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PERCEIVED ESG PERFORMANCE AND CUSTOMER BEHAVIORAL INTENTIONS IN ENGINEERING-INTENSIVE INDUSTRIES IN VIETNAM: A STRUCTURAL EQUATION MODELING STUDY

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ABSTRACT

Environmental, social and governance (ESG) practices are increasingly important to enterprises operating in engineering-intensive industries, where product reliability, technical risk, compliance, and long-term service assurance shape customer decisions. Yet the customer-side consequences of perceived ESG performance remain underexplored in emerging manufacturing economies such as Vietnam. Drawing on stakeholder theory, signaling theory, and the stimulus-organism-response framework, this study develops and tests a structural equation model linking three perceived ESG dimensions - environmental responsibility, social responsibility, and governance transparency - to customer behavioral intentions through ESG-based customer trust, corporate reputation, and perceived customer value. The proposed setting covers Vietnamese technical industries, including electronics and electrical devices, industrial machinery and equipment, construction materials and engineering services, renewable-energy technologies, automation, and ICT hardware. A cross-sectional survey design is proposed, using multi-item seven-point Likert scales and partial least squares structural equation modeling. To demonstrate the analytical logic and expected effect sizes before fieldwork, the paper reports simulated results based on a projected sample of 512 customers. The provisional results suggest that governance transparency and social responsibility are the strongest predictors of customer trust and corporate reputation, while perceived customer value is the strongest immediate predictor of loyalty, advocacy, repurchase intention, and willingness to pay a premium. The mediation analysis indicates that ESG perceptions influence behavior mainly through trust, reputation, and value rather than through purely direct effects. The study contributes a customer-centered ESG model for technical industries and provides practical implications for Vietnamese enterprises seeking to translate ESG commitments into market advantages.

Keyword: ESG, customer behavior, customer trust, corporate reputation, perceived value, PLS-SEM, engineering-intensive industries, Vietnam

1. INTRODUCTION

Sustainability has moved from a peripheral communication issue to a strategic market signal. The term ESG, derived from environmental, social, and governance criteria, initially emerged in responsible investment discourse, but it now influences customers, supply-chain partners, regulators, and employees. In markets characterized by technical complexity and long product life cycles, ESG performance may be especially consequential because customers cannot easily evaluate every aspect of product quality, operational safety, regulatory compliance, or post-purchase responsibility. Consequently, credible ESG practices may reduce perceived risk and shape customer behavior through trust, reputation, and value perceptions.

Vietnam offers a relevant context for examining this issue. The country has pursued a national green-growth agenda and committed to a low-carbon transition while continuing to expand manufacturing and engineering-related sectors. Engineering-intensive industries such as electronics, industrial machinery, electrical equipment, construction materials, renewable-energy technologies, automation, and ICT hardware are connected to global value chains and are increasingly exposed to sustainability

expectations from buyers, investors, and regulators. These industries also involve high-involvement purchases, after-sales services, warranty obligations, compliance requirements, and technical performance guarantees. ESG signals, therefore, may affect not only moral evaluations but also practical assessments of supplier reliability.

Prior consumer-behavior research has shown that corporate social responsibility and sustainability cues can influence attitudes, loyalty, word of mouth, and purchase intention (Sen & Bhattacharya, 2001; Du et al., 2010; Lai et al., 2010). Recent ESG studies extend this logic by demonstrating links between perceived ESG attributes and brand trust, brand credibility, customer engagement, and purchase intention (Koh et al., 2022; Tripopsakul & Puriwat, 2022; Bae et al., 2023; Cheng & Huang, 2024; Li & Chen, 2025). However, most evidence comes from hospitality, food and beverage, fashion, banking, or general consumer settings. Less is known about how customers evaluate ESG in technical industries, where governance transparency, occupational safety, quality assurance, supply-chain responsibility, and environmental performance can directly affect perceived product and service value.

This study addresses that gap by proposing a structural equation model of perceived ESG and customer behavioral intentions in Vietnam's engineering-intensive industries. The model examines three ESG dimensions as external market signals and tests whether customer trust, corporate reputation, and perceived customer value explain the conversion of ESG perceptions into behavioral intentions. Customer behavioral intentions are defined broadly to include repurchase intention, positive word of mouth, recommendation, loyalty, supplier preference, and willingness to pay a premium for responsible technical products or services.

The study makes three intended contributions. First, it adapts ESG-consumer behavior theory to engineering-intensive industries in an emerging economy. Second, it compares the relative role of environmental, social, and governance perceptions, rather than treating ESG as a single aggregate construct. Third, it clarifies the mediating mechanisms through which ESG perceptions may affect behavior, emphasizing that ESG initiatives create customer value when they are perceived as credible, reputation-enhancing, and relevant to product/service outcomes.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. ESG as a Customer-Perceived Signal

Stakeholder theory argues that firms create sustainable value by addressing the interests of multiple stakeholder groups rather than focusing only on shareholders (Freeman, 1984). ESG operationalizes this broader responsibility through environmental protection, social responsibility, and transparent governance. For customers, ESG practices can function as observable signals of a firm's values, capabilities, and risk-management orientation. Signaling theory is particularly relevant in technical markets because customers face information asymmetry: they often cannot directly observe the environmental footprint of components, the fairness of labor practices in supply chains, or the quality of governance processes behind warranties and compliance statements.

The stimulus-organism-response framework provides a useful behavioral explanation. Perceived ESG performance is the external stimulus; trust, reputation, and perceived value are internal cognitive and affective states; and loyalty, advocacy, repurchase intention, and willingness to pay are behavioral responses. This perspective is consistent with evidence that ESG disclosures and perceived ESG attributes can strengthen brand credibility and purchase intention (Cheng & Huang, 2024), brand trust and word of mouth (Bae et al., 2023), and customer engagement (Tripopsakul & Puriwat, 2022).

2.2. Perceived ESG Dimensions

Environmental responsibility refers to customers' perceptions that a firm reduces emissions, uses resources efficiently, prevents pollution, designs products for energy efficiency or recyclability, and invests in cleaner technologies. In technical industries, environmental responsibility can also be associated with lower total cost of ownership, energy-saving performance, compliance with environmental standards, and resilience to future regulation.

Social responsibility refers to perceptions that a firm treats employees fairly, protects health and safety, respects customer rights, contributes to

communities, and manages suppliers responsibly. In engineering-intensive industries, social responsibility has direct practical relevance because accidents, poor labor practices, or weak customer-service ethics can disrupt supply continuity and damage customer confidence.

Governance transparency refers to perceptions that a firm follows ethical business practices, discloses reliable information, honors warranties, protects data, prevents corruption, and maintains accountable management systems. Technical customers often value governance because complex products and services require long-term maintenance, compliance documentation, and credible commitments. Governance transparency can therefore reduce moral hazard and uncertainty.

2.3. ESG, Customer Trust, and Corporate Reputation

Customer trust is the willingness to rely on a company based on confidence in its reliability, competence, and benevolence. Trust has long been treated as a cornerstone of relationship marketing (Morgan & Hunt, 1994) and has been linked to brand loyalty and purchase outcomes (Chaudhuri & Holbrook, 2001). ESG practices can build trust by showing that a firm is not only technically capable but also responsible in how it produces, governs, and serves customers. Recent ESG studies find positive relationships between ESG perceptions and brand trust (Bae et al., 2023; Li & Chen, 2025).

Corporate reputation is an aggregate stakeholder assessment of a firm's credibility, responsibility, and attractiveness. Reputation reduces perceived risk, increases customer confidence, and becomes especially relevant when quality is difficult to verify before purchase. ESG practices can enhance reputation when customers interpret them as evidence of responsible management and long-term orientation. Because technical industries depend on reliability and after-sales commitments, ESG-based reputation may be an important bridge between corporate responsibility and customer behavior.

H1a: Perceived environmental responsibility positively affects ESG-based customer trust.

H1b: Perceived social responsibility positively affects ESG-based customer trust.

H1c: Perceived governance transparency positively affects ESG-based customer trust.

H2a: Perceived environmental responsibility positively affects corporate reputation.

H2b: Perceived social responsibility positively affects corporate reputation.

H2c: Perceived governance transparency positively affects corporate reputation.

2.4. Trust, Reputation, Perceived Value, and Customer Behavioral Intentions

Perceived customer value is the customer's overall assessment of benefits received relative to sacrifices made (Zeithaml, 1988). In a green or responsible consumption context, perceived value can include functional performance, financial value, emotional value, social value, and sustainability-related value (Sweeney & Soutar, 2001; Koller et al., 2011). In technical industries, ESG-related trust and reputation may increase perceived value because customers see the firm as safer, more reliable, more compliant, and more aligned with long-term operating needs.

Customer behavioral intentions refer to future-oriented responses such as repurchase intention, loyalty, recommendation, positive word of mouth, supplier preference, and willingness to pay for responsible solutions. Prior marketing literature has consistently linked perceived value, trust, and reputation to behavioral outcomes (Oliver, 1999; Chaudhuri & Holbrook, 2001; Walsh & Beatty, 2007). This study expects perceived value to be the strongest immediate predictor of behavioral intentions because technical customers ultimately require ESG to be translated into tangible reliability, efficiency, risk reduction, and service quality.

H3: ESG-based customer trust positively affects perceived customer value.

H4: Corporate reputation positively affects perceived customer value.

H5: ESG-based customer trust positively affects customer behavioral intentions.

H6: Corporate reputation positively affects customer behavioral intentions.

H7: Perceived customer value positively affects customer behavioral intentions.

H8: ESG-based customer trust, corporate reputation, and perceived customer value mediate the relationships between perceived ESG dimensions and customer behavioral intentions.

2.5. Conceptual Model

Figure 1 presents the proposed SEM framework. The three ESG dimensions are modeled as exogenous latent constructs. ESG-based trust and corporate reputation act as relational mechanisms, perceived customer value acts as a value mechanism, and customer behavioral intentions represent the final outcome. Direct ESG-to-behavior paths are included as controls in the estimation to evaluate whether the mediation is partial or dominant; they are omitted from the figure for clarity.

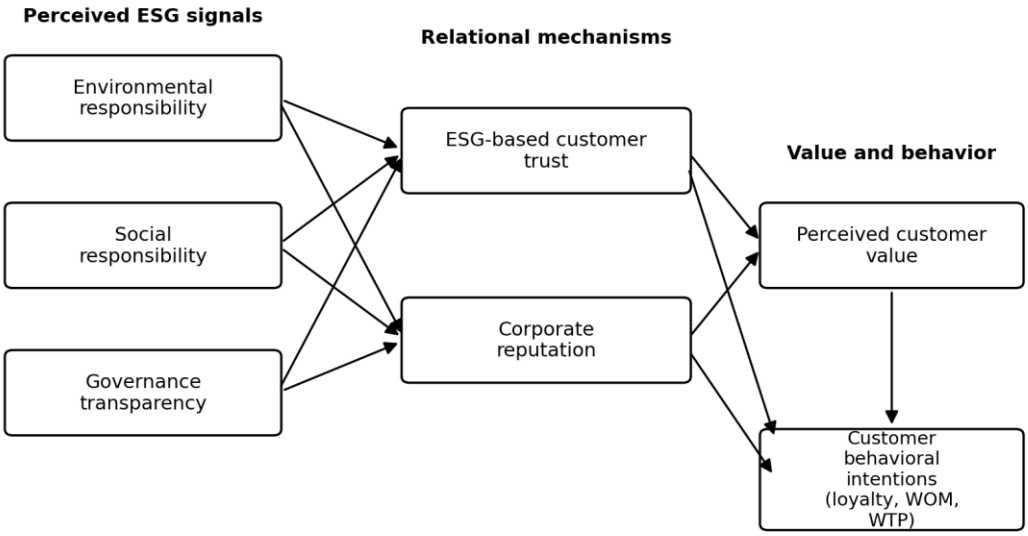

Figure 1. Proposed structural equation model

3. RESEARCH METHODOLOGY

3.1 Research Design and Population

The recommended empirical design is a cross-sectional survey of customers who have purchased, evaluated, specified, or used products/services from Vietnamese engineering-intensive enterprises during the previous 24 months. Eligible respondents may include individual customers of technical products, B2B procurement staff, engineers, project managers, facility managers, distributors, and after-sales service users. The industry scope includes electronics and electrical devices, industrial machinery and equipment, construction materials and engineering services, renewable-energy technologies, automation, and ICT hardware.

A seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree is recommended. The questionnaire should be translated using back-translation if administered in Vietnamese. Screening questions should confirm that respondents know the focal company and have enough experience to evaluate its ESG behavior and technical offerings. To reduce single-source bias, the survey should separate predictor and outcome sections, vary scale wording where appropriate, and assure respondents that there are no right or wrong answers.

3.2. Measurement

All constructs are modeled reflectively. Items are adapted from established CSR, ESG, trust, reputation, perceived value, and loyalty scales and contextualized for technical industries. Table 1 summarizes the constructs and indicative measurement sources. Appendix A provides the proposed questionnaire items.

Table 1. Constructs and indicative measurement sources

Construct	Abbrev.	Definition in this study	No. of items	Indicative sources
Environmental responsibility	ENV	Customer perception that the enterprise minimizes environmental harm and offers resource-efficient technical solutions.	4	Koh et al. (2022); Bae et al. (2023); Li & Chen (2025)
Social responsibility	SOC	Customer perception that the enterprise protects employees, customers, suppliers, and communities.	4	Carroll (1991); Lai et al. (2010); Koh et al. (2022)
Governance transparency	GOV	Customer perception that the enterprise is ethical, transparent, compliant, and accountable.	4	Gillan et al. (2021); Koh et al. (2022); Cheng & Huang (2024)
ESG-based customer trust	TRU	Customer confidence that the enterprise is reliable, competent, and sincere in ESG-related commitments.	4	Morgan & Hunt (1994); Chaudhuri & Holbrook (2001); Chen (2010)
Corporate reputation	REP	Overall customer evaluation of the enterprise's credibility, responsibility, and market standing.	4	Walsh & Beatty (2007); Lai et al. (2010)
Perceived customer value	VAL	Customer assessment that ESG-responsible technical offerings provide functional, financial, relational, and sustainability-related benefits.	4	Zeithaml (1988); Sweeney & Soutar (2001); Koller et al. (2011)
Customer behavioral intentions	CBI	Customer intention to repurchase, continue the relationship, recommend, advocate, and pay a responsible premium.	5	Oliver (1999); Chaudhuri & Holbrook (2001); Bobâlcă et al. (2012)

3.3. Data Analysis Procedure

Partial least squares structural equation modeling (PLS-SEM) is appropriate because the study is prediction-oriented, includes multiple mediators, and aims to compare the relative contribution of ESG dimensions in an emerging empirical context. The analysis should follow a two-step logic: first, evaluate the measurement model; second, evaluate the structural model. Measurement quality should be assessed through indicator loadings, Cronbach's alpha, composite reliability, average variance extracted (AVE), and discriminant validity using the heterotrait-monotrait ratio (HTMT). Structural quality should be assessed through collinearity diagnostics, path coefficients, bootstrapped confidence intervals, R-squared, f-squared effect sizes, predictive relevance, and mediation effects.

For actual fieldwork, a minimum sample above 400 is recommended to support multi-group comparisons between B2B and B2C respondents and to provide stable bootstrapping estimates. The simulated demonstration in this manuscript uses a projected sample of 512 respondents and 5,000 bootstrap resamples.

3.4. Simulated/Projected Results Disclosure

Because no real survey data have been collected for this draft, the numerical findings in the next section are simulated and should be interpreted only as reasonable expectations for model development, questionnaire refinement, and doctoral application preparation. They are not

empirical evidence. Before journal submission, the author must collect actual data, rerun the SEM analysis, and replace every simulated statistic.

4. SIMULATED RESULTS

4.1. Projected Sample Profile

Table 2 describes a plausible sample structure for a national survey in Vietnam's engineering-intensive industries. The distribution intentionally balances B2B and B2C respondents while emphasizing major industrial centers. These values are included to illustrate reporting style and should be replaced after fieldwork.

Table 2. Projected sample profile (n = 512; simulated)

Profile variable	Category	n	%
Customer type	B2B/professional buyer or technical evaluator	231	45.1
Customer type	B2C/end user or household/business user	281	54.9
Industry segment	Electronics and electrical devices	158	30.9
Industry segment	Industrial machinery and equipment	116	22.7
Industry segment	Construction materials and engineering services	94	18.4
Industry segment	Renewable-energy and energy-efficiency technologies	72	14.1
Industry segment	Automation and ICT hardware	72	14.1
Region	Ho Chi Minh City and nearby industrial provinces	201	39.3
Region	Hanoi and northern industrial provinces	173	33.8
Region	Central Vietnam and other provinces	138	27.0
Gender	Male	286	55.9
Gender	Female	226	44.1
Age	18-29	134	26.2
Age	30-44	246	48.0
Age	45 and above	132	25.8

4.2. Measurement Model

The simulated measurement model indicates acceptable reliability and convergent validity. All standardized loadings are above the recommended .70 threshold, composite reliability values exceed .80, and AVE values exceed .50. These outcomes suggest that the proposed item pool is likely to be suitable for field testing, although actual reliability and validity must be established with real responses.

Table 3. Measurement model quality criteria (simulated)

Construct	Items	Loading range	Cronbach's alpha	rho_A	Composite reliability	AVE
ENV	4	.76-.88	.86	.87	.90	.69
SOC	4	.74-.86	.84	.85	.89	.66
GOV	4	.78-.90	.88	.89	.92	.73
TRU	4	.80-.91	.89	.90	.93	.76
REP	4	.77-.89	.87	.88	.91	.71
VAL	4	.75-.88	.85	.86	.90	.68
CBI	5	.73-.89	.90	.91	.93	.72

Discriminant validity is evaluated with HTMT. Table 4 reports projected HTMT values below .85, supporting discriminant validity among constructs. As a conservative rule, the upper bound of bootstrapped HTMT confidence intervals should also remain below .90 in the actual study.

Table 4. HTMT discriminant validity matrix (simulated)

Construct	ENV	SOC	GOV	TRU	REP	VAL	CBI
ENV	-						
SOC	.64	-					
GOV	.58	.66	-				
TRU	.70	.68	.72	-			
REP	.61	.72	.75	.74	-		
VAL	.57	.63	.66	.76	.73	-	
CBI	.54	.61	.60	.71	.69	.78	-

4.3. Structural Model

Collinearity diagnostics are acceptable in the simulated model, with all inner VIF values below 3.30. The model explains 58% of the variance in ESG-based customer trust, 55% of the variance in corporate reputation, 59% of the variance in perceived customer value, and 69% of the variance in customer behavioral intentions. The standardized root mean square residual (SRMR = .057) indicates acceptable approximate fit for a PLS-SEM model.

Table 5. Structural path estimates (simulated; bootstrapping = 5,000)

Hypothesis/path	Std. beta	t-value	p-value	95% CI	f-squared	Decision
H1a: ENV -> TRU	.29	6.21	<.001	.20, .38	.09	Supported
H1b: SOC -> TRU	.24	5.18	<.001	.15, .33	.06	Supported
H1c: GOV -> TRU	.33	7.02	<.001	.24, .42	.12	Supported
H2a: ENV -> REP	.17	3.49	.001	.07, .27	.03	Supported
H2b: SOC -> REP	.30	6.44	<.001	.21, .39	.10	Supported
H2c: GOV -> REP	.36	7.88	<.001	.27, .45	.14	Supported
H3: TRU -> VAL	.42	9.76	<.001	.34, .50	.22	Supported
H4: REP -> VAL	.38	8.41	<.001	.29, .47	.18	Supported
H5: TRU -> CBI	.25	5.62	<.001	.16, .34	.08	Supported
H6: REP -> CBI	.20	4.17	<.001	.11, .30	.05	Supported
H7: VAL -> CBI	.44	10.33	<.001	.36, .52	.27	Supported
Control: ENV -> CBI	.05	1.36	.174	-.02, .12	.01	Not significant
Control: SOC -> CBI	.08	2.06	.040	.01, .15	.02	Weak direct effect
Control: GOV -> CBI	.04	1.12	.263	-.03, .11	.01	Not significant

4.4. Mediation Analysis

The simulated mediation analysis supports H8. ESG dimensions influence customer behavioral intentions primarily through trust, reputation, and perceived value. The strongest total indirect effect is associated with governance transparency, followed by social responsibility and environmental responsibility. This pattern is theoretically reasonable for technical industries because governance affects expectations about contract fulfillment, warranty reliability, compliance documentation, and ethical risk.

Table 6. Selected indirect effects (simulated)

Indirect effect	Std. beta	t-value	95% CI	Interpretation
ENV -> TRU -> CBI	.073	4.52	.045, .108	Significant
SOC -> TRU -> CBI	.060	3.98	.034, .093	Significant
GOV -> TRU -> CBI	.083	5.11	.053, .119	Significant
ENV -> REP -> CBI	.034	2.58	.012, .062	Significant

Indirect effect	Std. beta	t-value	95% CI	Interpretation
SOC -> REP -> CBI	.060	4.07	.033, .095	Significant
GOV -> REP -> CBI	.072	4.85	.043, .109	Significant
ENV -> TRU -> VAL -> CBI	.054	4.19	.031, .082	Significant
GOV -> REP -> VAL -> CBI	.060	4.63	.036, .090	Significant

4.5. Robustness and Common Method Bias Checks

In the actual study, common method bias should be examined using procedural and statistical remedies. Procedural remedies include anonymity, psychological separation of independent and dependent variables, and clear item wording. Statistical diagnostics may include full collinearity VIF, a marker variable, Harman's single-factor diagnostic, and comparison with an unmeasured latent method factor. In the simulated demonstration, full collinearity VIF values range from 1.42 to 2.87, below the conservative 3.30 guideline, suggesting that common method bias is unlikely to fully account for the pattern of relationships. This statement must be validated with real data.

5. DISCUSSION

The simulated results illustrate four insights that can guide the actual study. First, governance transparency is expected to be a particularly important ESG dimension in technical industries. Customers of engineering-related products and services frequently depend on warranties, compliance documents, maintenance commitments, and technical assurances that cannot be fully verified at the moment of purchase. Transparent governance therefore reduces uncertainty and strengthens both trust and reputation.

Second, social responsibility is expected to matter through reputation and a modest direct behavioral effect. In Vietnam's technical sectors, customers may interpret responsible labor practices, occupational safety, customer care, and community commitments as signs of stable operations and ethical management. This is consistent with CSR and ESG literature showing that social responsibility can generate favorable customer responses when customers perceive the firm as sincere and stakeholder-oriented.

Third, environmental responsibility is likely to influence behavior through trust and value rather than a strong direct path. This pattern is plausible because technical customers may not purchase solely because a firm claims to be green. Instead, environmental responsibility must translate into energy efficiency, resource savings, regulatory compliance, lower lifecycle costs, or reduced operating risk. Environmental initiatives become behaviorally powerful when they are linked to concrete customer value.

Fourth, perceived customer value is expected to be the strongest immediate driver of behavioral intentions. ESG communication alone is unlikely to secure loyalty unless customers understand how it improves product performance, service reliability, compliance confidence, lifecycle cost, or social legitimacy. For technical enterprises, ESG strategy should therefore be integrated with quality management, after-sales service, product innovation, and transparent documentation.

6. THEORETICAL CONTRIBUTIONS

This study extends customer-oriented ESG research in three ways. First, it shifts the context from general consumer products and services to engineering-intensive industries, where ESG is linked to technical reliability and procurement risk. Second, it separates environmental, social, and governance perceptions, allowing the model to identify which ESG pillar most strongly affects trust and reputation. Third, it integrates relational mechanisms (trust and reputation) with a value mechanism (perceived customer value), thereby explaining why ESG signals do not automatically become behavioral intentions.

The model also contributes to the application of S-O-R logic in responsible consumption. Perceived ESG dimensions act as stimuli, customer trust and reputation are relational organismic states, perceived value is a cognitive value state, and behavioral intentions are the final response. This integrated mechanism may be useful for future studies in industrial marketing, sustainable supply

chains, green innovation, and technical service management.

7. MANAGERIAL AND POLICY IMPLICATIONS

For Vietnamese engineering-intensive enterprises, ESG should be treated as a market-facing capability rather than only a compliance or investor-reporting exercise. Environmental initiatives should be linked to measurable customer benefits such as energy savings, material efficiency, product durability, recyclability, and lifecycle cost reduction. Technical product sheets, warranty documents, and after-sales reports should communicate these benefits in verifiable language.

Social responsibility should focus on safety, workforce training, responsible supplier management, customer rights, and community impact. Customers in technical markets often care about operational continuity; therefore, responsible labor and supplier practices can be framed as indicators of stable production and reliable service delivery. Enterprises should avoid vague claims and instead provide evidence such as safety certifications, training hours, complaint-resolution metrics, or supplier codes of conduct.

Governance transparency is especially important. Enterprises should strengthen anti-corruption systems, contract transparency, warranty fulfillment, quality-control documentation, data protection, and ESG reporting. For B2B customers, governance information can be integrated into bid documents, supplier portals, and compliance dossiers. For B2C customers, governance can be communicated through transparent warranty policies, product-origin information, and accessible service commitments.

For policy makers and industry associations, the findings imply that ESG guidance should not only target financial markets. Sector-specific ESG disclosure templates for technical industries could help customers compare suppliers and reduce greenwashing. Training programs for SMEs should emphasize how to translate ESG practices into customer value, not merely how to produce sustainability reports.

8. LIMITATIONS AND FUTURE RESEARCH

The primary limitation of this draft is that the reported findings are simulated. They are intended to demonstrate a coherent SEM model and plausible reporting style, not to substitute for empirical data. Future research must collect survey responses from qualified customers, clean the data, validate the measurement model, and report the actual estimates transparently.

Second, the proposed cross-sectional design cannot establish strong causal inference. Future studies may use longitudinal data, experiments, or matched customer-enterprise records to examine how ESG improvements change customer behavior over time. Third, the industry scope is broad. Multi-group analysis should compare B2B versus B2C respondents and examine differences across electronics, machinery, construction materials, renewable-energy technologies, and automation. Fourth, future research should integrate objective indicators such as actual repeat purchases, complaint records, service renewal, or supplier-selection outcomes.

9. CONCLUSION

This paper develops a structural equation model explaining how perceived ESG performance can affect customer behavioral intentions in Vietnam's engineering-intensive industries. The proposed model suggests that ESG affects customers mainly by building trust, strengthening reputation, and increasing perceived value. Governance transparency and social responsibility are expected to be particularly influential in technical markets, while environmental responsibility becomes behaviorally powerful when customers can see practical benefits such as efficiency, compliance, and lower lifecycle risk. The model offers a feasible foundation for doctoral-level empirical research, but the simulated results must be replaced with real survey evidence before journal submission.

10. DECLARATIONS

Funding: No external funding is assumed for this draft.

Conflicts of interest: The author should declare any actual conflicts before submission.

Ethics statement: Actual fieldwork should obtain informed consent, protect respondent anonymity, and follow the author's university ethics requirements.

Data availability: The current numerical results are simulated for model-development purposes. Actual survey data and analysis scripts should be

archived or made available according to the target journal's policy.

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