability, credibility, and e-commerce platforms' responsible use of AI technology.

Perceived Value

Perceived value represents consumers' overall evaluation of the benefits they gain from AI-enabled marketing relative to the effort or cost of using the platform. AI-driven marketing technologies can increase perceived value by improving shopping efficiency, reducing search costs, and presenting relevant product recommendations tailored to individual preferences. When consumers perceive that AI-powered features enhance convenience and decision-making, they are more likely to develop favourable evaluations of the platform. In this study, perceived value is measured using four items that assess the extent to which AI-enabled marketing contributes to consumers' perceived usefulness, efficiency, and overall shopping benefits.

Perceived Intrusiveness

Perceived intrusiveness refers to the degree to which consumers feel that AI-driven marketing practices invade their privacy or create psychological discomfort. While personalized marketing can increase relevance, excessive data-driven targeting may make consumers feel monitored or overly profiled by e-commerce platforms. Such perceptions can trigger privacy concerns and reduce consumers' acceptance of AI-enabled marketing practices. In online environments where personal data is frequently collected and analyzed, perceived intrusiveness becomes a key factor shaping consumer attitudes and behavioural intentions. In this study, perceived intrusiveness is measured using four items that capture consumers' feelings of privacy invasion, discomfort, and concern regarding AI-driven personalization.

Attitude Toward AI-Enabled Marketing

Attitude toward AI-enabled marketing refers to consumers' overall evaluative judgement regarding the use of artificial intelligence technologies in e-commerce marketing practices. This construct reflects both cognitive and emotional evaluations of AI-driven personalization, automated recommendations, and algorithm-based marketing communication. Positive attitudes may emerge when consumers perceive AI technologies as useful, convenient, and beneficial, whereas negative attitudes may arise when consumers experience privacy concerns or discomfort with automated decision-making. In this study, attitude toward AI-enabled marketing is measured using four items assessing consumers' general favourability toward using artificial intelligence in online retail marketing.

Purchase Intention

Purchase intention represents consumers' likelihood or willingness to purchase products from e-commerce platforms using AI-enabled marketing features. It reflects a behavioural outcome resulting from consumers' evaluations of AI-driven marketing practices and their overall experience with personalized recommendations. In digital commerce research, purchase intention is widely used as an indicator of consumer response and future purchasing behaviour. When consumers perceive AI marketing as trustworthy, valuable, and beneficial, they are more likely to develop stronger intentions to purchase products through the platform. In this study, purchase intention is measured using four items that capture consumers' willingness and likelihood to purchase products recommended through AI-enabled marketing systems.

Summary of Measurement Items

All constructs in this study are measured using multiple items adapted from prior studies and modified to suit the context of AI-enabled marketing in Malaysian e-commerce platforms. All items use a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The use of multi-item reflective measures is appropriate for Structural Equation Modeling (SEM) because it allows the researcher to assess construct reliability and validity before testing the structural relationships among variables.

Table 1

Measurement Items of Study Constructs

Construct	Code	Measurement Item
AI-Enabled Marketing Capability	AIMC1	The e-commerce platform provides personalized product recommendations that match my interests.
	AIMC2	AI-driven recommendations help me discover products that are relevant to my needs.
	AIMC3	Automated recommendations improve my online shopping experience.
	AIMC4	AI marketing features make it easier to find products quickly.
Trust	TR1	I trust the AI-driven recommendations provided by this e-commerce platform.
	TR2	I believe the platform uses my personal information responsibly.
	TR3	I feel confident relying on AI-powered features when shopping online.
	TR4	This platform is trustworthy in its use of AI technology.
Perceived Value	PV1	AI-driven recommendations provide useful information when shopping online.
	PV2	AI-enabled marketing saves me time when searching for products.
	PV3	Personalized recommendations improve the quality of my purchase decisions.
	PV4	AI marketing features add value to my online shopping experience.
Perceived Intrusiveness	PI1	AI-driven marketing sometimes feels intrusive.
	PI2	I feel uncomfortable when e-commerce platforms track my online behavior.
	PI3	Personalized recommendations sometimes feel like an invasion of privacy.
	PI4	AI marketing can make me feel that my personal data is overused.
Attitude Toward AI-Enabled Marketing	ATT1	I have a positive attitude toward AI-driven marketing in e-commerce.
	ATT2	AI-enabled marketing improves my overall shopping experience.
	ATT3	I like using platforms that use AI to personalize recommendations.
	ATT4	AI marketing technologies are beneficial for online shoppers.
Purchase Intention	PIU1	I am likely to purchase products recommended by AI systems.
	PIU2	I intend to buy products through e-commerce platforms using AI recommendations.
	PIU3	I would consider purchasing products suggested by personalized marketing.
	PIU4	I am willing to continue shopping on platforms that use AI-enabled marketing.

Source: Adapted from prior studies on AI marketing, e-commerce trust, and consumer behaviour (Davenport et al., 2020; Huang & Rust, 2021; Gefen et al., 2003; Pavlou, 2003).

Pilot Study

Before full-scale data collection, a pilot study will assess the clarity, relevance, and preliminary reliability of the measurement items in Table 1. Because all items were adapted from established scales and modified to fit the AI-enabled

marketing context, pilot testing is necessary to identify wording ambiguity, cultural or contextual misfit, or item redundancy before deploying the instrument to the full sample.

The pilot study will be administered to at least 30 respondents drawn from the same target population (Malaysian consumers with prior online shopping experience and exposure to AI-driven personalization), following established minimum sample size guidance for pilot and pre-testing stages in survey-based structural equation modeling research (Memon et al., 2020). Pilot respondents will be excluded from participation in the main study to avoid response bias arising from prior exposure to the questionnaire.

The pilot data will be used to (1) assess the internal consistency reliability of each construct using Cronbach's alpha, with values below the 0.70 threshold flagged for item review; (2) identify items with low item-to-total correlations or ambiguous wording based on respondent feedback; and (3) refine the final questionnaire prior to full-scale administration. Any items requiring substantive revision following the pilot study will be re-assessed to confirm improved clarity and reliability before proceeding to the main data collection phase.

Data Analysis Technique

This study employs Structural Equation Modeling (SEM) to test the proposed conceptual framework and hypotheses. SEM is suitable because it allows simultaneous examination of multiple relationships among latent constructs and enables assessment of both the measurement and structural models. The analysis will be conducted in two stages. First, the measurement model will be evaluated to assess construct reliability and validity. Second, the structural model will be tested to examine the hypothesized relationships among AI-enabled marketing capability, trust, perceived value, perceived intrusiveness, attitude toward AI-enabled marketing, and purchase intention.

Descriptive Analysis

Descriptive analysis will summarize respondents' demographic characteristics, including age, gender, education level, online shopping frequency, and preferred e-commerce platform. In addition, mean scores and standard deviations will be calculated for all measurement items and constructs to provide an overview of respondents' perceptions of AI-enabled marketing practices.

Measurement Model Assessment

The measurement model will be assessed by examining internal consistency reliability, convergent validity, and discriminant validity. Internal consistency reliability will be evaluated using Cronbach's alpha and composite reliability values. Convergent validity will be assessed through factor loadings and average variance extracted (AVE). Discriminant validity will be examined using the Fornell–Larcker criterion and the heterotrait–monotrait ratio (HTMT). These procedures ensure that the measurement items adequately represent their intended constructs before testing the structural relationships.

3.5.3 Structural Model Assessment

After confirming the measurement model's adequacy, the structural model will be evaluated to test the hypothesized relationships among the constructs. Path coefficients, t-values, p-values, and coefficient of determination (R^2) values will be examined to assess the model's significance and explanatory power. Where relevant, mediation effects will also be

assessed to determine whether trust, perceived value, perceived intrusiveness, and attitude toward AI-enabled marketing explain the relationship between AI-enabled marketing capability and purchase intention.

Common Method Bias Assessment

In addition to the procedural remedies applied during questionnaire design (Section 3.1), this study statistically assesses common method bias using the full collinearity assessment approach recommended for PLS-SEM (Kock, 2015). This procedure treats each construct in the model, in turn, as a dependent variable predicted by all other constructs and examines the resulting variance inflation factor (VIF) values. Following Kock's (2015) guideline, VIF values at or below the conservative threshold of 3.3 indicate that the model is unlikely to be contaminated by common method bias, pathological collinearity, or vertical collinearity. This approach is preferred over the traditional Harman's single-factor test, which has been criticized for low diagnostic sensitivity, and is directly compatible with the SmartPLS software already used for this study's measurement and structural model assessment.

FINDINGS AND DISCUSSION

This study examines the relationships between AI-enabled marketing capability, trust, perceived value, perceived intrusiveness, attitude toward AI-enabled marketing, and purchase intention in the context of Malaysian e-commerce platforms. Structural Equation Modeling (SEM) will be used to test the hypothesized relationships and evaluate both the measurement and structural models.

The measurement model assessment is expected to demonstrate satisfactory construct reliability and validity. Specifically, Cronbach's alpha and composite reliability values are anticipated to exceed the recommended threshold of 0.70, indicating internal consistency. Convergent validity is expected to be supported by factor loadings above 0.70 and average variance extracted (AVE) values exceeding 0.50. Discriminant validity is anticipated to be confirmed using the Fornell–Larcker criterion and HTMT ratios, ensuring that each construct is distinct from others in the model.

The structural model is expected to provide support for the proposed hypotheses. First, AI-enabled marketing capability is anticipated to have a significant positive effect on trust and perceived value, indicating that effective AI-driven personalization enhances consumers' confidence and perceived benefits. At the same time, AI-enabled marketing capability is also expected to positively influence perceived intrusiveness, suggesting that increased personalization may simultaneously trigger privacy concerns.

Furthermore, trust and perceived value are expected to positively influence consumers' attitude toward AI-enabled marketing, reflecting the importance of perceived usefulness and platform reliability in shaping favorable evaluations. In contrast, perceived intrusiveness is expected to negatively affect attitude, highlighting the potential risks of excessive data-driven targeting.

Finally, attitude toward AI-enabled marketing is anticipated to have a strong positive effect on purchase intention, indicating that consumers who hold favorable evaluations of AI marketing technologies are more likely to engage in purchasing behavior. This finding would be consistent with prior research in technology acceptance and e-commerce literature, which emphasizes attitude as a key predictor of behavioral intention.

Overall, the expected findings support the applicability of the Stimulus–Organism–Response (S-O-R) framework in explaining consumer responses to AI-enabled marketing. AI marketing capability functions as the stimulus, influencing internal psychological states (trust, perceived value, and perceived intrusiveness), which in turn shape consumer attitudes and behavioral intentions. The results highlight the dual nature of AI-enabled marketing: its ability to enhance personalization and convenience must be balanced against potential concerns about privacy and intrusiveness.

CONCLUSION

This study proposes a conceptual framework to examine how AI-enabled marketing capabilities influence consumer responses in Malaysian e-commerce platforms. Drawing on the Stimulus–Organism–Response (S-O-R) framework, the study integrates both positive and negative psychological mechanisms, including trust, perceived value, and perceived intrusiveness, to explain consumer attitudes and purchase intentions.

The findings are expected to demonstrate that AI-enabled marketing enhances consumer trust and perceived value, which positively influence attitudes and purchase intention. At the same time, AI-driven personalization may increase perceptions of intrusiveness, which can negatively affect consumer evaluations. These results highlight the importance of balancing personalization benefits with privacy considerations in AI-driven marketing strategies.

From a theoretical perspective, this study contributes to the literature by providing an integrated framework that captures both enabling and inhibiting factors influencing consumer responses to AI marketing. From a practical perspective, the findings offer valuable insights for e-commerce platforms in designing AI systems that enhance consumer experience while maintaining trust and minimizing perceived intrusiveness.

Future research may extend this study by incorporating additional variables such as perceived risk, transparency, and user control, as well as testing the model across different cultural or technological contexts. Empirical validation using larger and more diverse samples is also recommended to strengthen the generalizability of the findings.

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CONFLICT OF INTEREST

The authors declare no known competing financial interests or personal relationships that could have appeared to influence the work reported in the paper.

AUTHOR CONTRIBUTION STATEMENT

Alireza Rezaei was responsible for conceptualization, research design, literature review, data collection planning, methodology development, analysis framework, and manuscript preparation. The author reviewed and approved the final version of the manuscript.

ETHICS STATEMENT

This research was conducted in accordance with the ethical standards of Geomatika University Malaysia and adhered to established principles of responsible academic research. Participation in the study was voluntary, and respondents were informed of the purpose of the research before completing the survey. The researchers obtained informed consent from all participants before data collection began. Respondents were assured that their responses would remain anonymous and confidential. No personally identifiable information was collected, and all data were used solely for academic research purposes.

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