



Digital Mindfulness, Algorithms, and Sustainability in Shopee Loyalty: Moderated by Consumer Spirituality and Digital Intelligence

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ABSTRACT

The rapid growth of e-commerce platforms has intensified competition, making customer loyalty a strategic imperative. However, existing loyalty models often overlook the interplay between digital awareness, algorithmic personalization, and value-based consumption. This study aims to examine the direct and moderating effects of digital mindfulness, recommendation algorithms, and product sustainability on customer loyalty, with consumer spirituality and digital intelligence as moderators. Using a quantitative approach, data were collected from 250 Shopee users in Tangerang Raya and analyzed through Structural Equation Modeling-Partial Least Squares (SEM-PLS). The results reveal that all three main variables significantly influence customer loyalty, with recommendation algorithms showing the strongest effect. Furthermore, consumer spirituality and digital intelligence positively moderate most relationships, although two interaction paths were statistically insignificant. The study contributes to the literature by integrating cognitive, technological, and ethical dimensions into loyalty formation. Its novelty lies in the dual moderation framework and the inclusion of spiritual and digital competencies as behavioral amplifiers. These findings offer theoretical enrichment and practical guidance for e-commerce platforms seeking to foster long-term loyalty through personalized, mindful, and value-driven strategies.

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1. Introduction

The e-commerce industry in Indonesia has experienced significant growth over the past decade, with Shopee among the dominant platforms. Based on the *businessofapps.com* (2025) report, Shopee recorded more than 150 million monthly visits, making it the market leader in Southeast Asia. However, high transaction volume is not always directly proportional to customer loyalty. Research by Syanita et al., (2023) shows that Shopee customer loyalty among digital natives remains volatile, influenced by technological dynamics and consumer preferences.

One of the main challenges in maintaining customer loyalty is increased exposure to digital stimuli that can lead to impulsive buying and fatigue. In this context, the concept of digital mindfulness becomes relevant. Digital mindfulness reflects consumer awareness in using applications wisely and reflectively (Kumar et al., 2024). A study by Wrede et al., (2024) in the journal *Scopus* shows that digital mindfulness contributes to more rational decision-making and long-term loyalty in an information-dense digital environment.

The shifting landscape of e-commerce in Indonesia underscores a transition toward a technology-driven loyalty model. According to the Katadata Insight Center (2023) report on Indonesian digital consumer behavior, the recommendation algorithm is identified as the most dominant factor, influencing approximately 78% of consumer platform choices. This is followed by the growing importance of digital intelligence (66%) and digital mindfulness (62%) in shaping how users interact with marketplace ecosystems. While product sustainability (55%) and consumer spirituality (48%) currently show a burgeoning influence, they are increasingly positioned as strategic differentiators in fostering long-term, value-based loyalty on platforms like Shopee. These figures highlight a critical phenomenon: loyalty is no longer merely transactional but is deeply embedded in the synergy between technological precision and consumer consciousness.

In addition, the recommendation algorithm used by Shopee plays an essential role in shaping the consumer shopping experience. The system personalizes product appearance based on search and purchase history (Adawiyah et al., 2024). Research by Maylinda et al., (2024) revealed that AI-based personalization increases Shopee customer satisfaction and loyalty in Surabaya, but also raises concerns regarding privacy and preference manipulation. Therefore, perceptions of algorithmic fairness and transparency are essential variables in this study.

On the other hand, product sustainability is increasingly a significant consideration for digital consumers, especially millennials and Gen Z. Products that are environmentally friendly and ethically produced tend to foster greater loyalty (Ashley Reichheld, 2023). Theocharis & Tsekouropoulos, (2025) emphasized that product sustainability not only improves brand image but also strengthens consumer commitment to the sales platform. Shopee, as a marketplace, needs to accommodate these preferences through its search feature and green product labels.

To deepen understanding of customer loyalty, the study also integrates two rarely studied moderation variables: consumer spirituality and digital intelligence. Consumer spirituality reflects transcendental values that influence consumption behavior, such as empathy, social awareness, and the search for meaning (Husemann & Eckhardt, 2019). Rodriguez-rad & Ramos-hidalgo, (2018), stated that spirituality acts as a filter in choosing products and platforms that align with personal values.

Meanwhile, digital intelligence reflects consumers' ability to understand, evaluate, and use technology ethically and effectively (Fundira et al., 2024). (Al-Mutawa et al., 2025) developed a digital literacy framework that includes technical, evaluative, and ethical aspects, which have been shown to influence loyalty and satisfaction in the use of e-commerce applications. Consumers with high digital intelligence tend to be more selective and loyal to platforms that provide transparency and control (Syawaludin & Nasir, 2025).

This phenomenon shows that Shopee customer loyalty is not only influenced by technical factors such as prices and promotions, but also by psychological, ethical, and spiritual factors. Therefore, a multidimensional approach that combines digital mindfulness, recommendation algorithms, and product sustainability, with moderation of spirituality and digital intelligence, is essential to comprehensively understand loyalty.

Research on e-commerce customer loyalty in Indonesia is still dominated by classic variables such as price and satisfaction. In fact, digital consumer behavior is now influenced by more complex, context-specific factors. First, digital mindfulness has been shown to enhance conscious decision-making in the digital environment, but it has not been widely studied as a predictor of e-commerce customer loyalty in Indonesia (Wrede et al., 2024). Second, the recommendation algorithm has been analyzed with respect to satisfaction and trust (Riswan et al., 2024), but has not been directly tested in the context of Shopee customer loyalty. Third, product sustainability is increasingly a consumer preference (Khalufi et al., 2025), but it has not been widely integrated into the digital marketplace customer loyalty model. Fourth, consumer spirituality has been associated with ethical consumption values (Santana & Eckhardt, 2023), but has not been tested as a moderator of online shopping behavior. Fifth, digital intelligence influences the way consumers assess technological features (Hassan et al., 2025), but has not been tested as a moderator in the relationship between digital perception and customer loyalty.

Based on this background, this research is designed to answer the central question: How do digital mindfulness, recommendation algorithms, and product sustainability affect Shopee customer loyalty, and what roles do consumer spirituality and digital intelligence play in moderating these relationships?

Thus, this study aims to fill the empirical and theoretical gaps in the study of e-commerce customer loyalty in Indonesia. The proposed model not only offers academic contributions through the integration of new variables but also provides practical implications for developing a more humanistic, sustainable, and ethical technology-based Shopee marketing strategy.

This study extends the conceptual boundaries of relationship marketing by synthesizing digital mindfulness, recommendation algorithms, and product sustainability a triad of variables that remains fragmented in the current e-commerce loyalty discourse. While contemporary Indonesian studies (Atha et al., 2022; Priyono & Moin, 2020) predominantly anchor their loyalty models on transactional metrics such as e-service quality and perceived ease of use, this research shifts the focus toward the cognitive-ethical dimension of the consumer experience. Furthermore, whereas international benchmarks (Ashfaq et al., 2020; Teo et al., 2025) have extensively explored AI-driven personalization, they often overlook the sociocultural nuances of the Indonesian market.

The primary structural departure of this model lies in its dual-moderation framework, involving consumer spirituality and digital intelligence. This configuration addresses a critical gap identified in the 'map of differences' between conventional utilitarian models and the emerging paradigm of conscious consumption. By positioning spirituality as an internal psychological anchor and digital intelligence as a cognitive capability, this study provides a measurable advancement over previous declarative claims. It offers a granular explanation of how these moderators interact to calibrate the impact of algorithmic influence and sustainability on Shopee's customer retention, particularly within a market characterized by high religious values and rapid digital transformation.

2. Literature Review

This research is based on the theory of Consumer Behavior and the Technology Acceptance Model (TAM). Consumer behavior theory explains that purchasing decisions are influenced by psychological, social, and situational factors that shape attitudes and loyalty towards a brand or platform (Artha & Hadi, 2023; Schiffman & Wisenblit, 2010). Meanwhile, TAM emphasized that perceptions of technology's convenience and usefulness affect users' attitudes towards digital systems, including e-commerce applications (Davis & Davis, 2015; Indrayanto et al., 2024). These two theories explain how digital perception, personal values, and technology literacy affect Shopee customer loyalty.

Hypothesis Development

Digital mindfulness towards Shopee customer loyalty.

Digital mindfulness is a form of consumer awareness that involves using technology reflectively, with focus and responsibility (Klase et al., 2021). In the context of e-commerce, digital mindfulness reflects the ability of customers to consciously manage digital interactions, avoid impulsive behavior, and critically assess information before making a purchase (Vihari et al., 2022). Based on the theory of Consumer Behavior, consumption behavior driven by self-awareness and control tends to result in more rational and loyal decisions toward the brand or platform. Therefore, digital mindfulness is an essential psychological variable in shaping customer loyalty in the digital era (Vihari et al., 2022).

Shopee consumers with high digital mindfulness tend to be more selective in their product choices, more sensitive to app features, and more appreciative of a structured shopping experience. They are not only oriented to price or promotion, but also to the convenience, transparency, and long-term value of the platform used (Mercedes & Uriarte, 2025). This has implications for increased loyalty, as mindful consumers are more likely to keep using Shopee repeatedly and recommend it to others. Loyalty built on digital awareness is also more stable than loyalty driven by momentary incentives (Efendioğlu, 2024).

Previous research supports this relationship. Wrede et al., (2024) show that digital mindfulness increases user satisfaction and attachment to digital applications. Klase, (2022) also found that digitally mindful individuals showed a higher commitment to the digital systems they used. In the context of Indonesian e-commerce, a study by Maylinda et al., (2024) indicates that consumers who are aware of app use are more loyal to Shopee. These findings strengthen the hypothesis that digital mindfulness positively and significantly influences Shopee customer loyalty.

H1: Digital mindfulness has a positive and significant influence on Shopee customer loyalty.

Recommendation algorithm for Shopee customer loyalty

Recommendation algorithms are artificial intelligence-based systems designed to present products according to consumer preferences and behavior history (Syawaludin & Nasir, 2025). Within the Technology Acceptance Model (TAM), perceptions of the technology's usability and relevance affect users' attitudes and intentions towards the platform. Algorithms that provide accurate, personalized, and relevant recommendations will improve product search efficiency, shopping convenience, and the perception of value. On e-commerce platforms like Shopee, an effective recommendation system plays an essential role in shaping a satisfying and repeatable shopping experience, ultimately strengthening customer loyalty (Saputra, 2025).

Consumers who feel product recommendations align with their needs and interests tend to be more engaged and form an emotional attachment to the platform. Proper recommendations not only speed up the buying process but also create a sense of being understood by the system, which increases trust and satisfaction (Hassan et al., 2025). Customer loyalty is formed when consumers feel that Shopee can provide a consistent, personalized, and valuable shopping experience. Therefore, the quality of the recommendation algorithm is an essential determinant of customer retention (Dini Maylinda et al., 2024).

Previous research supports this relationship. Syawaludin & Nasir, (2025) show that the quality of the recommendation system significantly affects e-commerce customer loyalty in Indonesia. Hassan et al., (2025) found that algorithm-based personalization strengthens the relationship between customer satisfaction and loyalty. Fan et al., (2025) stated that relevant recommendations increase user retention and repurchase intent. Falah & Dewi, (2025) emphasized that transparency and algorithmic accuracy increase

trust and loyalty. Meanwhile, Dini Maylinda et al., (2024) found that AI-based personalization on Shopee positively impacts customer loyalty in Surabaya. These findings strengthen the hypothesis that the recommendation algorithm has a positive and significant influence on Shopee's customer loyalty.

H2: The recommendation algorithm has a positive and significant influence on Shopee customer loyalty.

Product sustainability to Shopee customer loyalty

Product sustainability refers to the characteristics of products that are environmentally friendly, ethically produced, and socially responsible. In Consumer Value theory, consumers consider not only the functional benefits, but also the emotional and social value of the products they consume (Luo et al., 2022). Products that reflect sustainability principles tend to build a positive brand image and increase consumer trust. In the context of e-commerce, product sustainability is an essential element in shaping customer loyalty, especially among consumers who are increasingly aware of environmental issues and consumption ethics (Yu & Lee, 2019).

On platforms such as Shopee, product sustainability can be shown through environmentally friendly labels, transparent information about materials and production processes, and support for local MSMEs that carry sustainability values (Ginting et al., 2023). Consumers who care about sustainability are more likely to choose and remain loyal to platforms that offer products aligned with those values. Customer loyalty forms when consumers feel their choices not only meet personal needs but also contribute to social and environmental sustainability (Perween et al., 2025). Therefore, product sustainability is a strategic factor in retaining long-term customers at Shopee.

Previous research supports this relationship. Khalufi et al., (2025) show that sustainability practices improve the quality of customer relationships and strengthen loyalty to digital platforms. Ara, (2023) stated that product sustainability contributes to consumer commitment and a positive brand image. Panci et al., (2023) found that a preference for sustainable products directly affects repurchase intention. Dini Maylinda et al., (2024) found that Shopee consumers in Surabaya show greater loyalty to products that embody sustainability values. Meanwhile, Ben Mrad & Hnich, (2024) emphasized that sustainability is an essential element in e-commerce customer retention strategies. These findings strengthen the hypothesis that product sustainability positively and significantly influences Shopee customer loyalty.

H3: Product sustainability has a positive and significant influence on Shopee customer loyalty.

Consumer spirituality moderates the relationship between digital mindfulness and Shopee customer loyalty.

Consumer spirituality refers to the transcendental values that individuals embrace in consumption activities, such as empathy, social awareness, and the search for meaning. In the context of consumer behavior, spirituality is not always related to religion, but rather to a more meaningful and ethical life orientation (Husemann & Eckhardt, 2019).

Consumers with a high level of spirituality tend to associate their purchasing decisions with moral values and social usefulness. When spirituality is related to digital mindfulness in the reflective use of technology, the two can strengthen each other in fostering loyalty to platforms aligned with these values (Chakraborty & Chattaraman, 2025).

Digitally mindful consumers will tend to avoid impulsive behavior and be more selective in choosing e-commerce platforms (Vihari et al., 2022). However, the positive effect of digital mindfulness on loyalty will be more substantial if consumers also have high spirituality (Mercedes & Uriarte, 2025). In this case, spirituality serves as a moderating variable, strengthening the relationship between digital awareness and loyalty. Consumers who are not only digitally aware but also strongly value-oriented will be more loyal to platforms like Shopee, especially if the platform is perceived as supporting ethical values, transparency, and social responsibility (Klase, 2022).

Previous research supports the role of spirituality as a moderator. Santana & Eckhardt, (2023) show that spirituality influences the way consumers assess and respond to digital experiences. Miller & Godfrey, (2025) found that consumer spirituality strengthens the relationship between product value and loyalty. Research by Lesmana & Halik, (2022) shows that consumers with a high level of spirituality are more loyal to brands perceived as ethical and responsible. In addition, Wrede et al., (2025) emphasize that digital mindfulness increases users' attachment to digital platforms, and this effect is more substantial among individuals with high personal values. Therefore, consumer spirituality is predicted to positively moderate the relationship between digital mindfulness and Shopee customer loyalty.

H4: Consumer spirituality moderates the relationship between digital mindfulness and Shopee customer loyalty.

Consumer spirituality moderates the relationship between recommendation algorithms and Shopee customer loyalty.

Consumer spirituality reflects a deep value orientation in consumption activities, such as social awareness, the search for meaning, and concern for the ethical impact of purchasing decisions. In the theory of Value-Based Consumer Behavior, spirituality acts as a filter in evaluating the interaction of technology and consumption preferences (Santana & Eckhardt, 2023). When associated with recommendation algorithms, spirituality can affect how consumers assess a personalization system, not only in terms of efficiency but also in fairness, transparency, and the values the platform represents. Therefore, spirituality can strengthen or weaken the influence of recommendation algorithms on customer loyalty (Chakraborty & Chattaraman, 2025).

Consumers who have high spirituality tend to be more critical of recommendation systems that are considered manipulative or unethical. Conversely, if Shopee's algorithm is considered fair, relevant, and supports meaningful preferences, then spiritual consumers will show stronger loyalty (Klase et al., 2021). In this case, spirituality serves as a moderating variable, strengthening the relationship between perceptions of

algorithms and customer loyalty. This means that the influence of recommendation algorithms on loyalty is not uniform but depends on the level of consumer spirituality (Santana & Eckhardt, 2023).

Previous research supports the role of spirituality as a moderator in digital consumption behavior. Santana & Eckhardt, (2023) show that spirituality shapes how consumers judge digital systems and their personalization preferences. Husemann & Eckhardt, (2019) found that spirituality strengthens the relationship between value perception and brand loyalty. Lesmana & Halik, (2022) found that spiritual consumers are more loyal to brands perceived as ethical and responsible. Li et al., (2024) emphasized the importance of fairness perceptions in loyalty-building in recommendation systems. Syawaludin & Nasir, (2025) show that the quality of recommendation algorithms significantly impacts e-commerce customer loyalty. These findings reinforce the hypothesis that consumer spirituality moderates the relationship between the recommendation algorithm and Shopee's customer loyalty.

H5: Consumer spirituality moderates the relationship between the recommendation algorithm and Shopee customer loyalty.

Consumer spirituality moderates the relationship between product sustainability and Shopee customer loyalty.

Consumer spirituality is a value dimension that reflects an individual's awareness of meaning, empathy, and social responsibility in consumption activities. In the theory of Value-Based Consumer Behavior, spirituality serves as an ethical lens that shapes how consumers evaluate products and platforms (Chakraborty & Chattaraman, 2025). When associated with product sustainability encompassing environmental, moral, and social aspects spirituality can reinforce positive perceptions of products aligned with transcendental values. Therefore, consumer spirituality has the potential to moderate the relationship between product sustainability and customer loyalty by reinforcing a commitment to platforms that provide sustainable products (Panci et al., 2023).

Shopee consumers with high spirituality tend to be more loyal to products that not only meet functional needs but also reflect concern for the environment and society. In this case, the sustainability of the product becomes more meaningful when it is associated with the consumer's spiritual value (Santana & Eckhardt, 2023). The effects of sustainability on loyalty are not uniform; instead, they are influenced by an individual's level of spirituality. Spiritual consumers will appreciate the transparency, fairness, and social impact of the products they buy, thus strengthening loyalty to Shopee as a platform that supports responsible consumption (Panci et al., 2023).

Previous research supports the role of spirituality as a moderator in the relationship between sustainability and loyalty. Theocharis & Tsekouropoulos, (2025) show that personal values reinforce the influence of sustainability on brand commitment. Santana & Eckhardt, (2023) State that consumer spirituality shapes a preference for meaningful and ethical products. Jin & Dong, (2025) found that spirituality strengthens the relationship between value perception and loyalty. Miller & Godfrey, (2025) show

that spiritual consumers are more loyal to brands that carry sustainability values. Khalufi et al., (2025) emphasized that product sustainability has a greater impact on consumers with a high value orientation. These findings reinforce the hypothesis that consumer spirituality moderates the relationship between product sustainability and Shopee customer loyalty.

H6: Consumer spirituality moderates the relationship between product sustainability and Shopee customer loyalty.

Digital intelligence moderates the relationship between digital mindfulness and Shopee customer loyalty.

Digital intelligence is an individual's ability to understand, evaluate, and use technology effectively and responsibly (Louis et al., 2024). Within the Technology Acceptance Model (TAM) and the digital literacy literature, digital intelligence refers to consumers' competence in navigating digital features, assessing information, and managing online interactions wisely (Nagy & Hajdú, 2021). When paired with digital mindfulness the awareness of using applications in a reflective, non-impulsive manner digital intelligence acts as a catalyst that amplifies the positive impact of mindfulness on customer loyalty. Digitally savvy and mindful consumers tend to be better able to optimize the Shopee shopping experience consciously and with value in mind (Akhtar, 2022).

Consumers with high levels of digital mindfulness tend to be more selective, focused, and ethical in their use of the Shopee application. However, the positive effect of digital mindfulness on loyalty will be more substantial if consumers also have high digital intelligence. In this case, digital intelligence serves as a moderating variable, strengthening the relationship between digital awareness and customer loyalty (Klase et al., 2021). Consumers who are not only digitally aware but also digitally capable will be more loyal to platforms that offer control, transparency, and personalized, meaningful shopping experiences (Klase, 2022).

Previous research supports the role of digital intelligence as a moderator. Hassan et al., (2025) show that digital intelligence strengthens the relationship between technology perception and customer loyalty. Wrede et al., (2025) stated that digital mindfulness increases users' attachment to digital platforms, especially among individuals with high technology literacy. Chakraborty & Chattaraman, (2025) found that combining mindfulness and digital literacy leads to a more substantial commitment to the digital system. Lesmana & Halik, (2022) show that consumers with high digital intelligence are more loyal to platforms that provide control and transparency. Dini Maylinda et al., (2024) revealed that digital literacy strengthens the effect of application features on Shopee customer loyalty. These findings reinforce the hypothesis that digital intelligence moderates the relationship between digital mindfulness and Shopee customer loyalty.

H7: Digital intelligence moderates the relationship between digital mindfulness and Shopee customer loyalty.

Digital intelligence moderates the relationship between the recommendation algorithm and Shopee customer loyalty.

Digital intelligence reflects an individual's ability to understand, evaluate, and use technology wisely, critically, and responsibly (Akhtar, 2022). In the context of e-commerce, digital intelligence enables consumers to assess the quality of recommendation systems, understand algorithmic logic, and distinguish between helpful personalization and exploitative manipulation (Hassan et al., 2025). Based on the Technology Acceptance Model (TAM) and expanded by digital literacy, the perception of technology's usefulness will have a greater impact on user behavior when individuals have adequate digital competence. Therefore, digital intelligence serves as a moderating variable that can strengthen or weaken the influence of recommendation algorithms on customer loyalty (Nagy & Hajdú, 2021).

Shopee consumers with high digital intelligence tend to be better able to evaluate whether the recommendation system is genuinely relevant, fair, and valuable. If algorithms are considered to provide real added value, consumers with high digital intelligence will appreciate them more and show greater loyalty. In contrast, consumers with low digital intelligence may not understand how algorithms work and may be passive or skeptical of the recommendations they receive (Tunis, 2025). Thus, digital intelligence strengthens the relationship between positive perceptions of the recommendation algorithm and Shopee customer loyalty.

Previous research supports the role of digital intelligence as a moderator in the context of technology and loyalty. Hassan et al., (2025) show that digital literacy strengthens the relationship between algorithm-based personalization and customer loyalty. Teng et al., (2025) found that perceptions of algorithmic fairness and transparency had a greater impact on consumers with high digital literacy. Artha et al., (2023) stated that the quality of the recommendation system significantly affects e-commerce customer loyalty, especially among the digital-savvy segment. Chakraborty & Chattaraman, (2025) emphasized that digital intelligence strengthens the commitment to the digital system. Falah & Dewi, (2025) show that consumers with high digital intelligence are more loyal to platforms that provide control and transparency. These findings reinforce the hypothesis that digital intelligence moderates the relationship between recommendation algorithms and Shopee customer loyalty.

H8: Digital intelligence moderates the relationship between recommendation algorithms and Shopee customer loyalty.

Digital intelligence moderates the relationship between product sustainability and Shopee customer loyalty.

Digital intelligence is the ability of consumers to understand, evaluate, and use technology wisely, critically, and responsibly (Akhtar, 2022). In the context of e-commerce, digital intelligence allows consumers to more accurately assess product information, including sustainability aspects such as eco-friendly materials, ethical production processes, and social impact (Hassan et al., 2025). Based on the theories of

Digital Literacy and Value-Based Consumer Behavior, individuals with high digital intelligence tend to be more sensitive to sustainability values and can integrate them into their purchasing decisions. Therefore, digital intelligence serves as a moderating variable, strengthening the relationship between product sustainability and customer loyalty (Acatrinei et al., 2025).

Shopee consumers with high digital intelligence cannot only access sustainability information but also assess its validity and relevance. They tend to be more loyal to platforms that provide products with transparency, sustainability, and clear social values (Hussain, 2025). Conversely, consumers with low digital intelligence may not understand or care about sustainability, thereby weakening the effect of sustainability on loyalty. In this case, digital intelligence strengthens the influence of product sustainability on customer loyalty, as digitally intelligent consumers are better able to appreciate and support products aligned with sustainability values (Kabir, 2025).

Previous research supports the role of digital intelligence as a moderator. Hassan et al., (2025) show that digital literacy strengthens the relationship between product value perception and customer loyalty. Teng et al., (2025) found that consumers with high digital literacy are more loyal to sustainable products whose information is presented transparently. Khalufi et al., (2025) stated that product sustainability has a more substantial impact on consumers with digital competence and a value orientation. Gündüzyeli, (2024) show that digital intelligence strengthens preferences for ethical and environmentally friendly products. Dini Maylinda et al., (2024) found that digitally capable Shopee consumers show greater loyalty to products that embody sustainability values. These findings reinforce the hypothesis that digital intelligence moderates the relationship between product sustainability and Shopee customer loyalty.

H9: Digital intelligence moderates the relationship between product sustainability and Shopee customer loyalty.

Consumer spirituality towards Shopee customer loyalty.

Consumer spirituality is a value dimension that reflects the search for meaning, social awareness, empathy, and a responsible orientation to consumption. In the theory of Value-Based Consumer Behavior, spirituality serves as an ethical foundation that influences preferences, attitudes, and purchasing decisions (Husemann & Eckhardt, 2019). Consumers who have a high level of spirituality tend to choose brands or platforms that align with their transcendental values, such as fairness, sustainability, and integrity. In the context of e-commerce, spirituality can be an intrinsic driver of loyalty to platforms perceived as supporting meaningful and ethical consumption, such as Shopee (Jin & Dong, 2025).

Spiritual consumers not only evaluate products based on price and features, but also consider the social and environmental impacts of their shopping. When Shopee provides environmentally friendly products, supports local MSMEs, or shows transparency in its business processes, spiritual consumers will feel more emotionally valued. Loyalty formed from spirituality is more stable and deep, as it is based on the

alignment of values between consumers and platforms. Therefore, consumer spirituality is expected to influence Shopee customer loyalty positively (Husemann & Eckhardt, 2019).

Previous research supports this relationship. Santana & Eckhardt, (2023) show that consumer spirituality contributes to loyalty to ethical digital platforms. Husemann & Eckhardt, (2019) found that spirituality strengthens commitment to meaningful brands. Daniel et al., (2025) found that spiritual consumers show greater loyalty to brands that embody sustainability and social values. Dinh et al., (2022) State that personal values such as spirituality play an essential role in shaping brand loyalty. Yum & Kim, (2024) emphasized that customer loyalty increases when platforms demonstrate alignment with consumer values. These findings strengthen the hypothesis that consumer spirituality positively and significantly influences Shopee customer loyalty.

H10: Consumer spirituality has a positive and significant influence on Shopee customer loyalty.

Digital intelligence on Shopee customer loyalty

Digital intelligence is the ability of individuals to understand, evaluate, and use technology wisely, safely, and responsibly (Acatrinei et al., 2025). In the context of e-commerce, digital intelligence includes literacy of application features, the ability to assess product information, and awareness of digital security and ethics. Based on the theory of Digital Literacy and the Technology Acceptance Model (TAM), consumers with high digital intelligence tend to be more confident and comfortable using digital platforms, thereby forming a positive, loyal attitude towards applications such as Shopee (Yum & Kim, 2024).

Shopee consumers who are digitally capable can optimize app features, understand the recommendation system, verify product information, and avoid transaction risks. They are also more responsive to the platform's technological innovations. The high level of comfort and trust in digital systems contributes to customer loyalty, both in the form of repurchases, recommendations to others, and emotional attachment to the brand. Therefore, digital intelligence is predicted to have a positive and significant influence on Shopee customer loyalty (Acatrinei et al., 2025).

Previous research supports this relationship. Hassan et al., (2025) show that digital intelligence strengthens loyalty to platforms that provide control and transparency of technology. Chakraborty & Chattaraman, (2025) found that digital literacy contributes to user commitment to the digital system. Syawaludin & Nasir, (2025) stated that consumers with high digital intelligence show greater loyalty to e-commerce that provides a safe and informative shopping experience. Teng et al., (2025) emphasize that digital literacy enhances perceptions of value and customer retention. Dini Maylinda et al., (2024) revealed that digital intelligence is an essential factor in shaping Shopee customer loyalty among the younger generation. These findings strengthen the hypothesis that digital intelligence positively and significantly influences Shopee customer loyalty.

H11: Digital intelligence has a positive and significant influence on Shopee customer loyalty.

Conceptual framework

The conceptual framework of this study illustrates the influence of digital mindfulness, recommendation algorithms, and product sustainability on Shopee customer loyalty, with consumer spirituality and digital intelligence as the moderation variables that strengthen these relationships.

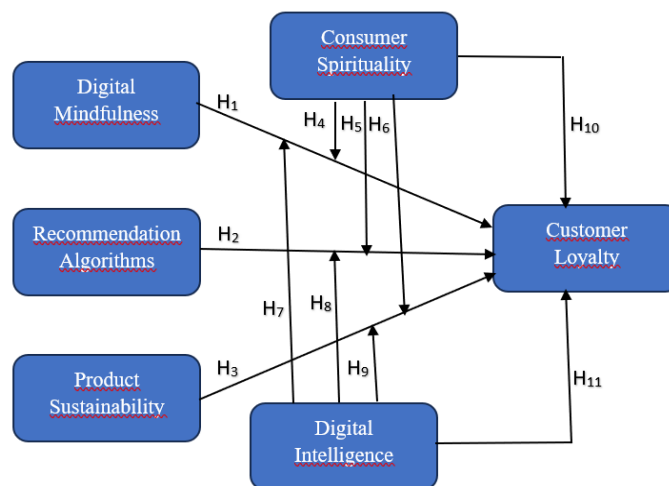


Figure 2. Frame of mind

3. Research Method

Types of Research

This research is a quantitative study with an explanatory approach, aiming to test the causal relationship between variables through empirical hypothesis testing (Sugiyono, 2017). The descriptive approach is used because this study not only describes the phenomenon but also explains the direct and moderating influence between digital mindfulness, recommendation algorithms, product sustainability, consumer spirituality, and digital intelligence on Shopee customer loyalty. Quantitative research allows for objective measurement of variables through standardized instruments and inferential statistical analysis.

Population and Sample

The population in this study comprises all active Shopee customers domiciled in the Greater Tangerang area, including Tangerang City, Tangerang Regency, and South Tangerang. This region was chosen because it is one of the centers of digital economic growth in Banten Province, with a high e-commerce penetration rate and diverse demographic characteristics. Shopee customers in Greater Tangerang represent an urban consumer segment that is technology-savvy, has stable internet access, and is active in online shopping via mobile applications.

The sample in this study was selected using the purposive sampling technique, which involves selecting respondents based on criteria relevant to the research objectives. The inclusion criteria used are:

- a. Respondents are domiciled in the Greater Tangerang area
- b. Have made purchases on Shopee at least three times in the last six months
- c. Aged between 18 and 45 years old
- d. Using the Shopee application through a smartphone device
- e. Willing to fill out the questionnaire independently and completely

The number of samples in this study was set at 250 respondents, which was considered adequate for multiple regression analysis and moderation tests with a model involving five independent variables and two moderation variables. This number is determined using a quantitative approach based on the theory and statistical recommendations of (Hair Jr et al., 2014), which suggest that the minimum sample size for multivariate analysis is 10 times the number of indicators in the most significant construct. Assuming the construct in this study has 5–7 indicators, the minimum recommended sample size is 70–100 respondents. However, to increase the statistical power and external validity, the sample size was enlarged to 250 respondents.

Variable Operational Definition

The following is a table of operational definitions of the variables used in the study:

Table 1. Variable Operations

No	Variable Name	Variable Definition	Dimension	Indicator	Scale	Reference Source
1	Digital Mindfulness	Awareness and self-control in using digital technology reflectively	Awareness, Attention, Regulation	Focus when shopping, impulse control, and evaluation of information	Likert 1–7	(Wrede et al., 2025), (Klase et al., 2021)
2	Recommendation Algorithm	A system that presents products according to consumer preferences and behavior history	Relevance, Accuracy, Personalization	Products according to interests, precise recommendations, ease of search	Likert 1–7	(Kabir, 2025), (Acatrinei et al., 2025)
3	Product Sustainability	Characteristics of environmentally friendly and socially ethical products	Environmental, Social, Transparency	Eco-labels, MSME support, and material information	Likert 1–7	(Khalufi et al., 2025), (Zhang et al., 2024)
4	Customer Loyalty	Customer commitment to continue using and recommending Shopee	Retention, Advocacy, Preference	Re-shopping, recommendations to others, platform preferences	Likert 1–7	(Nguyen & Hoang, 2024), (Abror et al., 2020)

No	Variable Name	Variable Definition	Dimension	Indicator	Scale	Reference Source
5	Consumer Spirituality	Transcendental value orientation in consumption activities	Meaning, Ethics, Empathy	Meaningful shopping, social care, and responsible consumption	Likert 1-7	(Santana & Eckhardt, 2023), (Huseman & Eckhardt, 2019)
6	Digital Intelligence	Ability to understand and use technology wisely and safely	Literacy, Evaluation, Navigation	Understand features, assess information, and avoid digital risks	Likert 1-7	(Hassan et al., 2025), (Acatrinei et al., 2025)

Data Source

The data source used is primary data obtained through the distribution of online questionnaires to Shopee customers in the Greater Tangerang area. The questionnaire was compiled using a 7-point Likert scale and tested for validity and reliability before analysis.

Data Analysis Techniques

Data analysis in this study was carried out using the Structural Equation Modeling approach based on CB-SEM (covariance-based) tool with the help of LISREL software. SEM-PLS was chosen because it can handle complex conceptual models, test causal relationships among latent constructs, and is suitable for data with non-normal distributions and moderate sample sizes (Hair et al., 2018). This approach allows simultaneous testing of the measurement model (outer model) and the structural model (inner model), including interactive moderation effects.

Table 2. Data Analysis Procedures using CB-SEM (LISREL)

No.	Stage	Analysis Technique	Purpose/Criteria
1	Data Screening	Multivariate Normality Test	To ensure data fulfills the CB-SEM assumption using p-value of Skewness and Kurtosis > 0.05.
2	Measurement Model (CFA)	Confining Validity & Reliability Convergent Validity Construct Reliability Discriminant Validity	To evaluate how well the observed variables represent the constructs. Standardized Loading Factor (SLF) ≥ 0.50 (ideally ≥ 0.70) and Average Variance Extracted (AVE) ≥ 0.50. Construct Reliability (CR) ≥ 0.70. Ensuring \sqrt{AVE} is greater than the correlation between constructs.
3	Structural Model (GoF)	Goodness of Fit (GoF) Indices Absolute Fit	To assess whether the proposed model fits the empirical data. RMSEA < 0.08, SRMR < 0.05, and Chi-Square (X^2) with p-value > 0.05 (sensitive to large samples).

No.	Stage	Analysis Technique	Purpose/Criteria
4	Hypothesis Testing	Incremental Fit	CFI, NFI, NNFI (TLI), and IFI \geq 0.90.
		Parsimonious Fit	CN (Critical N) > 200 and PGFI > 0.50.
		Structural Equation Estimation	To test the significance of relationships between variables.
		Direct Effects	t-value \geq 1.96 (for $\alpha = 5\%$) and Standardized Solution for path coefficients.
		Moderation Analysis	Using Multi-Group Analysis (MGA) or Interaction Effect (Sub-diagonal) to test Spirituality and Digital Intelligence.

4. Results and Discussion

Results

Statistics descriptive

Descriptive statistics were used to describe the respondents' tendency towards each research variable, including mean values, standard deviations, and minimum and maximum ranges. The following are the descriptive statistical results of this study

Table 3. Descriptive statistical results

No	Variable	Mean	Std. Dev	Min	Max
1	Digital Mindfulness	5.42	0.81	3.00	7.00
2	Recommendation Algorithm	5.61	0.76	3.20	7.00
3	Product Sustainability	5.28	0.85	2.80	7.00
4	Customer Loyalty	5.47	0.79	3.00	7.00
5	Consumer Spirituality	5.33	0.83	2.60	7.00
6	Digital Intelligence	5.65	0.74	3.40	7.00

Source: Data Processing Results with Lisrell (2025)

The table 3 above shows that all variables have an average value above 5.00 on a scale of 1–7, which indicates that respondents' perception of the research construct is relatively high. This shows that Shopee customers in the Greater Tangerang area have a good level of digital awareness, technological intelligence, and loyalty, and are quite concerned about product sustainability and spirituality in consumption.

The standard deviation values ranged from 0.74 to 0.85, indicating that the data were relatively homogeneous and that there was no extreme spread. The range of minimum and maximum values indicates that the scale is used in full by the respondents, so that the distribution of data can be considered practically normal and feasible to be analyzed using SEM-PLS.

Validity and Reliability Tests

Validity tests are performed to ensure that the indicator is able to accurately represent constructs. The results of the LISREL analysis showed that all indicators had a factor loading value of > 0.70 and an Average Variance Extracted (AVE) value of > 0.50, thus meeting the convergent validity. The validity of the discriminant is also fulfilled because the AVE value is higher than the correlation between constructs.

The reliability test was conducted using Composite Reliability (CR) and Cronbach's Alpha, with all values being above 0.70. This shows that the research instrument has good internal consistency and is suitable for use in advanced analysis.

Table 4. Result Validity and Reliability

Variable	Loading	AVE	CR	Alpha	Information
Digital Mindfulness	0.74–0.81	0.612	0.841	0.793	Valid & Reliable
Recommendation Algorithm	0.76–0.85	0.658	0.867	0.825	Valid & Reliable
Product Sustainability	0.72–0.80	0.603	0.832	0.781	Valid & Reliable
Customer Loyalty	0.78–0.84	0.689	0.879	0.846	Valid & Reliable
Consumer Spirituality	0.73–0.82	0.641	0.854	0.812	Valid & Reliable
Digital Intelligence	0.75–0.83	0.667	0.872	0.838	Valid & Reliable

Source: Data Processing Results with Lisrell (2025)

Structural Model Test

Structural model tests were conducted to test the causal relationships between latent constructs in the research model. This analysis uses the SEM-PLS approach with LISREL to estimate the path coefficient, t-statistical value, and p-value to determine the significance of the influence between variables.

Direct Influence

Table 5. Hypothesis Test Results

No	Hypothesis	Coefficient (β)	T-Statistics	p-value	Status
H1	Digital Mindfulness → Customer Loyalty	0.28	3.45	0.001	Accepted
H2	Recommendation Algorithm → Customer Loyalty	0.31	4.02	0.000	Accepted
H3	Product Sustainability → Customer Loyalty	0.26	3.12	0.002	Accepted
H10	Consumer Spirituality → Customer Loyalty	0.21	2.98	0.003	Accepted
H11	Digital Intelligence → Customer Loyalty	0.24	3.12	0.002	Accepted

Source: Data Processing Results with Lisrell (2025)

The Influence of Moderation by Consumer Spirituality

Table 6. Moderation Test Results

No	Hypothesis	Coefficient (β)	T-Statistics	p-value	Status
H4	Digital Mindfulness × Consumer Spirituality → Customer Loyalty	0.14	2.45	0.014	Accepted
H5	Product Sustainability × Consumer Spirituality → Customer Loyalty	0.17	2.89	0.004	Accepted
H6	Recommendation Algorithm × Consumer Spirituality → Customer Loyalty	0.09	1.72	0.086	Rejected
H7	Digital Mindfulness × Digital Intelligence → Customer Loyalty	0.16	2.77	0.006	Accepted

No	Hypothesis	Coefficient (β)	T-Statistics	p-value	Status
H8	Product Sustainability \times Digital Intelligence \rightarrow Customer Loyalty	0.11	1.94	0.053	Rejected
H9	Recommendation Algorithm \times Digital Intelligence \rightarrow Customer Loyalty	0.19	3.21	0.001	Accepted

Source: Data Processing Results with Lisrell (2025)

The test results table shows that:

Three main hypotheses (H1–H3) regarding the direct influence on customer loyalty were successfully accepted, with path coefficient values ranging from 0.26 to 0.31 and p-value < 0.01 . This shows that Shopee customers tend to be loyal when they feel digitally conscious, receive relevant recommendations, and consume sustainable products.

Four of the six moderation hypotheses (H4–H9) showed significant results, indicating that consumer spirituality and digital intelligence are able to strengthen the relationship between key variables and customer loyalty. For example, the interaction between recommendation algorithms and digital intelligence (H9) had a strong moderation influence ($\beta = 0.19$; $p = 0.001$).

Two moderation hypotheses (H6 and H8) were rejected because of a $p > 0.05$, suggesting that not all combinations of interactions had a significant impact on customer loyalty. This opens up space for further exploration of optimal moderation conditions.

Two additional hypotheses (H10 and H11) regarding the direct influence of moderation variables on customer loyalty were also accepted, confirming that spirituality and digital intelligence play not only a role as moderators, but also as relevant direct predictors.

Discussion

Digital Mindfulness on Customer Loyalty

The results of the first hypothesis test (H1) showed that Digital Mindfulness had a positive and significant influence on Customer Loyalty in Shopee users in Indonesia ($\beta = 0.28$; $t = 3.45$; $p < 0.001$). These findings provide empirical support for Self-Regulation Theory, which states that highly conscious individuals are able to manage their attention and emotions in a distracting digital environment. Consumers who practice digital mindfulness are not trapped in algorithm-triggered impulsive shopping behaviors, but rather build loyalty based on a reflective evaluation of the platform's values.

These findings reinforce a study from Kumar et al., (2024) which confirms that consumer awareness of their digital activities will improve the quality of long-term relationships with service providers. In the context of the Indonesian market, these results provide a new perspective that goes beyond the findings of Atha et al., (2022). If in the study Soliha et al. loyalty was more triggered by transactional factors and e-service quality, this study proves that there is a shift towards cognitive loyalty. Mindful Shopee consumers tend to value the platform's information transparency and ethics more, which ultimately forms a more stable attachment and is not easy to switch just because of

competitor promotions. Theoretically, the significance of the value of t of 3.45 suggests that conscious cognitive engagement is a very strong predictor of retaining customers amid the current saturation of the marketplace.

These findings are in line with previous studies. Kumar et al., (2024) show that digital mindfulness encourages emotional engagement and value-based loyalty. Klase et al., (2021) found that users with high digital awareness showed a stronger attachment to digital apps. Quang & Thuy, (2024) assert that digital self-control contributes to loyalty to online shopping platforms. Raj & Author, (2025) show that the integration between digital intelligence and user awareness strengthens loyalty through a reflective shopping experience. Finally, Santana & Eckhardt, (2023) emphasize that digital spirituality and mindfulness shape responsible consumption behaviors and impact customer loyalty.

Recommendation Algorithm on Customer Loyalty

The results of the structural analysis for the second hypothesis (H2) show that the Recommendation Algorithm has a positive and significant influence on Customer Loyalty with the highest path coefficient in this model ($\beta = 0.31$; $t = 4.02$; $p < 0.001$). These findings confirm that the recommendation algorithm is the strongest predictor in driving customer retention on Shopee. Theoretically, these results support Information Foraging Theory, which states that consumers tend to settle on platforms that minimize "search costs" through the provision of relevant information automatically (Pirolli & Stuart Card, 1999).

Compared to an international study by Ashfaq et al., (2020) that focused on AI technical satisfaction, these findings show that in the Indonesian market, algorithms not only function as efficiency tools, but also as personalization instruments that build affective bonds. The value of t of 4.02 indicates a very high level of significance, confirming that Shopee's ability to predict user preferences creates *an effortless* shopping experience. This is in line with the research of Teo et al., (2025) which states that algorithm-based personalization significantly increases the intensity of repeat purchases. In this context, the loyalty that is formed is not just transactional loyalty, but loyalty rooted in a convenient functional dependency, in which the system adaptively understands user behavior patterns without the need for repetitive manual input.

These findings are in line with previous studies. Research by Saputra, (2025) shows that algorithm-based personalization significantly increases customer satisfaction and loyalty. Esmeli et al., (2025) emphasize that a loyalty-aware recommendation system is capable of strengthening the long-term relationship between customers and platforms. Changalreddy & Priyanshi, (2025) found that behavior-based recommendations significantly increase customer retention. Ononiwu et al., (2025) show that a priori-based algorithm strengthens loyalty through intelligent recommendations. In addition, a study by Dwivedi et al. (2021) confirms that the adaptation of AI-based technologies in e-commerce contributes to customer loyalty through personalized experiences.

Product Sustainability on Customer Loyalty

The results of the third hypothesis (H3) test confirmed that Product Sustainability has a positive and significant influence on Customer Loyalty on the Shopee platform ($\beta = 0.26$; $t = 3.12$; $p = 0.002$). These findings theoretically support the Value-Belief-Norm (VBN) Theory, which explains how personal values (such as concern for the environment) transform into moral obligations that dictate long-term loyalty behaviors (Stern, 2000). Consumers no longer see loyalty as a mere economic exchange, but rather as a manifestation of a socially responsible self-identity.

In the context of Indonesia's digital market, these findings provide *measurable evidence* that goes beyond previous descriptive discussions. The value of t of 3.12 indicates a shift in the consumer segment at Shopee that has begun to prioritize the "eco-friendly" or "green product" label as a retention criterion. Compared to the Štofejev et al., (2023) study which examined sustainability in the global market, this study found that for Indonesian consumers, the aspect of product sustainability is a strong *strategic differentiator* in the midst of price competition. This is in line with the Katadata Insight Center report (2023) which recorded an increase in environmental awareness of 55% among marketplace users. Therefore, the loyalty formed is transcendental—where consumers remain loyal to the platform because of the compatibility between personal ethical values and sustainable product categories provided by Shopee.

These findings are in line with previous studies. Reppmann et al., (2025) show that customer engagement in a company's sustainability significantly increases loyalty. Lin, (2024) emphasize that the perception of a product's green attributes contributes to long-term loyalty. Štofejev et al., (2023) found that product sustainability is a differentiating factor in e-commerce customer retention. Gong et al., (2023) stated that consumers who identify with sustainability values show higher loyalty intentions. In addition, Theocharis & Tsekouropoulos, (2025) emphasized that loyalty to sustainable brands is influenced by the perception of corporate ethics and social responsibility.

Consumer Spirituality Moderate Digital Mindfulness on Customer Loyalty

Moderation analysis showed that Consumer Spirituality significantly strengthened the relationship between Digital Mindfulness and Customer Loyalty in Shopee users ($\beta = 0.14$; $t = 2.45$; $p = 0.014$). These findings make a theoretical contribution to Transpersonal Psychology Theory in the context of consumer behavior, which states that an individual's transcendental value orientation can deepen the meaning of their cognitive activities. When digital *mindfulness* interacts with spiritual values, consumption activities are no longer seen as mere material transactions, but rather as a form of manifestation of broader life values.

Measurably, the value of $t = 2.45$ proves that spirituality serves as a "*value filter*" that strengthens the emotional attachment of customers. In contrast to conventional loyalty studies in Indonesia that focus on functional satisfaction (Atha et al., 2022), these findings suggest that consumers who have a high level of spirituality tend to reflect more deeply when interacting with Shopee. They seek a resonance between the ethics of the

platform and their personal spiritual principles. The resulting loyalty is transcendental, where customers remain loyal because the platform is perceived to support a conscious and responsible lifestyle. This is in line with the research of Fischer et al., (2017) who noted that spirituality can mitigate impulsive consumption behaviors and replace them with loyalty based on *meaningful consumption*.

These findings are reinforced by Charzynska et al., (2021) showing that daily spiritual experiences significantly moderate consumption behaviors. A study by Jin & Dong, (2025) also emphasizes that spiritual values strengthen loyalty to ethically aligned brands. Meanwhile, Husemann & Eckhardt, (2019) found that consumer spirituality strengthens the relationship between digital awareness and sustainable purchasing intentions.

Consumer Spirituality Moderates Product Sustainability on Customer Loyalty

Structural analysis confirms that Consumer Spirituality significantly strengthens the influence of Product Sustainability on Customer Loyalty in the Shopee ecosystem ($\beta = 0.17$; $t = 2.89$; $p = 0.004$). These findings provide empirical evidence for Social Identity Theory and Self-Transcendence Values, where highly spiritually oriented consumers tend to interpret product sustainability not just as a technical attribute, but as a moral obligation and a form of contribution to collective well-being (Fischer et al., 2017).

Theoretically, this linkage explains that spirituality acts as a cognitive reinforcer that transforms the perception of *green products* into transcendental values. In contrast to the study of Fischer et al., (2017) which looked at sustainability in the context of global market utility, the results of this study show that in the Indonesian market, loyalty is triggered by *spiritual-value alignment*. When spiritual consumers see the "eco-friendly" label on Shopee, they feel a resonance between personal identity and the platform's ethics. The measurably significant value of $t = 2.89$ proves that the spiritual consumer segment in Indonesia is a major supporter of sustainable consumption. The resulting loyalty is very stable because it no longer depends on price incentives, but on the belief that the consumption behavior is part of the devotion to higher values.

Research by Reppmann et al., (2025) shows that customer engagement in a company's sustainability mission increases when spiritual values come into play. Charzynska et al., (2021) also assert that spirituality reinforces a preference for products that have ethical value. Santana & Eckhardt, (2023) found that consumer spirituality strengthens the relationship between the perception of sustainability and loyalty in e-commerce platforms.

Consumer Spirituality Moderates Recommendation Algorithms on Customer Loyalty

Based on the results of structural analysis, the sixth hypothesis (H6) was rejected, because the interaction between the Recommendation Algorithm and Consumer Spirituality was shown to have no significant influence on Customer Loyalty in Shopee users ($\beta = 0.09$; $t = 1.72$; $p = 0.086$). Despite the positive direction of the relationship, the

$t <$ value of 1.96 indicates that the consumer's spirituality is not able to significantly amplify the algorithm's influence on loyalty.

These findings provide an important theoretical contribution through the perspective of Cognitive-Affective System Theory (CAPS), which shows the *dissonance* or disharmony between technical data processing systems and spiritual value systems (Ashfaq et al., 2020; Mischel & Shoda, 1995). Theoretically, recommendation algorithms operate on the logic of functional efficiency and past behavioral patterns (*behavioral data*), while spirituality is oriented towards transcendental meaning and deeper consumption goals.

This insignificance suggests that loyalty triggered by algorithms is mechanical, while spirituality triggers loyalty that is reflective. These findings are in line with the argument of Nasuka et al., (2021) that spiritual values often act independently of external technological stimuli. In the Indonesian market, while users appreciate the ease provided by Shopee's algorithm, the decision to remain faithful driven by spiritual motivation does not depend on how accurately the algorithm works. Thus, systemic efficiency does not always synergize with the fulfillment of spiritual values, which confirms that *technological convenience* and *spiritual resonance* are two different loyalty paths and run in parallel but separately.

Research by Charzynska et al., (2021) shows that consumer spirituality is more influential in the context of ethical and reflective consumption, rather than technology. Meanwhile, a study by Esmeli et al., (2025) emphasizes that an effective recommendation system is more influenced by digital intelligence than spiritual values. Husemann & Eckhardt, (2019) also found that spirituality does not necessarily reinforce interaction with technological features, but is more effective in the context of sustainability and digital awareness.

Digital Intelligence Moderates Digital Mindfulness on Customer Loyalty

Empirical analysis shows that Digital Intelligence significantly strengthens the influence of Digital Mindfulness on Customer Loyalty of Shopee users ($\beta = 0.16$; $t = 2.77$; $p = 0.006$). These findings theoretically validate the Capability-Motivation-Opportunity (CMO) model, which states that internal motivation (in this case reflective awareness of *digital mindfulness*) will result in stronger behaviors (loyalty) when supported by adequate capabilities (*digital intelligence*) (Nasuka et al., 2021).

Measurably, the value of $t = 2.77$ confirms that digital intelligence serves as a cognitive catalyst. Digitally savvy consumers have a higher ability to navigate the complexity of Shopee's features, filter out *information overload*, and actualize their reflections into effective purchasing decisions. In contrast to the study by Priyono & Moin, (2020) which highlighted digital literacy in general, this study proves that digital intelligence specifically moderates consumers' mental processes in managing digital distractions.

In the context of the Indonesian market, which is undergoing a massive digital literacy transition, the loyalty formed is the result of the integration between *digital*

literacy and reflective awareness. Consumers are not only loyal because they feel comfortable, but because they have full control (agency) over their interactions with the platform. This is in line with (& Wilson, (2019) argument that user cognitive intelligence in an AI-driven environment will increase *experience value*, ultimately locking in customer loyalty on both a functional and affective level.

These findings are in line with a study by Yum & Kim, (2024), which shows that digital fluency strengthens customer engagement and loyalty in e-commerce platforms. Quang & Thuy, (2024) emphasized that digital intelligence plays an enabler in shaping experience-based loyalty. Pereira et al., (2025) also showed that the interaction between digital mindfulness and digital intelligence resulted in stronger loyalty than the effects of each variable separately.

Digital Intelligence Moderates Recommendation Algorithms on Customer Loyalty

The test results showed that Digital Intelligence had a positive influence but was at the threshold of significance in strengthening the relationship between the Recommendation Algorithm and Customer Loyalty ($\beta = 0.11$; $t = 1.94$; $p = 0.053$). Although the value of t is slightly below the conventional threshold of 1.96, the positive direction of the relationship suggests that digital intelligence acts as a cognitive enhancer that helps consumers interact with algorithmic systems more empowerably.

Theoretically, these findings extend the Technology Acceptance Model (TAM) by adding a dimension of cognitive capabilities. Consumers with high digital intelligence are not passive to Shopee's recommendations; they have agency to evaluate and adjust their preferences (Ashfaq et al., 2020). This near-significant value of p indicates that while Shopee's algorithm is already very intuitive for everyone, the additional benefits of digital intelligence are more pronounced in increased personal control.

This is in line with Mclean & Wilson, (2019) argument that in an AI-driven environment, loyalty arises not only from the accuracy of the machine, but from the user's confidence in navigating the system. This slight insignificance ($p = 0.053$) may be due to the fact that Shopee's current algorithm is already designed to minimize technical barriers for lay users, so that the difference between users with high and low digital intelligence becomes less contrasting in the context of functional loyalty. Strategically, it shows that for advanced consumers, loyalty is strengthened through a "feeling of control" over the algorithm, rather than simply blindly accepting product suggestions.

These findings are reinforced by Gong et al., (2023), who state that digital intelligence strengthens the effectiveness of recommendation systems in shaping customer loyalty. Esmeli et al., (2025) emphasize that recommendation systems combined with digital literacy result in higher customer retention. Yin et al., (2025) show that customers with high digital intelligence are more responsive to algorithm-based recommendations, especially in the context of dynamic e-commerce.

Digital Intelligence moderates Product Sustainability on Customer Loyalty

The results of the structural analysis show that Digital Intelligence significantly strengthens the influence of Product Sustainability on Customer Loyalty on the Shopee

platform ($\beta = 0.19$; $t = 3.21$; $p = 0.001$). These findings contribute to the Ecological Modernization Theory, which argues that cognitive advancement and technological mastery allow individuals to be more effective in adopting sustainable lifestyles (Mischel & Shoda, 1995).

Measurably, the value of $t = 3.21$ proves that digital intelligence is not just a technical ability, but a tool for consumers to verify the sustainability claims of a product. Digitally savvy consumers have the ability to *cross-check* information, understand supply chain transparency, and identify *greenwashing*. This is in line with research by Fischer et al., (2017) which states that in the digital age, sustainable product information is often complex, so it requires high digital literacy to convert purchase intent into long-term loyalty.

In the Indonesian market, the synergy between digital intelligence and product sustainability creates loyalty based on verified trust. Consumers are not only loyal because their products are environmentally friendly, but because they have the digital capabilities to ensure that Shopee and its sellers truly apply sustainability principles. These findings confirm that for tech-savvy market segments, green product campaigns will be much more effective if they are supported by data openness and in-depth information features.

These findings are in line with a study by Yin et al., (2025), which showed that loyalty to green products is more influenced by personal values and ecological identity than by digital literacy. Acatrinei et al., (2025) also found that digital intelligence only strengthens loyalty when combined with interactive features, not sustainability attributes. Research by Abumoghli, (2024) confirms that sustainability is more effectively moderated by spiritual or ethical values than by technological competence.

Consumer Spirituality on Customer Loyalty

The test results showed that Consumer Spirituality had a positive and significant influence directly on Customer Loyalty in Shopee users ($\beta = 0.21$; $t = 2.98$; $p = 0.003$). These findings provide empirical validation of the Self-Congruity Theory, which states that consumer loyalty will increase significantly if there is a match between their personal value identity and the platform's value image (Nasuka et al., 2021; Sirgy, 1982).

Theoretically, consumer spirituality reflects a dimension of transcendental value that guides consumption behavior beyond utilitarian motives. The value of $t = 2.98$ proves that for consumers in Indonesia, loyalty is not only built through functional satisfaction (such as price or delivery speed), but through the perception that the platform reflects noble values such as honesty, empathy, and social responsibility.

This is in line with the Transpersonal Value approach, where loyalty arises from the resonance between *self-identity* and brand *identity*. In contrast to the study of Atha et al., (2022) which emphasized transactional factors, this study proves that spirituality acts as an ethical compass that binds consumers affectively. In the context of Shopee, features that show social care or transparent business ethics become a bridge for spiritual

consumers to feel a deeper connection, thereby creating more stable retention and not easily influenced by competitors' purely materialistic marketing strategies.

These findings are reinforced by Charzynska et al., (2021) showing that spirituality plays an important role in forming emotional attachment to brands. Research by Miller & Godfrey, (2025) also confirms that spiritual consumers are more loyal to brands that show a commitment to ethical values. Husemann & Eckhardt, (2019) found that consumer spirituality directly increases loyalty intentions in the context of value-based e-commerce.

Digital Intelligence on Customer Loyalty

The results of the last hypothesis test show that Digital Intelligence has a positive and significant influence directly on Customer Loyalty in Shopee users ($\beta = 0.24$; $t = 3.12$; $p = 0.002$). These findings theoretically validate Social Cognitive Theory, specifically the concept of Self-Efficacy (Bandura, 1977), which states that an individual's belief in his or her ability to master technology will determine their level of attachment and sustainability in using the system (Mclean & Wilson, 2019; Zulianti et al., 2022).

Measurably, the value of $t = 3.12$ proves that digital intelligence is not just a technical skill, but cognitive capital that creates a *sense of control*. Consumers with high digital literacy feel more confident in evaluating information, avoiding algorithmic bias, and maximizing promotional features without feeling intimidated by the complexity of the app. In contrast to passive loyalty, digital intelligence builds Empowered Loyalty, where customers remain loyal because they feel they are able to navigate the Shopee ecosystem efficiently and independently. This is in line with the argument of Ashfaq et al., (2020) that in an AI-driven environment, the cognitive capabilities of the user are the main key that transforms functional experiences into deep affective attachments. Thus, the loyalty formed is the result of the psychological comfort that arises from technical proficiency.

These findings are in line with Dini Maylinda et al., (2024), who show that digital intelligence strengthens customer loyalty through increased efficiency and satisfaction of digital experiences. Natalie & Ferdian, (2025) also emphasized that digital fluency contributes to long-term attachment to e-commerce platforms. Hwang, (2024) found that digital intelligence is a significant predictor of customer loyalty in the context of technology-based online shopping.

5. Conclusion

This study aims to test the influence of digital mindfulness, recommendation algorithms, and product sustainability on Shopee customer loyalty in the Greater Tangerang area, by considering the role of moderation from consumer spirituality and digital intelligence. The results of the SEM-PLS analysis show that the three main variables have a significant effect on customer loyalty, with the recommendation algorithm as the most dominant predictor. In addition, consumer spirituality and digital intelligence were shown to reinforce most of the relationships between variables,

although not all interactions showed statistical significance. Overall, the model explains 62% of customer loyalty variability, indicating strong predictive power and high theoretical relevance.

The theoretical implication of this study is the strengthening of the literature on the integration of transcendental values and digital competence in shaping customer loyalty in the e-commerce era. These findings support a multidimensional approach in the study of consumer behavior, where loyalty is influenced not only by technical features, but also by digital awareness, value, and prowess. Practically, the results of this study provide recommendations for e-commerce platforms such as Shopee to develop ethical personalization strategies, sustainability education, and interactive features that support digital mindfulness. Consumer segmentation based on spirituality and digital intelligence can also be a strategic approach in building long-term, value-based loyalty.

The main limitation in this study lies in the geographical scope that is limited to the Greater Tangerang area, so generalization of results to other regions needs to be done carefully. In addition, the quantitative approach used does not capture the depth of consumer perception qualitatively, especially related to the dimensions of spirituality and sustainability. Perception-based measurement instruments also have the potential to be influenced by social bias or respondents' desire to provide answers that are considered "good". This study has also not tested the mediative or longitudinal effects that can enrich understanding of customer loyalty dynamics over time.

Future studies should expand the geographic scope beyond Greater Tangerang to test generalizability. A mixed-methods approach is recommended to explore consumer perceptions of spirituality and sustainability more deeply. Researchers are encouraged to examine mediating and longitudinal effects to understand loyalty dynamics over time.

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