International Journal of Multidisciplinary Sciences and Arts
E-ISSN :2962-1658
Volume 5, **Number** 4, October 2026
https://doi.org/10.47709/ijmdsa.v5i4.9706

The Effect of Consumer Satisfaction on MSME Performance: The Moderating Role of Digital Marketing

Wahyu Haryadi[1*], **Kamaruddin**[2]
[1]Doctoral Program in Management Science, Universitas Dr. Soetomo, Surabaya, Indonesia
[2]Faculty of Economics and Business, Universitas Samawa, Sumbawa, Indonesia
[1]* wahyu@samawa-university.ac.id

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***Corresponding Author**

Article History:
Submitted: 28-09-2026
Accepted: 10-10-2026
Published: 12-10-2026

Keywords:
digital marketing; consumer satisfaction; green innovation; MSME performance; moderation; PLS-SEM.

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ABSTRACT

Micro, small, and medium enterprises (MSMEs) increasingly face demands to improve environmental performance while sustaining customer value and business outcomes. This study examines whether digital marketing moderates the relationship between consumer satisfaction and MSME performance, within a model in which green innovation acts as the antecedent of both satisfaction and performance. A quantitative explanatory cross-sectional design was applied to food and beverage MSMEs in Sumbawa Regency, Indonesia. Data from 100 respondents were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The measurement model met convergent validity, discriminant validity, and reliability requirements: outer loadings ranged from 0.797 to 0.926, average variance extracted ranged from 0.720 to 0.779, and composite reliability ranged from 0.911 to 0.934. The structural model explained 27.6% of the variance in consumer satisfaction and 58.3% of the variance in MSME performance. Digital marketing significantly strengthened the satisfaction–performance relationship ($\beta = 0.241$, $p < 0.001$), and it also had a positive direct effect on performance ($\beta = 0.419$, $p < 0.001$). Green innovation was positively associated with consumer satisfaction ($\beta = 0.525$, $p < 0.001$) and MSME performance ($\beta = 0.325$, $p < 0.001$), and consumer satisfaction was positively associated with performance ($\beta = 0.282$, $p = 0.002$). Consumer satisfaction partially mediated the green innovation–performance relationship ($\beta = 0.148$, $p = 0.007$). These findings position digital marketing as a capability that amplifies the performance returns of consumer satisfaction generated by green innovation in MSMEs.

INTRODUCTION

Micro, small, and medium enterprises (MSMEs) are important to inclusive economic development because they support employment, entrepreneurship, and local livelihoods. Their role is particularly visible in developing regions such as Sumbawa Regency, Indonesia, where food and beverage businesses connect local resources, community livelihoods, and cultural identity. Nevertheless, growth in the number of enterprises does not automatically translate into stronger productivity, competitiveness, or resilience.

Current market shifts create two simultaneous pressures. First, consumers increasingly consider environmental consequences, ethical production, quality, and social responsibility when evaluating products (Haris Fadzilah et al., 2025). Second, digital channels have changed how small firms communicate, transact, and maintain customer relationships (Mehralian & Khazaee, 2022); (Mulyanto & Budi, 2025). MSMEs therefore need capabilities that improve products and processes while also translating those improvements into value recognized by consumers. Green innovation can reduce waste, improve resource efficiency, strengthen environmental legitimacy, and differentiate an enterprise;(Khan, S. J., Dhir, A., Parida, V., & Papa, 2023); (Appiah & Essuman, 2024a); (Maziriri, 2022). Digital marketing can extend market reach, accelerate feedback, and improve the conversion of customer satisfaction into repeat purchase and business growth.

The resource-based view explains green innovation and digital capability as strategic resources that can produce superior performance when they are valuable and difficult to substitute (Barney, J. B., Ketchen, D. J., & Wright, 2021); (Sari, N., & Ahmad, 2023). These capabilities may improve market outcomes by addressing consumer expectations and strengthening the value perceived in the firm's products and services. However, the strength of the satisfaction–performance relationship may depend on the firm's capacity to communicate and engage through digital channels. This study consequently tests a moderated model in which green innovation drives consumer satisfaction and MSME performance, while digital marketing conditions how effectively satisfaction is converted into performance in Sumbawa food and beverage enterprises. The study primarily asks whether digital marketing moderates, and specifically strengthens, the relationship between consumer satisfaction and MSME performance. It also asks whether green innovation raises satisfaction and performance, and whether satisfaction mediates the green innovation effect.

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LITERATURE REVIEW

Green Innovation and MSME Performance

Green innovation refers to product and process improvements intended to reduce environmental harm through safer raw materials, lower energy consumption, cleaner production, recyclable packaging, and better waste management. From a resource-based perspective, these practices become distinctive capabilities when they simultaneously lower costs, improve product value, and strengthen market legitimacy. Prior studies report that green product and process innovation improves sustainable competitive advantage and business outcomes (Appiah & Essuman, 2024b); (Nuryakin, 2022); (Rachman et al., 2025). Accordingly, green innovation is expected to influence performance both directly and through the consumer's evaluation of the offer.

Consumer Satisfaction as a Mediating Mechanism

Consumer satisfaction is the post-consumption evaluation arising from the comparison between expected and perceived product performance (Gonu, E., Agyei, P. M., Richard, O. K., & Asare-Larbi, 2023); (González-Viralta, D., 2023). Green attributes create value only when consumers perceive the resulting quality, safety, convenience, or environmental benefit. Satisfaction encourages loyalty, repeat purchase, and positive recommendations, thereby connecting operational innovation with market and financial performance. Evidence of the satisfaction–profitability relationship supports this mechanism (Damberg, S., Schwaiger, M., & Ringle, 2022); (Kristina, N., Gunawan, E. T., & Memarista, 2023). Recent evidence likewise identifies satisfaction as an important mechanism connecting customer value with MSME performance (Nona et al., 2021).

Digital Marketing as a Direct and Moderating Capability

Digital marketing uses websites, social media, email, search advertising, and interactive channels to reach and engage customers. It gives MSMEs broad, measurable access to markets at relatively low cost and enables rapid communication of product value. The dynamic capabilities perspective emphasizes the integration and reconfiguration of capabilities in changing environments (Pitelis, C. N., Teece, D. J., & Yang, 2024); (Shiferaw, A., & Amentie Kero, 2024). Applied to the present model, digital marketing may directly improve performance and may amplify the returns from consumer satisfaction by converting positive experiences into engagement, repeat transactions, and electronic word of mouth (Mehralian & Khazaee, 2022);(Mulyanto & Budi, 2025).

Hypotheses and Model Specification

H1: Green innovation positively affects consumer satisfaction.
H2: Green innovation positively affects MSME performance.
H3: Consumer satisfaction positively affects MSME performance.
H4: Digital marketing positively affects MSME performance.
H5: Consumer satisfaction mediates the relationship between green innovation and MSME performance.
H6: Digital marketing positively moderates the relationship between consumer satisfaction and MSME performance.

H5 represents the indirect green innovation–satisfaction–performance pathway, whereas H6 is tested through the consumer satisfaction × digital marketing interaction term predicting performance. The structural relationships are specified in this text, and the reflective measurement specification is presented in Table 1.

METHOD

The study used a quantitative explanatory cross-sectional survey. The unit of analysis was the owner or principal manager of a food and beverage MSME in Sumbawa Regency, West Nusa Tenggara, Indonesia. Respondents were selected purposively based on business experience, operational involvement, repeat customers, awareness of environmentally responsible practices, and use of at least one digital channel. The empirical model was estimated from 100 complete responses. A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used.

Table 1. Constructs and measurement specification

Construct	Indicators	Items	Mode
Green Innovation (X)	Green materials; cleaner production; energy efficiency; recyclable packaging	X1–X4	Reflective
Digital Marketing (M)	Website; social networks; email; search advertising; interactive media	M.1–M.5	Reflective
Consumer Satisfaction (Z)	Expectation fit; product quality; service; repurchase intention	Z1–Z4	Reflective
MSME Performance (Y)	Financial; marketing; business growth; sustainability	Y1–Y4	Reflective
Interaction (Z × M)	Product indicator	KK × PD	Single indicator

Source: Research instrument and SmartPLS specification, processed (2026).

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Table 1 operationalizes the four reflective constructs with 17 indicators and models the interaction between consumer satisfaction and digital marketing as a product indicator. Green innovation is measured by X1–X4, digital marketing by M.1–M.5, consumer satisfaction by Z1–Z4, and MSME performance by Y1–Y4. The reflective specification treats the observed indicators as manifestations of their respective latent constructs. The separate interaction term (Z × M; KK × PD in the software output) tests whether digital marketing changes the strength of the satisfaction–performance relationship; it is not an additional substantive construct. This specification ensures that the measurement items correspond directly to the structural relationships tested in the study.

PLS-SEM analysis was conducted in SmartPLS 3 using the path-weighting scheme. Measurement assessment covered outer loadings, average variance extracted (AVE), Cronbach's alpha, composite reliability, Fornell–Larcker criteria, crossloadings, and the heterotrait–monotrait ratio (HTMT), following established measurement-model guidance (Hair et al., 2022). Structural assessment focused on collinearity, path coefficients, R^2, indirect effects, and interaction effects. The R^2-derived descriptive index reported in the source analysis was distinguished from a blindfolding-based predictive assessment. Significance was evaluated through bootstrapping with 500 subsamples, a two-tailed 5% level, and 95% bias-corrected and accelerated confidence intervals.

RESULTS

Measurement Model

All indicators met the recommended loading threshold. Standardized outer loadings ranged from 0.797 to 0.926, and all were significant at $p < 0.001$. AVE values exceeded 0.50, while Cronbach's alpha and composite reliability exceeded 0.70. The Fornell–Larcker criterion was satisfied, and the highest HTMT value was 0.619, below the conservative threshold of 0.85.

The constructs therefore demonstrated convergent validity, discriminant validity, and internal consistency according to the reported assessment criteria.

Table 2. Measurement model quality

Construct	Alpha	Composite reliability	AVE	Loading range
Green Innovation	0.869	0.911	0.720	0.797–0.926
Digital Marketing	0.911	0.934	0.738	0.817–0.885
Consumer Satisfaction	0.906	0.934	0.779	0.819–0.916
MSME Performance	0.886	0.922	0.746	0.823–0.886

Source: SmartPLS 3 output, processed (2026).

Structural Model

The inner VIF values ranged from 1.000 to 1.411, indicating no critical collinearity. Green innovation explained 27.6% of consumer satisfaction ($R^2 = 0.276$). Green innovation, digital marketing, consumer satisfaction, and the interaction term jointly explained 58.3% of MSME performance ($R^2 = 0.583$). The source analysis additionally reports an R^2-derived index of 0.698, calculated as $1 - (1 - 0.276)(1 - 0.583)$. This value is an algebraic summary of the reported R^2 values, not a blindfolding-based Stone–Geisser Q^2 statistic, and does not independently establish predictive relevance or out-of-sample predictive performance (Hair et al., 2022).

Table 3. Explanatory power and R^2-derived descriptive index

Endogenous construct	R^2	Adjusted R^2	Interpretation
Consumer Satisfaction	0.276	0.268	Weak
MSME Performance	0.583	0.566	Moderate
R^2-derived overall index	0.698	—	Descriptive; not predictive validation

Source: SmartPLS 3 output, processed (2026).

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https://doi.org/10.47709/ijmdsa.v5i4.9706

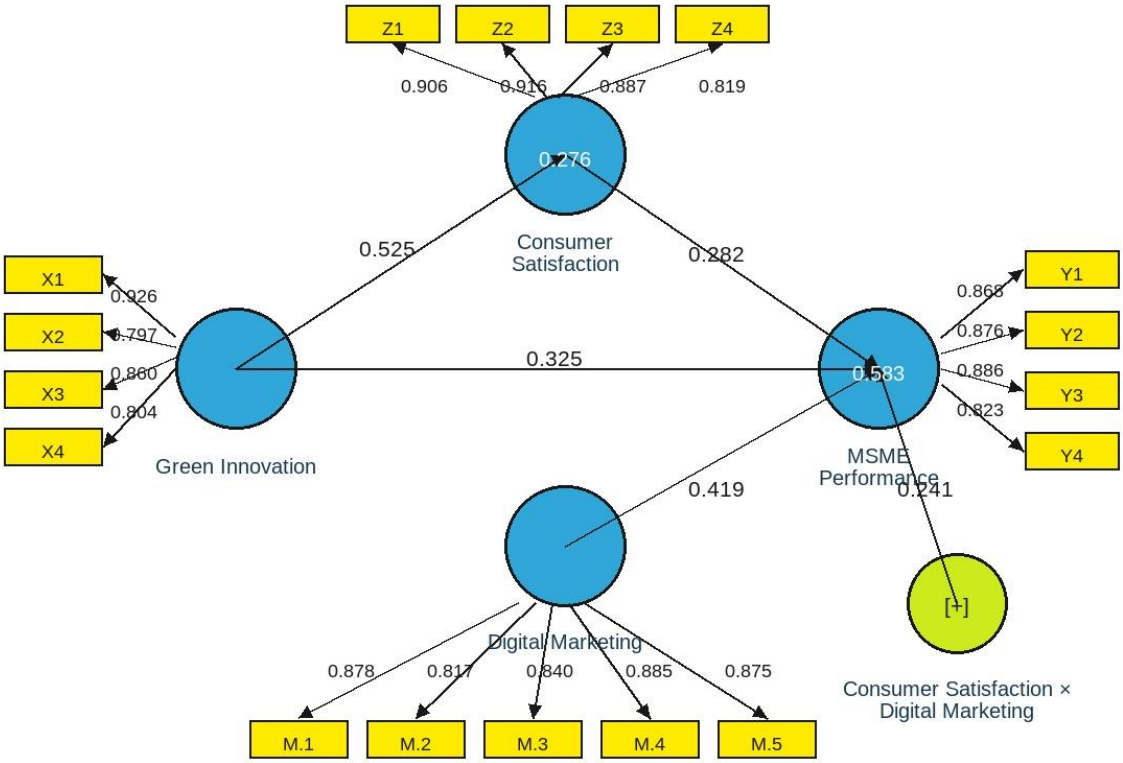


Figure 1. PLS algorithm results: outer loadings, path coefficients, and R^2

Figure 1 summarizes the estimated model. The arrows between constructs indicate standardized path coefficients, the indicator values represent outer loadings, and the values within the endogenous constructs represent R^2. Green innovation predicts consumer satisfaction (β = 0.525) and MSME performance (β = 0.325); consumer satisfaction (β = 0.282) and digital marketing (β = 0.419) also predict performance. The positive interaction coefficient (β = 0.241) indicates that the association between satisfaction and performance becomes stronger as digital marketing increases. The model explains 27.6% of satisfaction and 58.3% of performance. The figure presents PLS algorithm estimates, whereas statistical significance and the indirect effect are reported from bootstrapping in Table 4.

Table 4. Direct, indirect, and moderating effects

Hypothesis / path	β	t	p-value	Decision
H1: Green Innovation → Consumer Satisfaction	0.525	6.306	<0.001	Supported
H2: Green Innovation → MSME Performance	0.325	4.237	<0.001	Supported
H3: Consumer Satisfaction → MSME Performance	0.282	3.076	0.002	Supported
H4: Digital Marketing → MSME Performance	0.419	6.886	<0.001	Supported
H5: Green Innovation → Satisfaction → Performance	0.148	2.700	0.007	Supported; partial mediation
H6: Satisfaction × Digital Marketing → Performance	0.241	4.055	<0.001	Supported; strengthening

Source: SmartPLS 3 bootstrapping, 500 subsamples, processed (2026).

Table 4 confirms support for all six hypotheses. The four direct effects are positive and significant, consumer satisfaction partially mediates the green innovation–performance relationship (β = 0.148, p = 0.007), and digital marketing significantly strengthens the satisfaction–performance relationship (β = 0.241, p < 0.001).

DISCUSSION

Green innovation was positively associated with consumer satisfaction (β = 0.525). Environmentally safer inputs, cleaner processes, energy efficiency, recyclable packaging, and waste management can improve the perceived responsibility and quality of a food or beverage business. This supports the resource-based view: environmental routines create value when they are integrated into products and operations rather than treated merely as compliance. The finding is consistent with evidence that green innovation enhances competitiveness and sustainable performance (Appiah & Essuman, 2024b); (Nuryakin, 2022).

Green innovation also directly improved MSME performance (β = 0.325). The sum of the reported direct coefficient and indirect coefficient was 0.473. In a model containing moderation, this sum is a descriptive summary of

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E-ISSN :2962-1658
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those coefficients rather than evidence that the mediated effect is constant across all levels of digital marketing. This indicates that green practices can create both operational and market returns. The mediation result was significant (β = 0.148; p = 0.007), with a variance accounted for of 31.2%. Because the direct and indirect effects were both significant and moved in the same direction, consumer satisfaction represented complementary partial mediation. MSMEs therefore obtain stronger performance when environmentally responsible improvements are recognized and valued by consumers.

Digital marketing had the largest direct effect on MSME performance among the immediate predictors (β = 0.419). It also strengthened the consumer satisfaction–performance link (β = 0.241). The significant positive interaction is consistent with a stronger satisfaction–performance association at higher levels of digital marketing. No simple-slope values or conditional-effect confidence intervals are reported here, so the interaction should not be interpreted as evidence of significance at every possible moderator level. Digital channels facilitate continued communication, reviews, recommendations, repeat purchasing, and broader market access. Thus, satisfaction is not automatically converted into growth; firms also require channels that retain and mobilize satisfied customers.

The model explained a moderate proportion of MSME performance but only a weak proportion of consumer satisfaction. This suggests that satisfaction is also influenced by omitted factors such as price fairness, service speed, taste consistency, convenience, brand trust, and store accessibility. The findings nevertheless offer a coherent capability pathway: green innovation creates valued improvements, satisfaction confirms their acceptance, and digital marketing scales the resulting relationship into improved performance.

CONCLUSION

This study concludes that green innovation positively improves both consumer satisfaction and MSME performance among food and beverage enterprises in Sumbawa Regency. Consumer satisfaction is a significant complementary mediator, while digital marketing contributes directly to performance and positively moderates the effect of satisfaction on performance. All six hypotheses are supported. Practically, MSME owners should integrate environmental improvements with customer-oriented communication: adopt safer inputs and cleaner processes, improve energy and waste efficiency, communicate these changes consistently, and use interactive digital channels to encourage repeat purchase and advocacy. Public support programs should combine environmental upgrading with digital capability development rather than treating them as separate interventions.

The cross-sectional design limits causal inference, the sample is restricted to one regency and one sector, and the model omits several determinants of satisfaction. Future research should use longitudinal or multi-region designs, larger samples, and additional constructs such as price fairness, service quality, brand trust, local wisdom, and transformational leadership. Future studies may also compare product-indicator and two-stage moderation procedures and use out-of-sample predictive assessment.

ACKNOWLEDGMENT

The authors thank the participating MSME owners and managers in Sumbawa Regency for their contribution to the survey.

REFERENCES

Appiah, L. O., & Essuman, D. (2024a). Bagaimana perusahaan mengembangkan dan mendapatkan manfaat finansial dari inovasi produk hijau di negara berkembang? *Business Strategy and the Environment*, *33*(7), 7241–7252.

Appiah, L. O., & Essuman, D. (2024b). How do firms develop and financially benefit from green product innovation in a developing country? Roles of innovation orientation and green marketing innovation. *Business Strategy and the Environment*, *33*(7), 7241–7252. https://doi.org/10.1002/bse.3864

Barney, J. B., Ketchen, D. J., & Wright, M. (2021). Resource-based theory and the value creation framework. *Journal of Management*, *47*(7), 1936–1955.

Damberg, S., Schwaiger, M., & Ringle, C. M. (2022). What's important for relationship management? The mediating roles of relational trust and satisfaction for loyalty of cooperative banks' customers. *Journal of Marketing Analytics*, *10*(1), 3–18.

Gonu, E., Agyei, P. M., Richard, O. K., & Asare-Larbi, M. (2023). Customer orientation, service quality and customer satisfaction interplay in the banking sector: An emerging market perspective. *Cogent Business & Management*, *10*(1), 2163797.

González-Viralta, D., et al. (2023). Positive effects of green practices on consumers' satisfaction, loyalty, word-of-mouth. *Heliyon*, *9*(10), e20353.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). SAGE Publications.

Haris Fadzilah, A. H., Ahmed, A., Ramdzan Ali, A. A. E., Hassan, M. M., & Ramli, M. S. (2025). Driving sustainable consumption: The role of green innovation, creativity and media in shaping consumers' purchase intentions in Malaysia. *Discover Sustainability*, *6*, 1334. https://doi.org/10.1007/s43621-025-02061-4

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E-ISSN :2962-1658
Volume 5, **Number** 4, October 2026
https://doi.org/10.47709/ijmdsa.v5i4.9706

Khan, S. J., Dhir, A., Parida, V., & Papa, A. (2023). Past, present, and future of green product innovation. *Business Strategy and the Environment*, *32*(7), 4081–4106.

Kristina, N., Gunawan, E. T., & Memarista, G. (2023). E-commerce implementation towards SME's achievement: The role of customer satisfaction. *Journal of Management and Business, 15*(2), 112–125.

Maziriri, E. T. (2022). Green innovation in SMEs: The impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal*, *28*(3), 1–14.

Mehralian, M. M., & Khazaee, P. (2022). Effect of digital marketing on the business performance of MSMEs during the COVID-19 pandemic: The mediating role of customer relationship management. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4195985

Mulyanto, D., & Budi, A. P. (2025). Penerapan pemasaran digital dan kinerja UMKM: Dukungan faktor lingkungan internal dan eksternal. *Jurnal Bisnis Dan Kewirausahaan*, *14*(2), 301–313. https://doi.org/10.37476/jbk.v14i2.5173

Nona, R., Suharno, Mintarti, S., & Kuleh, Y. (2021). The factors affecting customer satisfaction, competitive advantage, and performance in MSMEs in the craft industry sector from East Kalimantan Province. *Social Development and Security*, *11*(1), 117–130. https://doi.org/10.33445/sds.2021.11.1.13

Nuryakin, N. (2022). Green product innovation, green process innovation, and its impact on green performance of batik SMEs. *Benefit: Jurnal Manajemen Dan Bisnis*, *7*(1), 1–8. https://doi.org/10.23917/benefit.v7i1.18132

Pitelis, C. N., Teece, D. J., & Yang, H. (2024). Dynamic capabilities and MNE global strategy: A systematic literature review-based novel conceptual framework. *Journal of Management Studies*, *61*(8), 3295–3326.

Rachman, A. B., Efani, A., & Atikawati, D. (2025). The impact of green innovation on corporate sustainability performance: A case study of MSMEs in Malang City, Indonesia. *Jurnal Penelitian Pendidikan IPA*, *11*(12), 620–630. https://doi.org/10.29303/jppipa.v11i12.13267

Sari, N., & Ahmad, R. (2023). Resource-based view and competitive advantage of SMEs: A systematic review. *International Journal of Accounting, Finance, Auditing, Management and Economics*, *4*(1), 1–15.

Shiferaw, A., & Amentie Kero, C. (2024). Dynamic capabilities and organizational resilience in MSMEs. *Journal of Innovation and Entrepreneurship*, *13*(1), 15.

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