

Innovation, Perceived Value, and Customer Satisfaction as Antecedents of Behavioural Intention: Evidence from the Terrarium Market in Bangkok, Thailand

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Abstract

Although increasing interest with respect to green products, little is known about how innovation affects perceived value, satisfaction, and behavioural intention within niche green product markets. This gap is particularly evident in the terrarium sector, where empirical evidence remains scarce, especially in the Thai context. To address this gap, this empirical study, which focused on the interrelation among innovation, perceived value, satisfaction, and behavioural intention determinants was carried out in Thailand's terrarium market.

A quantitative approach using an online survey was conducted with 400 sample participants. The study implemented a probability sampling method applying systematic random sampling to select the participants. A path analysis with latent variables employed structural equation modelling (SEM) to analyze the data via AMOS version 24.

The findings indicate that perceived value is the most influential factor significantly affecting customers' behavioural intention. Among its dimensions, perceived emotional value and perceived functional value emerged as the strongest indicators. Innovation was identified as the second most influential factor, with marketing, service, and cultural innovation serving as its strongest indicators. Satisfaction ranked as the third most influential factor, with meaningfulness and affordability identified as its most important dimensions. All hypothesised relationships were statistically significant at the 0.05 level. The standardized total effects showed that perceived value had the strongest influence on customers' behavioural intention ($\beta = .634$), followed by innovation ($\beta = .513$) and satisfaction ($\beta = .195$).

These findings provide empirical evidence and contextual insights into Thailand's terrarium market. From a practical perspective, businesses should adopt an integrated strategy that combines innovation, value creation, and customer satisfaction enhancement to strengthen market demand for terrarium products.

Keywords: 1) Innovation 2) Satisfaction 3) Perceived value 4) Behavioural intention 5) Green product

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Introduction

In the current digital social era, technology is increasingly playing a major role in Thai society. In particular, people who live in cities or urban areas participate in many activities and pursue a range of interests, and there can be a vast difference of opinion compared to people who live in suburban areas. The selection trend for urban people looking to purchase accommodation shows a preference for apartments or condominiums rather than detached houses. Nevertheless, there is a limit to the amount of land which can be used for building condominium, and therefore with space at a premium there are no garden areas for planting large trees. However, balcony garden area could be provided to allow small gardens in each room, as well as miniature parks which could be available between condominium buildings.

Bangkok is the capital city of Thailand and is the most economically prosperous city in the country. The population density is high and the city faces various environmental problems such as heavy traffic, noise pollution, air pollution, water pollution, toxic waste, and e-waste problems. Thus, the government and private sector have devoted their efforts to promoting green space creation for urban areas in order to mitigate the levels of toxic pollution.

Hence, people who live in condominiums are expected to show an increasing trend towards green space creation in their accommodation by planting trees and gardening in mini green spaces. Furthermore, the overall market value of the ornamental plant market

and tree business indicates high growth. In particular, ornamental plant cultivation for export reveals the overall market value equal to 3.5-4 billion baht per year (ARDA, 2024). Additionally, data reports of registered residences in Bangkok and surrounding areas in the past 10 years (2013-2022) have identified that the numbers of registered condominium residences have greatly exceeded the numbers of housing estates and built-up house residences (Open Government Data, 2024). Thus, entrepreneurs can see the opportunities to enter the market in the terrarium industry with the target market of people who live in condominiums.

The terrarium market was selected because it represents an emerging, innovation-driven niche within green products, characterized by strong aesthetic and emotional value. Terrarium market yet remains underexplored in consumer behaviour research, especially in Thai context.

Therefore, empirical evidence with respect to green products, particularly in research within the terrarium sector appears to be rare to find it. Thus, little is known and understood insight about the role of innovation influences perceived value, satisfaction, and behavioural intention within the terrarium market. To fill this gap, researcher investigated this empirical study, which concentrated on the interrelationship among innovation, perceived value, satisfaction, and behavioural intention factors in Thailand's terrarium market.

Innovation, particular in green innovation, appears increasingly to be important for academia and has been the focus in recent years (Chen, et al., 2021, p. 2). Past studies

have consistently suggested that innovation positively influences customer satisfaction across various industry (Nguyen, Ho and Ngo, 2024, p. 8; Nwachukwu and Vu, 2022, p. 1). Innovation management and customer orientation have been widely recognized as key determinants of firm performance (Nguyen, Ho and Ngo, 2024, p. 8). However, most of the previous studies related to innovation factors appear to investigate only the service and tourism sectors. Thus, the contribution to knowledge for this empirical study is to extend the research and comprehend the role of innovation with respect to green product sectors such as the terrarium market in Thai context.

An abundance of research has been conducted to study perceived value as well as behavioural intention and their relationships with a range of variables (Jaleel, et al., 2021, p. 1847). However, little empirical attention has been given with respect to an examination of perceived value and behavioural intention in different industries such as terrariums.

The major aim of innovation appears to induce a sustainable competitive edge for the firm and act as a driver to enhance customer satisfaction (Naveed, Akhtar and Cheema, 2012, p. 2). Additionally, past studies have asserted that firms which had less focus on customer satisfaction often left the industry (Naveed, Akhtar and Cheema, 2012, p. 3). As a consequence, increasing customer satisfaction appears to be the major challenge for firms.

Therefore, the findings of this research could help to increase the potential for competitive capability in the terrarium market, develop the city community and encourage the

growth of the terrarium market in Thailand.

Research Objectives

1. Examine the influence of the innovation factor on customers' behavioural intention.
2. Investigate the influence of the perceived value factor towards behavioural intention.
3. Explore the impact of the satisfaction factor on customers' behavioural intention.
4. Encourage the competitive capability of businesses in Thailand's terrarium market.

Literature Review

Innovation

Innovation refers to the development of new ideas, knowledge, technologies, or practices that generate value for firms and enhance their competitiveness rather than merely introducing something new (Varadarajan, 2024, pp. 704–706). In this study, innovation is conceptualized as a multidimensional construct comprising six dimensions: product innovation, technological innovation, image innovation, service innovation, marketing innovation, and cultural innovation. The dimensions were synthesized from past studies to represent the innovation construct in the study (Chen, et al., 2021, pp. 7–8; Mutonyi, et al., 2022, p. 2; Tomczak, 2022, pp. 118–122).

Perceived Value

Perceived value reflects customers' assessment of the benefits obtained from a product or service in relation to the costs or sacrifices incurred during the consumption process (Nafisyah and Marsasi, 2023, p. 764).



Rather than representing a single dimension, perceived value encompasses multiple aspects of evaluations. The study conceptualizes perceived value through four dimensions: perceived functional value, perceived emotional value, perceived monetary value, and perceived social value. These dimensions were synthesized from past studies for perceived value criteria (Chen and Chen, 2010, p. 30; Huiming and Yuning, 2020, p. 2).

Customer Satisfaction

Customer satisfaction reflects customers' evaluation of their consumption experience (Yesitadewi and Widodo, 2024, p. 419). This evaluation represents customers' post-consumption judgment regarding whether the product has fulfilled or exceeded their expectations. Satisfaction is conceptualized as a multidimensional construct through four dimensions: novelty, meaningfulness, complexity, and affordability. These dimensions were developed from Truong, et al. (2020, p. 9).

Customers' Behavioural Intention

Customers' behavioural intention reflects their willingness to engage in future purchasing behaviours and is widely regarded as a reliable predictor of actual purchasing behaviour. Actual purchase is difficult to observe directly, behavioural intention has been extensively adopted as an alternative measure in consumer behaviour research (Bosnjak, Ajzen and Schmidt, 2020, p. 353). Intention is conceptualized through three criteria: trial, repurchase, and word-of-mouth from previous studies (Chen and Chen, 2010, p. 31; Huiming and Yuning, 2020, p. 2; Jaleel, et al., 2021, p. 1847).

Related Past Studies

Influence of the Innovation Determinant

Past studies have recognized innovation as a key driver of customer satisfaction, perceived value, and behavioural intention. Innovation enables firms to introduce new products, services, technologies, and marketing practices that enhance customers' experiences and strengthen their competitive advantage. Thus, firms with stronger innovation capabilities are more likely to create superior customer value and foster favourable behavioural responses.

Empirical evidence supports the positive impact of innovation on customer satisfaction. Nwachukwu and Vu (2022, pp. 7–10) and Naveed, Akhtar and Cheema (2012, pp. 1–10) reported that innovation significantly enhances satisfaction by improving customers' overall service and consumption experiences. However, more recent evidence indicates that this relationship may not always be direct. Yeboah and Amponsah (2025, p. 8) found that service innovation did not significantly influence customer satisfaction, suggesting that innovation alone may be insufficient to improve satisfaction unless it is supported by high-quality service delivery.

Similarly, previous research has demonstrated that innovation positively contributes to customers' perceived value and behavioural intention. Chen, et al. (2021, pp. 1–17) asserted that innovation had significant positive direct effects on both perceived value and behavioural intention. Nevertheless, Hwang, Lee and Cho (2025, pp. 31–46) argued that the influence of innovation on behavioural inten-

tion depends on customers' value perceptions, indicating that perceived value may serve as an important mechanism through which innovation affects customers' future behavioural responses. These mixed findings suggest that the relationships among innovation, perceived value, customer satisfaction, and behavioural intention warrant further investigation.

Influence of Perceived Value

Perceived value has been widely recognized as a basic factor of customer satisfaction and behavioural intention in consumer behaviour research. Customers who perceive greater value from a product or service are more likely to develop favourable evaluations, resulting in higher satisfaction and stronger intentions to engage in future purchasing behaviours. Thus, perceived value has frequently been incorporated into relationship models as a key antecedent of customer responses (Jaleel, et al., 2021, p. 1846; Chen and Chen, 2010, p. 30).

Previous empirical studies consistently reported that perceived value exerts a significant positive direct effect on both customer satisfaction and behavioural intention. Jaleel, et al. (2021, pp. 1845–1852) demonstrated that perceived value positively influenced customer satisfaction and behavioural intention; however, they found that customer satisfaction did not significantly mediate the relationship between perceived value and behavioural intention. In contrast, Chen and Chen (2010, pp. 32–33) asserted that perceived value not only had direct positive effects on customer satisfaction and behavioural intention but also indirectly influenced behavioural intention

through customer satisfaction.

Although prior studies consistently support the direct effects of perceived value on customer outcomes, the mediating role of satisfaction remains inconclusive. These inconsistent findings suggest that further research is required to clarify how perceived value contributes to customers' behavioural intention through satisfaction across different research contexts.

Influence of Customer Satisfaction

Customer satisfaction has long been recognized as one of the most influential factors of customers' behavioural intention. Satisfied customers are more likely to maintain long-term relationships with firms, repurchase products or services, and engage in favourable word-of-mouth communication. Hence, satisfaction has been widely regarded as a key mechanism linking customers' consumption experiences with their future behavioural responses (Chen and Chen, 2010, p. 32; Huiming and Yuning, 2020, p. 5; Jaleel, et al., 2021, p. 1852).

Empirical evidence asserts the positive influence of satisfaction on intention. Singh and Söderlund (2020, p. 12) indicated that higher levels of satisfaction significantly increased repurchase intention and willingness to recommend products to others. Similarly, Chen and Chen (2010, p. 32), Huiming and Yuning (2020, p. 5), and Jaleel, et al. (2021, p. 1852) found that satisfaction positively and directly influenced intention across different service contexts.



The consistency of these findings suggests that satisfaction plays a critical role in encouraging favourable post-purchase behaviours. Therefore, customer satisfaction is expected to function as an important predic-

tor of customers' behavioural intention in the present study.

Conceptual Framework

The researcher proposes a conceptual framework for the study as shown in Figure 1.



Figure 1 The conceptual framework

Source: Author's own elaboration

Research Hypotheses

Hypothesis H1: The development of a causal relationship model among innovation, perceived value, satisfaction, and behavioural intention indicate congruence with empirical data.

Hypothesis H2: The innovation factor has a positive and direct influence on intention.

Hypothesis H3: The perceived value mediates the effect of innovation on intention.

Hypothesis H4: Satisfaction mediates the influence of innovation on intention.

Hypothesis H5: The perceived value mediates the innovation influence on satisfaction.

Hypothesis H6: Satisfaction mediates the impact of perceived value on intention.

Hypothesis H7: The innovation factor has a positive indirect effect on consumers' behavioural intention through perceived value and satisfaction.

Hypothesis H8: The perceived value has a positive and direct effect on intention.

Hypothesis H9: Satisfaction has a positive and direct influence on behavioural intention.

Hypothesis H10: The innovation factor has a positive and direct effect on perceived value.

Hypothesis H11: The innovation factor has a positive and direct influence on satisfaction.

Hypothesis H12: The Perceived value has a positive and direct influence on satisfaction.

Methods

Population and Sample

Thai nationals and people who are not of Thai nationality who live in the Bangkok area were population for the research. The samples were Thai nationals and people who are not of Thai nationality, both male and female, aged from 18 to 60 living in condominiums that were located in Bangkok. Bangkok was chosen due to its prosperity and abundance of condominiums. Schumacker and Lomax (2016, p. 39) advised that the sample size of 400 participants was deemed to be sufficient for data analysis employing SEM. Taking on board this consideration, the size of the sample equal to 400 participants for this study was deemed sufficient.

Data Collection

A probability sampling method based on systematic random sampling was conducted to recruit the sample respondents. Starting from considering the various channels of on-line platforms (i.e., email, Facebook, LINE), a random method was then used to select the first participant for each platform. The next participant would be randomly selected in the subsequent every k unit (assigned to $k=3$) and the link or QR code of the questionnaire was then sent to the participants via those online platforms. Researcher decided to choose the probability sampling method because it would help to reduce selection bias, increase external validity, support statistical inference, and make the SEM results more reliable.

The data collection period was held during July – October, 2024. The questionnaire provided a tick box for participants to give their

consent before participating in the survey. All data gathered were anonymous and treated in the strictest confidence. Data collection was discontinued after receiving 400 completed questionnaires which met the target sample size (from 500 distributed questionnaires). The response rate was therefore equal to 80%.

Validity and Reliability Measurement

The online questionnaire included closed-ended questions for evaluating innovation, perceived value, satisfaction, and behavioural intention by using a Likert scale from 1 to 5 for measurement. Content validity analysis using the Item-Objective Congruence Index (IOC) was performed to increase internal validity. A pre-test was then carried out with 30 consumers to confirm the quality of the research tool. The study found Cronbach's alpha values indicate to be greater than 0.70 [0.950 for overall innovation, 0.929 for overall perceived value, 0.914 for overall satisfaction, and 0.882 for overall behavioural intention ($p < 0.05$)]. These four latent variables were deemed reliable and suitable to collect data (Bryman and Bell, 2015, pp. 1-778).

Common Method Bias Diagnostic

The assessment of common method bias was conducted by using the Harman's single-factor test. The results revealed that the first unrotated factor accounted for 39.394% of the total variance, which is below the threshold of 50%. The results suggest that common method bias is unlikely to be a serious concern (Baumgartner and Weijters, 2021, pp. 7-22).

Construct Measurement

CFA analysis helps to confirm that a series of observed variables indicated construct



validity according to a theoretical latent variable (Brown, 2015, pp. 2-4). Before conducting the CFA analysis, the study performed Bartlett's Test of Sphericity which demonstrated the value of 0.003046 ($P = 0.000$). KMO was equal to 0.905, which was greater than 0.5. Each observed variable revealed its Measure

of Sampling Adequacy (MSA) value between 0.800 to 0.953, clearly exceeding 0.5. All of the observed variables were deemed to be suitable to incorporate in the CFA analysis (Hair, et al., 2019, pp. 1-813) as the results illustrated in Figure 2.

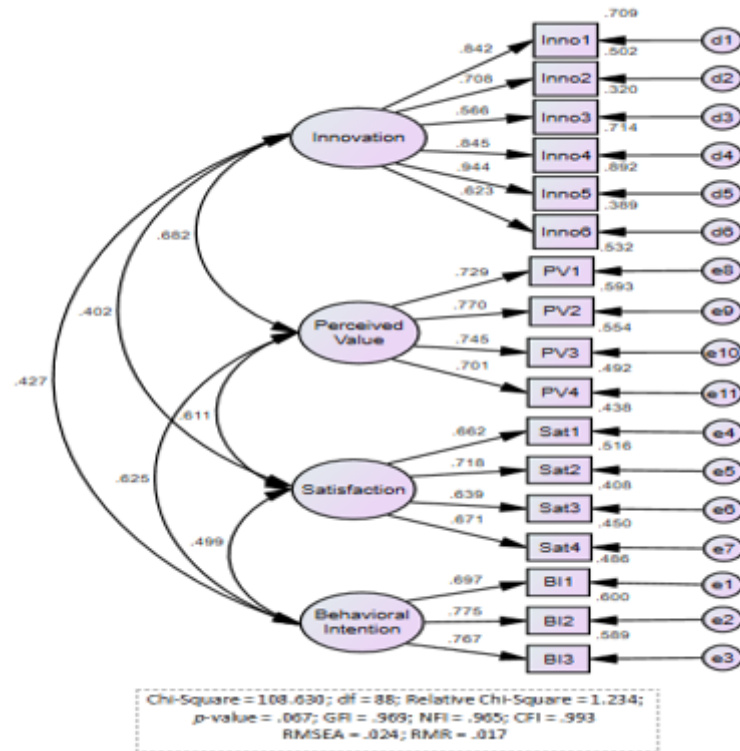


Figure 2 Confirmatory Factor Analysis: CFA

Source: Own elaboration.

Every latent variable passed the test of measurement model inspection based on the criteria, which comprised relative χ^2 less than 2, the indices of RMSEA and RMR less than .05, and the indices with regard to GFI, NFI, and CFI greater than .95 (Schumacker and Lomax, 2016, p. 112). These criteria values can be seen in Figure 2. Thus, innovation, perceived value, satisfaction, and behavioural intention can be used as measures from their observed variables.

The outcomes of CFA analysis identified the values of standardized factor loading, which should be greater than 0.5 for all latent variables (Hair, et al., 2019, pp. 1-813). CFA analysis helps in determining the Convergent Validity (AVE), Construct Reliability (C.R.), and Discriminant Validity (D.V.) as indicated in the Table 1, Table 2.

The results of Convergent Validity for the latent variables in Table 1 based on the criterion that the AVE must be 0.5 or more

than 0.5. Construct Reliability (C.R.) should be greater than or equal to 0.7 as well. Therefore,

the latent variables have (inherent) convergent validity (Hair, et al., 2014, p. 603).

Table 1 Convergent Validity (AVE) and Construct Reliability (C.R.)

Latent Variables	AVE	C.R.
Innovation	0.587	0.892
Perceived Value	0.543	0.826
Satisfaction	0.500	0.768
Behavioural Intention	0.558	0.791

Source: Own elaboration.

In regard to the Discriminant Validity, the square root of AVE must be more than the correlation coefficient of the latent variables between all constructs (Hair, et al., 2014, p. 603) as indicated in Table 2. In addition, the study found that the Maximum Shared Vari-

ance (MSV = 0.465) was less than AVE for each latent variable (range: 0.500-0.587). The Average Shared Variance (ASV = 0.304) was also less than AVE for each latent variable (range: 0.500-0.587). Thus, the differences for each latent variable in this study occurred.

Table 2 Discriminant Validity (D.V.)

Latent Variables	Innovation	Perceived Value	Satisfaction	Behavioural Intention
Innovation	0.766*			
Perceived Value	0.682	0.737*		
Satisfaction	0.402	0.611	0.707*	
Behavioural Intention	0.427	0.625	0.499	0.747*

* Square Root of AVE

Source: Own elaboration.

The criteria items for each latent variable are able to capture the construct. There are also differences for each latent variable. As a consequence, all of the observed variables appear to be appropriate for measurement of the four latent determinants in the model.

Data Analysis

Descriptive statistics such as standard deviation, and mean were identified on the basis of the study participant characteristics. Inferential statistic, namely a path analysis with the latent variables was used. The study conducted SEM to test the hypotheses using AMOS Version 24.

Results

Participant Characteristics

A total of 400 samples completed the online survey. The larger part of the participants was female (76.80%), and aged 21–37 years (56.80%). The education level, most respondents were graduates (73.00%). The majority of respondents were students (44.80%), and single (86.50%).

Arithmetic Mean and Standard Deviation of Observed Variables

Table 3 presents the arithmetic mean and standard deviation of observed variables.

**Table 3** Observed variables' arithmetic mean and standard deviation

Latent variables	Observed variables	Measurement adapted from	Mean	Standard deviation (S.D.)
Innovation	1.1 Product Innovation (Inno1)	Chen, et al., 2021;	3.638	0.575
	1.2 Technological Innovation (Inno2)	Mutonyi, et al., 2022;	3.603	0.620
	1.3 Image Innovation (Inno3)	Tomczak, 2022	3.653	0.618
	1.4 Service Innovation (Inno4)		3.671	0.605
	1.5 Marketing Innovation (Inno5)		3.576	0.667
	1.6 Cultural Innovation (Inno6)		3.621	0.614
Perceived Value	1.1 Perceived Social Value (PV1)	Chen and Chen, 2010; Huiming and Yuning, 2020	3.613	0.607
	1.2 Perceived Functional Value (PV2)		3.657	0.647
	1.3 Perceived Emotional Value (PV3)		3.628	0.652
	1.4 Perceived Monetary Value (PV4)		3.516	0.637
Satisfaction	1.1 Novelty (Sat1)	Truong, et al., 2020	3.295	0.612
	1.2 Meaningful (Sat2)		3.483	0.626
	1.3 Complexity (Sat3)		3.542	0.548
	1.4 Affordability (Sat4)		3.467	0.600
Behavioural Intention	1.1 Trial (BI1)	Chen and Chen, 2010	3.528	0.676
	1.2 Repurchase (BI2)	Huiming and Yuning, 2020; Jaleel et al., 2021	3.545	0.782
	1.3 Word-of-mouth (BI3)		3.540	0.675

Source: Author's own research.

Hypothesis Testing

To test the study's hypotheses, the researcher conducted SEM. The target sample was 400 participants, which was considered sufficient as this is more than the 200 respondents considered essential by Hair, et al. (2019, pp. 1-813). Hence, the data distribution can be assumed to be normal. Based on these assumptions, this study can employ SEM for data analysis.

Nevertheless, this study would not employ SEM based on the assumption of normal theory, which assessment used the significance test (p-value) provided by AMOS. The study would instead conduct the boot-

strap confidence intervals method to analyze the data. The bootstrap method would help to improve the reliability and accuracy of the findings.

The Pearson's correlation coefficient analysis of seventeen observed variables found that the correlation coefficient values ranged from 0.124-0.799, with all outcomes less than 0.8. Every pair of variables was statistically significant ($p < 0.05$). These outcomes were also evaluated to determine the presence or otherwise of multicollinearity (Shrestha, 2020, pp. 39-42). Thus, the 17 observed determinants were considered to be appropriate to incorporate in SEM.

Relationship model testing among innovation, satisfaction, perceived value, and intention

The bootstrap confidence intervals based on 5,000 iterations were computed. The

95% confidence interval for the effect did not include zero, confirming a significant result (Table 4).

Table 4 Bootstrap Confidence Intervals (5,000 Iterations)

Bootstrap Confidence, Bias-Corrected Percentile Method, 95% Confidence Intervals					
Parameter	S.E.	Estimate	Lower CI	Upper CI	P
Innovation ----> Perceived Value	.064	.798	.682	.930	.000*
Innovation ----> Satisfaction	.092	.172	-.005	.364	.057
Perceived Value ----> Satisfaction	.107	.359	.158	.573	.002*
Innovation ----> Behavioural Intention	.172	.247	-.085	.595	.125
Perceived Value ----> Behavioural Intention	.197	.303	-.027	.754	.071
Satisfaction ----> Behavioural Intention	.152	.276	-.010	.598	.063

* p < .01, ** p < .05, S.E. = Standard Error, CI = Confidence Intervals

Table 4 demonstrates only the 2 paths with respect to “innovation to perceived value” as well as the path “perceived value to satisfaction” reveal the significant results, which their confidence Intervals did not include zero. As a consequence, the proposed model seems to be inappropriate because the other 4 paths indicate non-significance results.

Based on the outcomes derived from Table 4, researcher would propose a final model for the study, which is presented in the following Figure 3:

From the final model in Figure 3, researcher modified the model in accordance with theoretical reasons or content of question by allowing the error terms of certain indicator pairs to correlate. The certain indicator pairs include d1 ↔ d5 and e5 ↔ e11, which correlation between error terms appear to be .664 and .192, respectively with statistical significance. The goodness of fit indices revealed that χ^2

= 181.327, df = 113, relative χ^2 = 1.605, p = .000, RMSEA = .039, RMR = .016, GFI = .948, NFI = .941. These findings are related to the inspection criteria, which are assigned as relative χ^2 less than 2, the indices of RMSEA and RMR less than .05, and the indices of GFI, NFI greater than .90, and TLI greater than .95 (Schumacker and Lomax 2016, p. 112). The outcomes of final model indicate that the model appropriately is congruence with empirical data (sample = 400, estimated parameter = 40).

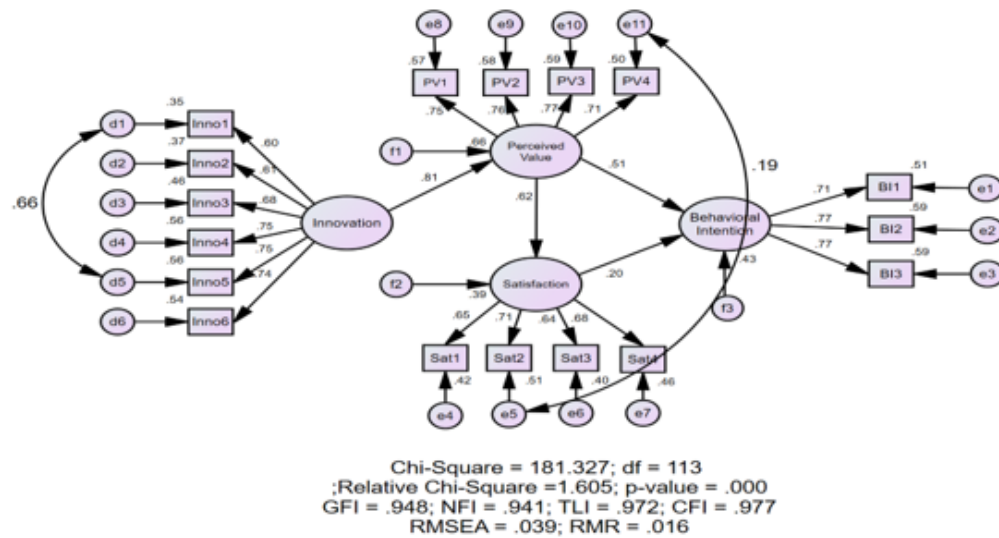


Figure 3 The final model

Source: Author's own elaboration.

Considering the forecasting coefficients, it was found that innovation can explain 65.5% of the variance in perceived value, while perceived value can explain 39.0% of the variance in satisfaction, and perceived value

combined with satisfaction can explain 43% of the variance in behavioral intention.

Regarding the direct effect coefficients of the structural model, reports present in Table 5:

Table 5 direct effect coefficients of the structural model

Direct Effect Path	b	S.E.	C.R.	p	β	95% CI of β	Testing Results
Innovation → Perceived Value	.817	.066	12.318	< .001	.810	.709 - .882	Support
Perceived Value → Satisfaction	.554	.060	9.264	< .001	.625	.512 - .727	Support
Perceived Value → Intention	.612	.094	6.532	< .001	.512	.311 - .680	Support
Satisfaction → Intention	.263	.104	2.528	.028	.195	.018 - .376	Support

Considering the direct effects of the model in Table 5, innovation had a statistically significant positive effect on perceived value ($\beta = .810$, $p < .001$). Perceived value had a statistically significant positive effect on satisfaction ($\beta = .625$, $p < .001$) and on intention ($\beta = .512$, $p < .001$). Satisfaction also had a statistically significant positive effect on intention, although the effect size was relatively small ($\beta = .195$, $p = .028$). The bias-corrected bootstrap confidence intervals for all pathways did not

cross zero, supporting the significance of these pathways.

Next, direct effect, indirect effect, and total effect were considered in Table 6. Innovation has a direct influence on perceived value of .810 [.709, .882] and an indirect influence on satisfaction of .506 [.409, .606], as well as behavioral intention of .513 [.392, .623]. This indicates that Innovation significantly influences satisfaction and behavioral intention through perceived value. Perceived value has both a

direct influence on behavioral intention of .512 [.311, .680] and an indirect influence through satisfaction of .122 [.014, .253], with a total

influence of .634 [.512, .736]. Satisfaction has a direct influence on behavioral intention of .195 [.018, .376].

Table 6 Direct Effect, Indirect Effect, and Total effect of Latent Variables in the model

Independent Variable	Dependent Variables	Direct Effect	Indirect Effect	Total Effect
Innovation	Perceived Value	.810 [.709, .882]	—	.810 [.709, .882]
Innovation	Satisfaction	—	.506 [.409, .606]	.506 [.409, .606]
Innovation	Behavioural Intention	—	.513 [.392, .623]	.513 [.392, .623]
Perceived Value	Satisfaction	.625 [.512, .727]	—	.625 [.512, .727]
Perceived Value	Behavioural Intention	.512 [.311, .680]	.122 [.014, .253]	.634 [.512, .736]
Satisfaction	Behavioural Intention	.195 [.018, .376]	—	.195 [.018, .376]

Note: The values in the top line are standardized influence coefficients, and the values in square brackets are 95% confidence intervals from bias-corrected bootstrap estimations; the hyphen (-) indicates that no such influence path exists in the estimated model.

To sum up, the structural equation modeling analysis shows that the final model has a very good fit with the empirical data (Figure 3). This reflects that the relationship structure of the variables in the model can explain the empirical data.

In addition, these results reflect that perceived value is a key mechanism linking innovation to satisfaction and behavioral intention. In other words, innovation clearly impacts satisfaction and behavioral intention when users perceive the innovation as valuable.

Based on these findings, the development of a causal relationship model among innovation, perceived value, satisfaction, and behavioural intention with respect to the terrarium product indicates congruence with em-

pirical data. The outcomes allow us to accept the **Hypothesis H1**. The details of the analysis and hypotheses can be concluded as follows:

1. Innovation, perceived value, and satisfaction collaborate to describe the variance of customers' behavioural intention to purchase that accounts for 43 percent.

2. Perceived value and satisfaction have a positive and direct impact on intention ($p < .05$) These outcomes allow us to accept the **Hypothesis H8**, and **Hypothesis H9**.

3. Innovation has an indirect effect on customer satisfaction through perceived value at the statistical significance level of .05. The result allows us to accept the **Hypothesis H5**.

4. Perceived value possesses an indirect effect on intention to purchase through



customer satisfaction at the statistical significance level of .05. The outcome accepts the **Hypothesis H6**.

5. Innovation shows the indirect effects on customers' behavioural intention to purchase. In terms of indirect effects, there are three situations shown as follows:

5.1 Innovation reveals an indirect influence on customers' behavioural intention through perceived value ($p < .05$). The outcome allows us to accept the **Hypothesis H3**.

5.2 Innovation indicates an indirect effect on intention through perceived value and satisfaction ($p < .05$). The findings appear to accept the **Hypothesis H7**.

5.3 Innovation has no an indirect impact on customers' behavioural Intention through satisfaction at the statistical significance level of .05. The result rejects the **Hypothesis H4**.

6. Perceived value is the most influential determinant affecting intention to purchase. The determinants with minor influence appear to be innovation and customer satisfaction. The three determinants revealed the overall effects as equal to .634, .513, and .195 ($p < .05$), respectively.

7. Innovation has a total effect towards perceived value equal to .810 at the statistical significance level of .01. Innovation also has a total effect on satisfaction equal to .506 ($p < .05$).

8. Innovation has no direct impact on customer satisfaction at the statistical significance level of .05. The result rejects the **Hypothesis H11**.

9. Innovation has no direct influence on consumers' behavioural intention to purchase

at the statistical significance level of .05. The result rejects the **Hypothesis H2**.

10. Innovation has a positive direct impact on perceived value at the statistical significance level of .01. The result accepts the **Hypothesis H10**.

11. Perceived value has a total effect towards satisfaction equal to .625 ($p < .01$).

12. Perceived value has a positive direct influence on customers' satisfaction at the statistical significance level of .01. The result accepts the **Hypothesis H12**.

In Figure 3, the model indicates that the most important elements appeared to be Service Innovation (Inno4) as well as Marketing Innovation (Inno5) for Innovation; Perceived Emotional Value (PV3) for Perceived Value; Meaningful (Sat2) for Satisfaction; and Repurchase (BI2) together with Word-of-Mouth (BI3) for Behavioural Intention. These high potential elements revealed the values of the standardized factor loading to be equal to .75, .75, .77, .71, .77, and .77 for Inno4, Inno5, PV3, Sat2, BI2, and BI3, respectively.

Discussion and Conclusion

The findings indicate a likelihood of intention to purchase the terrarium products as a value equal to 43 percent ($R^2_{\text{Behavioural Intention}} = .43$). The outcome means that innovation, perceived value, and customer satisfaction determinants can forecast customers' behavioural intention. Nevertheless, there is approximately 57 percent of the variance remains unexplained. This implies that other omitted variables not included in the current model might also play potential roles in shaping

customers' purchase intention. The outcomes are anticipated to find application with both theoretical and practical implications, which describes in the followings.

Theoretical Implications (New Knowledge)

This study contributes to the academic literature in three important ways. First, it extends the innovation literature by conceptualizing innovation as a multidimensional construct comprising product, technological, image, service, marketing, and cultural innovation. Unlike previous studies that have primarily focused on service and technological innovation, this study incorporates cultural innovation as a key dimension of innovation. Given that cultural innovation has received relatively limited attention in previous research, the findings extend existing knowledge by demonstrating its relevance in explaining customers' value perceptions and behavioural responses in the terrarium market. Furthermore, the findings highlight the potential role of cultural innovation in creating social value and strengthening firms' competitive advantage through culturally meaningful and customer-oriented innovation.

Second, this study advances the understanding of the mechanism through which innovation influences customers' behavioural intention. The findings indicate that innovation indirectly influences behavioural intention through perceived value, while the serial mediation through perceived value and customer satisfaction provides a more comprehensive explanation of how innovation is translated into favourable behavioural responses. These findings suggest that perceived value serves

as the primary mechanism linking innovation with behavioural intention, whereas customer satisfaction further reinforces this relationship.

Third, the findings provide additional theoretical support for both Cultural Identity Theory and Value Congruence Theory. The importance of cultural innovation suggests that innovation aligned with customers' cultural values and identities can strengthen customers' value perceptions. Moreover, the significant mediating role of perceived value supports the proposition of Value Congruence Theory that value is created when organisational initiatives are consistent with customers' expectations and shared values. Consequently, this study enriches the application of these theories within the emerging context of the terrarium market and provides empirical evidence for future research on innovation, perceived value, customer satisfaction, and behavioural intention.

Practical Implications

Latent variable innovation. Regarding the first research objective, this study examined whether innovation influences customers' behavioural intention to purchase terrarium products. The findings indicate that innovation does not have a significant direct effect on behavioural intention, although it exerts an indirect influence through other variables. This finding is inconsistent with Chen, et al. (2021, pp. 1–17), who reported a positive direct relationship between green innovation and behavioural intention. However, it is consistent with Hwang, Lee and Cho (2025, pp. 31–46), who suggested that customers develop purchase intention only after perceiving the



value created by innovation.

The findings indicate that innovation has a positive direct effect on perceived value, which is consistent with the findings reported by Chen, et al. (2021, p. 5). This suggests that innovation enhances customers' evaluations of the value offered by terrarium products. For example, Innovations in product design, technology, and sustainability may strengthen customers' value perceptions. Nevertheless, innovation alone was not found to directly enhance customer satisfaction.

The findings indicate that innovation indirectly influences behavioural intention through perceived value as well as through the sequential mediation of perceived value and customer satisfaction, suggesting that innovation strengthens purchase intention by creating greater customer value.

The measurement model further revealed that service, marketing, and cultural innovation were the three strongest indicators of the innovation construct, with factor loadings of .75, .75, and .74, respectively. Therefore, businesses should prioritise these innovation dimensions to strengthen customers' perceived value.

From a managerial perspective, businesses should integrate cultural, marketing, and service innovation to strengthen customers' perceived value. This may be achieved through cultural storytelling, stakeholder co-creation, environmentally responsible practices, and green service initiatives, thereby enhancing both customer value and broader social benefits.

Latent variable perceived value.

Regarding the second research objective, perceived value emerged as the strongest determinant of customers' behavioural intention to purchase terrarium products. The findings indicate that perceived value has a positive direct effect on behavioural intention, consistent with the results reported by Jaleel, et al. (2021, pp. 1851–1852) and Chen and Chen (2010, p. 32). In addition, perceived value was found to positively influence customer satisfaction, supporting previous evidence reported by Chen and Chen (2010, p. 32) and Jaleel, et al. (2021, pp. 1851–1852).

The findings further indicate that perceived value indirectly influences purchase intention through customer satisfaction. This result supports the mediation effect reported by Chen and Chen (2010, p. 32), although it differs from the findings of Jaleel, et al. (2021, pp. 1851–1852), who did not observe a significant indirect effect of perceived value through satisfaction.

The significant indirect effect of perceived value suggests that firms can strengthen customers' purchase intention by enhancing customer satisfaction. Accordingly, businesses should focus on delivering greater value through product quality, product design, and customer experience to reinforce both satisfaction and purchase intention.

The findings further reveal that perceived emotional value is the strongest indicator of the perceived value construct (factor loading = .77), followed closely by perceived functional value (factor loading = .76). Accordingly, businesses should focus on enhancing both the emotional and functional value of

terrarium products through creative design, product variety, enjoyable user experiences, and practical product benefits. Strengthening these value dimensions is likely to reinforce customers' behavioural intention to purchase terrarium products.

Latent variable satisfaction. Regarding the third research objective, customer satisfaction was found to have a positive direct effect on customers' behavioural intention to purchase terrarium products. This finding is consistent with previous studies (Chen and Chen, 2010, p. 32; Huiming and Yuning, 2020, p. 5; Jaleel, et al., 2021, pp. 1851–1852). In addition, customer satisfaction mediated the relationship between perceived value and behavioural intention, whereas no mediating effect was found between innovation and behavioural intention. These findings are consistent with Chen and Chen (2010, p. 32).

The findings suggest that innovation alone is insufficient to strengthen purchase intention. Instead, innovation enhances behavioural intention only when it increases customers' perceived value, which subsequently leads to higher customer satisfaction. Therefore, businesses should prioritise strategies that enhance perceived value in order to strengthen both customer satisfaction and purchase intention.

Meaningfulness and affordability were the strongest indicators of customer satisfaction (factor loadings = .71 and .68, respectively). Therefore, marketers should emphasise the practical and environmental benefits of terrarium products while communicating their affordability and long-term value. Such efforts

are likely to strengthen customer satisfaction and, consequently, purchase intention.

Latent variable behavioural intention. Word-of-mouth and repurchase intention were the strongest indicators of behavioural intention, with both factor loadings equal to .77. One possible explanation is that the respondents were predominantly female students, a group that tends to rely on interpersonal communication and social media when evaluating environmentally friendly products. Therefore, marketers should strengthen both WOM and e-WOM strategies to encourage repeat purchases of terrarium products.

Recommendations for terrarium business

(1) Entrepreneurs should integrate marketing, service, and cultural innovation into their business strategies. In particular, they should focus on developing culturally distinctive products that reflect local identity and creativity. Such initiatives can create a competitive advantage that is difficult for competitors to imitate.

(2) Businesses should strengthen customers' emotional value by providing meaningful experiences through storytelling and personalized products that foster stronger emotional connections with the brand. In addition, they should enhance the functional value of their products by clearly communicating their practical benefits and usefulness.

(3) Meaningfulness and affordability were identified as the primary determinants of customer satisfaction. Therefore, entrepreneurs should ensure that their products are priced reasonably in relation to their quality



and perceived benefits. Offering products at different price levels can also attract a broader customer base while maintaining customer satisfaction.

(4) Word-of-mouth and repurchase intention were identified as the most influential factors affecting intention. Firms should actively encourage customer reviews, referrals, and community engagement through social media platforms and customer participation activities.

Collectively, these strategies can strengthen terrarium businesses' differentiation capability, customer relationship capability, value-for-money competitiveness, and community-based marketing capability. Ultimately, these efforts can contribute to achieving a sustainable competitive advantage in the terrarium industry.

Limitations and Future Research Suggestions

(1) Limitations for the research appear to be financial and time constraints. Therefore, Bangkok was the only selected location. Con-

ducting in a single city may limit the generalizability of the outcomes to other geographic areas. Expanding the outcomes to other geographical locations should be concerned with caution.

(2) The data were collected through self-reported questionnaires that may emerge response bias, social desirability bias, and ultimately affecting the accuracy of the findings.

(3) The enlargement of sample size and more diverse sample are recommended in order to gain further insight for the future research.

(4) Future research is suggested to be conducted in a different product category or industry that is associated with green products.

(5) Future research may incorporate omitted variables such as trust, brand image, loyalty, and customer experience to provide a more comprehensive understanding of the factors affecting intention. These omitted variables may act as mediating or moderating mechanisms.

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