

CONSUMER LOYALTY IN THE DIGITAL ERA: THE ROLE OF GREEN INNOVATION STRATEGY, BRAND EQUITY, MARKETING COMMUNICATION, AND PURCHASING DECISIONS AS A MEDIATOR

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Abstract

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This study investigates the influence of green product innovation, brand equity, and marketing communication on consumer loyalty, with purchasing decisions as a mediating variable. The research focuses on Samsung smartphone users in Gresik and Sidoarjo, Indonesia. Using a quantitative approach, data were collected from 153 respondents through online questionnaires, and analysis was conducted using structural equation modeling (SEM). The results show that green product innovation, brand equity, and marketing communication significantly positively affect purchasing decisions and consumer loyalty. Additionally, purchasing decisions play a mediating role in the relationships between these independent variables and consumer loyalty. This study offers practical business insights, emphasizing the importance of green product innovation, brand equity enhancement, and strategic marketing communication in shaping consumer behavior and loyalty. The results provide a comprehensive understanding of the factors driving consumer loyalty, which can guide companies in developing strategies to improve customer retention and competitive advantage in the marketplace.

Keywords: Green Product Innovation, Brand Equity, Marketing Communication, Purchasing Decisions, Consumer Loyalty

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1. INTRODUCTION

In the era of Society 5.0, technology has become a pivotal aspect of daily life, driving a digital transformation that demands proficiency from all segments of society (Rinchen et al., 2024). The rapid

advancement of technology facilitates global business operations and intensifies competition within the marketplace (Meygoonpoury et al., 2024). As industries expand at an unprecedented rate, their environmental impact grows, leading to significant challenges such as global warming, pollution, and

erratic weather patterns (Oyedotun & Ally, 2021). Consequently, consumer behavior is shifting towards a preference for environmentally friendly products. According to Xie et al. (2024), contemporary consumers increasingly favor and demand green products.

Green product innovation refers to the strategic creation of products to minimize excessive resource use and reduce environmental damage (Li & Li, 2024). Companies that successfully implement green product innovation can attract consumers who value environmental sustainability, thus positioning themselves favorably in the market (Cai et al., 2024).

In line with this trend, green product innovation has become a key strategy for companies to attract consumers who are increasingly concerned about environmental sustainability (Li & Li, 2024). This concept includes reducing production waste, increasing energy efficiency, and using more environmentally friendly materials. Previous studies have shown that green product innovation not only improves a company's image but also contributes to consumers' purchasing decisions (Kirkizoglu & Karaer, 2022). Therefore, it is important for companies, especially in the technology industry, to develop effective green innovation strategies to build customer loyalty.

Smartphones are among Indonesian consumers' most ubiquitous products. Statistics from 2015 show that smartphone penetration in Indonesia was 28.6% of the population, which surged to over 63.3% by 2019 (Chandrasapth et al., 2022). However, this increase in smartphone usage has also contributed to the rise of electronic waste. Parajuly et al. (2019) report that electronic waste will reach 111 million tons by 2050. Thus, green product innovation in smartphones is crucial for reducing environmental harm and enhancing consumer perceptions of product value. According to a report from the top brand index (TBI), Samsung ranks first as the smartphone brand most chosen by Indonesian consumers, with a TBI score of 33% (Chandrasapth et al., 2022). This shows the dominance of the Samsung brand in the national market. Sandambi (2025) states that Samsung controls around 20–22% of the smartphone market share in Indonesia, making it the market leader along with major competitors such as Xiaomi and Oppo. In addition, based on Meng et al. (2023), the number of internet users accessing mobile devices has reached more than 197 million people, and more than 80% of them use Android smartphones, of which Samsung is one of the largest manufacturers.

Samsung's popularity is not only driven by its product innovation but also by the brand equity that has been built through various marketing communication strategies and campaigns that emphasize quality, innovation, and sustainability. Therefore, Samsung smartphone users in Indonesia, especially in urban areas such as Gresik and Sidoarjo, are a relevant target for analyzing the influence of green innovation strategies, brand equity, and marketing communications on consumer loyalty.

In addition to green product innovation, brand equity plays a significant role in influencing consumer purchasing decisions. In today's saturated market, where multiple brands compete even within the same product category, substantial brand equity

differentiates products and builds consumer trust (Palomba, 2022). Companies with robust brand equity are perceived as more reliable, leading to increased consumer loyalty and preference (Sun et al., 2024).

Another factor that is no less important is marketing communication. In the digital era, companies need to develop the right marketing communication strategy to reach and influence potential customers (Chu et al., 2019). Effective marketing communication not only increases brand awareness but also builds long-term relationships with customers through various communication channels, such as social media, digital advertising, and direct promotions (Tong et al., 2022).

Samsung is one of the leading smartphone brands in Indonesia, consistently ranking high in consumer preference. However, beyond brand equity, effective marketing communication is essential for maintaining consumer engagement and influencing purchasing decisions (Sarker et al., 2021). According to Bartikowski et al. (2023), marketing communication can reshape consumer attitudes, informing them about product usage and benefits and ultimately driving purchasing behavior (Prakash et al., 2024). Effective marketing communication boosts sales and reinforces brand loyalty over time (Grandi & Cardinali, 2022).

Given Samsung's leadership position in the global smartphone market, accounting for 20% of total global sales in Q3 2023 (Varriale et al., 2022), it is crucial to explore the interplay between green product innovation, brand equity, and marketing communication in shaping consumer loyalty. Moreover, understanding the mediating role of purchasing decisions in this relationship offers valuable insights for businesses aiming to enhance consumer retention and brand loyalty.

However, there is still a research gap in understanding the relationship between green product innovation, brand equity, and marketing communication on customer loyalty, especially in the Indonesian market. In addition, the role of purchasing decisions as a mediating variable in this relationship has not been widely discussed in previous literature. Therefore, this study aims to analyze how green product innovation, brand equity, and marketing communication affect customer loyalty, with purchasing decisions as a mediating variable. This study focuses on Samsung smartphone users in Gresik and Sidoarjo, two areas experiencing rapid technology market growth.

The rest of the paper is structured as follows. Section 2 presents the relevant literature, including the concepts of green product innovation, brand equity, marketing communication, purchasing decisions, and consumer loyalty. Section 3 describes the research methodology, including the research design, population, and sample, data collection procedures, and measurement instruments. Section 4 discusses the results and findings derived from the data analysis using the structural equation modeling (SEM) approach. Section 5 provides a comprehensive discussion of the implications of the findings. Section 6 outlines the conclusions, limitations of the study, and recommendations for future research.

2. LITERATURE REVIEW

2.1. Marketing management

Marketing management refers to the process by which organizations plan, execute, and oversee marketing activities to achieve their business objectives. It involves a series of coordinated efforts to understand customer needs, develop products and services, and effectively communicate their value to the target audience. The ultimate goal of marketing management is to build strong customer relationships while maximizing company profitability (Gazi et al., 2024).

Effective marketing management is essential for businesses to maintain competitiveness in a rapidly evolving marketplace. According to recent studies, marketing management encompasses several vital activities, including market research, product development, pricing strategies, promotion, and distribution (Wengler & Kolk, 2023). These activities must align with consumer preferences and market trends to ensure the company's offerings remain relevant and appealing.

Critical indicators of successful marketing management include:

1. *Market research and consumer insights.* Conducting thorough market research to gather data on consumer behavior, preferences, and trends is crucial. This information forms the foundation for strategic decision-making in product development and marketing campaigns (Jafari et al., 2022).

2. *Product development and innovation.* Developing products that meet consumer needs and preferences is a core aspect of marketing management. This involves creating new products and improving existing ones to maintain market relevance (Mehralian et al., 2024).

3. *Pricing strategy.* Pricing is a critical element that affects consumer perception and demand. Effective pricing strategies optimize market share and profitability (Nivornusit et al., 2024).

4. *Promotion and communication.* Marketing communication strategies, including advertising, sales promotions, and public relations, play a significant role in shaping consumer perceptions and driving sales. These activities must be carefully managed to ensure they resonate with the target audience (Spotts et al., 2022).

5. *Distribution and channel management.* Ensuring that products are available to consumers when and where they want them is another critical aspect of marketing management. Efficient distribution channels are necessary to minimize costs and maximize customer satisfaction (Makienko & Rixom, 2022).

Effective marketing management requires an integrated approach that aligns all aspects of marketing with the overall business strategy. As competition intensifies and consumer expectations evolve, companies must continuously adapt their marketing strategies to maintain a competitive edge (Heredia Pérez et al., 2023).

2.2. Brand equity

According to McAlister et al. (2016), brand equity is one of the most critical aspects of intangible assets that a company may have. According to He et al. (2017), brand equity is the added value a product or service receives. It is determined by customer perception of the brand, price, market share, and

organizational profitability. According to Sun et al. (2021), strong brand equity is needed if it outperforms competitors. This is because a product with more substantial brand equity will be more attractive and valuable to customers than competing brands, so it will encourage purchases and increase profits for the company.

According to Palomba (2022), brand equity is measured using the following four indicators: 1) brand awareness, 2) perceived quality, 3) brand association, and 4) brand loyalty.

2.3. Marketing communication

Marketing communication is a means a business uses to provide information to consumers, convince them, and remind them about the goods and brands they offer, both directly and indirectly (Suryono et al., 2021). Marketing communication is essential to ensure that marketers (communicators) and potential consumers (communicants) understand each other's meaning consistently, even though the market form is still straightforward (Lv et al., 2018). Shankar et al. (2022) explain that the existence of marketing communication carried out by the company can be a means for the company to build relationships with its consumers. There are five marketing communication indicators: 1) advertising (advertising), 2) personal selling (personal selling), 3) sales promotion (sales promotion), 4) public relations (public relations), and 5) direct marketing (direct marketing).

2.4. Purchasing decision

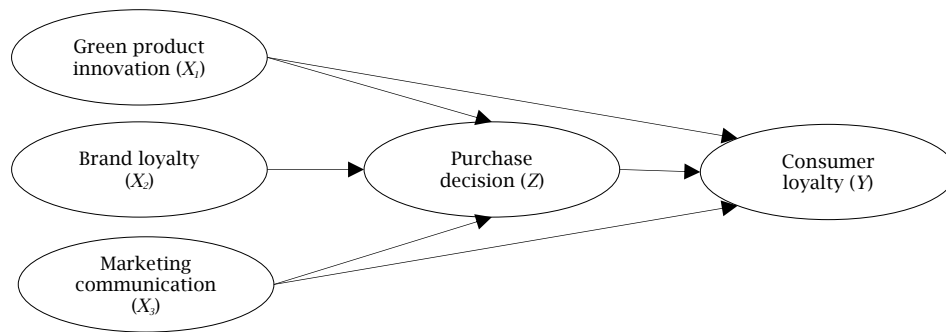
A purchasing decision results from a decision-making process that includes determining whether a good or service is necessary and finding, evaluating, and choosing among competing brands (Medina et al., 2020). According to Cunha et al. (2018), a purchasing decision is a series of steps that begin with consumers identifying their problems, seeking information about a particular brand or product, and assessing the brand or product based on how good each brand or product is.

According to Leal et al. (2014), purchasing decisions can be measured through the following four indicators: 1) determination to buy after knowing product information, 2) deciding to buy because of a preferred brand, 3) buying because it suits your wants and needs, and 4) buying because of recommendations from others.

2.5. Consumer loyalty

According to Sun et al. (2024), consumer loyalty is a customer's dedication to a store, brand, or supplier based on a positive attitude manifested in the form of regular follow-up purchases. According to Sun et al. (2024), consumer loyalty is a high level of customer commitment demonstrated by repeat purchases or subscriptions to products or services. According to Kumar and Reinartz (2016), customer loyalty is an asset for a business that, if handled properly, can provide added value by reducing marketing costs, attracting new clients, increasing trade, and offering protection against competitors. According to Sun et al. (2024), there are three indicators of consumer loyalty, including: 1) making repeat purchases, 2) resistance to negative influences regarding the company, and 3) recommending to others.

Figure 1. Conceptual framework



H1: Green product innovation positively and significantly affects purchasing decisions among Samsung smartphone users in Gresik and Sidoarjo.

H2: Brand equity positively and significantly affects purchasing decisions among Samsung smartphone users in Gresik and Sidoarjo.

H3: Marketing communication positively and significantly affects purchasing decisions among Samsung smartphone users in Gresik and Sidoarjo.

H4: Green product innovation positively and significantly affects consumer loyalty among Samsung smartphone users in Gresik and Sidoarjo.

H5: Brand equity positively and significantly affects consumer loyalty among Samsung smartphone users in Gresik and Sidoarjo.

H6: Marketing communication positively and significantly affects consumer loyalty among Samsung smartphone users in Gresik and Sidoarjo.

H7: Purchasing decisions positively and significantly affect consumer loyalty among Samsung smartphone users in Gresik and Sidoarjo.

H8: Purchasing decisions mediate the relationship between green product innovation and consumer loyalty among Samsung smartphone users in Gresik and Sidoarjo.

H9: Purchasing decisions mediate the relationship between brand equity and consumer loyalty among Samsung smartphone users in Gresik and Sidoarjo.

H10: Purchasing decisions mediate the relationship between marketing communication and consumer loyalty among Samsung smartphone users in Gresik and Sidoarjo.

These hypotheses are formulated to reflect the relationships between green product innovation, brand equity, marketing communication, purchasing decisions, and consumer loyalty. The mediation hypotheses (H8, H9, H10) are designed to test the role of purchasing decisions as a mediator in the influence of the independent variables on consumer loyalty, which aligns with the findings from your study.

3. RESEARCH METHODOLOGY

This study uses a quantitative approach with an explanatory research design, which aims to analyze the causal relationship between independent variables (*green product innovation, brand equity, and marketing communication*) and dependent variables (*consumer loyalty*), with *purchase decision* as a mediating variable. This study employed the partial least squares SEM (PLS-SEM) technique using SmartPLS software due to its suitability for complex models involving multiple constructs and mediating variables, its robustness with smaller sample sizes, and non-normal data distributions.

PLS-SEM was chosen particularly for its predictive capability and ability to handle both reflective and formative constructs.

Future studies may consider using covariance-based SEM (CB-SEM), which is suitable for theory testing and validation when the sample size is larger and the data meet multivariate normality assumptions. In addition, regression-based mediation analysis (e.g., using the PROCESS macro in SPSS or AMOS) could also be applied to examine direct and indirect effects with simpler models. These alternative approaches could help triangulate results or provide additional robustness checks for model validation.

3.1. Population and sample

The population in this study consisted of Samsung smartphone users in the Gresik and Sidoarjo areas of Indonesia. The selection of this area was based on the rapid growth of smartphone users in urban and suburban areas. Because the population size is not known for certain, the non-probability sampling method was used, with the purposive sampling technique as the main approach.

The determination of the number of samples was carried out using G*Power software, which recommends a minimum of 153 respondents based on power analysis for SEM. The inclusion criteria in this study were:

1. Active users of Samsung smartphones in the last six months.
2. The age group is 18–45 years old, considering that this age segment is the main user of smartphones in daily digital activities.
3. It is located in the Gresik and Sidoarjo areas.

3.2. Data collection techniques

Data were collected through an online questionnaire distributed via Google Forms. The questionnaire consists of two main parts:

Part 1: Demographic data (age, gender, occupation, domicile, frequency of smartphone use).

Part 2: Likert scale (1–5) to measure respondents' perceptions of green product innovation, brand equity, marketing communications, purchasing decisions, and customer loyalty.

The primary tool used for data collection in this study was an online questionnaire developed and distributed via Google Forms. The questionnaire was structured into two main sections: 1) demographic information and 2) variable measurement. The measurement section utilized a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) to assess respondents' perceptions,

attitudes, and satisfaction levels concerning green product innovation, brand equity, marketing communication, purchasing decisions, and consumer loyalty. This scale allowed the researchers to quantitatively capture the degree of agreement or disagreement toward each statement aligned with the constructs being examined.

3.3. Operationalization of variables

To ensure the clarity of the concepts being measured, the variables in this study are described as follows:

1. *Green product innovation (X_1)*: Strategy carried out by companies in developing more environmentally friendly products (Li & Li, 2024). Indicators: Efficient use of resources, environmentally friendly materials, and carbon emission reduction.

2. *Brand equity (X_2)*: Consumer perception of Samsung's brand value is based on brand recognition and trust (Palomba, 2022). Indicators: Brand awareness, perceived quality, brand association, brand loyalty.

3. *Marketing communication (X_3)*: Communication strategy carried out by companies to build relationships with consumers (Bartikowski et al., 2023). Indicators: Advertising, promotions, social media, public relations.

4. *Purchase decision (Z)*: Consumer evaluation process before deciding to buy a product (Medina et al., 2020). Indicators: Purchase decisions based on preference, quality, price, and recommendations.

5. *Customer loyalty (Y)*: Consumer willingness to continue using Samsung products and recommend them to others (Sun et al., 2024). Indicators: Repeat purchases, resistance to competitors, recommendations to others.

3.4. Data analysis techniques

Data analysis was carried out using the SEM method with PLS. The stages of analysis include:

1. *Validity and reliability test*: 1) convergent & discriminant validity test using average variance extracted (AVE) > 0.50 and 2) reliability test with Cronbach's alpha (CA) > 0.70 to ensure internal consistency between indicators.

2. *Outer model test (model measurement)*: 1) measuring construct validity by looking at loading factors (> 0.7) and 2) testing construct reliability with Composite reliability (CR) > 0.70.

3. *Inner model test (structural model evaluation)*: 1) R-square (R^2) to see the proportion of variance explained by the model, 2) Q-square (goodness-of-fit [GoF] test) to measure the predictive power of the model, and 3) path analysis to see the direct and indirect effects between variables.

4. *Hypothesis testing*: 1) using t-statistic > 1.96 and p-value < 0.05 to determine the significance of the influence between variables, and 2) purchase decision mediation analysis is carried out using the indirect effect test.

4. RESULT

Based on the questionnaire data collection distributed via Google Form, the results of the respondent classification based on domicile showed that 60.1% of respondents were domiciled in Gresik, and the rest were domiciled in Sidoarjo, namely 39.9%.

Table 1. Variable description

No.	Variables	Mean
1	Green product innovation	4.29
2	Brand equity	4.49
3	Marketing communication	4.25
4	Purchase decision	4.38
5	Consumer loyalty	4.31

This study shows that each variable has a relatively high mean value, indicating that X_1 , X_2 , and X_3 significantly affect Z and Y . Z acts as a mediating variable between these factors and Y .

Table 2. Reliability test

Variables	Item	CA	Critical value	Information
X_1	8	0.889	0.70	Reliable
X_2	8	0.891	0.70	Reliable
X_3	12	0.938	0.70	Reliable
Z	6	0.871	0.70	Reliable
Y	8	0.915	0.70	Reliable

Reliability testing is conducted to measure the internal consistency of each variable used in the study. The value used to estimate reliability is the CA value, where an instrument is considered reliable if the CA value is greater than the critical value set, which is 0.70 (Acquila-Natale & Iglesias-Pradas, 2020). Overall, all variables measured in this study have a CA value above 0.70, which indicates that the instrument used in this study has good internal consistency and can be trusted to measure the related variables.

Table 3. Discriminant validity test

Variables	AVE	Information
X_1	0.563	Valid
X_2	0.567	Valid
X_3	0.595	Valid
Z	0.611	Valid
Y	0.629	Valid

A discriminant validity test ensures that each variable in the research model measures different concepts. One indicator of discriminant validity is the AVE value. A variable is declared valid if its AVE value is greater than 0.5.

All variables in this study have AVE values above 0.5, which indicates that the variables meet the requirements of discriminant validity. This shows that each variable can measure different constructs well, with no significant overlap between variables.

4.1. Inner model evaluation

Based on the results of the R-square test in Table 4, the Z variable has an R-square value of 0.663 and an adjusted R-square of 0.656, which indicates that 66.3% of the variation in Z can be explained by independent variables such as X_1 , X_2 , and X_3 .

In comparison, other factors outside the model influence the remaining 33.7%. This is supported by the theory of consumer behavior (Rita et al., 2019), which states that consumer perceptions of product quality and value, marketing communications, and perceived product innovation influence purchasing decisions.

Table 4. Coefficient of determination

Variables	R-square	Adjusted R-square
Z	0.663	0.656
Y	0.697	0.689

$$Q^2 = 1 - [(1 - R_1^2) \times (1 - R_2^2)] = 1 - [(1 - 0,663) \times (1 - 0,697)] = 1 - (0,337 \times 0,303) = 1 - 0,102 = 0,90 \quad (1)$$

4.3. Path analysis

X_1 has a significant effect on Z. This effect is substantial because consumers are increasingly aware of the importance of environmentally friendly products, especially in an era that is increasingly paying attention to sustainability issues. Products that prioritize green innovation can create a positive perception in the eyes of consumers, where they feel that the decision to buy the product is also

4.2. Goodness-of-fit

The Q-square value of 0.90 indicates that this model has an excellent GoF, which means that the combination of independent variables in the model can explain about 90% of the variance in purchasing decisions and consumer loyalty. This high value indicates a robust and relevant model describing the relationship between variables. GoF in structural models: GoF is an overall measure of a structural model used to determine how well the model can predict the data. In PLS-SEM-based models, Q-square is one method used to measure the predictive relevance of the model, which can be seen as an alternative measurement of GoF (Riyadi & Arif, 2023).

a contribution to the environment. This result also reflects the increasing public awareness of the importance of sustainability and the environmental impact of their products. This phenomenon is in line with the research of Guo et al. (2024) and Fudhla et al. (2024), which found that green product innovation has a significant positive impact on purchasing decisions because consumers increasingly value environmentally friendly products.

Table 5. Hypothesis test of direct effect

Relation	TTO	M	STDEV	t-statistic	p-values
$X_1 > Z$	0.225	0.225	0.064	3.535	0.000
$X_2 > Z$	0.185	0.186	0.076	2.421	0.016
$X_3 > Z$	0.387	0.389	0.061	6.304	0.000
$X_1 > Y$	0.201	0.202	0.071	2.853	0.005
$X_2 > Y$	0.328	0.329	0.061	5.369	0.000
$X_3 > Y$	0.228	0.234	0.097	2.355	0.019
$Z > Y$	0.345	0.338	0.096	3.589	0.000

X_2 significantly affects Z by creating added value that strengthens consumer purchasing decisions. When consumers know and trust a brand, they feel more confident in buying products from that brand because they believe in the quality and reputation offered. This creates a sense of security in Z, so a substantial X_2 is essential in strengthening consumer decisions. This phenomenon is supported by Upadhyay and Tripathi (2023), which states that brands with high equity can influence positive consumer perceptions and increase purchase intentions because of trust and familiarity with the brand.

X_3 has the most significant influence on Z because effective marketing communication conveys the right message about the product's benefits to consumers, strengthens brand image, and encourages purchasing actions. In an increasingly digitally connected world, targeted, consistent, relevant marketing communication can build emotional and rational consumer involvement in the product. This explains the phenomenon that a well-planned communication strategy not only increases awareness but also directly influences purchasing decisions. Behera et al.'s (2022) research emphasizes the importance of marketing communication in building a solid product perception and encouraging purchasing decisions through effective campaigns.

X_1 significantly affects Y because environmentally friendly product innovation creates strong differentiation in the market, which ultimately drives loyalty. Consumers who care about environmental issues tend to be more loyal to brands they perceive as aligned with their values. By offering green innovation, brands can build deep emotional connections with consumers, ultimately increasing their loyalty. This phenomenon is supported by research by Valderrama and Cameron (2023), who found that the decision to remain loyal to a product is often related to the green image of the product.

X_2 significantly influences Y because substantial brand equity creates a deep emotional connection between consumers and the brand. Consumers are more likely to be loyal when they have consistently positive experiences with a brand because the brand represents the values they value. This phenomenon shows that brands that successfully build high equity can create a loyal consumer base, as supported by Li and Zhang (2023), where brand equity contributes significantly to long-term loyalty.

X_3 has a significant influence on Y because effective marketing communication not only builds awareness but also strengthens long-term relationships between consumers and brands. Consumers actively involved with relevant marketing campaigns will likely remain loyal to the brand

because they feel close to the values and messages conveyed. Lopez's (2021) research supports this finding by showing that proper marketing communication can help build consumer loyalty through ongoing relationships.

Z significantly affects Y because positive purchasing decisions reflect consumer satisfaction with the products or services received, which

encourages consumers to remain loyal. This phenomenon explains that satisfaction at the first purchase stage can create a strong bond between consumers and brands, increasing loyalty. Von Helversen et al. (2018) found that purchasing decisions that meet consumer expectations directly contribute to loyalty formation.

Table 6. Indirect hypothesis testing

<i>Relation</i>	<i>O</i>	<i>M</i>	<i>STDEV</i>	<i>t-statistic</i>	<i>p-values</i>
$X_1 > Z > Y$	0.078	0.076	0.032	2.451	0.015
$X_2 > Z > Y$	0.133	0.132	0.045	2.959	0.003
$X_3 > Z > Y$	0.113	0.110	0.036	3.165	0.002

These results indicate a significant indirect effect of X_1 on Y through Z , with a t -statistic of 2.451 and a p -value of 0.015. This means that X_1 directly increases Y and indirectly affects loyalty through positive Z . This can happen because consumers interested in environmentally friendly innovations will feel more confident in purchasing decisions. When the decision is per expectations, they tend to be more loyal. This phenomenon is based on the research of González-Viralta et al. (2023), which shows that green innovation has a significant positive effect on purchasing decisions and, ultimately, on consumer loyalty.

The indirect effect of X_2 on Y through Z is also significant, with a t -statistic of 2.959 and a p -value of 0.003. This shows that brand equity influences loyalty directly and through consumer purchasing decisions. Consumers who believe in a brand have greater confidence in their decision to purchase, and when the decision is favorable, they tend to remain loyal to the brand. This phenomenon is supported by Wu et al.'s (2024) research, which found that brand equity creates strong trust among consumers, influencing purchasing decisions and increasing loyalty.

The indirect effect of X_3 on Y through Z is also significant, with a t -statistic of 3.165 and a p -value of 0.002. Effective marketing communication not only directly affects Y but also builds consumer trust in their Z . When X_3 successfully persuades consumers to make positive Z , the result is increased Y for the product or brand. This is in line with research by Gazi et al. (2024), which emphasizes that effective marketing communication can strengthen purchasing decisions and ultimately increase consumer loyalty.

5. DISCUSSION

The results of this study indicate that X_1 has a positive and significant influence on Z (coefficient 0.225, p -value = 0.000) and Y (coefficient 0.201, p -value = 0.005). This influence can be explained by the increasing consumer awareness of the importance of sustainability and environmentally friendly products. X_1 creates differentiation in the market and provides significant added value for consumers who care about the environmental impact of their products.

This finding is in line with the research of Srivastava et al. (2024), which states that X_1 significantly influences Z because consumers tend to prefer products that support sustainability. In addition, Y to products that offer X_1 is also supported by research by Han and Hyun (2017),

where consumers who are aware of environmental issues tend to be more loyal to brands that align with these values.

While the X_2 variable reveals that it has a significant effect on Z (coefficient 0.185, p -value 0.016) and Y (coefficient 0.328, p -value 0.000), X_2 plays a vital role in building consumer trust and influencing Z . When consumers positively perceive a brand, they feel more confident in their purchasing decisions, strengthening loyalty to the brand.

This result is supported by Huang et al. (2022), which emphasizes that solid X_2 builds a deep emotional connection between consumers and brands, ultimately increasing consumer loyalty. This study is also consistent with the findings of Huang et al. (2022), which shows that X_2 creates added value for consumers and strengthens Z through brand trust and reputation.

Another finding of this study is that X_3 significantly influences Z (coefficient 0.387, p -value = 0.000) and Y (coefficient 0.228, p -value = 0.019). Effective marketing communication can build a strong relationship between consumers and products and encourage consumers to make purchasing decisions. Good communication helps increase brand awareness and enables consumers to purchase based on their preferences and values.

This finding is similar to the study of Shankar et al. (2022), which confirms that well-designed X_3 can influence consumer Z by creating emotional and rational involvement. This study also supports the findings of Spotts et al. (2022), who state that targeted and consistent X_3 help build long-term relationships with consumers, ultimately increasing their loyalty to the brand.

The role of purchasing decision mediating. Z was found to be a significant mediating variable in this study. The indirect effect of X_1 on Y through Z (coefficient = 0.078, p -value = 0.015) shows that consumers interested in X_1 are more likely to make purchases, affecting their loyalty. Likewise, X_2 (coefficient = 0.133, p -value = 0.003) and X_3 (coefficient = 0.113, p -value = 0.002) affect consumer loyalty through positive purchase decisions.

This finding supports the mediation theory proposed by Namazi and Namazi (2016), which states that mediating variables, such as Z , can strengthen the relationship between independent and dependent variables. Consumers who feel their Z is based on X_1 , X_2 , or X_3 will be more likely to be loyal to the brand.

The results of this study have several practical implications for companies, especially in terms of marketing strategy and product development. X_1

should be a primary focus for companies that want to attract consumers who care about the environment. In addition, building substantial X_2 and designing effective marketing communications are essential in shaping positive purchasing decisions and increasing Y . Companies must realize the importance of understanding consumer needs and delivering relevant values to encourage long-term loyalty.

Overall, this study's results support existing theories related to consumer behavior and brand loyalty. X_1 , X_2 , and X_3 significantly influence Y , both directly and through Z as a mediating variable. These results align with previous studies and contribute to the literature related to marketing, product innovation, and consumer loyalty.

6. CONCLUSION

This study investigated the influence of green product innovation, brand equity, and marketing communication on consumer loyalty, with purchasing decisions acting as a mediating variable, using Samsung smartphone users in Gresik and Sidoarjo as the sample. The results demonstrate that all three independent variables significantly and positively affect both purchasing decisions and consumer loyalty. Moreover, purchasing decisions are shown to partially mediate the relationship between the independent variables and consumer loyalty, indicating that the consumer decision-making process plays a pivotal role in building lasting brand engagement.

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Theoretically, this study contributes to the literature on green marketing and consumer behavior by validating a comprehensive model that links innovation, brand perception, and marketing communication to loyalty outcomes through purchasing decisions. It also supports the mediating role of purchase decisions, which has been underexplored in the context of green consumerism and mobile technology brands in developing countries.

The findings offer valuable insights for marketers and business strategists. Companies, particularly in the smartphone industry, should prioritize environmentally responsible innovation, strengthen brand equity through consistent quality and trust-building efforts, and implement well-targeted and engaging marketing communication strategies. These actions will not only influence consumers' willingness to buy but also enhance long-term loyalty in a highly competitive digital market.

However, this study has several limitations. The sample was limited to two regions in East Java, which may not fully represent the diversity of consumer behavior across Indonesia. Additionally, the study relied solely on self-reported data via online surveys, which may introduce response bias. Future research is encouraged to apply a broader sampling strategy, integrate qualitative methods (e.g., interviews or focus groups), and compare cross-brand or cross-country consumer behavior to enrich the findings.

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