



Human–AI Collaboration in Agricultural Marketing: Consumer Acceptance of AI-Assisted Recommendations

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ABSTRACT :

Artificial Intelligence (AI) is increasingly transforming agricultural marketing through personalized product recommendations, consumer information, and decision support. However, consumer acceptance of AI-assisted recommendations may depend on perceived usefulness, ease of use, trust, accuracy, transparency, privacy, and human involvement. This paper develops a conceptual framework to explain consumer acceptance of AI-assisted recommendations in agricultural marketing. Grounded primarily in the Technology Acceptance Model (TAM), the framework extends conventional technology acceptance perspectives by incorporating trust in AI, recommendation accuracy, perceived transparency, privacy concerns, and human–AI collaboration. A review of relevant theoretical and empirical literature is used to develop eight propositions linking these factors with consumer acceptance and, subsequently, purchase intention and consumer decision-making. The framework proposes positive relationships between consumer acceptance and perceived usefulness, perceived ease of use, trust, recommendation accuracy, transparency, and human–AI collaboration, while privacy concerns are proposed to have a negative relationship with acceptance. The paper contributes to the emerging literature by integrating technological, trust-related, risk-related, and human factors within a unified framework. The proposed framework provides a theoretical foundation for future empirical research on consumer responses to AI-assisted recommendations in agricultural marketing.

Keywords: Artificial Intelligence; Human–AI Collaboration; Agricultural Marketing; Consumer Acceptance; AI-Assisted Recommendations; Trust in AI; Recommendation Accuracy; Transparency; Privacy Concerns

INTRODUCTION

Artificial Intelligence (AI) is increasingly transforming marketing by enabling personalized information, product recommendations, and consumer decision support. In agricultural marketing, AI-assisted recommendation systems can help consumers identify and evaluate agricultural and food products based on their preferences, product characteristics, price, quality, and other relevant information. However, the availability of AI-generated recommendations does not necessarily ensure consumer acceptance.

Consumer acceptance of AI-assisted recommendations may depend on factors such as perceived usefulness, perceived ease of use, trust, recommendation accuracy, transparency, privacy, and human involvement. The Technology Acceptance Model (TAM) developed by Davis (1989) provides a fundamental explanation of technology acceptance through perceived usefulness and perceived ease of use. However, AI-based recommendation environments involve additional concerns related to trust, accuracy, transparency, privacy, and the role of human judgement. Human–AI collaboration is therefore important because AI can provide recommendations and analytical support while consumers retain control over their final decisions.

Although previous studies have examined AI adoption, recommender systems, trust, transparency, privacy, and human–AI interaction, these factors have often been studied separately and across different contexts. Limited conceptual attention has been given to their integrated role in consumer acceptance of AI-assisted recommendations in agricultural marketing.

Accordingly, this paper develops a conceptual framework integrating *perceived usefulness, perceived ease of use, trust in AI, recommendation accuracy, perceived transparency, privacy concerns, and human–AI collaboration* as antecedents of *consumer acceptance of AI-assisted recommendations*, with *purchase intention and consumer decision-making* as outcomes. The framework is primarily grounded in TAM and develops eight propositions to explain the proposed relationships. The paper provides a theoretical foundation for future empirical research on consumer acceptance of AI-assisted recommendations in agricultural marketing.

2. Review of Literature

Marchand and Marx (2020) examined automated product recommendations and preference-based explanations. Their study highlighted the importance of recommendation accuracy and explanations in shaping consumer responses. The findings suggest that inaccurate recommendations can reduce trust and satisfaction, while explanations can improve consumers' understanding of automated recommendations. This supports the inclusion of recommendation accuracy and perceived transparency in the present framework.

Chinchanchokchai et al. (2021) investigated the role of consumer expertise in AI-based product recommendations. The study found that consumers with different levels of expertise may respond differently to recommendation approaches. This indicates that consumer knowledge can influence responses to AI recommendations and provides contextual support for understanding consumer acceptance.

Li, Grahl, and Hinz (2021) examined the influence of recommender systems on consumer purchases through a field experiment. The study found that personalized recommendations influenced consumers' consideration sets and purchasing behaviour. The findings demonstrate the potential of recommendation systems to influence consumer decision-making and purchase behaviour, supporting the outcome variables in the present framework.

Xie and Yu (2022) examined consumer responses to AI and human recommendations across different product types. Their findings indicated that consumer responses to AI recommendations can vary according to product characteristics. This suggests that the nature of agricultural and food products may influence how consumers evaluate AI-assisted recommendations.

Yue and Li (2023) examined different forms of human–AI collaboration and their effects on consumer evaluation and usage intention. The study emphasized the importance of perceived control and responsibility in human–AI interaction. This supports the inclusion of human–AI collaboration as an important factor in consumer acceptance of AI-assisted recommendations.

Pal, Chua & Banerjee (2023) examined consumer acceptance of AI recommendations in relation to trust, perceived accuracy, uncertainty, and behavioural intention. The study indicates that trust and perceived accuracy are important considerations in consumer responses to AI-generated recommendations. These findings provide support for including trust in AI and recommendation accuracy in the proposed framework.

Li, Deng, Hu, and Liu (2024) investigated the relationship between recommendation-system transparency and consumer trust. The findings indicate that transparency can influence trust by improving perceived effectiveness and reducing discomfort. This provides support for perceived transparency as an antecedent of consumer acceptance.

Wang, Chen & Kuang (2025) examined AI-driven recommendations in the context of functional food purchases. The study found that personalization influenced purchase intention, while transparency affected purchase intention through perceived value. The findings provide direct support for examining AI-assisted recommendations in the food marketing context and their relationship with consumer purchase intention.

Gong et al. (2026) examined consumer purchase intentions toward AI recommendations, focusing on privacy and incentives. Their findings highlight the importance of privacy-related considerations when consumers interact with AI recommendation systems. This supports the inclusion of privacy concerns as a potential barrier to consumer acceptance.

Bharadwaj, S. (2026) examined AI-based recommendations and sustainable agri-food purchase intentions among Generation Z consumers in India. The study considered trust, authenticity, perceived value, and purchase intention and found that AI recommendations were associated with perceptions of authenticity and trust, while their direct influence on purchase behaviour was limited. This study is particularly relevant because it provides recent evidence from the Indian agri-food context.

Synthesis of the Literature

The literature from 2020 to 2026 indicates that consumer responses to AI-assisted recommendations are influenced by technological, trust-related, informational, privacy, and human factors. Studies have highlighted the roles of usefulness, ease of use, recommendation accuracy, trust, transparency, personalization, and human involvement in shaping consumer acceptance and decision-making. Recent research has also extended these discussions to food and agri-food contexts. However, these factors have largely been examined separately or across different contexts. Therefore, this paper proposes an integrated framework combining perceived usefulness, perceived ease of use, trust in AI, recommendation accuracy, perceived transparency, privacy concerns, and human–AI collaboration to explain consumer acceptance of AI-assisted recommendations in agricultural marketing. Consumer acceptance is further linked to purchase intention and consumer decision-making.

3. Research Gap

The literature from 2020 to 2026 shows growing interest in AI-based recommendation systems, particularly in consumer research, e-commerce, food marketing, and agricultural applications. Previous studies have examined factors such as personalization, recommendation accuracy, trust, transparency, privacy, and human–AI collaboration. However, these factors have largely been studied separately and across different contexts.

A **theoretical gap** exists because the Technology Acceptance Model (TAM), while explaining perceived usefulness and perceived ease of use, does not fully capture AI-specific factors such as trust, recommendation accuracy, transparency, privacy concerns, and human involvement. A **contextual gap** also exists because limited conceptual attention has been given to the integrated role of these factors in consumer-facing AI recommendations within agricultural marketing.

Therefore, this paper proposes an integrated conceptual framework in which perceived usefulness, perceived ease of use, trust in AI, recommendation accuracy, perceived transparency, privacy concerns, and human–AI collaboration influence consumer acceptance of AI-assisted recommendations, which is further linked to purchase intention and consumer decision-making. The framework provides a theoretical foundation for future empirical research in agricultural marketing.

4. Theoretical Foundations

The proposed framework is primarily grounded in the Technology Acceptance Model (TAM) developed by Davis (1989). To address the specific characteristics of AI-assisted recommendations, TAM is extended by incorporating trust in AI, recommendation accuracy, perceived transparency, privacy concerns, and human–AI collaboration. These perspectives provide a theoretical foundation for explaining consumer acceptance of AI-assisted recommendations in agricultural marketing.

4.1 Technology Acceptance Model

TAM explains technology acceptance through perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which a technology is perceived to improve task performance, while perceived ease of use refers to the extent to which it is perceived as easy to use (Davis, 1989). In AI-assisted recommendations, consumers may be more willing to accept a system when they perceive its recommendations as useful and the system as convenient and easy to interact with. Therefore, perceived usefulness and perceived ease of use are included as key antecedents in the proposed framework.

4.2 Extension of TAM

Although TAM provides a strong foundation, AI-assisted recommendations involve additional issues related to trust, accuracy, transparency, and privacy. Consumers may evaluate whether AI recommendations are reliable and relevant, whether they understand how recommendations are generated, and whether their personal information is appropriately used.

Therefore, the present framework extends TAM by incorporating trust in AI, recommendation accuracy, perceived transparency, and privacy concerns to provide a broader explanation of consumer acceptance.

4.3 Human–AI Collaboration Perspective

Human–AI collaboration emphasizes the complementary roles of AI and human judgement. AI can provide information and recommendations, while consumers retain control over the final decision. This perspective is relevant to agricultural marketing because consumers may use AI recommendations as decision-support information while considering attributes such as price, quality, origin, and freshness. Accordingly, human–AI collaboration is included as an additional antecedent of consumer acceptance.

4.4 Theoretical Integration

The proposed framework integrates TAM, extended AI-acceptance factors, and the human–AI collaboration perspective. TAM explains the technological dimensions of acceptance, while trust, accuracy, transparency, and privacy address AI-specific considerations. Human–AI collaboration adds the role of human judgement and control.

Together, these perspectives provide a multidimensional foundation for explaining consumer acceptance of AI-assisted recommendations, followed by purchase intention and consumer decision-making in agricultural marketing.

5. Proposed Conceptual Framework

5.1 Framework Overview

Based on the literature review and theoretical foundations, this paper proposes a conceptual framework to explain consumer acceptance of AI-assisted recommendations in agricultural marketing. The framework is primarily grounded in the Technology Acceptance Model (TAM) and extends it by incorporating AI-specific factors such as trust, recommendation accuracy, transparency, privacy concerns, and human–AI collaboration.

5.2 Antecedent Variables

The framework identifies seven antecedents of consumer acceptance: perceived usefulness, perceived ease of use, trust in AI, recommendation accuracy, perceived transparency, privacy concerns, and human–AI collaboration. These factors represent consumers' perceptions of the usefulness, convenience, reliability, accuracy, transparency, privacy, and human involvement associated with AI-assisted recommendations.

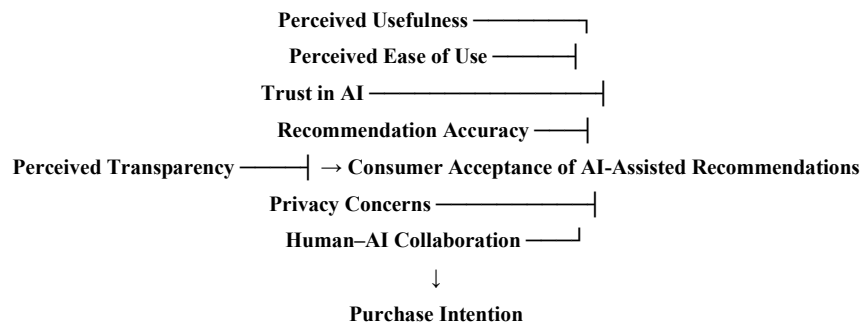
5.3 Consumer Acceptance and Outcomes

Consumer acceptance of AI-assisted recommendations is positioned as the central construct. It represents consumers' willingness to use and consider AI-generated recommendations when evaluating agricultural and food products. The framework further proposes that consumer acceptance is associated with purchase intention and consumer decision-making.

5.4 Proposed Conceptual Model

The proposed relationships are presented in Figure

Figure 1. Proposed Conceptual Framework



Consumer Decision-Making

The framework proposes positive relationships between perceived usefulness, perceived ease of use, trust in AI, recommendation accuracy, perceived transparency, and human–AI collaboration and consumer acceptance. Privacy concerns are proposed to have a negative relationship with consumer acceptance. Consumer acceptance is further proposed to influence purchase intention and consumer decision-making.

The framework provides the basis for developing eight propositions and integrates technological, trust-related, recommendation-related, privacy-related, and human factors into a unified conceptual model.

6. Development of Propositions

Based on the Technology Acceptance Model, the extended technology-acceptance perspective, human–AI collaboration literature, and the reviewed studies, eight propositions are developed. The framework considers seven antecedents of consumer acceptance: perceived usefulness, perceived ease of use, trust in AI, recommendation accuracy, perceived transparency, privacy concerns, and human–AI collaboration. Consumer acceptance is further linked to purchase intention and consumer decision-making.

6.1 Perceived Usefulness and Consumer Acceptance

Perceived usefulness is a core construct of TAM and refers to the extent to which consumers believe that technology provides benefits and improves their decision-making. In AI-assisted recommendations, useful and relevant information may help consumers evaluate agricultural and food products more efficiently. Previous research indicates that recommender systems can influence consumer consideration and purchasing behaviour (Li et al., 2022; Wang et al., 2025). Therefore:

P1: Perceived usefulness is positively associated with consumer acceptance of AI-assisted recommendations in agricultural marketing.

6.2 Perceived Ease of Use and Consumer Acceptance

Perceived ease of use refers to the extent to which consumers perceive an AI recommendation system as simple and convenient to use. When consumers can easily interact with and understand recommendations, they may be more willing to accept the technology. Therefore:

P2: Perceived ease of use is positively associated with consumer acceptance of AI-assisted recommendations in agricultural marketing.

6.3 Trust in AI and Consumer Acceptance

Trust reflects consumers' confidence in the reliability and dependability of AI-generated recommendations. Previous research highlights the importance of trust in consumers' responses to AI recommendations, including in agri-food contexts (Pal et al., 2023; Bharadwaj, 2026). Greater trust is therefore expected to support acceptance.

P3: Trust in AI is positively associated with consumer acceptance of AI-assisted recommendations in agricultural marketing.

6.4 Recommendation Accuracy and Consumer Acceptance

Recommendation accuracy refers to the extent to which AI-generated recommendations are relevant to consumers' needs and preferences. Accurate recommendations can improve the usefulness and credibility of recommendation systems, whereas inaccurate recommendations may reduce consumer responses (Marchand & Marx, 2020; Pal et al., 2023). Therefore:

P4: Recommendation accuracy is positively associated with consumer acceptance of AI-assisted recommendations in agricultural marketing.

6.5 Perceived Transparency and Consumer Acceptance

Perceived transparency refers to consumers' understanding of how AI recommendations are generated and how relevant information is used. Transparency can reduce uncertainty and support trust in recommendation systems (Li et al., 2024). Therefore:

P5: Perceived transparency is positively associated with consumer acceptance of AI-assisted recommendations in agricultural marketing.

6.6 Privacy Concerns and Consumer Acceptance

Privacy concerns arise when consumers perceive risks related to the collection and use of their personal or behavioural information. Recent research shows that privacy is an important consideration in consumer responses to AI recommendations (Gong et al., 2026). Higher privacy concerns may therefore reduce acceptance.

P6: Privacy concerns are negatively associated with consumer acceptance of AI-assisted recommendations in agricultural marketing.

6.7 Human–AI Collaboration and Consumer Acceptance

Human–AI collaboration refers to situations in which AI provides recommendations while consumers retain judgement and control over the final decision. Research suggests that perceived control and responsibility can influence consumer evaluations of human–AI collaboration (Yue & Li, 2023). Therefore:

P7: Human–AI collaboration is positively associated with consumer acceptance of AI-assisted recommendations in agricultural marketing.

6.8 Consumer Acceptance, Purchase Intention and Consumer Decision-Making

Consumer acceptance represents consumers' willingness to use and consider AI-assisted recommendations. When consumers accept such recommendations, they may be more likely to consider recommended products and use the information during purchasing decisions. Previous research has linked recommendation systems and AI-driven recommendations with consumer purchasing responses (Li et al., 2022; Wang et al., 2025; Bharadwaj, 2026). Therefore:

P8: Consumer acceptance of AI-assisted recommendations is positively associated with purchase intention and consumer decision-making in agricultural marketing.

Summary of Propositions

The eight propositions integrate technological, trust-related, recommendation-related, privacy-related, and human factors into the proposed framework. Six factors are proposed to have positive relationships with consumer acceptance, while privacy concerns are proposed to have a negative relationship. Consumer acceptance is further proposed to be positively associated with purchase intention and consumer decision-making.

7. Theoretical Discussion

The proposed framework provides an integrated perspective for understanding consumer acceptance of AI-assisted recommendations in agricultural marketing. It is primarily grounded in the Technology Acceptance Model (TAM) and extends it by incorporating trust in AI, recommendation accuracy, perceived transparency, privacy concerns, and human–AI collaboration.

7.1 Technological Dimension

Perceived usefulness and perceived ease of use represent the technological dimension of the framework. Consistent with TAM, consumers may be more willing to accept AI-assisted recommendations when they perceive them as useful, convenient, and easy to use.

7.2 AI-Specific and Risk Dimension

Trust, recommendation accuracy, transparency, and privacy concerns represent AI-specific and risk-related dimensions. Consumers may consider whether recommendations are reliable, relevant, understandable, and based on appropriate use of personal information. Thus, these factors extend the traditional TAM perspective to reflect the specific characteristics of AI-assisted recommendations.

7.3 Human Dimension

Human–AI collaboration introduces the role of human judgement and control. AI is viewed as a decision-support mechanism rather than a complete replacement for consumers' judgement. This allows consumers to combine AI-generated recommendations with their own preferences and knowledge.

7.4 Theoretical Contribution

The main theoretical contribution of the framework is the integration of technological, trust-related, recommendation-related, privacy-related, and human factors within a single conceptual model. Consumer acceptance is positioned as the central construct connecting these antecedents with purchase intention

and consumer decision-making. The framework therefore provides a theoretical foundation for future empirical research on AI-assisted recommendations in agricultural marketing.

8. Theoretical and Managerial Implications

8.1 Theoretical Implications

The proposed framework extends the Technology Acceptance Model (TAM) by incorporating AI-specific factors such as trust, recommendation accuracy, transparency, privacy concerns, and human–AI collaboration along with perceived usefulness and perceived ease of use.

The framework provides an integrated view of technological, trust-related, recommendation-related, risk-related, and human factors influencing consumer acceptance of AI-assisted recommendations. It also positions consumer acceptance as a central construct linking these factors with purchase intention and consumer decision-making.

Thus, the framework provides a theoretical foundation for future research on AI-assisted recommendations in agricultural and food marketing.

8.2 Managerial Implications

The framework suggests that agricultural marketers, retailers, and digital platforms should develop AI recommendation systems that provide useful, accurate, and relevant recommendations.

Organizations should also focus on transparency and trust by clearly explaining recommendations and communicating how consumer data are used. Appropriate privacy protection should be maintained to address consumer concerns.

Finally, AI should be used as a decision-support tool, while allowing consumers to retain control over their final purchasing decisions. These implications can guide the development of consumer-oriented AI recommendation systems in agricultural marketing.

9. Limitations and Future Research

This paper is conceptual in nature and is based on existing theoretical and empirical literature. Therefore, the proposed relationships have not been empirically tested and require validation using primary data from consumers.

The framework focuses on seven major factors: perceived usefulness, perceived ease of use, trust in AI, recommendation accuracy, perceived transparency, privacy concerns, and human–AI collaboration. Future studies may examine additional factors such as personalization, perceived value, AI literacy, consumer expertise, and algorithmic fairness.

Future research can empirically test the eight propositions using survey and experimental methods across different consumer groups, agricultural products, and digital platforms. Studies can also examine the effects of human involvement, transparency, privacy, and consumer experience with AI across different regions and countries.

10. Conclusion

Artificial Intelligence is increasingly influencing agricultural marketing through personalized information and AI-assisted recommendations. This paper developed a conceptual framework to explain consumer acceptance of AI-assisted recommendations in agricultural marketing.

The framework is primarily based on the Technology Acceptance Model (TAM) and incorporates trust in AI, recommendation accuracy, perceived transparency, privacy concerns, and human–AI collaboration. The proposed framework links these factors with consumer acceptance and further with purchase intention and consumer decision-making.

The main contribution of the paper is the integration of technological, trust-related, recommendation-related, privacy, and human factors into a unified framework. As the study is conceptual, the proposed relationships require empirical validation. Future research can test the framework across different agricultural and food products, consumer groups, and digital marketing platforms.

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