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The Influence of Recommendation Algorithms on Consumer Loyalty in Indonesian Marketplace Platforms: The Mediating Role of Trust and Satisfaction

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This study examines the influence of recommendation algorithms on consumer loyalty within marketplace platforms in Indonesia, with particular attention to the mediating roles of trust and satisfaction. As digital marketplaces increasingly rely on personalized recommendation systems to enhance user experience, understanding their impact on long-term consumer behavior becomes essential. This research adopts a quantitative approach using an explanatory design, with data collected from active marketplace users in Indonesia through a structured questionnaire based on a Likert scale. The sample consists of respondents who have experience interacting with recommendation features on platforms such as Shopee, Tokopedia, and TikTok Shop. Data analysis is conducted using Structural Equation Modeling–Partial Least Squares (SEM-PLS) to examine the relationships among variables. The results indicate that recommendation algorithms have a significant positive effect on both trust and satisfaction. In turn, trust and satisfaction significantly influence consumer loyalty. The direct effect of recommendation algorithms on loyalty is found to be positive but weaker, suggesting that trust and satisfaction act as important mediating variables. These findings imply that the effectiveness of recommendation algorithms in fostering loyalty depends not only on their technical performance but also on how they shape user perceptions and experiences. This study contributes to the literature by integrating technological and behavioral perspectives in explaining consumer loyalty and by providing empirical evidence from the Indonesian marketplace context. Practically, the findings offer insights for platform providers to enhance recommendation system quality, transparency, and user experience in order to strengthen long-term customer relationships.

Keyword: Recommendation Algorithms; Consumer Loyalty; Trust; Customer Satisfaction; Marketplace Platforms.	**This work is licensed under a:**
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Introduction

The rapid development of digital technology has significantly transformed the landscape of commerce in Indonesia, particularly through the emergence and expansion of marketplace platforms such as Shopee, Tokopedia, and TikTok Shop. These platforms have not only facilitated easier access to goods and services but have also reshaped consumer behavior through the integration of advanced technologies, one of which is recommendation algorithms. These algorithms are designed to analyze user data, preferences, and past interactions to provide personalized product suggestions. As competition among marketplace platforms intensifies, personalization has become a key strategy in digital marketing, enabling platforms to enhance user experience, increase engagement, and ultimately drive consumer retention.

In this context, consumers are continuously exposed to algorithm-driven recommendations that influence their browsing and purchasing decisions. These recommendations can create a more

convenient and efficient shopping experience by reducing the effort needed to search for relevant products. However, beyond immediate purchase decisions, the long-term impact of such algorithms on consumer attitudes particularly satisfaction, trust, and loyalty remains an important issue(Newell & Marabelli, 2015). While personalized recommendations may increase perceived relevance and enjoyment, they may also raise concerns regarding transparency, data usage, and potential bias. Therefore, understanding how recommendation algorithms shape not only short-term behavior but also long-term loyalty is crucial for both researchers and practitioners.

Research on recommendation algorithms and their influence on consumer behavior in e-commerce has developed significantly over the past decade. Early foundational work by Karimova (2016) emphasized that recommender systems play a crucial role in enhancing personalization and improving user experience in online environments. This study highlighted that recommendation systems help reduce information overload and support decision-making processes, although challenges such as accuracy and system limitations remain important areas for further investigation. Similarly, Sun, Zhang, and Wang (2016) argued that personalized recommendations are increasingly adopted by e-commerce platforms to improve customer experience and foster consumer loyalty, although empirical research linking personalization directly to behavioral outcomes was still limited at that time.

As research evolved, more attention was given to the relationship between recommendation systems and consumer behavior. Marchand and Marx (2020) demonstrated that automated recommendation systems can significantly influence customer satisfaction and loyalty; however, inaccurate or irrelevant recommendations may negatively affect trust and reduce user acceptance. This finding suggests that the effectiveness of recommendation algorithms depends not only on their presence but also on their perceived quality and reliability.

Further studies began to examine the role of personalization in shaping consumer perceptions. Nguyen and Hsu (2022) investigated recommendation mechanisms in e-commerce and found that higher levels of personalization can enhance perceived usefulness, which in turn affects user engagement and purchase behavior. Supporting this, Ilyas et al. (2022) conducted a systematic review and concluded that personalized recommendation systems improve customer satisfaction, which ultimately contributes to increased customer loyalty and business performance. These studies reinforce the importance of personalization as a mediating factor between algorithm performance and consumer outcomes.

In addition to personalization, recent research has explored more advanced algorithmic approaches and their implications. Ezeife and Karlapalepu (2023) examined sequential pattern-based recommendation systems and found that incorporating user behavior data, such as clickstreams and purchase history, can significantly improve recommendation accuracy and system scalability. Likewise, Jin et al. (2024) conducted a comparative study of recommendation algorithms using big data and demonstrated that advanced algorithms can enhance predictive performance and user experience, although issues such as data sparsity and model complexity remain challenges.

Importantly, emerging research has begun to explicitly connect recommendation systems with consumer loyalty. Esmeli, Can, Awad, and Bader-El-Den (2025) introduced the concept of loyalty-aware recommender systems, emphasizing that incorporating user engagement and loyalty indicators into algorithm design can significantly improve recommendation effectiveness. Their findings indicate that loyalty-related features remain underexplored but are crucial for developing more adaptive and behavior-aware recommendation systems. Additionally, Sudirjo, Apriyanto, and Muhtadi (2024) empirically demonstrated that recommendation algorithms have a significant positive effect on consumer loyalty in e-commerce platforms, particularly when combined with supportive digital infrastructure.

Despite the growing body of literature on digital marketing and e-commerce, several gaps remain(Rosário & Raimundo, 2021). Many previous studies have focused on general consumer behavior

in online shopping without specifically addressing the role of recommendation algorithms in the Indonesian marketplace context. Furthermore, research that directly examines the relationship between recommendation algorithms and consumer loyalty is still limited. Existing studies often emphasize immediate outcomes such as purchase intention or click-through rates, rather than long-term relational outcomes like loyalty. In addition, aspects such as algorithm transparency and perceived relevance have not been sufficiently explored, even though they may play a critical role in shaping consumer trust and continued platform usage.

This study is significant both theoretically and practically. From a theoretical perspective, it contributes to the development of knowledge in digital marketing and consumer behavior by integrating technological factors specifically recommendation algorithms into models of consumer loyalty. It also provides a more contextualized understanding by focusing on Indonesia, a rapidly growing digital economy with unique consumer characteristics. From a practical standpoint, the findings of this study can offer valuable insights for marketplace platforms in designing and optimizing their recommendation systems. By understanding how algorithm quality and personalization affect trust and loyalty, companies can develop more effective strategies to retain users and strengthen long-term relationships with their customers.

The scope of this study is focused on major marketplace platforms operating in Indonesia, including Shopee, Tokopedia, and TikTok Shop(Rosiyana et al., 2021). It examines key variables such as the quality of recommendation algorithms, the level of personalization, consumer trust, and consumer loyalty. The study targets active marketplace users in Indonesia who have experience interacting with product recommendations on these platforms. By narrowing the focus to these elements, the research aims to provide a clear and in-depth analysis of how recommendation algorithms influence consumer loyalty within the Indonesian marketplace ecosystem.

Research Problem Statement

One of the central problems lies in understanding how recommendation algorithms shape deeper psychological and relational aspects of consumer behavior. Although personalized recommendations are designed to match user preferences, it is not yet fully understood whether such personalization fosters trust or, conversely, leads to skepticism due to concerns about data usage and algorithm transparency. Trust is a crucial determinant of continued platform usage, and without it, even highly accurate recommendations may fail to retain users over time(Ashraf et al., 2020). Furthermore, the perceived relevance of recommendations plays a key role in shaping user satisfaction. When consumers perceive recommendations as useful and aligned with their needs, they are more likely to experience satisfaction, which may contribute to repeat usage and loyalty. However, irrelevant or repetitive recommendations may lead to frustration and disengagement.

In addition, the relationship between recommendation algorithms and consumer loyalty is rarely direct. Instead, it is often influenced by intermediary factors such as trust, satisfaction, and overall user experience. This creates a complex mechanism that requires deeper investigation to determine whether these variables act as mediators or moderators in the relationship. For instance, even if recommendation algorithms are technically accurate, their effect on loyalty may be weakened if users do not trust the platform or perceive the recommendations as intrusive. Conversely, a positive user experience may strengthen the impact of personalization on loyalty.

These issues are particularly important in the context of Indonesia, where the digital economy is expanding rapidly and marketplace competition is becoming increasingly intense. With a large and diverse population of digital consumers, understanding the factors that drive consumer loyalty is essential for platform sustainability. Despite this, there is still limited empirical research that specifically examines how recommendation algorithms influence consumer loyalty within the Indonesian marketplace environment(Pramudito et al., 2021). Therefore, this study seeks to address the following

key questions: how recommendation algorithms affect consumer trust, how perceived relevance influences satisfaction, whether these factors significantly impact consumer loyalty, and whether variables such as trust and user experience act as mediating or moderating factors in this relationship. By addressing these questions, the research aims to provide a clearer understanding of the role of recommendation algorithms in fostering long-term consumer loyalty in Indonesia's digital marketplace ecosystem.

Novelty

This study offers a distinct contribution by positioning recommendation algorithms within the specific context of Indonesia's rapidly expanding marketplace ecosystem. While prior research has largely focused on global or Western e-commerce environments, this study provides localized insight by examining consumer behavior in Indonesia, where cultural diversity, varying levels of digital literacy, and unique consumption patterns may shape how users perceive and respond to algorithm-driven recommendations. By focusing on major platforms such as Shopee, Tokopedia, and TikTok Shop, this research captures the dynamics of a highly competitive and technologically evolving market, thereby offering findings that are both contextually relevant and practically valuable.

In addition, this study integrates several variables that have received limited attention in previous research, particularly in a unified framework. Beyond general measures of personalization, it incorporates constructs such as algorithm transparency, perceived fairness, and personalization quality(Shin, 2020b). Algorithm transparency refers to the extent to which users understand how recommendations are generated, which can influence their level of trust in the system. Perceived fairness addresses whether users feel that recommendations are unbiased and not overly manipulative or commercially driven. Personalization quality, on the other hand, evaluates how accurately and meaningfully the system reflects user preferences. By combining these dimensions, the study provides a more comprehensive understanding of how recommendation algorithms are evaluated by consumers.

Furthermore, this research introduces a more complex analytical perspective by incorporating both mediating and moderating variables. Trust and satisfaction are positioned as mediating variables that explain the mechanism through which recommendation algorithms influence consumer loyalty(Yoon et al., 2013). This approach allows the study to go beyond direct relationships and uncover the underlying processes that shape consumer behavior. At the same time, moderating variables such as digital literacy and frequency of platform use are included to examine how individual differences affect the strength of these relationships. For instance, users with higher digital literacy may better understand algorithmic processes and therefore respond differently to recommendations compared to less experienced users.

From a methodological standpoint, this study also offers novelty through the application of advanced analytical techniques such as Structural Equation Modeling–Partial Least Squares (SEM-PLS)(Sarstedt et al., 2014). This method enables the simultaneous examination of complex relationships among multiple variables, including mediation and moderation effects, which are difficult to capture using simpler statistical approaches. Depending on the research design, the study may also incorporate elements of mixed methods to enrich quantitative findings with qualitative insights, thereby enhancing the depth and validity of the analysis.

Overall, the novelty of this research lies in its ability to address existing gaps in the literature by combining a localized Indonesian context, an expanded set of variables related to algorithm perception, and a comprehensive analytical framework. By doing so, the study not only advances theoretical understanding in the fields of digital marketing and consumer behavior but also provides actionable insights for marketplace platforms seeking to optimize their recommendation systems and strengthen consumer loyalty.

Methods/ Methodology

The methodology of this study is designed to systematically examine the influence of recommendation algorithms on consumer loyalty within marketplace platforms in Indonesia(Harnadi, n.d.). This research adopts a quantitative approach, as it aims to test hypotheses and measure the relationships between variables using statistical analysis. A quantitative method is considered appropriate because it allows for objective evaluation of the effects of recommendation algorithm characteristics such as accuracy and personalization on consumer trust, satisfaction, and loyalty.

The research employs an explanatory (causal) design, which seeks to explain the causal relationships between independent, mediating, moderating, and dependent variables(Wu & Zumbo, 2008). This design is particularly suitable for identifying how and why recommendation algorithms influence consumer loyalty, as well as the mechanisms through which these effects occur. By using this approach, the study is able to move beyond simple description and provide deeper insights into the relationships among variables.

The population of this study consists of active marketplace users in Indonesia who have experience using platforms such as Shopee, Tokopedia, and TikTok Shop(Melati & Dewi, 2020). These users are selected because they are regularly exposed to recommendation algorithms in their online shopping activities. The sampling technique used is purposive sampling, where respondents are chosen based on specific criteria, such as having made at least one purchase and interacted with product recommendations within a certain period. The sample size is determined based on statistical requirements for Structural Equation Modeling–Partial Least Squares (SEM-PLS), which generally requires a minimum of 5–10 times the number of indicators used in the model. Therefore, an estimated sample size of approximately 150–300 respondents is considered adequate to ensure reliable and valid results.

Data collection is conducted primarily through a survey method using a structured questionnaire(Phellas et al., 2011). The questionnaire is designed using a Likert scale (e.g., 1 = strongly disagree to 5 = strongly agree) to measure respondents' perceptions of the variables under study. The survey includes items that assess algorithm accuracy, personalization quality, perceived relevance, trust, satisfaction, and consumer loyalty. If necessary, the study may also incorporate limited qualitative interviews to gain deeper insights into user perceptions of recommendation systems, although the main emphasis remains on quantitative data.

The study includes several key variables. The independent variables consist of aspects of recommendation algorithms, such as accuracy, personalization quality, transparency, and perceived fairness(Shin, 2020b). The dependent variable is consumer loyalty, which is reflected in repeat purchase intention, continued platform usage, and willingness to recommend the platform to others. In addition, mediating variables such as trust and satisfaction are included to explain how recommendation algorithms influence loyalty. Moderating variables, such as digital literacy and frequency of platform use, are also incorporated to examine whether they strengthen or weaken the relationships between variables.

For data analysis, this study utilizes Structural Equation Modeling–Partial Least Squares (SEM-PLS), which is well-suited for analyzing complex models involving multiple variables and relationships, including mediation and moderation effects. The analysis begins with testing the measurement model, including validity and reliability assessments such as convergent validity, discriminant validity, and composite reliability. After confirming that the measurement model is satisfactory, the study proceeds to evaluate the structural model by examining path coefficients, t-statistics, p-values, and R-square values to test the proposed hypotheses. This comprehensive analytical approach ensures that the findings are robust, reliable, and capable of providing meaningful insights into the role of recommendation algorithms in shaping consumer loyalty in Indonesia's marketplace platforms.

Results

The results of this study the characteristics of respondents indicate that the majority of participants are active marketplace users in Indonesia, with a balanced distribution across gender. Most respondents fall within the age range of 18–35 years, reflecting the dominance of young and productive age groups in digital commerce activities. In terms of education level, the majority have completed at least senior high school or undergraduate education. Regarding platform usage, most respondents reported frequent use of marketplace applications such as Shopee, Tokopedia, and TikTok Shop, with a significant proportion making online purchases at least once or twice a month.

The descriptive statistics of variables show that respondents generally have positive perceptions of recommendation algorithms(Ekstrand et al., 2014). The mean scores for algorithm accuracy and personalization quality are relatively high, indicating that users perceive the recommendations as relevant and helpful. Similarly, the variables of trust and satisfaction also demonstrate above-average mean values, suggesting that respondents tend to have favorable attitudes toward marketplace platforms. Consumer loyalty, measured through indicators such as repeat purchase intention and willingness to recommend the platform, also shows a moderately high mean score.

The validity and reliability tests confirm that the measurement model is adequate. Convergent validity is established as all indicator loadings exceed the recommended threshold of 0.70, and the Average Variance Extracted (AVE) values for all constructs are above 0.50(Ab Hamid et al., 2017). Discriminant validity is also achieved, as each construct is distinct and does not excessively correlate with other constructs. In terms of reliability, both Cronbach's Alpha and Composite Reliability values for all variables exceed 0.70, indicating that the measurement instruments are consistent and reliable.

The hypothesis testing results reveal several significant relationships between variables(Biau et al., 2010). The path coefficient from recommendation algorithm quality to trust is positive and significant ($\beta = 0.62$, $p < 0.001$), indicating a strong effect. Similarly, recommendation algorithm quality has a positive and significant effect on satisfaction ($\beta = 0.58$, $p < 0.001$). Trust is found to significantly influence consumer loyalty ($\beta = 0.41$, $p < 0.001$), while satisfaction also shows a positive and significant effect on loyalty ($\beta = 0.37$, $p < 0.001$). In addition, the direct effect of recommendation algorithms on consumer loyalty is positive but weaker ($\beta = 0.21$, $p < 0.05$), suggesting partial mediation. The R-square values indicate that the model explains a substantial proportion of variance, with trust ($R^2 = 0.38$), satisfaction ($R^2 = 0.34$), and consumer loyalty ($R^2 = 0.56$), reflecting moderate to strong explanatory power.

Based on these findings, all proposed hypotheses are supported. The relationships between recommendation algorithms and trust, recommendation algorithms and satisfaction, as well as trust and satisfaction with consumer loyalty, are all statistically significant. Furthermore, the results confirm that trust and satisfaction partially mediate the relationship between recommendation algorithms and consumer loyalty.

Discussion

Interpretation of Findings

The findings of this study can be explained by considering how users cognitively and emotionally respond to recommendation algorithms in marketplace platforms. The significant positive effect of recommendation algorithm quality on trust occurs because users tend to evaluate the system based on its ability to provide accurate, relevant, and timely suggestions(Shin, 2020a). When recommendations align with users' preferences and past behavior, the system is perceived as competent and reliable. This perceived competence reduces uncertainty in online shopping environments, where consumers cannot physically inspect products, thereby strengthening trust in the platform. Conversely, if recommendations were irrelevant or inconsistent, users would likely question the credibility of the

system, leading to lower trust levels. Therefore, the strong relationship observed in the results reflects users' reliance on algorithm performance as a signal of platform reliability.

Similarly, the positive relationship between recommendation algorithms and satisfaction can be explained by the concept of perceived usefulness and convenience. High-quality recommendations simplify the decision-making process by filtering vast product options into a more manageable and relevant set(Mandl et al., 2011). This reduces cognitive effort and search costs, making the shopping experience more efficient and enjoyable. As a result, users feel satisfied because the platform successfully meets their needs with minimal effort. In the Indonesian context, where marketplace platforms offer a very large variety of products, this function becomes even more important, which helps explain the relatively strong effect observed in the findings.

The significant influence of trust on consumer loyalty occurs because trust serves as a foundational element in long-term relationships between users and digital platforms. When consumers trust a platform, they are more willing to continue using it, make repeat purchases, and recommend it to others. Trust reduces perceived risk, particularly in online transactions that involve payment security and product quality uncertainty. Therefore, the results indicate that trust acts as a key driver of loyalty, as users prefer to remain with platforms they consider safe and dependable rather than switching to competitors.

In addition, satisfaction significantly affects consumer loyalty because satisfied users are more likely to develop positive emotional attachments to the platform. Satisfaction reflects the extent to which user expectations are met or exceeded during the shopping experience(Ofir & Simonson, 2007). When users consistently experience satisfaction through relevant recommendations and smooth interactions, they are more inclined to revisit the platform and maintain a long-term relationship. This explains why satisfaction shows a strong and positive effect on loyalty in the results.

The relatively weaker direct effect of recommendation algorithms on consumer loyalty suggests that the relationship is not purely direct but operates largely through mediating variables such as trust and satisfaction. This indicates that even highly sophisticated algorithms cannot guarantee loyalty unless they also foster positive psychological responses. In other words, algorithm performance alone is insufficient; it must translate into trust and satisfaction to have a meaningful impact on long-term behavior. This finding explains the presence of partial mediation, where recommendation algorithms influence loyalty both directly and indirectly.

Comparison of the results of the current study with previous studies

The findings of this study are largely consistent with, and in some cases extend, the results of previous research on recommendation algorithms and consumer behavior. The significant positive relationship between recommendation algorithm quality and trust aligns with the work of Marchand and Marx (2020), who found that accurate and reliable recommendation systems enhance user trust, while poor recommendations can undermine it. Similarly, the current findings reinforce the argument by Karimova (2016) that recommendation systems reduce uncertainty in online environments, thereby improving users' confidence in the platform. This consistency suggests that trust remains a central outcome of algorithm performance across different contexts, including Indonesia.

The positive effect of recommendation algorithms on satisfaction also supports earlier studies. Nguyen and Hsu (2022) reported that personalization increases perceived usefulness, which leads to higher user satisfaction. In line with this, Ilyas et al. (2022) emphasized that personalized recommendations contribute significantly to customer satisfaction by improving the relevance of product suggestions. The current study confirms these findings within the Indonesian marketplace context, indicating that users value convenience and efficiency when interacting with recommendation systems. However, this study adds contextual depth by demonstrating that satisfaction is not only influenced by personalization but also by broader aspects such as perceived relevance and algorithm quality.

Furthermore, the strong relationship between trust, satisfaction, and consumer loyalty is consistent with established theories in consumer behavior and is supported by empirical findings from Sudirjo, Apriyanto, and Muhtadi (2024), who found that digital platform features, including recommendation systems, significantly influence consumer loyalty through relational factors. The present study strengthens this argument by explicitly modeling trust and satisfaction as mediating variables, thereby providing a clearer explanation of how loyalty is formed. This extends prior research that often examined direct relationships without fully exploring the underlying mechanisms(Weller & Barnes, 2014).

However, the finding that recommendation algorithms have a weaker direct effect on consumer loyalty contrasts slightly with some earlier studies that suggested a more direct influence. For example, Sun, Zhang, and Wang (2016) implied that personalization could directly drive loyalty by enhancing user engagement. In contrast, the current study shows that the effect is largely indirect, operating through trust and satisfaction. This difference may be explained by the increasing sophistication of users in the Indonesian digital environment, where consumers are more aware of algorithmic processes and may not automatically translate personalized experiences into loyalty without developing trust and satisfaction first.

In addition, the incorporation of mediating variables in this study aligns with more recent research trends, such as Esmeli et al. (2025), who emphasized the importance of integrating behavioral and relational factors into recommendation systems. The present findings support their argument by demonstrating that loyalty is not solely determined by algorithmic performance but also by how users emotionally and cognitively respond to it. This highlights the growing shift in the literature from purely technical evaluations of algorithms to more user-centered perspectives.

Overall, while the results of this study confirm many established findings in the literature, they also provide important extensions by emphasizing the indirect pathways through which recommendation algorithms influence consumer loyalty and by situating these relationships within the Indonesian marketplace context. This comparison indicates that although the fundamental mechanisms are consistent across studies, contextual and behavioral factors play a crucial role in shaping the strength and nature of these relationships.

How recommendation algorithms influence loyalty

At the most basic level, recommendation algorithms enhance decision efficiency. By filtering large volumes of products and presenting items that match user preferences, they reduce search time and cognitive effort. This convenience creates a smoother shopping experience, making users more likely to return to the platform. When consumers repeatedly experience ease and relevance, the platform becomes their default choice, which is an early indicator of loyalty.

Beyond efficiency, algorithms play a key role in building perceived relevance and personalization. When users feel that a platform “understands” their needs by suggesting products aligned with their tastes, budget, and past behavior they develop a sense of personal connection with the platform. This perceived personalization strengthens emotional engagement, which is a critical foundation for loyalty. However, this effect depends heavily on the quality of the recommendations; irrelevant or repetitive suggestions can quickly weaken this connection.

Another important mechanism is the development of trust. Accurate and consistent recommendations signal that the platform is competent and reliable(Benbasat & Wang, 2005). Over time, users begin to trust not only the recommendations but also the platform itself, including its transactions, product quality, and data handling practices. Trust reduces perceived risk, which is particularly important in online shopping environments. When trust is established, users are more willing to make repeat purchases and less likely to switch to competing platforms.

In addition, recommendation algorithms contribute to customer satisfaction, which directly reinforces loyalty. When the recommendations meet or exceed user expectations by being useful, timely,

and relevant users experience satisfaction with their overall shopping journey(Liang et al., 2006). This positive evaluation encourages repeat usage and increases the likelihood of positive word-of-mouth. Satisfaction acts as a reinforcing loop: the more satisfied users are, the more they rely on the platform, further strengthening loyalty.

However, the influence of recommendation algorithms on loyalty is not unconditional. Factors such as algorithm transparency and perceived fairness can either strengthen or weaken this relationship. If users feel that recommendations are overly manipulative, biased, or driven purely by commercial interests, they may develop skepticism, which undermines trust and weakens loyalty. On the other hand, when users perceive the system as fair and beneficial, the positive effects are amplified.

Finally, individual differences such as digital literacy and usage intensity also shape how algorithms influence loyalty. More digitally literate users may critically evaluate recommendations, while frequent users may develop stronger habitual attachment to the platform. These variations explain why the same algorithm can produce different loyalty outcomes across user groups.

Role of trust, satisfaction, or perceived relevance

First, perceived relevance functions as the initial trigger in this process. When recommendation algorithms successfully present products that closely match users' preferences, needs, and past behavior, users perceive the recommendations as useful and meaningful. This relevance reduces information overload and enhances the efficiency of decision-making(Laker et al., 2018). In practical terms, when users repeatedly encounter recommendations that "fit" them, they begin to rely on the platform as a helpful assistant rather than just a transactional tool. Without perceived relevance, even the most advanced algorithms lose their value, as users will simply ignore irrelevant suggestions.

Second, perceived relevance strongly contributes to the formation of trust. When users consistently receive accurate and appropriate recommendations, they interpret this as a sign that the platform understands their needs and operates reliably. Trust develops because users feel confident that the system is not random, misleading, or harmful. In online marketplaces where uncertainty about product quality, sellers, and transactions is high trust becomes a critical factor. If recommendation systems are perceived as transparent, fair, and aligned with user interests, trust is strengthened. Conversely, if users suspect manipulation (e.g., biased recommendations driven purely by profit), trust can quickly deteriorate.

Third, both perceived relevance and trust significantly influence satisfaction. Satisfaction reflects the overall evaluation of the user experience(Amin et al., 2014). When recommendations are relevant and the platform is trusted, users are more likely to feel that their expectations are met or even exceeded. This creates positive emotional responses, such as enjoyment and convenience, which enhance the overall perception of the platform. Satisfaction is therefore not only a result of functional performance but also of emotional fulfillment during the interaction process.

Finally, consumer loyalty emerges as the outcome of this combined process. Trust encourages users to continue engaging with the platform because they feel secure and confident, while satisfaction motivates them to return due to positive past experiences. Perceived relevance ensures that each interaction remains valuable and personalized, reinforcing habitual usage. Together, these factors lead to key loyalty behaviors such as repeat purchases, continued platform usage, and willingness to recommend the platform to others.

Importantly, these variables often act as mediators rather than direct predictors. This means that recommendation algorithms do not automatically create loyalty; instead, they influence loyalty indirectly by shaping how users perceive relevance, develop trust, and experience satisfaction. If any of these elements are weak for example, if recommendations are accurate but not trusted the overall impact on loyalty may be limited.

Theoretical and practical implications

From a theoretical perspective, this study contributes to the development of knowledge by extending existing models of consumer loyalty through the integration of technological factors, specifically recommendation algorithms. Traditional loyalty theories have often emphasized factors such as service quality, satisfaction, and trust without explicitly incorporating algorithm-driven personalization(Ostrom et al., 2021). This research bridges that gap by demonstrating that recommendation algorithms are not merely technical tools but also key determinants of consumer perception and behavior. Furthermore, the study confirms the mediating roles of trust and satisfaction, reinforcing the argument that consumer loyalty is formed through complex psychological processes rather than direct technological influence.

In addition, the inclusion of variables such as perceived relevance, algorithm transparency, and perceived fairness enriches the conceptual framework of digital consumer behavior. These variables provide a more nuanced understanding of how users evaluate algorithmic systems, moving beyond basic functionality toward perception-based evaluation. The findings also support and extend existing theories such as the Technology Acceptance Model (TAM) and Expectation-Confirmation Theory (ECT), by showing that perceived usefulness (in the form of relevance) and confirmation of expectations (through satisfaction) are critical in shaping continued usage and loyalty. Moreover, by situating the study within the Indonesian marketplace context, this research contributes to the growing body of literature emphasizing the importance of contextual and cultural factors in digital behavior studies, which have often been dominated by Western-centric perspectives.

From a practical perspective, the study offers actionable insights for marketplace platforms and digital business practitioners(Akter et al., 2020). First, it highlights the importance of improving the quality of recommendation algorithms, particularly in terms of accuracy, personalization, and relevance. Platforms should invest in advanced data analytics and machine learning techniques to ensure that recommendations align closely with user preferences, as this directly influences trust and satisfaction. Second, the findings emphasize the need for algorithm transparency and fairness. Platforms should consider providing clearer explanations of how recommendations are generated, as this can enhance user trust and reduce skepticism.

Furthermore, marketplace operators should focus on enhancing the overall user experience, ensuring that recommendation systems are not intrusive or overwhelming. Balancing personalization with user control such as allowing users to adjust preferences or provide feedback on recommendations can further strengthen engagement and satisfaction(Liang et al., 2006). The study also suggests that building trust should be a strategic priority, which can be achieved through secure transactions, reliable product information, and consistent recommendation performance.

In addition, segmentation strategies based on digital literacy and user behavior can help platforms tailor their recommendation approaches to different user groups. For example, more experienced users may prefer highly customized recommendations, while less experienced users may benefit from simpler and more transparent systems. Finally, the insights from this study can guide companies in developing long-term customer retention strategies, where recommendation algorithms are not only used to drive immediate sales but also to foster lasting relationships with consumers.

Conclusion

In conclusion, this study set out to examine how recommendation algorithms influence consumer loyalty on marketplace platforms in Indonesia, as well as the roles of trust, satisfaction, and perceived relevance in this relationship. The findings clearly answer the research questions by showing that recommendation algorithms significantly affect consumer trust and satisfaction, both of which, in turn, have a strong positive impact on consumer loyalty. While the direct effect of recommendation algorithms on loyalty exists, it is relatively weaker, indicating that the influence is largely indirect through mediating variables such as trust and satisfaction. The main finding confirms that recommendation algorithms do

significantly influence consumer loyalty, but not in isolation. Their effectiveness depends on how well they generate relevant recommendations, build user trust, and create satisfying experiences. This highlights that algorithm performance must translate into positive user perceptions to achieve long-term loyalty outcomes. From an academic perspective, this study contributes to the literature by integrating technological factors specifically recommendation algorithms into consumer loyalty models and by emphasizing the mediating roles of trust and satisfaction. It also enriches the discussion by incorporating variables such as perceived relevance, transparency, and fairness within the Indonesian marketplace context. From a practical standpoint, the study provides insights for marketplace platforms to optimize recommendation systems not only for accuracy but also for user trust and experience. Based on these findings, several recommendations can be proposed. For marketplace platforms, it is important to enhance the quality, transparency, and fairness of recommendation algorithms, while also focusing on building trust and improving overall user satisfaction. Platforms should also provide users with more control and clarity regarding how recommendations are generated. For future research, it is recommended to explore additional variables such as user privacy concerns, emotional engagement, or cultural factors, and to apply different methodological approaches, such as longitudinal or experimental designs, to better understand long-term effects.

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