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Consumer's Purchase Intention on Sustainable and Greener Liquid Laundry Pods Driven by Green Innovation and Green Brand

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Abstract: This study examines the factors influencing consumer purchase intention toward environmentally friendly laundry pods in Indonesia, a country facing severe waste challenges and increasing demand for sustainable products. The research aims to analyze how green product innovation, green perceived quality, green customer value, and attitude toward green brand shape purchase intention in the context of eco friendly household products. Using a quantitative correlational design, data were collected through an online questionnaire from 135 respondents who use washing machines and have experience with laundry pods. The data were analyzed using Partial Least Squares Structural Equation Modeling through SmartPLS 4. The results show that green product innovation positively affects green customer value and purchase intention, while green customer value significantly influences both purchase intention and attitude toward green brand. Green perceived quality also has a direct positive effect on purchase intention. However, attitude toward green brand does not significantly predict purchase intention, and its mediating role is not supported. In contrast, green customer value successfully mediates the relationship between green product innovation and purchase intention. These findings highlight the importance of product innovation and perceived value in strengthening consumer interest in sustainable household products.

Keywords: Attitude, Green Innovation, Green Quality, Purchase Intention, Value

INTRODUCTION

Environmental management and protection represent an organized and coordinated effort to preserve environmental functions and prevent pollution or degradation. These efforts encompass planning, utilization, control, maintenance, supervision, and legal compliance to achieve sustainable development, as emphasized by *Otoritas Jasa Keuangan* (2016). Indonesia faces environmental challenges similar to many other countries, particularly regarding solid waste accumulation. With a coastline of 99093 kilometers and a population of 255.46 million people, Indonesia has become the second largest producer of plastic waste after China. According to the Indonesian Institute of Sciences LIPI, an estimated 270000 to 900000 tons of waste enter the oceans annually through river flows, dominated by single use plastic waste such as styrofoam and plastic sheets as reported by www.aa.com.tr. These conditions highlight the

urgency of adopting environmentally responsible behaviors and products in everyday life. In the modern era, awareness of environmental protection continues to grow and has become a central focus across various aspects of life. The increasingly visible impacts of climate change and threats to environmental sustainability have strengthened public demand for environmentally friendly technologies. Effective marketing strategies play a significant role in introducing these technologies and encouraging widespread adoption among consumers (Prayogo et al., 2024). Prayogo et al. (2024) further assert that consumer behavior has undergone a major shift in recent years, with individuals now paying closer attention to environmental considerations when making purchasing decisions. This trend aligns with the findings of Islam et al. (2024) who argue that customers today are more aware of environmental impacts and carefully consider how their purchasing decisions affect surrounding communities and the broader world.

To enhance business reputation and meet increasing consumer demand for environmentally responsible products, companies have begun paying greater attention to green marketing strategies (Hendra et al., 2023). Green marketing refers to a comprehensive marketing approach covering pricing, development planning, material selection, packaging, production processes, promotion, and personnel management, all aimed at minimizing environmental impacts of products and services offered by companies (Q. Zhang et al., 2020). According to Chen and Huang (2021), green marketing creates environmental value that helps build consumer trust in eco friendly products. Consumers who are environmentally conscious tend to express their concern through various activities such as evaluating and assessing products before purchasing to ensure that the items are environmentally responsible (Kaviya & Priyadarshini, 2022). However, Duong (2023) highlight that not all consumers with high intentions to engage in pro environmental consumption actually translate their intentions into green purchasing behaviors. This finding is consistent with the Theory of Planned Behavior which states that intention is the most significant predictor of actual behavior in pro environmental consumption research.

Green product innovation has attracted increasing attention from companies because it encourages consumers to purchase environmentally friendly products. Businesses are now developing various green products and services to capture a larger share of the eco friendly market segment (Immawati & Anggi, 2023). Green innovation helps reduce certain environmental risks such as CO2 emissions and other climate change consequences, while improving product usage efficiencies (Khan et al., 2022). Lewis (2013) supports this notion by stating that green innovation involves designing products that perform well while minimizing environmental harm. Hitchcock and Willard (2009) also remark that green product innovation requires companies to rethink their materials, waste management, energy use, and design processes from the earliest stages of production. Companies engaging in green innovation practices often experience improved financial and market performance (Majali et al., 2022). Chen and Chang (2013) further argue that as more consumers pay attention to environmentally friendly products, companies that develop sustainable offerings gain competitive value and contribute to sustainable development in the international market (Luan et al., 2022).

Environmental value is closely tied to consumer perceptions of the benefits associated with eco friendly products. These benefits may include environmental preservation, better personal health, and improved quality of life. Consumers who prioritize sustainability tend to select products aligned with their personal values and that offer both individual advantages and positive environmental impact. The stronger the perceived environmental value of a product, the higher the likelihood of purchase (Afianto & Waskito, 2025). In addition, attitude plays a significant role in shaping purchase intention, as it influences the psychological evaluation conducted by consumers toward a product (Pandey and Yadav, 2023). Green consumer attitudes are shaped by internal values that drive purchasing behavior toward environmentally responsible products (Shehawy, 2024). Mowen and Minor (as cited in Riptiono & Yuntafi'ah,

2021) explain that attitudes, beliefs, and behaviors are interconnected and ultimately shape an overall attitude. Positive feelings and favorable perceptions contribute to the formation of customer attitudes that subsequently influence their purchase intention toward eco friendly products. Therefore, businesses should provide products that are both environmentally friendly and of high quality to increase consumer purchase intention (Wicaksono, 2022). According to Kurniawati and Nina, green perceived quality refers to consumer assessment of product quality in relation to environmental aspects. While Evasari and Yani (2024) found that green perceived quality has a direct influence on green purchase intention, Hartanti et al. (2024) reported different results. Their study suggests that green perceived quality did not significantly affect green purchase intention for Garnier micellar cleansing water, indicating that the environmentally friendly claim was insufficient to influence consumer decisions. This research gap highlights the need to further investigate the factors influencing green purchase intention.

Market data reveal increasing interest in laundry pods in Indonesia, with Tokopedia and TikTok recording 250000 transactions in 2025 up to June, while Shopee reported 156000 transactions during the same period. These purchases mainly involve packaging of 50 pods per pack, with one pod suitable for up to 5.5 kilograms of laundry. User reviews show a high rate of repeat purchases, though most buyers are new users who learned about the product from TikTok. More than 90 percent of reviews are positive, highlighting fragrance, softness, and convenience. A small portion of users expressed hope that concentrated products such as laundry pods could help reduce waste. In 2020, non powder detergent products in Indonesia reached a market value of USD 290 million out of a total USD 1.1 billion for fabric care products, with growth at approximately 8 percent CAGR. However, specific data on laundry pods remain limited because the category is still in its infancy in Indonesia. In China, laundry pods have reached a 30 percent growth rate, while in the United States the growth rate is 12 percent. China's success is partly driven by government efforts encouraging the use of concentrated detergents to promote green consumption and reduce ineffective chemical use as well as water consumption as reported by (China Daily, 2019).

Despite increasing public awareness of environmental issues, adoption of environmentally friendly products such as laundry pods remains low in Indonesia. Laundry pods still occupy a niche market and are mostly used by higher income consumers who tend to have greater awareness of efficiency and environmental sustainability. One key challenge is the public's limited literacy regarding the advantages of laundry pods. Many consumers continue to prefer conventional liquid or powder detergents because of familiarity, low price, and wide availability. Informal surveys by Kompas.com and Detik.com in 2024 revealed that over 70 percent of Indonesian households are unaware of the specific benefits of laundry pods, including efficiency, reduction of plastic waste, and positive environmental impact. Statista (2023) reported that the penetration of laundry pods in Southeast Asia including Indonesia remains below 10 percent compared with conventional detergents. This gap indicates that although Indonesian consumers are becoming more environmentally aware, their actual purchasing behavior is not yet aligned with their pro environmental intentions. Higher prices, lack of knowledge, unfamiliarity, and limited availability in traditional markets are among the main barriers to adoption. Therefore, understanding psychological factors such as green perceived quality, green perceived value, and green attitude is essential for identifying what drives purchase intention toward environmentally friendly products like laundry pods. This condition makes the research relevant, given the gap between global trends and domestic market realities in Indonesia and the need to investigate how green product innovation, green customer value, and green brand attitude influence consumer decisions in the context of sustainable product adoption.

METHOD

Research Design

This study employed a quantitative research design that focuses on numerical data and statistical analysis to obtain objective findings. The approach used was correlational, which aims to determine the relationships between variables through correlation coefficients. Data were collected using a structured questionnaire to ensure standardization, objectivity, and reliability in measurement.

Population and Sample

The population consisted of individuals in Indonesia who have used or are aware of laundry pods and who wash their clothes using a washing machine. The sample size was determined using the guidelines proposed by Hair and Bentler, which recommend a minimum of five respondents for each parameter in the structural model. With a total of 27 indicators, the minimum required sample was 135 respondents. Since the exact population size was unknown, the study adopted non probability sampling with purposive sampling, selecting respondents who met the criteria of being users or potential users of laundry pods. This technique was appropriate as not all members of the population had an equal chance of being included in the sample.

Data Collection Technique

Primary data were obtained through a questionnaire distributed online. The questionnaire method was chosen because it supports efficient, standardized, and comparable data collection, which is essential for quantitative analysis. This technique also facilitates faster processing and ensures the accuracy of responses.

Research Variables

The study involved independent, dependent, and mediating variables. The independent variables included Green Product Innovation and Green Perceived Quality. The dependent variable was Purchase Intention. The mediating variables were Green Customer Value and Attitude Toward Green Brand. Each variable was measured using multiple indicators adapted from established scales and assessed on a five point Likert scale.

Data Analysis Technique

Data analysis was conducted using the SmartPLS 4 software with the Partial Least Squares Structural Equation Modeling approach. The analysis consisted of two stages, namely the measurement model and the structural model. The measurement model evaluated convergent validity, discriminant validity, composite reliability, and collinearity through loading factors, average variance extracted, cross loading values, composite reliability coefficients, Cronbach alpha values, and variance inflation factor scores. The structural model assessed the strength of relationships between latent variables through R square values, path coefficients, and hypothesis testing. Hypotheses were evaluated by comparing t statistics with the critical value of 1.645 at a significance level of 0.05 using one tailed testing.

Pre Test Procedure

A pre test involving 60 respondents was conducted to examine early trends related to laundry pod usage. The results indicated that more than half of the respondents had used laundry pods and that most participants were from productive age groups, with balanced gender distribution and diverse backgrounds. All respondents used washing machines, indicating suitability for the product category. The pre test supported the feasibility of the research instrument and confirmed that the target population was appropriate for further data collection.

RESULTS AND DISCUSSION

Respondent Profile

The descriptive analysis of respondent characteristics provides an overview of the sample involved in this study. All respondents reported having experience using liquid laundry pods, indicating that the product is widely adopted within the studied population. The distribution of gender, age, profession, and laundry method is summarized in Table 1. This integrated table replaces the previously presented figures to provide a more concise and structured overview of respondent demographics.

Table 1. Respondent Profile

Profile Aspect	Percentage	Description
Experience Using Laundry Pods		
Ever used	100%	All respondents have prior experience using liquid laundry pods, demonstrating full product adoption.
Never used	0%	No respondents reported lack of experience with the product.
Gender		
Male	52%	Slightly more than half of the respondents are male.
Female	48%	A nearly proportional representation of female respondents.
Age		
17–25 years	50%	The largest age group in the sample.
26–35 years	31%	The second-largest age group.
36–45 years	19%	The smallest age segment among respondents.
Profession		
Entrepreneur	29%	One of the two dominant professional categories.
Professional cleaner/launderer	29%	Equal proportion to entrepreneurs.
Private/public employee	26%	The third-largest occupational group.
Student	15%	Represents a moderate portion of respondents.
Homemaker/home-based individual	1%	The least represented category.
Laundry Method		
Using washing machine	100%	All respondents rely on washing machines for laundry.
Without washing machine	0%	No respondents wash clothes manually without a machine.

Source: Data Processing, 2025

Descriptive Analysis

The interpretation of descriptive results in this study is based on the Likert scale categories shown in Table 2. This scale was used to interpret respondent perceptions toward each statement in the questionnaire.

Table 2. Likert Scale Score Range and Categories

Mean Range	Response Category
1.00 – 1.80	Strongly Disagree
1.81 – 2.60	Disagree
2.61 – 3.40	Neutral
3.41 – 4.20	Agree
4.21 – 5.00	Strongly Agree

Table 3 presents descriptive statistics for the indicators of each variable. The analysis includes minimum and maximum values, mean scores, standard deviations, and the corresponding Likert category.

Table 3. Descriptive Statistics of Variable Indicators

Indicator	Max	Min	Mean	Standard Deviation	Response Category
GPI1	5	3	4.260	0.867	Strongly Agree
GPI2	5	3	4.745	0.574	Strongly Agree
GPI3	5	3	4.680	0.598	Strongly Agree
GPI4	5	3	4.630	0.688	Strongly Agree

GPI5	5	1	4.145	1.065	Agree
PI1	5	1	4.190	1.051	Agree
PI2	5	3	4.640	0.656	Strongly Agree
PI3	5	1	4.590	0.814	Strongly Agree
PI4	5	3	4.280	0.838	Strongly Agree
PI5	5	3	4.390	0.754	Strongly Agree
GCV1	5	3	4.620	0.682	Strongly Agree
GCV2	5	3	4.715	0.611	Strongly Agree
GCV3	5	2	4.185	0.895	Agree
GCV4	5	3	4.175	0.886	Agree
GCV5	5	1	4.540	0.818	Strongly Agree
ATGB1	5	3	4.685	0.588	Strongly Agree
ATGB2	5	1	4.510	0.818	Strongly Agree
ATGB3	5	1	4.395	0.938	Strongly Agree
ATGB4	5	2	4.305	0.844	Strongly Agree
ATGB5	5	2	4.610	0.706	Strongly Agree
GPQ1	5	1	4.215	0.959	Strongly Agree
GPQ2	5	1	4.565	0.791	Strongly Agree
GPQ3	5	1	4.400	0.889	Strongly Agree
GPQ4	5	1	4.385	0.988	Strongly Agree
GPQ5	5	2	4.285	0.885	Strongly Agree

Source: Data Processing, 2025

Overall, the results show that respondents provided highly positive evaluations across all variables including green product innovation, purchase intention, green customer value, attitude toward green brand, and green perceived quality. Most indicators scored within the strongly agree category which spans 4.21 to 5.00. Standard deviation values also show relatively small variations which indicate consistency across responses.

Measurement Model Evaluation (Outer Model)

1. Convergent Validity

Convergent validity was assessed using outer loadings and average variance extracted. Indicators were considered valid if outer loading values exceeded 0.7 although values above 0.4 were still acceptable. Variables were considered valid if AVE values exceeded 0.5. Table 4 presents the results.

Table 4. Convergent Validity Test Results

Variable	Indicator	Loading Factor	AVE	Result
ATGB	ATGB1	0.832	0.568	Valid
	ATGB2	0.818		Valid
	ATGB3	0.656		Valid
	ATGB4	0.595		Valid
	ATGB5	0.833		Valid
GCV	GCV1	0.752	0.547	Valid
	GCV2	0.801		Valid
	GCV3	0.705		Valid
	GCV4	0.708		Valid
	GCV5	0.727		Valid
GPI	GPI1	0.749	0.770	Valid
	GPI2	0.894		Valid
	GPI3	0.939		Valid
	GPI4	0.916		Valid
GPQ	GPQ1	0.871	0.800	Valid
	GPQ2	0.931		Valid
	GPQ3	0.881		Valid
PI	PI1	0.760	0.592	Valid
	PI2	0.784		Valid
	PI3	0.752		Valid

PI4	0.666	Valid
PI5	0.872	Valid

Source: Data Processed, 2025

The results confirm that all indicators met the loading factor criteria except for ATGB3, ATGB4, and PI4 which still met the acceptable threshold. All constructs achieved AVE values above 0.5, indicating that convergent validity was achieved for all variables after removing GPI5, GPQ4, and GPQ5.

2. Discriminant Validity

Discriminant validity was evaluated using the heterotrait monotrait ratio. The recommended HTMT threshold is below 0.95. Table 5 shows that all construct pairs met this requirement, supporting discriminant validity.

Table 5. HTMT Results

Variable	ATGB	GCV	GPI	GPQ
GCV	0.885			
GPI	0.869	0.770		
GPQ	0.943	0.800	0.633	
PI	0.822	0.929	0.814	0.775

Source: Data Processed, 2025

3. Reliability Test

Composite reliability was used to evaluate internal consistency. All constructs achieved composite reliability values above 0.7 as shown in Table 6. This indicates that all constructs are reliable.

Table 6. Composite Reliability Test Results

Variable	Composite Reliability
ATGB	0.866
GCV	0.858
GPI	0.930
GPQ	0.923
PI	0.878

Source: Data Processed, 2025

Structural Model Evaluation

1. Collinearity Test

Collinearity was assessed through VIF values. As shown in Table 7, none of the variables exceeded the critical threshold of 5, indicating the absence of multicollinearity.

Table 7. Latent Variable Correlations and VIF Values

Variable	ATGB	GCV	PI
ATGB	–	–	4.364
GCV	1.000	–	2.439
GPI	–	1.000	2.647
GPQ	–	–	2.778

Source: Data Processed, 2025

2. Effect Size Evaluation

Effect size was assessed using the f square values in Table 8. Several relationships demonstrated moderate to high influence including the effect of green product innovation on green customer value and the effect of green customer value on attitude toward green brand.

Table 8. f Square Test Results

Variable	ATGB	GCV	PI

ATGB	–	–	0.007
GCV	1.091	–	0.263
GPI	–	0.786	0.149
GPQ	–	–	0.074

Source: Data Processed, 2025

3. R Square Evaluation

Coefficient of determination values are shown in Table 9. The results indicate moderate explanatory power for attitude toward green brand and purchase intention and weak explanatory power for green customer value.

Table 9. R Square Test Results

Variable	R Square
ATGB	0.522
GCV	0.440
PI	0.693

Source: Data Processed, 2025

Hypothesis Testing

Figure 1 illustrates the inner model that was analyzed in this study.

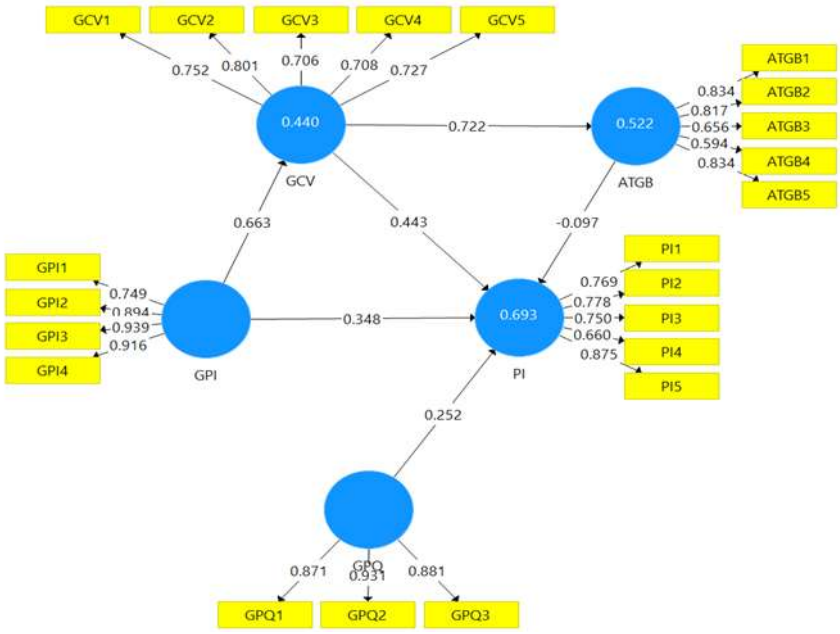

Figure 1. Structural Model

Hypothesis testing was conducted using p values, t statistics, and standardized path coefficients. Table 10 summarizes the results.

Table 10. Significance of Structural Paths

No.	Path	Standardized Path Coefficient	T-Statistics	P-Values	Conclusion
H1	Green Product Innovation → Green Customer Value	0.663	12.749	0.000	Supported
H2	Green Product Innovation → Purchase Intention	0.348	5.878	0.000	Supported
H3	Green Customer Value → Purchase Intention	0.443	9.152	0.000	Supported

H4	Green Customer Value → Attitude Towards Green Brand	0.722	19.823	0.000	Supported
H5	Attitude Towards Green Brand → Purchase Intention	-0.097	1.173	0.241	Not Supported
H6	Green Perceived Quality → Purchase Intention	0.252	3.041	0.002	Supported
H7	Green Customer Value as mediator between Green Product Innovation and Purchase Intention	0.294	7.633	0.000	Supported
H8	Attitude Toward Green Brand as mediator between Green Customer Value and Purchase Intention	-0.070	1.169	0.243	Not Supported

Source: Data Processed, 2025

The analysis shows that hypotheses H1 through H4 were supported. Green product innovation significantly influenced green customer value and purchase intention. Green customer value significantly influenced purchase intention and attitude toward green brand. Hypothesis H5 was not supported because attitude toward green brand did not significantly influence purchase intention. Hypothesis H6 was supported showing that green perceived quality significantly affected purchase intention. Mediating effects were also evaluated. Hypothesis H7 was supported which indicates that green customer value mediated the relationship between green product innovation and purchase intention. Meanwhile hypothesis H8 was not supported because the mediating role of attitude toward green brand was not significant.

Importance–Performance Map Analysis (IPMA)

This section presents an in-depth analysis of the performance and importance levels of the evaluated factors. The visualization clearly illustrates the contribution of each factor to the overall outcome, as well as its current performance. This analysis is crucial for identifying areas that require further attention for optimization and improvement.

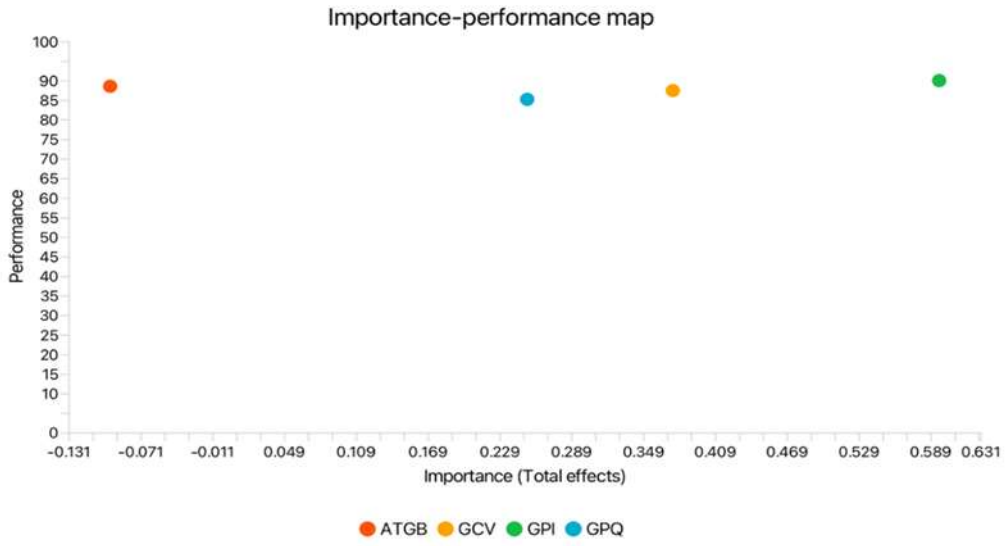

Figure 2. Importance–Performance Map (IPMA)

1. Average Construct Total Effect

This subsection focuses on evaluating the overall impact of each construct on the *Performance Index* (PI) through the *Average Construct Total Effect* analysis. The calculation results indicate that the average total effect of all constructs is 0.281. This figure provides a general overview of the combined influence strength of all constructs toward PI.

To offer a deeper understanding of the specific contribution of each construct, Table 11 presents the *Importance–Performance Map*, showing the total effects of each construct on PI. This information is essential for identifying factors that exhibit significant positive or negative impacts on overall performance.

Table 11. Importance–Performance Map [PI] (Constructs) – Construct Total Effects for [PI]

Construct	PI Total Effect
ATGB	-0.097
GCV	0.373
GPI	0.596
GPQ	0.252
Average	**0.281**

Source: Data Processing, 2025

The table above presents the numerical Importance–Performance Map, specifically the construct total effects for ATGB, GCV, GPI, and GPQ on the Performance Index (PI). These values, representing the average total effects, indicate the strength of both direct and indirect impacts of each construct on PI. For example, a value of 0.596 for GPI indicates that GPI has a highly significant positive total effect on PI, making it an essential factor for performance improvement. Conversely, the value of –0.097 for ATGB suggests a slight negative effect, which may require further evaluation. Comparing these values to the average construct total effect of 0.281 helps identify which constructs fall above or below the overall influence average, forming a strong foundation for developing improvement strategies.

2. Average Construct Performance

After identifying the total effects of each construct, the next step is evaluating their actual performance. This subsection presents the Average Construct Performance analysis, which measures how well each construct is performing. Based on the calculations, the average performance score across all constructs is 87.765. This value serves as an important benchmark for understanding the relative position of each construct in achieving performance goals.

For more detailed information, Table 12 outlines the performance scores of each construct within the context of the Importance–Performance Map, offering a clear picture of each construct's strengths and areas with potential for improvement.

Table 12. Importance–Performance Map [PI] (Constructs) – Construct Performances for [PI]

Construct	Performance
ATGB	88.515
GCV	87.400
GPI	89.964
GPQ	85.179
Average	**87.765**

Source: Data Processing, 2025

The table above presents the performance levels of each construct (ATGB, GCV, GPI, and GPQ), expressed as percentages that reflect how well each construct contributes to the Performance Index (PI). The average construct performance is 87.765. The table shows that GPI has the highest performance at 89.964, while GPQ has the lowest at 85.179. These performance levels are essential for understanding each construct's position on the performance map, where higher values indicate better outcomes. Comparing these actual performance values against the overall average helps determine priority areas for managerial action.

3. Managerial Implication: Positioning GCV as the "Implication Manager"

Based on the comprehensive analysis of the *Importance–Performance Map* and *Construct Performances* presented in Tables 4.10 and 4.11, it is evident that the GCV construct holds a strategic position. Although GPI demonstrates higher total effects and performance, GCV shows a balanced combination of importance (total effect of 0.373) and strong performance

(87.400), with its total effect exceeding the overall average (0.281). Therefore, it is recommended to designate GCV as the *Implication Manager*. This implies that:

a. Priority in Management and Monitoring
   Managers are advised to provide special attention to the continuous management and monitoring of GCV. Its condition and performance should be treated as key indicators, as changes in GCV may exert direct and significant implications for the overall Performance Index (PI).
b. Source for Strategic Interventions
   GCV can serve as a focal point for strategic improvements. With performance already at a good level yet still offering room for enhancement (particularly when compared with GPI), optimizing GCV is likely to produce substantial positive impact on PI. Managers may design programs or initiatives that specifically target the components forming GCV to maintain or further enhance its performance.
c. Basis for Managerial Decision-Making
   Information and trends associated with GCV should play a major role in decision-making processes. For example, when decisions are expected to affect GCV, managers should evaluate the potential implications for overall performance. GCV can act as a leading indicator signaling necessary actions.
d. Communication and Impact Explanation
   Managers should understand and effectively communicate the implications of GCV to team members and other stakeholders. This will build awareness of GCV's importance and encourage collaboration to sustain or improve its performance, ultimately driving positive results on PI.

Discussion

1. The Influence of Green Product Innovation on Green Customer Value

Based on the descriptive analysis, business actors who emphasize energy efficiency, recycling concepts, reusability, and biodegradability in the development of laundry pods contribute to enhancing the green value perceived by consumers. The Green Customer Value variable further indicates that consumers tend to choose environmentally friendly products because of their concern for the sustainability of the planet. However, respondents have not yet directly perceived that laundry pods can reduce waste and distribution costs. These findings highlight a strong link between environmentally oriented product innovation and the value perceived by consumers toward green products. The higher the level of product innovation that integrates sustainability aspects, the greater the perceived consumer value. In an era of increasing environmental awareness, consumers no longer consider only functional attributes or price. They prioritize sustainability and ethical values in their purchase decisions.

When a product is designed with a comprehensive life cycle perspective, including recyclable materials, low pollution manufacturing, energy efficient use, and non toxic biodegradable components, consumers tend to perceive the product as having a higher value. This value extends beyond functional satisfaction to include emotional, ethical, and long term functional benefits that stem from the product's contribution to environmental preservation and human well being. Consumers increasingly feel responsible and empowered when choosing innovative products aligned with green principles.

The finding that Green Product Innovation positively and significantly influences Green Customer Value is consistent with global trends in green marketing and consumer behavior literature. Kotler and Keller (2016) explain that customer value is the difference between the total perceived value and total cost, and green product innovation increases perceived value not only functionally but also emotionally, socially, and ethically. Porter and Kramer's (2011) concept of shared value is also relevant, emphasizing that companies can generate economic value while simultaneously creating societal benefits. Green product innovation represents this

shared value creation by capturing environmentally conscious market segments while contributing to sustainability.

Peattie and Crane (2005) argue that green marketing is not merely about environmentally friendly products but about how these products communicate values to consumers. Understanding consumer motives and values is essential, and green product innovation aligned with these values will be well received. Although direct empirical studies examining the GPI–GCV relationship remain limited, the findings align closely with those of Huang et al. (2024), which highlight the crucial role of product attributes and sustainability practices in shaping consumer responses to environmental labeling. This provides indirect support that green innovations enhance perceived product value.

2. The Influence of Green Product Innovation on Purchase Intention

The highest loading indicator in the GPI variable reflects respondents' awareness of product life cycles. Respondents are willing to purchase environmentally friendly products if the price difference with conventional products is not excessive. This shows that Green Product Innovation enhances purchase intention, particularly when innovations promote planetary sustainability while remaining affordable.

These results provide strong empirical evidence that the higher the level of green product innovation, the greater the consumer purchase intention. This signals a shift in consumer preferences where products that are good for the planet are considered just as important as products that are good for financial value or functional performance. Modern consumers actively seek environmentally responsible solutions. Products designed with green innovation principles such as recyclability, energy efficiency, non toxic materials, and pollution reduction inherently attract purchase interest because they offer additional value.

The influence of GPI on purchase intention aligns with major marketing and consumer behavior theories. Ajzen's Theory of Planned Behavior (1991) holds that purchase intention is shaped by positive attitudes toward the behavior, subjective norms, and perceived behavioral control. Green innovations enhance these attitudes. Crane and Matten's (2016) Ethical Consumption Theory suggests that consumers make ethical decisions when choosing environmentally responsible products, which supports the notion that green innovation increases purchase intention. Polonsky and Rosenberger III (2009) further argue that effective green marketing requires designing and communicating environmentally friendly products in ways that directly influence buying behavior.

Empirical studies support these findings. Cuc et al. (2022) show that innovations in green marketing, including digital tools, significantly influence green behavior and purchase intention. Lin et al. (2021) further report that green innovation strategies enhance brand value, which indirectly increases consumer purchase intention.

3. The Influence of Green Customer Value on Purchase Intention

The GCV2 indicator shows that consumers perceive the value of green products through their concern for planetary sustainability, while PI2 shows that respondents are willing to buy environmentally friendly products if the price remains affordable. These findings confirm that Green Customer Value is essential in shaping purchase intention. The higher the perceived green value, the higher the consumer likelihood to purchase.

This demonstrates that when consumers perceive strong environmental value in a product, such as eco friendly materials, low pollution processes, or consistent environmental standards, their intention to purchase significantly increases. Consumers now buy not only to fulfill functional needs but also to reflect personal values such as environmental responsibility. Green Customer Value therefore produces emotional and symbolic value, giving consumers a sense of pride and moral fulfillment.

Solomon (2018) explains that green product purchases may reflect symbolic consumption, where the product expresses personal identity and environmental concern.

Bandura's Social Learning Theory (1977) suggests that consumers learn sustainability through social influence, meaning that well communicated green value strengthens purchase intention.

Jose et al. (2022) empirically confirm that green consumption value mediates the relationship between consumer attitudes and sustainable purchasing behavior. Zhang and Yuan (2024) also illustrate that green consumption value strengthens the link between green marketing practices and sustainable behavior, reinforcing its importance in shaping purchase intention.

4. The Influence of Green Customer Value on Attitude Toward Green Brand

The highest GCV2 score reflects sustainability awareness, and the ATGB1 indicator shows that respondents appreciate companies that demonstrate environmental care. Consumers who value environmental sustainability develop more positive attitudes toward brands that offer environmentally friendly products. However, this positive attitude is not yet strong enough to encourage consumers to actively voice or share information about laundry pods.

The finding indicates that the higher the Green Customer Value, the more positive the Attitude Toward Green Brand. When companies effectively deliver green value through environmentally responsible materials, low impact production, and clear environmental benefits, consumers form a strong emotional and cognitive connection with the brand.

These results align with the Customer Value Theory by Zeithaml et al. (2018), which argues that functional, emotional, and social benefits of green products shape positive brand attitudes. Fishbein and Ajzen's (1975) Attitude Formation Theory explains that positive beliefs about environmental benefits lead to positive brand attitudes. Kotler and Armstrong (2020) also emphasize that communicating green values effectively helps companies build favorable brand attitudes.

Although previous studies do not always test the exact GCV to ATGB relationship, the logic is supported by Jose et al. (2022), who show that green consumption value influences sustainable behavior beginning with positive brand attitudes.

5. The Influence of Attitude Toward Green Brand on Purchase Intention

ATGB1 indicates strong respondent appreciation toward environmentally responsible companies. Meanwhile, PI2 shows that consumers are willing to buy environmentally friendly products if the price is reasonable. Although this suggests a positive relationship, hypothesis testing reveals a negative and insignificant path coefficient of minus 0.097. Therefore, the hypothesis is not supported.

The nonsignificant and negative effect is surprising because literature typically assumes that positive attitudes toward green brands increase purchase intention. This contradiction demonstrates behavioral complexity. Carrington et al. (2014) describe the attitude behavior gap, where external factors such as availability and price or internal factors such as greenwashing skepticism prevent attitudes from translating into purchases. Ajzen's Theory of Planned Behavior (1991) also states that attitudes alone are insufficient without supportive social norms and perceived behavioral control.

Dlamini and Mahowa (2024) found that while price perception and attitudes influence purchase intention for green cosmetics, mediating variables such as awareness and product availability complicate the relationship. Erdem et al. (2002) emphasize that brand credibility and trust are essential. In contexts where consumers may doubt environmental claims, positive attitudes toward green brands do not necessarily lead to purchase intention.

This finding implies that companies must go beyond building positive attitudes. They must strengthen consumer trust, ensure product availability, improve price competitiveness, and demonstrate genuine environmental commitment.

6. The Influence of Green Perceived Quality on Purchase Intention

The highest GPQ2 score of 4.565 shows that consumers recognize the environmental contribution of their individual actions, reflecting high perceptions of green product quality.

Hypothesis testing confirms a significant positive effect with a path coefficient of 0.252. Therefore, the hypothesis is supported.

This finding highlights that perceived green quality plays a vital role in shaping purchase intention. Consumers now demand environmentally friendly products that also demonstrate reliability, effectiveness, and high performance. When consumers perceive green products as high quality, concerns about inefficiency or higher costs diminish, leading to stronger purchase intention.

Therefore, successful green marketing should not focus solely on environmental claims but must also emphasize product excellence. High quality environmentally friendly products reduce waste, last longer, and optimize resource use. These inherent qualities reinforce the product's green image and strengthen consumer willingness to buy.

The results are consistent with Zeithaml's Perceived Quality Theory (1988), which states that perceived quality reduces risk and builds trust. The Value Perception Behavior Model similarly holds that high perceived quality enhances value perception, increasing purchase intention. Spence's Signaling Theory (1973) explains that credible environmental claims and consistent product performance signal trustworthiness, encouraging purchase intention.

CONCLUSION

The findings of this study clarify how green product innovation, green customer value, attitude toward green brands, and green perceived quality shape consumer purchase intention for sustainable and greener liquid laundry pods. The results indicate that green product innovation consistently enhances both green customer value and purchase intention, demonstrating that innovation is a fundamental starting point for encouraging consumer interest in environmentally responsible products. Green customer value and green perceived quality emerge as the strongest predictors of purchase intention, confirming that consumers are more willing to purchase green products when they perceive meaningful value and reliable quality. Although green customer value strengthens attitudes toward green brands, this attitude does not translate directly into purchase intention, suggesting that attitudes alone are insufficient without strong perceptions of value and product quality. The mediation analysis further highlights the central role of green customer value, which significantly bridges the influence of green product innovation on purchase intention. This outcome emphasizes that consumer decisions in the context of sustainable products are driven primarily by functional and value based considerations rather than by brand related attitudes. These findings contribute to the development of consumer behavior and green marketing theories by reinforcing the importance of perceived value and quality as psychological mechanisms underlying green purchase decisions. The study advances industrial engineering and sustainability science by providing empirical insight into how innovation and perceived product performance can guide the design, evaluation, and adoption of greener consumer goods. Overall, the study concludes that increasing the perceived value and quality of sustainable products holds the greatest potential for strengthening consumer purchase intention, which is crucial for accelerating the transition toward environmentally responsible consumption.

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