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Effectiveness of recommendation algorithms on impulsive buying in e-commerce platforms: A systematic literature review

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ABSTRACT

This study analyzes the effectiveness of recommendation algorithms in influencing impulsive buying behavior on e-commerce platforms. Through a comprehensive review of the existing research literature, it was revealed that personalization strategies such as collaborative filtering, content-based filtering, and artificial intelligence (AI) boost impulsive buying tendencies by alleviating cognitive burdens and enhancing elements such as limited-time offers, social proof, and emotional connection. Factors such as flow experience, positive feelings, and moderating elements such as age, social media influence, and economic circumstances also play a crucial role in determining the effectiveness of these algorithms. This study provides beneficial knowledge for algorithm developers and digital marketers to refine personalization efforts and to consider psychological and contextual influences when crafting more impactful marketing strategies.

Keywords: recommendation algorithm, impulsive buying, e-commerce, consumer behavior.

1. INTRODUCTION

Advancements in digital technology have led to remarkable transformations across various facets of life, particularly in consumer shopping habits. A key indicator of this shift is the rise and swift expansion of e-commerce platforms, which empower consumers to shop effortlessly from any location at any time (Marhumi., 2024). E-commerce has become a normal part of life, and it generates a lot of transactional data that may be used to improve user experience. These platforms have revolutionized the way consumers engage with products and services, providing convenience and adaptability, while simultaneously introducing challenges in ensuring a smooth, effective, and relevant shopping journey. In this environment, one of the biggest problems for e-commerce platforms is creating a shopping experience that is enjoyable, efficient, and personalized according to individual preferences. Recommendation systems have emerged as essential solutions to address this issue. These systems are crafted to suggest products that resonate with users' tastes and requirements, based on data such as browsing history, previous purchases, and product features (Kurniawan, 2024). By facilitating this process, they assist users in making informed purchasing decisions, while alleviating the cognitive burden associated with an overwhelming array of product options.

Employing recommendation algorithms wisely can greatly increase customer happiness, boost purchases, and make individuals more likely to buy products on a whim. Collaborative filtering, content-based filtering, and AI-driven algorithms are all common methods used in these systems (Jiang, 2024; Li et al., 2019; Zhang, 2023). The purpose of combining these methods is to create more accurate and tailored recommendations to keep customers interested. Impulse buying is the act of purchasing an item without much consideration before its purchase. This might happen because of psychological causes including stress, boredom, or the need for immediate satisfaction (Qalbi & Isalman, 2023). Flash sales, discounts, and product displays that are visually appealing and directly suggested to consumers are some of the marketing strategies that make this behavior more common on e-commerce sites. In addition to psychological aspects, social elements like good reviews and high ratings from other users also play a big role in encouraging people to buy things without thinking (Anitasari & Zoniarti, 2024). However, it is crucial to remember that recommendation systems may not always give users the desired results, even though they may have certain benefits. When these systems are not developed or implemented correctly, they can provide consumers with ideas that are irrelevant to their interests. This can lead to a disappointing user experience, which may eventually lead to less trust and loyalty from customers over time. Therefore, it is important to conduct a thorough and in-depth study of how recommendation algorithms can affect and change consumer behavior, especially when it comes to impulse buys that may come from these suggestions.

As competition between e-commerce platforms increases, it is important for key players and researchers to understand which recommendation systems are best at attracting customers and increasing sales. Previous studies have shown that the performance of recommendation systems depends on the types of products, how they are implemented, and how consumers behave Sidharta & Suzanto, 2024; Rachbini, 2023). Hence, this study conducts a systematic analysis of the effectiveness of recommendation algorithms in influencing impulsive buying behavior on e-commerce platforms, drawing on recent literature and findings.

2. THEORETICAL BACKGROUND

2.1. Recommendation Algorithms in E-Commerce

Recommendation Algorithms are specific types of software or processes that recommend helpful and relevant products to users, based on their requirements or preferences. Their main purpose is to assist people find products, information, or services that fit their preferences in a sea of data (Fitrianti., 2024). Various algorithms are used in recommendation systems.

- Content-based filtering makes suggestions for products that are comparable to those that the user has already liked or chosen based on the features of those items (Li et al., 2019; Zhang, 2023).
- Collaborative filtering uses data from many users to guess what a certain user might like based on what other users with similar tastes have liked (Li et al., 2019; Zhang, 2023).
- AI-based recommendation systems employ machine learning to examine user data in more detail, making their predictions more accurate. These systems use natural language processing and data mining, among other things, to improve the quality of recommendations and change in real time based on how users engage with them (Jiang, 2024).

Additionally, adding sentiment analysis and user reviews to recommendation systems makes them more accurate by considering how people feel. However, problems such as the "filter bubble" effect (which limits access to different kinds of information) and the "cold start" problem (which means that there is not enough data for new users or products) exist. To fix these problems, we need to do more study and make progress in technology (Zhang, 2023).

2.2. Impulsive Buying Behavior

Kotler and Keller (2016) impulse buying is when people buy something without planning to do so because of their feelings or other factors. Schiffman and Kanuk (2010) describe it as spontaneous purchases triggered by attractive product displays or promotions. Key characteristics include quick decision-making, emotional influence, and irrationality. In the digital age, Internet stores make it easy to buy things on a whim with attractive designs, time-limited deals, and marketing that are specific to you. This behavior is caused by both psychological reasons (such wanting to feel something new and having low self-control) and environmental variables (like how a product is presented or a promotion) (Faber, 2010; Hamza & Elsantil, 2024; Swarnalatha & Soundhariya, 2016). Social media and advertisements exacerbate this tendency, particularly among younger consumers (Nyrhinen et al., 2023). While impulsive buying provides instant gratification, it often leads to regret or financial strain (Swarnalatha & Soundhariya, 2016). Consumers can make more thoughtful buying decisions if they improve their self-control and media literacy (Nyrhinen et al., 2023).

2.3. The Relationship Between Recommendation Algorithms and Impulsive Buying

The way technology affects consumer behavior shapes the relationship between recommendation algorithms and impulsive purchasing. By making product recommendations based on user data, recommendation algorithms improve online shopping platforms' perceived usefulness and ease of use, which increases the possibility of impulsive purchases. Perceived usefulness, perceived ease of use, and trust are the three main components of the Technology Acceptance Model (TAM), that explain this relationship. These factors are crucial for influencing how consumers feel and act when making impulsive purchases. The likelihood of impulsive purchasing is increased by recommendation algorithms that examine user preferences to make product recommendations that correspond with their interests and emotional triggers (Song, 2023). Personalized suggestions make shopping more interesting and encourage impulsive purchases (Purwianti et al., 2024). TAM asserts that users are more likely to make impulsive purchases on platforms that are simple to use (Karomi & Purwanto, 2024; Purwianti et al., 2024). Although perceived usefulness is significant, ease of use and the user's attitude toward technology have a greater direct influence on impulsive purchasing. A favorable perception of the platform improves the entire shopping experience and makes people more open to suggestions (Karomi & Purwanto, 2024).

Adopting recommendation systems requires trust because users who have faith in the platform are more likely to make impulsive purchases (Wang & Benbasat, 2004). According to Zhong-ying (2008), trust increases the sense of control over purchasing decisions, which in turn promotes more impulsive behavior. According to research from Sri Lanka and Indonesia, cultural differences affect how users engage with recommendation systems (Anwar, 2024; Arachchi & Samarasinghe, 2023). In addition to platform-specific

features like Shopee Paylater, the kind of product being recommended—fashion items, for example—also influences impulsive buying behavior (Anwar, 2024). Even though trust and ease of use are important considerations, other factors, such as customer mood and past online shopping experience, can influence impulsive purchasing more than technological factors (Khalid et al., 2018). Additionally, recommendation systems that elicit emotional impulses imply that emotional triggers in addition to rational utility considerations are the driving forces behind impulsive purchasing (Purwianti et al., 2024). By comprehending these dynamics, e-commerce platforms can create more efficient plans to control impulsive purchasing habits.

2.4. Conceptual Model

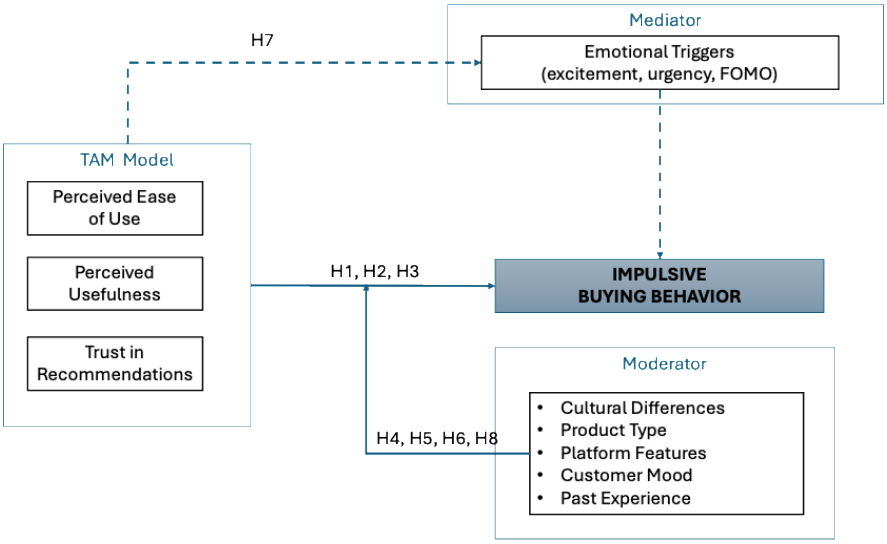

Figure 1. Conceptual Model

In accordance with the theoretical research framework delineated Figure 1 above, the proposed hypotheses are as follows.

H1: The perceived ease of use of recommendation algorithms positively influences impulsive purchasing behavior on e-commerce platforms.
H2: The perceived usefulness of recommendation algorithms positively influences impulsive purchasing behavior, but the effect is less significant than that of ease of use.
H3: Trust in recommendation systems positively influences impulsive purchasing behavior.
H4: Cultural differences influence how consumers interact with recommendation systems and their tendency to engage in impulsive buying.
H5: Product type (e.g., fashion vs. other categories) moderates the relationship between recommendation algorithms and impulsive buying behavior.
H6: Platform-specific features, such as payment options like Shopee Paylater, influence the likelihood of impulsive purchasing behavior.
H7: Emotional triggers induced by recommendation systems positively influence impulsive purchasing behavior.
H8: Customer mood and prior online shopping experience significantly moderate the relationship between recommendation algorithms and impulsive buying behavior.

3. METHODOLOGY

This study employed a Systematic Literature Review (SLR) approach. SLR systematically identifies, reviews, interprets, critically evaluates, and synthesizes existing research to transparently and rigorously

address relevant research questions (Pati & Lorusso, 2018). The SLR process follows the PSALSAR framework (Mengist et al., 2020), which comprises six key stages:

(1) **Protocol:** Establishing Research Scope
The researcher reviewed previous studies on the effectiveness of recommendation algorithms in influencing impulsive buying behavior on e-commerce platforms. Subsequently, the research questions were formulated as follows.
RQ1: How are impulsive purchasing behaviors on e-commerce platforms influenced by the elements of the TAM, such as perceived usefulness, perceived ease of use, and trust?
RQ2: What moderating factors affect how well recommendation algorithms drive impulsive buying behavior, such as cultural differences, product types, and platform features?
RQ3: How do consumer traits and emotional triggers (such as mood and prior shopping experience) impact the connection between recommendation algorithms and impulsive purchasing behavior?

(2) **Search:** Literature Retrieval
Literature searches were conducted using Publish or Perish (PoP) software accessing the Web of Science, Scopus, and Google Scholar databases. The search strategy employed a combination of keywords in English and Indonesian.

- "recommendation algorithm" AND "e-commerce" AND "impulse buying"
- "sistem rekomendasi" AND "pembelian impulsif" AND "e-commerce"
- "personalized recommendation" AND "consumer behavior"

The search parameters were limited to publications from to 2015-2025, encompassing journal articles, conference proceedings, and book chapters in both English and Indonesian.

(3) Appraisal: Quality and Relevance Assessment
This stage involved establishing screening criteria for literature selection, including the inclusion and exclusion criteria (see Table 1).

Table 1. Inclusion and Exclusion Criteria

Aspect	Inclusion Criteria	Exclusion Criteria
Topic	Recommendation algorithms in e-commerce and their impact on impulse buying	Does not discuss recommendation algorithms or focuses solely on consumer behavior
Language	Indonesian or English	Languages other than Indonesian and English
Publication Year	Published between 2015–2025	Published before 2015
Accessibility	Full-text available	Abstract only or full text not accessible
Methodology	Clear and valid methodology	Lacks detailed methodology or uses weak methods

Source: Processed from primary data (2025)

Articles that met the inclusion criteria were comprehensively evaluated to gather information on titles, data collection methods, research results, and conclusions. The data extraction process centered on the three research questions of this systematic literature review. Two independent reviewers checked all retrieved article titles, abstracts, and full texts against predetermined inclusion and exclusion criteria to guarantee methodological rigor and reduce selection bias. Disagreements were settled through dialogue until an agreement was reached. The use of dual independent screening, in conjunction with consensus discussions, improved the transparency and reliability of the study selection process.

(4) **Synthesis:** The findings from various studies are combined to identify key patterns and insights.
After removing duplicates, the 127 articles were reduced to 103 unique records. 42 articles were left for full-text review after 61 articles were filtered out based on their titles and abstracts because they did not meet topical or methodological requirements. Sixteen studies were included in the final synthesis after 26 studies were eliminated because they lacked sufficient methodological details or were not directly related to the research questions. The Covidence platform, which facilitates independent assessments, expedits duplicate detection, and documents conflict resolution, was used to manage the entire process.

(5) **Analysis:** Analyze the synthesized findings to test hypotheses or answer the research questions. To identify important trends and insights pertaining to the research questions, the findings from the chosen studies were combined. Classifying results according to TAM constructs, moderating factors, and consumer characteristics or emotional triggers was another step in the analytical process.
(6) **Report:** Compiling a report explaining the methodology, findings, conclusions, and recommendations to be presented to stakeholders (see Figure 2).

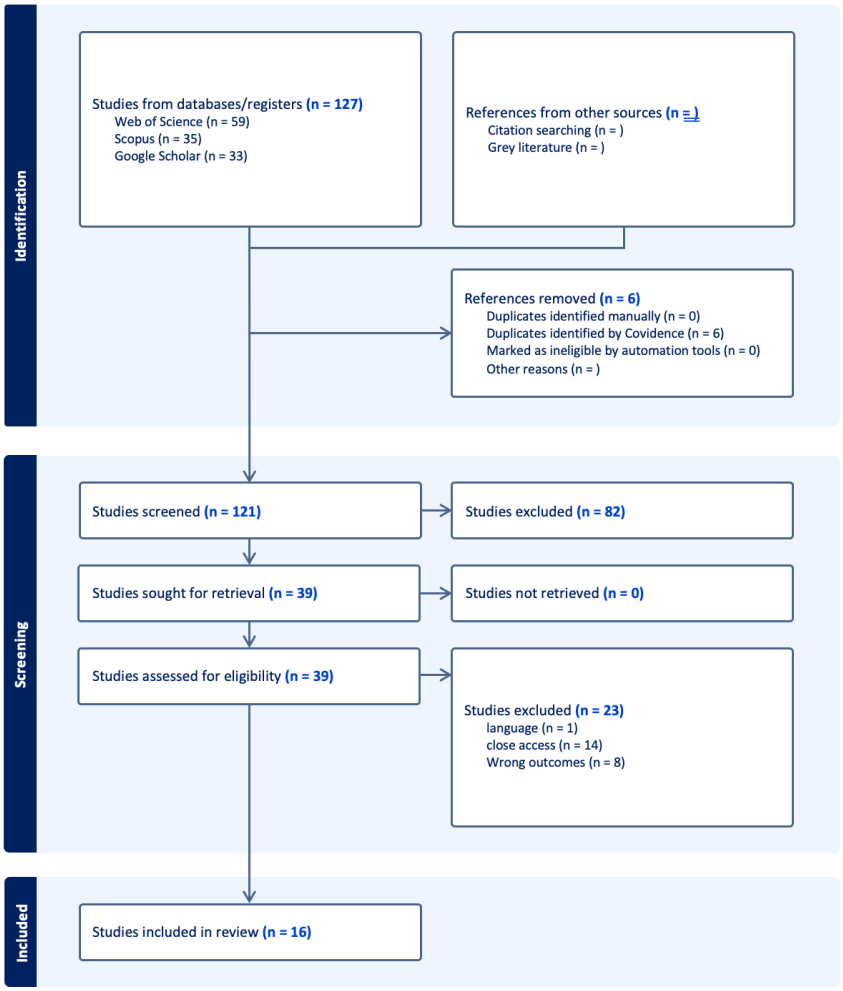

Figure 2. SLR Methodology

Source: *Processed from primary data (2025)*

4. RESULT AND DISCUSSION

4.1 Result

The table below shows the outcomes of the journal selection process that met the inclusion criteria. The journals were selected based on their relevance to the topic, how strongly their methods were, and how much they added to our understanding of the issue being studied. The purpose of this selection approach was to ensure that only the most relevant and high-quality materials were included. The goal of this research was to provide a more complete understanding of the topic being studied using this carefully chosen body of literature. It also aims to identify gaps in the research that need to be addressed in future studies.

Table 2. Included Studies based on Inclusion Criteria

No	Author	Objectives
1	(Ofem, 2024)	The study aims to bring together previous research on how algorithms affect people's emotional purchases in online shopping. It also aims to find and study the psychological triggers that algorithms use to make people buy things.
2	(Jeong et al., 2022)	The study's goals are to find out how personalized recommendation stimuli affect how customers act in an online setting and to improve the performance of recommender systems for customized Home Meal Replacement (HMR) goods.
3	(Amin, 2025)	The study's goals are to find out how people feel about AI-powered suggestions on social media sites and to look into how the exposure of AI-powered labels affects people's impulse purchases. This study looks into how differences between generations affect how people respond.
4	(Cui et al., 2022)	The study investigates how cognitive and perceptual inputs affect impulsive purchase through flow experience and examines the impact of personalized recommendations on impulsive purchases.
5	(Kundu et al., 2024)	The goal of the paper is to look at the strengths and growth of Bangladeshi e-commerce, looking at both past and present trends. .
6	(Patnaik et al., 2025)	The study's main goal is to find out how feelings affect personalized suggestions and how easy it is to use the system. It looks into how personalized goods affect how people feel and what they want to buy.
7	(Yun & Chun, 2024)	The study examines how personalized recommendations affect consumer purchasing intentions by assessing factors such information layout, recommendation mechanism, strength, precision, timeliness, and interactivity and how tailored recommendations affect customers' mind-flow experience and perceived trust, using them as mediating variables.
8	(Poleac & Gherguț-Babii, 2024)	The study examines how social media algorithms affect decision-making and participation, as well as their function in data curation and real-time customisation, notably regarding FOMO (fear of missing out).
9	(Choi et al., 2017)	The study aims to examine the effectiveness of social interaction factors in explaining personalized recommender systems (PRS) for smartphone applications. It investigates how social presence and self-referencing affect perceived accuracy and novelty of PRS
10	(Alawadh & Barnawi, 2025)	The article tries to improve shopping experience using Metaverse and machine learning predictions. The goal is to provide a framework for forecasting consumer behavior via association rule learning.
11	(Chandrasekhar et al., 2024)	The study compares impulse purchase frequency in physical locations, e-commerce sites, and mobile apps.
12	(Tee et al., 2023)	The study aims to explore TikTok's influence on consumer impulse purchase behavior in Malaysia using the S-O-R model. It investigates the relationship between visual appeal, product feasibility, perceived enjoyment, and perceived usefulnes
13	(Van & Ly, 2022)	The research paper aims to analyze the impact of online sales promotions on consumers' online impulsive buying decisions. It investigates the relationship between anticipated regret (both upward and downward) and online promotional activities.
14	(Pal, 2025)	The study intends to examine the psychological and technical aspects of impulsive buying in the digital environment and propose ways to promote healthy consumer behaviors.
15	(Roy et al., 2024)	The research aims to investigate AI's influence on impulsive buying behaviour in digital commerce. It explores how AI algorithms and marketing strategies reshape impulsive buying decisions
16	(Han, 2024)	The core objective of the research is to analyze the operational mechanism of personalized recommendations on the TikTok platform. It aims to evaluate the actual influence of these recommendations on the purchasing decisions of college students.

Source: *Processed from primary data (2025)*

The screening method identified 16 journals that met all the set inclusion criteria. The chosen papers will go deeper to find important information that answers the research questions in this study.

4.2 TAM and Impulse Buying: How Perceptions Drive E-Commerce Behavior

The three fundamental components of the Technology Acceptance Model (TAM)—perceived utility, perceived ease of use, and trust—have a major impact on impulsive buying behaviors on e-

commerce platforms. These factors influence how users engage in digital technologies, and are essential in promoting impulsive purchases. The perceived ease of use of recommendation algorithms is a big part of why people buy things on e-commerce sites without thinking about them. This is in line with Davis (1989) TAM, which says that ease of use and perceived usefulness are important for people to adopt new technology. Many studies show that interfaces that work well together and suggestions that are tailored to the user increase engagement and the chance of making an impulse purchase (Chandrasekhar et al., 2024). These systems make it easier for people to think clearly, which lets them act quickly and without much thought Rook (1987) foundational work supports this even more by finding situational cues and emotional triggers, like urgency and scarcity, that make people act on impulse. These are now actively built into recommendation systems (Ofem, 2024). Also, trust and social proof, which are often built through user-generated reviews, have been shown to boost consumer confidence, leading to more spontaneous purchases (Chandrasekhar et al., 2024).

However, careful examination shows that there are many inconsistencies and holes. Some studies, like (Tee et al., 2023), say that perceived usefulness is the most important factor in TikTok's algorithm ($\beta = 0.612$, $p < 0.01$). Others say that the ease of use is more important. This difference suggests that factors specific to a platform or context may affect the relationship between TAM variables and consumer behavior. This is an area that hasn't been studied much in cross-platform research (Khotimah & Febriansyah, 2018). People talk a lot about how accurate and user-friendly AI-driven recommendation systems are (Amin, 2025), but not much is said about how they affect users' cognitive load, privacy, or freedom. Platforms like TikTok may make it even harder for consumers to be aware of what's going on because people often act on their emotions instead of thinking things through (Hirschman & Stern, 1999).

From an ethical point of view, the literature does not do a good job of discussing the effects of exploiting people's psychological weaknesses. Recommendation systems are being increasingly optimized to take advantage of heuristics, such as FOMO, urgency, and social validation. This raises concerns regarding algorithmic persuasion and digital nudging. When users do not know what the algorithm is trying to do, these mechanisms make it difficult to distinguish between personalization and manipulation. Also, when people feel tricked or too influenced by these systems after they buy something, they often feel regret and cognitive dissonance (Ofem, 2024). Although people are becoming more worried, few studies provide frameworks for ethical design, openness, or consumer protection in this area. There is little research on regulatory oversight and algorithmic accountability, which is important as these systems become more common across platforms and demographics.

In summary, the literature mostly agrees that ease of use, perceived usefulness, and trust are important factors in impulsive purchases. However, it is still unclear how these factors affect different platforms, ethical issues, and user awareness. To gain a better understanding of how recommendation systems affect consumer autonomy and how they can be regulated to protect users while still meeting business goals, future studies should take an interdisciplinary approach that includes behavioral economics, digital ethics, and AI governance.

4.3 Mediating and Moderating Variables

Generational differences, platform features, emotional triggers, and moderators all play a role in how AI-powered recommendation algorithms affect impulsive buying behavior. Older generations, such Millennials and Gen X, are more likely to respond to tailored recommendations than younger generations, like Gen Z (Amin, 2025). However, other studies have stated that Gen Z is also responsive to these recommendations. Platform elements, including how recommendations are automatically added to social media feeds, are a big part of how impulsivity is increased by getting around rational reasoning (Amin, 2025; Roy et al., 2024). However, we still do not know enough about how user interface design and other platform aspects affect impulsive buying behavior. Emotional triggers like urgency, scarcity, and social proof make people buy things on impulse much more often, especially when the products are visually appealing, like fashion (Ofem, 2024; Pal, 2025). Personalized recommendations typically make people feel

good, but buyers' regret and financial stress—especially with systems such as Shopee Paylater—are becoming more of a problem, although they have not been studied enough in the literature.

Generational differences remained a significant factor. Younger people, including Millennials and Gen Z, are more likely to buy things on impulse after seeing AI-generated recommendations. On the other hand, older customers are more likely to be dubious, which affects how they make decisions and buy things (Amin, 2025; Choi et al., 2017; Cui et al., 2022). Flow experience is also very important. This occurs when users feel involved in their purchasing trips. When product suggestions are very similar to what a person likes, they make them more engaged and more inclined to buy something on impulse (Cui et al., 2022; Han, 2024). Fear of missing out (FOMO) and social validation make these impulsive behaviors even stronger, especially when people are given limited-time deals or told that supply is running low (Amin, 2025; Choi et al., 2017; Pal, 2025).

In addition, how often people use platforms is a major factor in how impulsively they act. People who use TikTok and Instagram a lot are more likely to make impulsive purchases because they are constantly exposed to personalized content (Poleac & Gherguț-Babii, 2024; Yun & Chun, 2024). Income levels and other economic characteristics can play a role in impulsive buying behavior. Wealthier people are more likely to make impulse purchase, especially for expensive things (Choi et al., 2017; Yun & Chun, 2024). From an ethical point of view, concerns about privacy, buyers' remorse, and financial trouble are very important, but generally ignored. The use of personal data for recommendation algorithms poses privacy concerns, and buyers' remorse and financial problems can hurt consumer trust and long-term participation. Future studies should examine these ethical issues, particularly the long-term effects of buying things on a whim. It should also work on creating rules that safeguard consumers while making algorithms operate properly.

5. CONCLUSION

This study analyzes the effectiveness of recommendation algorithms in influencing impulsive buying behavior on e-commerce platforms. A thorough and systematic analysis of the literature showed that algorithms that use personalization methods, such as collaborative filtering, content-based filtering, and artificial intelligence, significantly enhance impulsive buying tendencies. Effective personalization can reduce consumers' cognitive load and increase their confidence in making unplanned purchases. Limited time offers, social proof, and emotional triggers such as excitement and urgency reinforce this behavior. Flow experience and positive emotional states combined with moderating variables such as age differences, social media dependence, user engagement, and economic status significantly shape the degree to which recommendation algorithms influence impulsive purchases.

However, this study had several limitations. First, the literature examined spans 2015 to 2025, which may exclude more recent technological advancements in recommendation algorithms. Second, although a systematic review approach was applied, potential selection bias in the included studies could have affected the reliability of the findings. Third, this study did not directly test these algorithms on specific e-commerce platforms, which may limit the real-world applicability of the results. Importantly, the study primarily emphasizes positive impacts and does not sufficiently address ethical concerns, such as the potential for manipulation, invasion of privacy, buyers' remorse, or financial distress resulting from impulsive buying. These factors warrant further investigation to ensure that consumers' well-being is not compromised. Additionally, contextual factors such as cultural differences, product categories, and platform-specific features (Shopee PayLater and TikTok integration) that may influence algorithm effectiveness have not been thoroughly explored, thus limiting the generalizability of the conclusions across diverse markets and user environments.

Despite these limitations, this study offers valuable insights for algorithm developers and digital marketers. This emphasizes the importance of continuously improving personalization while ensuring ethical transparency to avoid consumer manipulation. Limited time offers and social proof should be used responsibly to maintain user trust. Marketers should also incorporate mediating and moderating variables such as emotional responses, user flow experience, generational characteristics, platform habits, and

socioeconomic conditions into the design of ethical and effective marketing strategies. Future studies should adopt a more interdisciplinary approach that integrates digital ethics, behavioral economics, and cross-cultural perspectives to safeguard consumer autonomy while optimizing algorithm performance.

Ethical Approval
Ethical approval was not required for this study.

Informed Consent Statement
Informed consent was not obtained for this study.

Author Contributions
Nuriya Fadilah was responsible for conceptualizing the research framework, developing the methodology, and drafting the initial manuscript. Itaul Masarroh contributed to data collection, formal analysis, and interpretation of the results. Muhammad Alkirom Wildan assisted in literature review, provided critical revisions to enhance academic rigor, and supported the final editing process. All authors reviewed and approved the final version of the manuscript, with Nuriya Fadilah serving as the corresponding author.

Disclosure Statement
No potential conflicts of interest were reported by the authors.

Data Availability Statement
The data presented in this study are available upon request from the corresponding author for privacy reasons.

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Notes on Contributions

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