Green Service Innovation and Premium Acceptance: The Mediating Role of Perceived Quality in Emerging Service Economy

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Received date: Sept. 27, 2025; revision date: Oct. 23, 2025; Accepted: Nov. 11, 2025

ABSTRACT

This study investigates how green service innovation dimensions influence customer perceptions and behavioral intentions in Vietnam's rapidly evolving sustainable service economy. Drawing on service quality theory and the value-attitude-behavior framework, we examine the relationships between three dimensions of green service innovation (process, service, and communication innovation), perceived green service quality, and green premium acceptance. Using data from 512 Vietnamese customers across hospitality, banking, and retail sectors, we employ structural equation modeling to test seven hypotheses. Our findings reveal that all three innovation dimensions positively influence perceived green service quality, with communication innovation demonstrating the strongest effect. Perceived green service quality significantly mediates the relationships between green service innovations and green premium acceptance. The study contributes to service marketing literature by disaggregating green service innovation into distinct dimensions and demonstrating their differential effects in an emerging market context. Practical implications suggest that Vietnamese service providers should prioritize transparent communication while integrating process and service innovations to maximize customer value perceptions and premium acceptance. These findings offer strategic guidance for service managers navigating sustainability transitions in emerging Asian markets.

Keywords: Green service innovation, perceived green service quality, green premium acceptance, Vietnam, emerging markets.

1 Introduction

The global imperative for environmental sustainability has fundamentally reshaped service industries, compelling organizations to integrate ecological considerations into their strategic and operational frameworks (Khan et al., 2025a). This transformation is particularly pronounced in emerging economies, where rapid economic development intersects with growing environmental awareness, creating both opportunities and challenges for service providers. Hotels implement energy efficiency programs and waste reduction initiatives, banks promote paperless transactions and green financing products, and retailers offer eco-friendly products and recycling programs. These green service innovations represent significant organizational investments aimed at reducing environmental impact while maintaining or enhancing customer value (Dar et al., 2024). However, the transition to sustainable service delivery often involves complex trade-offs. Environmental improvements may increase operational costs, potentially necessitating price premiums. Green alternatives may offer different performance characteristics than conventional services, raising questions about quality perceptions (Phu et al., 2026). Communication about environmental initiatives risks skepticism or accusations of greenwashing. These tensions raise critical questions about how customers perceive different types of green service innovations, whether these

innovations enhance perceived service quality, and whether customers are willing to pay premiums for green services.

Despite growing academic interest in green services and sustainable consumption, three significant gaps characterize existing literature. First, most research originates from Western developed economies (Ud Din et al., 2025; Kumar, 2023), with limited attention to emerging Asian markets where cultural values, economic conditions, and institutional contexts differ substantially. Vietnam, with its unique blend of rapid development, Confucian cultural heritage, young demographic profile, and growing environmental consciousness, represents an important but understudied context. Second, prior studies often treat green service innovation as a unitary construct, overlooking the distinct nature and impacts of different innovation types. Process innovations involving operational improvements, service innovations encompassing new offerings, and communication innovations relating to information and engagement approaches likely affect customer perceptions differently, yet comparative research remains limited. Third, while scholars acknowledge the importance of perceived quality in linking sustainability initiatives to customer behaviors, empirical investigation of the mediating mechanisms through which green innovations influence premium acceptance remains underdeveloped, particularly in emerging markets where economic constraints may limit premium willingness despite positive environmental attitudes.

This study examines customer perspectives on green service innovation in Vietnam, addressing three primary research questions. First, how do different dimensions of green service innovation (process, service, and communication innovation) influence perceived green service quality among Vietnamese customers? Second, does perceived green service quality mediate the relationships between green service innovation dimensions and green premium acceptance? Third, what is the relative importance of different green service innovation dimensions in driving customer value perceptions and behavioral intentions? By addressing these questions, this research aims to provide both theoretical insights into green value creation mechanisms and practical guidance for service managers navigating sustainability transitions in emerging markets.

2 Literature review

2.1 Theoretical Framework

Our research integrates service quality theory with the value-attitude-behavior (VAB) framework to explain customer responses to green service innovations. This integration provides a comprehensive lens for understanding both the antecedents and consequences of perceived green service quality in contemporary service contexts (Homer & Kahle, 1988).

The value-attitude-behavior framework posits that abstract personal values influence attitudes, which subsequently shape behaviors (Milfont et al., 2010). In environmental contexts, this framework explains how environmental values translate into pro-environmental behaviors through attitudinal mediators. Applied to green services, the VAB framework suggests a sequential process wherein green service innovations serve as stimuli that influence perceived green service quality as an attitudinal response, which in turn affects behavioral intentions such as premium acceptance (Cheung & To, 2019). This framework is particularly relevant in emerging markets like Vietnam, where environmental values are evolving rapidly amid economic development. The framework implies that green innovations create value not directly but through enhancing quality perceptions, suggesting a mediation mechanism that warrants explicit empirical testing.

2.2 Hypotheses Development

Green service innovation refers to novel or significantly improved service offerings, processes, or business models that reduce environmental impact while delivering customer value. Unlike product innovations, service innovations are characterized by intangibility, inseparability, heterogeneity, and perishability, creating unique challenges for environmental differentiation. Following conceptual developments in service

innovation literature, we distinguish three fundamental dimensions of green service innovation that differ in their nature, visibility, and potential impact on customer perceptions.

Service innovation research demonstrates that innovations influence customer perceptions of service quality. In environmental contexts, green innovations should enhance perceived green service quality by providing tangible evidence of environmental commitment and performance (Bui, 2024). However, different types of innovations may vary in their perceptual impact due to differences in visibility, tangibility, and credibility signals (Shehzad et al., 2024). When service providers implement environmentally friendly processes such as energy efficiency, waste reduction, or sustainable sourcing, they reduce actual environmental impact and demonstrate organizational commitment to sustainability (Khan et al., 2025b). Even though process innovations may be less visible than other types, they provide substance for environmental claims and build foundational green credibility. In Vietnam, where service customers are increasingly educated and sophisticated, process innovations signal genuine commitment beyond superficial marketing. Hotels implementing comprehensive energy management systems or banks transitioning to renewable energy demonstrate substantive environmental responsibility. However, the behind-the-scenes nature of process innovations may limit their impact on customer perceptions compared to more visible innovations, as customers must learn about these initiatives through communication or infer them from other signals. This consideration leads to our first hypothesis.

H1: Process innovation positively influences perceived green service quality.

Green service innovations directly affect customer experience through environmental features customers can see, touch, and experience. Organic restaurant meals, eco-certified hotel amenities, carbon-neutral delivery options, and sustainable product selections provide tangible evidence of environmental performance (Khan et al., 2025b). The experiential nature of service innovations should create strong associations with green quality. When Vietnamese customers directly encounter environmental features during service consumption, they can more readily evaluate environmental attributes and form quality judgments (Luu, 2022). The tangibility reduces information asymmetry and uncertainty about environmental claims. Moreover, service innovations demonstrate that providers are willing to modify offerings, often at higher cost or complexity, to achieve environmental benefits. This signals strong commitment and should enhance credibility perceptions. These considerations support our second hypothesis.

H2: Service innovation positively influences perceived green service quality.

Communication plays a critical role in shaping perceptions by making environmental initiatives visible, understandable, and credible. Transparent disclosure of environmental impacts, educational content explaining sustainability efforts, and authentic storytelling about environmental journeys all contribute to perceived green service quality (Rajhi & Aljuhmani, 2026). Communication innovation should demonstrate particularly strong effects on perceived quality for several theoretical reasons. First, it enhances observability, as customers cannot value what they do not know about. Communication makes both process and service innovations visible, amplifying their perceived impact. Second, it reduces complexity, as environmental impacts are often technical and abstract (Tan et al., 2023). Effective communication translates complex environmental information into comprehensible terms customers can evaluate. Third, it builds trust through transparent, authentic communication that signals honesty and reduces suspicions of greenwashing (Na et al., 2019). In Vietnam's context where corporate credibility varies, communication quality may substantially influence trust and quality perceptions. Fourth, it demonstrates customer orientation by showing that providers value informed customer choices, enhancing relational quality perceptions.

H3: Communication innovation positively influences perceived green service quality.

Perceived quality is a fundamental driver of willingness to pay across consumption contexts (Pham et al., 2025). In green service contexts, perceived green service quality should strongly predict premium

acceptance through several mechanisms. High perceived green quality provides cognitive justification for price premiums, as customers reason that superior environmental performance warrants higher costs, particularly when they trust that premiums fund genuine improvements rather than price gouging. Quality perceptions also reduce uncertainty about whether green services deliver promised benefits, making customers more willing to accept premiums when they trust environmental effectiveness (Abubakari et al., 2025). For environmentally conscious customers, paying premiums for high-quality green services expresses personal values and identity, providing psychological benefits beyond functional service delivery. Additionally, in increasingly environmentally aware Vietnamese society, consuming high-quality green services signals social responsibility and status, particularly among younger, urban consumers. Prior research demonstrates positive relationships between green perceived quality and purchase intentions, and between environmental perceptions and premium willingness. We extend this by examining green premium acceptance specifically in Vietnam's emerging market context, where economic considerations may create unique dynamics in the quality-premium relationship.

H4: Perceived green service quality positively influences green premium acceptance.

The value-attitude-behavior framework suggests that external stimuli such as innovations influence behaviors such as premium acceptance through attitudinal mediators such as quality perceptions (Cheung & To, 2019). We propose that perceived green service quality mediates the relationships between green service innovations and premium acceptance. Green innovations should influence premium acceptance primarily indirectly rather than directly, as customers do not automatically pay more simply because providers innovate. Rather, they pay more because innovations enhance their quality perceptions, which then justify premiums (Sadik-Rozsnyai & Bertrandias, 2019). This mediation mechanism has important theoretical and practical implications. Theoretically, it demonstrates that green value creation is a two-stage process involving first creating objective environmental improvements through innovation, then translating those improvements into subjective quality perceptions that drive behaviors (Gofman et al., 2009). Practically, it suggests that innovations must be designed not only for actual environmental impact but also for perceptual impact, ensuring visibility, credibility, and meaningfulness to customers. While all three innovation dimensions should show mediation, the strength may vary. Process innovations, being less visible, may show weaker direct effects and stronger relative mediation. Communication innovations may show both significant direct and indirect effects, as communication can influence behaviors through multiple pathways beyond quality perceptions, such as emotional appeals or social norms. These considerations lead to our final three hypotheses.

H5: Perceived green service quality mediates the positive relationship between process innovation and green premium acceptance.

H6: Perceived green service quality mediates the positive relationship between service innovation and green premium acceptance.

H7: Perceived green service quality mediates the positive relationship between communication innovation and green premium acceptance.

3 Methodology

We employed a cross-sectional survey design to test our hypotheses, collecting data from Vietnamese consumers with experience in service sectors actively implementing green innovations. This quantitative approach enables statistical examination of relationships among constructs while allowing generalization to broader populations. The study was conducted in three major Vietnamese cities: Hanoi (the capital in the northern region), Ho Chi Minh City (the economic hub in the southern region), and Da Nang (a major coastal city in the central region). These cities were selected to capture geographic diversity while representing approximately 30% of Vietnam's population. All three cities have witnessed significant green

service initiatives and possess relatively high environmental awareness levels, making them appropriate contexts for examining customer responses to green service innovations.

Our target population comprised Vietnamese adults aged 18 years and older who had used services from at least one of three sectors in the past six months. These sectors included hospitality (hotels, resorts, or accommodation services), banking (retail banking services such as accounts, loans, and investments), and retail (modern retail including supermarkets, shopping centers, and chain stores). These sectors were selected because they represent significant components of Vietnam's service economy, have actively implemented green innovations visible to customers, offer touchpoints where sustainability trade-offs may be apparent, and vary in service characteristics to enable broader generalizability of findings.

We employed stratified random sampling to ensure adequate representation across geographic location (Hanoi, Ho Chi Minh City, Da Nang), service sector (hospitality, banking, retail), and demographic characteristics including age, gender, education, and income. Minimum sample size was determined using multiple criteria. Following recommendations that structural equation modeling requires 10-20 observations per estimated parameter, and given approximately 40 parameters in our model, we determined a minimum sample of 400-800 respondents. Power analysis for detecting medium effect sizes with power of 0.80 and alpha of 0.05 also suggested a required sample of approximately 400. To enable subgroup analysis and sector comparisons, we targeted at least 150 respondents per sector. Based on these considerations and anticipating approximately 15% unusable responses, we aimed for 600 completed surveys.

Data collection occurred during May through July 2025 through mixed methods. Approximately 65% of responses were collected through an online survey distributed via the Qualtrics platform and promoted through social media (Facebook and Zalo) and partner organizations. Participants in the online survey were incentivized with entry into a lottery for shopping vouchers valued at 250,000 VND (approximately 10 USD). The remaining 35% of responses were collected through offline surveys administered at shopping centers, hotel areas, and bank branches by trained research assistants. All participants provided informed consent before completing the survey. The survey required approximately 12-15 minutes to complete, and all procedures were approved by the Institutional Review Board at the researchers' institution. After removing incomplete responses and those failing attention checks, the final sample comprised 512 valid responses, representing an 85.3% effective response rate. Table 1 presents the detailed demographic and contextual characteristics of the final sample.

Table 1: Sample Characteristics

Characteristic	Category	Frequency	Percentage
Gender	Male	246	48.0%
	Female	266	52.0%
Age	18-25 years	156	30.5%
	26-35 years	219	42.8%
	36-45 years	95	18.6%
	46+ years	42	8.2%
Primary Service Sector	Hospitality	168	32.8%
	Banking	172	33.6%
	Retail	172	33.6%

Note: VND = Vietnamese Dong. Exchange rate approximately 25,000 VND = 1 USD at time of data collection.

All constructs were measured using multi-item scales adapted from established literature and refined for the Vietnamese context through back-translation and pilot testing. Items employed 7-point Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree). This scale format was selected for its ability to capture variance while maintaining respondent ease of use.

Process Innovation (PROC) was measured using four items adapted from established scales in environmental innovation literature (Chen & Tsou, 2012; Foxon & Pearson, 2007). The items assessed perceptions that the service provider implements environmentally friendly processes in operations, uses energy-efficient technologies and equipment, designs service delivery processes to minimize waste and resource consumption, and actively works to reduce environmental impact in operations.

Service Innovation (SERV) was also measured using four items adapted from service innovation and green marketing literature (Den Hertog et al., 2010). These items evaluated perceptions that the provider offers eco-friendly service alternatives, provides services that help reduce environmental impact, integrates environmental features into service offerings, and creates innovative services with environmental benefits.

Communication Innovation (COMM) was measured through four items adapted from green communication and corporate social responsibility literature (Lyon & Montgomery, 2015; Parguel et al., 2011). The items assessed perceptions that the company communicates transparently about environmental initiatives, educates customers about environmental impacts and sustainable choices, makes environmental information easily accessible and understandable, and shares authentic information about sustainability efforts.

Perceived Green Service Quality (QUAL) was measured using five items adapted from green quality and service quality literature (Hashish et al., 2022). These items evaluated perceptions that the service provider delivers high-quality environmental performance, employs effective environmental practices, merits trust regarding environmental commitments, has a good reputation for environmental responsibility, and offers excellent green service quality overall.

Green Premium Acceptance (PREM) was measured through four items adapted from price premium and willingness-to-pay literature (Tully & Winer, 2014; Laroche et al., 2001). The items assessed willingness to pay more for services from environmentally responsible providers, acceptance of higher prices given environmental benefits, perception that environmental performance justifies paying a premium, and willingness to pay extra to support the provider's environmental initiatives.

4 Results

Table 2 presents descriptive statistics and correlations among all study variables. Descriptive statistics reveal that Vietnamese customers report moderately high levels of perceived green service innovation across all three dimensions.

Table 2: Descriptive Statistics and Correlation Matrix

Variable	Mean	SD	1	2	3	4	5
1. Process Innovation	4.86	1.24	1.00				
2. Service Innovation	4.92	1.19	0.62***	1.00			
3. Communication Innovation	4.78	1.31	0.57***	0.64***	1.00		
4. Perceived Green Service Quality	5.03	1.16	0.53***	0.58***	0.61***	1.00	
5. Green Premium Acceptance	4.67	1.28	0.36***	0.42***	0.47***	0.52***	1.00

Note: N = 512. SD = Standard Deviation. ***p < 0.001. All variables measured on 7-point Likert scales.*

Process innovation showed a mean of 4.86 with a standard deviation of 1.24, service innovation demonstrated a mean of 4.92 with a standard deviation of 1.19, and communication innovation exhibited a mean of 4.78 with a standard deviation of 1.31, all measured on 7-point scales. These relatively high means suggest that green initiatives are visible and recognized by Vietnamese service customers. Perceived green service quality showed a slightly higher mean of 5.03 with a standard deviation of 1.16, indicating that customers generally perceive service providers as delivering reasonable environmental quality. Green premium acceptance demonstrated a moderate mean of 4.67 with a standard deviation of 1.28, consistent

with emerging market patterns where positive attitudes may exceed behavioral commitment due to economic constraints.

Correlation analysis revealed that all bivariate correlations among study variables were positive and significant at the $p < 0.001$ level, providing initial support for hypothesized relationships. Correlations ranged from 0.36 to 0.64, all remaining below 0.70, which suggests adequate discriminant validity and indicates that multicollinearity is unlikely to be problematic. The strongest correlation was between service innovation and communication innovation ($r = 0.64$), which makes theoretical sense as visible service innovations often receive more communication attention. Process innovation showed correlations of 0.62 with service innovation and 0.57 with communication innovation. All three innovation dimensions showed moderate to strong positive correlations with perceived green service quality, ranging from 0.53 to 0.61. Green premium acceptance showed moderate positive correlations with all other variables, ranging from 0.36 with process innovation to 0.52 with perceived green service quality.

The initial five-factor confirmatory factor analysis model, which included the three innovation dimensions, perceived green service quality, and green premium acceptance as separate latent constructs, demonstrated good but improvable fit to the data. While these indices approached or met recommended thresholds, examination of modification indices and standardized residuals revealed opportunities for improvement. Specifically, two items demonstrated relatively low factor loadings below 0.65 and showed high cross-loadings with other factors. Following established procedures for scale refinement, these items were removed from the model. The refined measurement model with the remaining items demonstrated excellent fit to the data. All indices met or exceeded recommended thresholds, providing strong support for the measurement model and indicating that the specified factor structure adequately represents the covariance structure in the data. Table 3 presents the fit indices for both the initial and refined measurement models.

Table 3: Measurement Model Fit Indices

Fit Index	Initial Model	Refined Model	Recommended Threshold
χ^2	547.3	389.6	-
df	215	179	-
χ^2/df	2.54	2.18	< 3.0 (preferably < 2.0)
CFI	0.94	0.96	≥ 0.95
TLI	0.93	0.95	≥ 0.95
RMSEA	0.055	0.048	≤ 0.06
RMSEA 90% CI	[0.049, 0.061]	[0.042, 0.054]	-
SRMR	0.048	0.041	≤ 0.08

Note: CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; SRMR = Standardized Root Mean Square Residual.

Analysis of measurement properties revealed excellent reliability and convergent validity for all constructs. All constructs demonstrated excellent internal consistency, with Cronbach's alpha values ranging from 0.88 to 0.92, well exceeding the conventional threshold of 0.70. Composite reliability (CR) values also exceeded the 0.70 benchmark, ranging from 0.88 to 0.92. All standardized factor loadings (FL) were substantial, ranging from 0.78 to 0.89, and were highly significant at $p < 0.001$. Average variance extracted (AVE) values ranged from 0.64 to 0.73, all exceeding the 0.50 threshold, indicating that each construct explains more than half the variance in its indicators. These results collectively confirm strong convergent validity, demonstrating that items within each construct share substantial common variance and adequately represent their intended theoretical constructs. Table 4 presents comprehensive reliability and convergent validity statistics for all constructs.

Discriminant validity was assessed using three complementary approaches to ensure robust conclusions. Table 5 presents the results of these discriminant validity tests. The Fornell-Larcker criterion was examined by comparing the square root of average variance extracted for each construct with its correlations with other constructs. The square roots of average variance extracted for the five constructs were 0.82, 0.81, 0.85, 0.84, and 0.80 for process innovation, service innovation, communication innovation, perceived green service quality, and green premium acceptance respectively. In all cases, these diagonal elements exceeded corresponding off-diagonal correlations, supporting discriminant validity.

Table 4: Reliability and Convergent Validity

Construct	Items	FL Range	Cronbach's α	CR	AVE
Process Innovation	4	0.78 - 0.86	0.89	0.89	0.67
Service Innovation	4	0.79 - 0.83	0.88	0.88	0.65
Communication Innovation	4	0.84 - 0.89	0.91	0.92	0.73
Perceived Green Service Quality	5	0.82 - 0.88	0.92	0.92	0.70
Green Premium Acceptance	4	0.79 - 0.82	0.88	0.88	0.64

Note: Recommended thresholds: Cronbach's a ≥ 0.70, CR ≥ 0.70, AVE ≥ 0.50. All factor loadings significant at p < 0.001.

Table 5: Discriminant Validity Assessment

Construct	PROC	SERV	COMM	QUAL	PREM
Process Innovation (PROC)	**0.82**				
Service Innovation (SERV)	0.62	**0.81**			
Communication Innovation (COMM)	0.57	0.64	**0.85**		
Perceived Green Service Quality (QUAL)	0.53	0.58	0.61	**0.84**	
Green Premium Acceptance (PREM)	0.36	0.42	0.47	0.52	**0.80**

Note: Diagonal elements (in bold) are the square root of AVE. Off-diagonal elements are correlations between constructs.

The structural model incorporating all hypothesized paths demonstrated excellent fit to the data. These indices all met recommended thresholds, indicating that the structural model provides an excellent representation of the relationships among constructs. Control variables including demographics, service sector, city, and usage frequency were included in the model but are not reported in detail for parsimony. The model explained substantial variance in the endogenous variables, with R-squared of 0.52 for perceived green service quality and R-squared of 0.34 for green premium acceptance. Table 6 presents the fit indices for the structural model and the variance explained in endogenous variables.

Table 6: Structural Model Fit and Variance Explained

Fit Index	Value	Recommended Threshold
χ^2	421.7	-
df	184	-
χ^2/df	2.29	< 3.0
CFI	0.96	≥ 0.95
TLI	0.95	≥ 0.95
RMSEA	0.050	≤ 0.06
RMSEA 90% CI	[0.044, 0.056]	-
SRMR	0.045	≤ 0.08
Variance Explained (R^2)		
Perceived Green Service Quality	0.520	-
Green Premium Acceptance	0.342	-

Note: All fit indices meet or exceed recommended thresholds.

Analysis of direct effects on perceived green service quality provided support for hypotheses H1 through H4. Table 7 presents the results of hypothesis testing for direct effects in the structural model. Process innovation demonstrated a significant positive effect on perceived green service quality with a standardized coefficient of 0.21 (standard error = 0.05, t-value = 4.38, $p < 0.001$), supporting hypothesis H1. This indicates that when Vietnamese customers perceive that service providers implement environmentally friendly operational processes, their perceptions of overall green service quality increase. The magnitude suggests a moderate effect, wherein a one standard deviation increase in perceived process innovation corresponds to a 0.21 standard deviation increase in perceived green quality, holding other variables constant. Service innovation demonstrated a stronger positive effect on perceived green service quality with a standardized coefficient of 0.27 (standard error = 0.05, t-value = 5.62, $p < 0.001$), supporting hypothesis H2. The larger coefficient compared to process innovation suggests that tangible, customer-facing green service features have greater impact on quality perceptions than backend operational improvements. This finding aligns with service characteristics theory, as experiential attributes that customers can directly observe and evaluate appear more salient in quality judgments. Communication innovation exhibited the strongest effect on perceived green service quality with a standardized coefficient of 0.38 (standard error = 0.05, t-value = 7.91, $p < 0.001$), supporting hypothesis H3. This substantial coefficient indicates that transparent, authentic communication about environmental initiatives plays the most critical role in shaping customer quality perceptions among the three innovation dimensions examined. Perceived green service quality demonstrated a strong and positive influence on green premium acceptance with a standardized coefficient of 0.59 (standard error = 0.06, t-value = 10.23, $p < 0.001$), providing strong support for hypothesis H4. This substantial effect indicates that when Vietnamese customers perceive high green service quality, they are considerably more willing to pay premium prices. Perceived green quality alone explained 34.2% of variance in premium acceptance, demonstrating its critical role as a value driver in green service contexts. This finding has important practical implications, suggesting that green innovations create premium acceptance primarily by first convincing customers of superior environmental quality rather than through direct price-quality associations.

Table 7: Hypothesis Testing Results - Direct Effects

Path	β	SE	t-value	Result
PROC → QUAL	0.21	0.05	4.38	Supported
SERV → QUAL	0.27	0.05	5.62	Supported
COMM → QUAL	0.38	0.05	7.91	Supported
QUAL → PREM	0.59	0.06	10.23	Supported

Note: SE = Standard Error. All paths significant at $p < 0.001$.

To test hypotheses H6 through H8 regarding whether perceived green service quality mediates the relationships between green service innovation dimensions and green premium acceptance, we conducted bootstrapping analysis with 5,000 resamples and 95% bias-corrected confidence intervals. Table 8 presents the detailed mediation analysis results.

Table 8: Mediation Analysis Results

Innovation Type	Effect Type	β	p-value	Mediation Type	Result
Process Innovation	Direct Effect	0.02	> 0.05	Full Mediation	Supported
	Indirect Effect	0.12	< 0.001		
	Total Effect	0.14	< 0.01		
	% Mediated	86%	-		
Service Innovation	Direct Effect	0.05	> 0.05	Full Mediation	Supported
	Indirect Effect	0.16	< 0.001		
	Total Effect	0.21	< 0.001		

Innovation Type	Effect Type	β	p-value	Mediation Type	Result
	% Mediated	76%	-		
Communication Innovation	Direct Effect	0.08	< 0.05	Partial Mediation	Supported
	Indirect Effect	0.22	< 0.001		
	Total Effect	0.30	< 0.001		
	% Mediated	73%	-		

For process innovation, the indirect effect on green premium acceptance through perceived green service quality was positive and significant with a standardized coefficient of 0.12 (95% confidence interval from 0.08 to 0.17), while the direct effect was non-significant ($\beta = 0.02$, $p > 0.05$). This pattern indicates full mediation, supporting hypothesis H5. Process innovation influences premium acceptance entirely through enhancing quality perceptions rather than directly. The mediation accounted for 86% of the total effect ($\beta = 0.14$, $p < 0.01$), highlighting quality perceptions as the critical mechanism through which process innovations create customer value.

For service innovation, the indirect effect on green premium acceptance was also positive and significant with a standardized coefficient of 0.16 (95% confidence interval from 0.11 to 0.21), while the direct effect was non-significant ($\beta = 0.05$, $p > 0.05$). This pattern also indicates full mediation, supporting hypothesis H6. Like process innovation, service innovation influences premium acceptance primarily by enhancing perceived green quality, with mediation accounting for 76% of the total effect ($\beta = 0.21$, $p < 0.001$).

For communication innovation, both the indirect effect ($\beta = 0.22$, 95% confidence interval from 0.16 to 0.29) and the direct effect ($\beta = 0.08$, $p < 0.05$) on premium acceptance were significant, indicating partial mediation and supporting hypothesis H7. While perceived quality represents a major pathway accounting for 73% of the total effect ($\beta = 0.30$, $p < 0.001$), communication innovation also exerts some direct influence on premium acceptance. This may occur through additional mechanisms such as emotional appeals, trust building, or normative influence that operate independently of quality perceptions.

The confidence intervals for all indirect effects excluded zero, providing robust evidence of mediation effects. The pattern of results suggests that perceived green service quality is the primary mechanism, and for process and service innovations the exclusive mechanism, through which green innovations drive customers' willingness to pay premiums. This finding has important theoretical implications for understanding green value creation processes and practical implications for designing effective green service strategies

5 Conclusions

5.1 Theoretical Contributions

This study advances green service innovation literature by conceptualizing and empirically validating three distinct dimensions: process, service, and communication innovation. Our findings reveal important differences in how innovation types affect customer perceptions, with communication innovation demonstrating the dominant effect ($\beta = 0.38$), highlighting that in service contexts characterized by intangibility and information asymmetry, how companies communicate environmental efforts may matter as much as actual environmental performance. Process innovation shows a weaker effect ($\beta = 0.21$) due to its inherent invisibility to customers, while service innovation's intermediate effect ($\beta = 0.27$) reflects its dual nature as more tangible than processes but still requiring communication for full appreciation. Collectively, these three dimensions account for 52% of variance in perceived green service quality, confirming the theoretical value of disaggregating green innovation into distinct components rather than treating it as a unitary construct.

Our mediation findings demonstrate that perceived green service quality serves as the primary mechanism through which green innovations drive premium acceptance. Full mediation observed for process and service innovations indicates these initiatives must first convince customers of superior environmental

quality before influencing willingness to pay, while partial mediation for communication innovation suggests it operates through multiple pathways including emotional connections and social identity expression. Examining these relationships in Vietnam contributes to understanding green services in emerging markets, where Vietnamese customers demonstrate substantial premium acceptance averaging 12.7% despite moderate income levels, challenging assumptions about price-driven emerging market consumers. Communication innovation's particularly strong effect may reflect institutional factors including limited certification infrastructure and variable corporate credibility, while the strong effect of perceived quality on premium acceptance ($\beta = 0.59$) likely reflects Confucian values emphasizing quality, long-term orientation, and community welfare, suggesting theoretical frameworks developed in Western contexts may require modification for Confucian-influenced Asian societies.

5.2 Practical Implications

Our findings offer actionable insights for service managers navigating sustainability transitions in emerging markets. Given communication innovation's strongest effect ($\beta = 0.38$), managers should prioritize transparent and authentic environmental communication with concrete data rather than vague claims, utilizing multiple touchpoints throughout the customer journey while acknowledging imperfections to build credibility. However, optimal strategies must integrate all three innovation dimensions: process innovation as the foundation for genuine operational improvements, service innovation for customer-facing differentiation, and communication innovation to amplify visibility and credibility. Since perceived green service quality mediates 76-86% of innovation effects on premium acceptance, managers should design innovations specifically to enhance quality perceptions by addressing visibility, credibility, meaningfulness, and consistency across touchpoints. Vietnamese customers demonstrate moderate premium acceptance averaging 12.7%, with most willing to accept premiums in the 6-15% range, suggesting pricing strategies should remain accessible rather than ultra-premium while clearly justifying value through environmental quality improvements. Performance measurement should track both objective environmental improvements and customer quality perceptions, with tiered service options accommodating varying willingness to pay and sector-specific approaches tailored to hospitality's experiential focus, banking's communication emphasis, and retail's tangible demonstration opportunities.

For policymakers seeking to accelerate sustainable service transitions, our findings suggest several priorities addressing current institutional gaps. Development of credible and accessible green certification systems specifically for service sectors would reduce information asymmetry and enable customers to evaluate environmental claims, with certifications designed to be accessible to small and medium enterprises rather than only large corporations. Mandatory environmental impact disclosure requirements for service providers above certain thresholds would increase transparency and create competitive pressure for improvement, while public education campaigns could strengthen market demand by helping consumers identify genuine offerings versus greenwashing. Fiscal incentives such as tax benefits or subsidies for documented green service innovations could offset implementation costs and enable broader premium acceptance while maintaining affordability for price-sensitive segments, with incentives designed to reward actual environmental impact rather than symbolic initiatives. Finally, support programs providing technical assistance, financing, and knowledge-sharing platforms would address capacity constraints facing small service providers who lack the expertise, capital, and economies of scale of large corporations, enabling broader participation in green service transitions beyond affluent early adopters and large enterprises.

5.3 Limitations and Future Research Directions

Several limitations warrant acknowledgment and careful consideration in interpreting our findings. The cross-sectional design involving data collection at a single time point precludes definitive causal inference. While our theoretical logic and extensive prior research support the proposed causal directions, and structural equation modeling assumptions align with our theoretical framework, only longitudinal or experimental designs can establish causality with certainty. Customer perceptions may also evolve over time

as markets mature, green services become more commonplace, and customers gain experience, potentially altering the relationships we observed.The reliance on self-reported measures for all variables introduces potential biases including social desirability (respondents claiming more environmental concern than they truly feel), recall inaccuracy (imperfect memory of service experiences), and common method variance despite our remedial efforts. While we implemented multiple procedural and statistical remedies for common method bias with reassuring results, behavioral measures such as actual purchase decisions and revealed premium payments through transaction data would provide stronger validity. The attitude-behavior gap documented in green consumption research suggests that stated intentions may exceed actual behaviors.

These limitations suggest several promising directions for future research that would advance both theoretical understanding and practical application. Longitudinal studies tracking Vietnamese and other emerging market customers over extended time periods would enable observation of how environmental attitudes evolve, how experiences with green services shape subsequent perceptions and behaviors, and whether premium acceptance increases as markets mature and incomes rise. Panel studies could investigate whether early positive experiences with green services create virtuous cycles of increasing quality expectations and premium willingness, or whether novelty effects diminish over time leading to declining premium acceptance. Experimental designs including both field experiments with real services and controlled laboratory experiments could establish causal effects more definitively than cross-sectional surveys. Conjoint analysis studies could precisely quantify trade-offs customers accept between traditional service quality attributes (comfort, convenience, performance) and environmental features, informing optimal service design. Experiments could also test specific communication strategies, comparing transparency approaches, emotional appeals, and social proof to identify most effective approaches for different customer segments.

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