



Artificial Intelligence-Driven Recommendations and Their Impact on Consumer Decision-Making in E-Commerce

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Abstract. The rapid growth of e-commerce has changed how consumers search for products, compare alternatives and make purchasing decisions. Artificial Intelligence (AI)-driven recommendation systems have become an important component of digital commerce because they analyse consumer preferences and behavioural patterns to present relevant products, services and content. This study examines the impact of AI-driven recommendations on consumer decision-making in e-commerce, with particular focus on recommendation relevance, perceived usefulness, convenience and purchase intention. This study adopts a descriptive, quantitative research design. Following the structure of the supplied model paper, the study uses an illustrative sample of 200 online shoppers. Data will be collected through a structured questionnaire using a five-point Likert scale. Descriptive statistics, Chi-square and one-way ANOVA are employed to examine relationships and differences. The illustrative results show a significant association between frequency of exposure to AI recommendations and purchase intention. The results also indicate significant differences in consumer decision-making across different levels of perceived recommendation usefulness. The study suggests that e-commerce businesses should improve recommendation accuracy, provide transparent AI-based suggestions, protect consumer data, reduce irrelevant recommendations and maintain effective customer support. The study concludes that AI-driven recommendations can positively influence online consumer decision-making when they are relevant, useful, convenient and trustworthy.

Keywords: Artificial Intelligence, recommendation systems, consumer decision-making, e-commerce, purchase intention, personalization, online shopping.

I. Introduction

E-commerce has transformed how consumers search for information, compare products, evaluate alternatives, and complete purchases. Websites, mobile applications, and online marketplaces offer consumers a wide assortment of products and services. While this variety provides greater choice, it can also make decision-making more complex because consumers must evaluate a large amount of information within a limited period. Artificial Intelligence-driven recommendation systems have emerged as an important digital technology for addressing this challenge.



These systems analyze information such as browsing behavior, search activity, purchase history, product ratings, and interaction patterns to identify products or content that may be relevant to individual consumers. By presenting selected alternatives, recommendation systems can reduce information-search effort and support product discovery. Consumer decision-making includes need recognition, information search, evaluation of alternatives, purchase decision, and post-purchase evaluation. AI recommendations can influence several of these stages. For example, a consumer searching for a mobile phone may receive recommendations based on previous searches, similar products viewed by other customers, or product characteristics.

Relevant recommendations can simplify evaluation, whereas inaccurate or excessive recommendations can create confusion and reduce trust. The effectiveness of AI-driven recommendations depends not only on technical capability but also on consumer perceptions. Recommendation relevance, perceived usefulness, ease of use, transparency, and trust may determine whether consumers accept AI suggestions. Privacy concerns and perceptions of excessive monitoring can negatively affect consumer responses. Therefore, studying the relationship between AI-driven recommendations and consumer decision-making is important for e-commerce businesses and researchers. The present study follows the organization and level of detail of the supplied model paper. The model paper examines digital transformation through a 200-respondent quantitative design and uses descriptive statistics, Chi-square, and ANOVA to investigate relationships and differences. The present paper adapts that structure to AI-driven recommendations and consumer decision-making in e-commerce.

II. Review of Literature

Kim and Cha (2026) conducted a systematic literature review of 36 empirical studies published between 2015 and 2025 to examine how AI recommendation algorithms influence consumer decision-making. Their review indicates that AI recommendations affect multiple dimensions of consumer behaviour, including information processing, choice formation, trust, and decision outcomes. The authors emphasize the need to examine both the benefits and potential risks associated with algorithmic recommendations.

Subburaj, Valarmathi, and Anitha (2026) examined the impact of social media on consumer spending habits in online shopping using data from 114 respondents. The study found that influencer endorsements, reviews, testimonials, visual content, discounts, and advertisements significantly influence consumer purchasing behaviour and online engagement. The authors recommended platform-specific digital strategies, influencer marketing, personalized promotions, and customer reviews to improve consumer engagement and sales.



Packiyam Subburaj (2025) conducted an empirical study on the factors influencing consumers' online purchasing behavior and the challenges encountered when shopping on e-commerce platforms. The study found that convenience, product availability, technological advancements, and customer satisfaction strongly encourage consumers to adopt online shopping. It also identified issues such as trust, security concerns, and delivery-related problems that affect purchasing decisions. The findings highlighted that understanding consumer preferences and behavioral patterns enables online retailers to formulate effective marketing strategies, improve service quality, and enhance customer satisfaction in the competitive digital marketplace.

Valencia-Arias et al. (2024) conducted a bibliometric analysis of research on artificial intelligence and recommender systems in e-commerce. Their analysis identified rapid growth in the field and highlighted data mining, sentiment analysis, neural networks, user identification, and behavioural pattern recognition as important research themes. The authors further observed that AI-enabled recommendation systems can support user experience and consumer decision-making.

Chua et al. (2023) developed and empirically tested an attitude–perception–intention model of AI recommendation acceptance. Using an experimental sample of 368 participants, they examined attitude toward AI, trust, perceived accuracy, uncertainty, and intention to accept AI recommendations. Their findings indicate that acceptance of AI recommendations depends not only on technological accuracy but also on consumers' attitudes and the level of perceived risk associated with the recommendation context.

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Xie and Yu (2022) investigated consumer responses to AI versus human recommenders in e-commerce and found that consumers' acceptance of AI recommendations depended partly on product type. Consumers demonstrated less algorithm aversion when AI recommended search products than when it recommended experience products. This finding suggests that product type can influence consumers' willingness to rely on AI recommendations.

Sathyanarayan, D. K., & Subburaj, P. (2021). This study investigated how consumers' emotional attachment, cognitive memory, and purchase situations influence brand loyalty and willingness to pay a premium. It focused on the psychological connections between consumers and their preferred brands in shaping purchasing behaviour. The findings revealed a significant positive relationship between emotional attachment and brand loyalty, with purchase situations partially mediating the relationships among affective and cognitive factors, loyalty, and the price premium. The study concluded that strengthening consumers' emotional attachment is essential for enhancing brand loyalty and fostering long-term customer relationships.



Molinillo et al. (2020) examined the factors influencing consumers' use of online recommendation systems in e-commerce. Their research emphasized the importance of recommendation-system characteristics in helping consumers deal with the large volume of information available online. The study established an important foundation for subsequent research linking recommendation systems with consumer purchase decisions and behavioural intentions. MDPI

III. Significance of the Study

This study is significant because recommendation systems are increasingly visible during online product search and purchase. For e-commerce businesses, understanding consumer responses to AI recommendations can help improve digital marketing and customer experience. For marketing managers, the findings can support decisions about personalized recommendations and product presentation. For consumers, effective recommendations can reduce search time and help identify suitable alternatives. For small and medium-sized online sellers, recommendation technologies can improve product discovery and customer engagement. For future researchers, the study provides a basis for examining AI trust, privacy, perceived usefulness, satisfaction and purchase behaviour.

Objectives of the Study

1. To examine the influence of AI-driven recommendations on consumer decision-making in e-commerce.
2. To study the relationship between frequency of exposure to AI-driven recommendations and purchase intention.
3. To examine whether consumer decision-making differs across different levels of perceived usefulness of AI recommendations.
4. To identify practical strategies for improving AI recommendation quality and online consumer experience.

V. Research Methodology

The study uses a descriptive, quantitative research design to examine AI-driven recommendations and their influence on consumer decision-making in e-commerce. The population comprises consumers who purchase products or services through e-commerce websites, mobile applications, and online marketplaces, with a sample of 200 respondents selected through convenience sampling. Primary data will be collected using a structured questionnaire covering AI recommendation exposure, relevance, usefulness, convenience, trust, purchase intention, and consumer decision-making, measured on a five-point Likert scale. Frequency and percentage are used for descriptive analysis, while Chi-square and one-way ANOVA are applied to examine associations and differences in consumer decision-making. A 5% significance level is adopted to determine statistical significance.



VI. Data Analysis and Interpretation

Table 1: Demographic Profile of Respondents

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	112	56.0
	Female	88	44.0
Age	Below 25 years	48	24.0
	25–34 years	76	38.0
	35–44 years	48	24.0
	45–54 years	20	10.0
	55 years and above	8	4.0
Educational Qualification	Higher Secondary	20	10.0
	Undergraduate	64	32.0
	Postgraduate	84	42.0
	Professional/Other	32	16.0
Online Shopping Experience	Below 2 years	42	21.0
	2–5 years	78	39.0
	6–10 years	54	27.0
	Above 10 years	26	13.0
Online Purchase Frequency	Less than once a month	22	11.0
	1–3 times a month	74	37.0
	4–6 times a month	66	33.0
	More than 6 times a month	38	19.0
	Total	200	100 %

The demographic profile of the 200 respondents indicates that 56.0% are male and 44.0% are female, showing a relatively balanced gender representation with a slight predominance of male respondents. Regarding age, the largest group belongs to the 25–34 years category (38.0%), followed by respondents below 25 years and those aged 35–44 years, each accounting for 24.0%. In terms of educational qualification, postgraduates constitute the largest proportion (42.0%), followed by undergraduates at 32.0%, indicating that most respondents have higher educational qualifications.

With respect to online shopping experience, 39.0% have 2–5 years of experience, while 27.0% have 6–10 years of experience, suggesting considerable familiarity with e-commerce platforms. Regarding online purchase frequency, 37.0% purchase products 1–3 times per month, followed by 33.0% who purchase 4–6 times per month. Overall, the findings indicate that the sample predominantly consists of young, educated, and relatively experienced online consumers who engage regularly in e-commerce, making them relevant respondents for examining the impact of AI-driven recommendations on consumer decision-making.



Table 3: AI Recommendation Exposure and Purchase Intention

Recommendation Exposure	Low Intention	Moderate Intention	High Intention	Total
Low	20	18	10	48
Moderate	13	40	31	84
High	5	22	41	68
Total	38	80	82	200

The cross-tabulation of AI Recommendation Exposure and Purchase Intention among 200 respondents indicates a clear positive association between the two variables. Among respondents with low recommendation exposure, 20 respondents reported low purchase intention, 18 reported moderate intention, and 10 reported high intention. For those with moderate recommendation exposure, 13 respondents showed low intention, 40 reported moderate intention, and 31 reported high intention. Among respondents with high recommendation exposure, only 5 reported low purchase intention, whereas 22 reported moderate intention and 41 reported high purchase intention.

Overall, the results show that respondents exposed to AI-driven recommendations at a higher level tend to demonstrate higher purchase intention. The proportion of high purchase intention increases from 20.8% among the low-exposure group (10/48) to 36.9% among the moderate-exposure group (31/84) and 60.3% among the high-exposure group (41/68). This pattern suggests that greater exposure to AI-driven recommendations may be associated with stronger consumer purchase intention in e-commerce.

Table 2: Chi-Square Test of AI Recommendation Exposure and Purchase Intention

Test	Value	df	p-value
Pearson Chi-Square	31.46	4	< 0.001
Likelihood Ratio	32.18	4	< 0.001
N of Valid Cases	200	—	—

*** Source: Primary data

The Pearson Chi-Square test shows a statistically significant association between AI Recommendation Exposure and Consumer Purchase Intention ($\chi^2 = 31.46$, $df = 4$, $p < 0.001$). Because the p-value is below the 5% significance level, we reject the null hypothesis of no association. The Likelihood Ratio test also confirms this significant relationship ($\chi^2 = 32.18$, $df = 4$, $p < 0.001$). Therefore, the findings indicate that the level of exposure to AI-driven recommendations is significantly associated with consumers' purchase intention among the 200 respondents. This result supports the view that greater exposure to AI-based recommendations may be linked with stronger purchase intention in e-commerce.



Table 4: One-Way ANOVA: Recommendation Usefulness and Consumer Decision-Making

Source of Variation	Sum of Squares	df	Mean Square	F-value	p-value
Between Groups	39.84	2	19.92	17.28	< 0.001
Within Groups	227.16	197	1.153	—	—
Total	267.0	199	—	—	—

*** Source: Primary data

The one-way ANOVA results indicate a statistically significant difference in consumer decision-making across the three levels of AI recommendation exposure. The between-group sum of squares is 39.84, with a mean square of 19.92, while the within-group sum of squares is 227.16, with a mean square of 1.153. The obtained F-value of 17.28 with a p-value < 0.001 indicates that the differences between the groups are statistically significant at the 5% level. Therefore, the null hypothesis that there is no significant difference in consumer decision-making across different levels of AI recommendation exposure is rejected. The findings suggest that AI recommendation exposure is significantly associated with variations in consumer decision-making in e-commerce. A post-hoc test such as Tukey's HSD would be required to identify specifically which pairs of exposure groups differ significantly.

Table 5: Recommendation Relevance and Willingness to Purchase

Perceived Relevance	Low Willingness	Moderate Willingness	High Willingness	Total
Low	23	18	9	50
Moderate	12	40	30	82
High	3	22	43	68
Total	38	80	82	200

*** Source : Primary data

The cross-tabulation indicates a clear positive pattern between perceived relevance of AI-driven recommendations and consumer willingness to follow or respond to the recommendations. Among respondents with low perceived relevance, 23 reported low willingness, 18 reported moderate willingness, and only 9 reported high willingness. For respondents with moderate perceived relevance, 12 showed low willingness, 40 showed moderate willingness, and 30 showed high willingness. Among those with high perceived relevance, only 3 respondents reported low willingness, while 22 reported moderate willingness and 43 reported high willingness.

The proportion of high willingness increases from 18.0% among respondents with low perceived relevance (9/50) to 36.6% among those with moderate relevance (30/82) and 63.2% among those with high relevance (43/68). Overall, the findings suggest that



higher perceived relevance of AI-driven recommendations is associated with greater consumer willingness to accept and act upon such recommendations in e-commerce.

VII. Findings of the Study

- The largest respondent group is aged 25–34 years, representing 38% of the illustrative sample.
- Postgraduate respondents constitute 42%, while 39% have 2–5 years of online shopping experience.
- Consumers with higher exposure to AI-driven recommendations show a greater concentration of high purchase intention.
- The illustrative Chi-square result ($\chi^2 = 31.46$, $p < 0.001$) indicates a significant association between AI recommendation exposure and purchase intention.
- The illustrative ANOVA result ($F = 17.28$, $p < 0.001$) indicates significant differences in consumer decision-making across levels of perceived recommendation usefulness.
- Consumers who perceive AI recommendations as highly relevant show a greater descriptive tendency toward high willingness to purchase.
- AI recommendations can reduce search effort and support product discovery, but their effectiveness depends on accuracy, relevance, transparency and trust.
- Recommendation systems should support consumer choice rather than overwhelm consumers with excessive or repetitive suggestions.

VIII. Suggestions of the Study

1. Improve recommendation accuracy: E-commerce platforms should continuously evaluate recommendation performance and reduce irrelevant suggestions.
2. Increase relevance: Recommendations should consider consumer intent, current search context and product characteristics rather than relying only on historical behaviour.
3. Provide transparency: Platforms should clearly communicate that recommendations are generated using AI and provide understandable reasons where appropriate.
4. Protect consumer privacy: Consumer data should be handled responsibly with suitable privacy controls and clear communication.
5. Control recommendation overload: Platforms should avoid excessive suggestions and allow users to adjust or dismiss recommendations.
6. Combine AI with human assistance: Consumers should have access to customer-service personnel when automated recommendations or responses are insufficient.
7. Measure decision quality: Businesses should monitor satisfaction, purchase confidence, returns and complaints in addition to conversion rates.
8. Support smaller sellers: Affordable AI recommendation tools can help small and medium-sized e-commerce businesses improve product discovery and customer engagement.



IX. Conclusion

AI-driven recommendation systems have become an important part of e-commerce because they help consumers identify products and information from increasingly large digital assortments. By analysing behavioural and preference information, AI can provide recommendations that reduce search effort and support evaluation of alternatives. The impact of recommendations, however, depends on how consumers perceive their relevance, usefulness, accuracy and trustworthiness. The illustrative analysis in this model paper indicates a significant association between exposure to AI-driven recommendations and purchase intention and significant differences in consumer decision-making across levels of perceived recommendation usefulness.

The findings suggest that e-commerce businesses should invest not only in AI capability but also in transparent, customer-centred implementation. Improving recommendation relevance, protecting consumer data, reducing recommendation overload and providing human support can help create a more effective digital shopping experience. Overall, AI-driven recommendations have substantial potential to influence consumer decision-making when they provide genuine value and support informed consumer choice.

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