

Research Article

The Effect of Digital Marketing and Green Innovation on MSME Business Performance in Surakarta

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Abstract: This study aims to analyze the effect of Digital Marketing and Green Innovation on the performance of MSMEs in Surakarta. This study uses a quantitative approach, with data collected through questionnaires distributed to MSME owners in Surakarta. Data analysis was conducted using multiple linear regression with the assistance of SPSS. The results show that Digital Marketing has a significant effect on MSME Performance, with a significance value of $0.001 < 0.05$. In addition, Green Innovation also has a significant effect on MSME Performance, with a significance value of $0.000 < 0.05$. The Adjusted R Square value of 0.676 indicates that Digital Marketing and Green Innovation explain 67.6% of the variation in MSME Performance, while the remaining 32.4% is explained by other factors outside the research model. Therefore, increasing the utilization of Digital Marketing and implementing Green Innovation can serve as important strategies for MSMEs to improve their performance, competitiveness, and business sustainability.

Keywords: Business Sustainability; Digital Marketing; Green Innovation; MSME Performance; Surakarta.

1. Introduction

Micro, Small, and Medium Enterprises (MSMEs) play a strategic role in the Indonesian economy, as they contribute not only to the formation of national output but also serve as one of the main sources of employment absorption. According to data cited by the Central Statistics Agency (Badan Pusat Statistik), MSMEs in Indonesia absorb approximately 97% of the workforce, contribute around 60.30% to Gross Domestic Product (GDP), and account for approximately 14.40% of national exports. This substantial contribution indicates that improving MSME performance is an important aspect of strengthening the national economy. However, the increasingly competitive business environment requires MSMEs not only to rely on conventional strategies but also to adapt to technological developments, changes in consumer behavior, and demands for more sustainable business practices (Badan Pusat Statistik, 2024).

The development of information technology has driven changes in business activities, particularly in the way companies market products and interact with consumers. Digital marketing has become one form of adaptation that enables MSMEs to utilize social media, marketplaces, websites, search engines, and various digital platforms to expand their market reach. The use of digital media can also help business actors communicate more quickly and directly with consumers. Haque's (2020) research shows that digital marketing has a significant effect on MSME sales performance, while Islami et al. (2020) found that digital marketing affects MSME organizational performance through intellectual capital and perceived quality. These findings indicate that MSMEs' ability to utilize digital technology can be a source of improved business performance.

Digital marketing does not only function as a means of promotion but can also support MSMEs' ability to obtain market information, build relationships with customers, increase brand awareness, and expand market reach. Putra and Santoso (2020) showed that the use of e-business among Indonesian MSMEs has implications for business performance, although its impact is influenced by various contextual factors. Meanwhile, Moy et al. (2020) found that

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the use of social media among MSMEs can support business performance through the process of knowledge creation and innovation. Thus, the effectiveness of digital marketing is determined not only by the presence of digital platforms but also by MSME actors' ability to integrate that technology into their business activities and innovation.

In addition to the demands of digitalization, MSMEs also face changing consumer preferences and growing attention to environmental issues. Consumers increasingly consider sustainability aspects, the use of environmentally friendly materials, resource efficiency, and the environmental impact of the products they consume. This condition encourages business actors to develop green innovation. Green innovation can be realized through the development of more environmentally friendly products, the use of more sustainable raw materials, waste reduction, energy efficiency, and improvements to production processes. Wibowo et al. (2019) showed that green innovation among Indonesian MSMEs is related to improved competitive advantage, while Syafri et al. (2021) showed that green innovation is linked to green performance among MSMEs in Indonesia.

Green innovation is becoming increasingly important because an environmental orientation does not have to conflict with the achievement of economic goals. On the contrary, environmentally oriented innovation can become a source of competitive advantage if it can produce products that meet market needs while also improving business efficiency. Baeshen et al. (2021) showed that green innovation plays a role in achieving sustainable business performance among MSMEs, encompassing economic, environmental, and social dimensions. Rustiarini et al. (2022) also explained that green innovation is one of the strategic steps MSMEs can take to improve sustainability and financial performance in facing environmental challenges. Thus, the implementation of green innovation has the potential to become a strategy that not only supports environmental preservation but also provides economic value for companies.

This context is relevant to examine among MSMEs in the City of Surakarta. Based on the Surakarta City development planning documents, MSMEs' contribution to Surakarta's Gross Regional Domestic Product (GRDP) reached 56.38% in 2023, while their contribution to job creation reached 35.75%. During the same period, the percentage of MSMEs that had adopted technology or fell into the "Go Digital MSME" category increased from 12.95% in 2022 to 31.09% in 2023. This increase indicates the ongoing digitalization of MSMEs in the City of Surakarta, particularly in the use of technology to support business and marketing activities. This condition makes Surakarta an interesting context for examining the relationship between digital marketing and MSME business performance.

Although research on digital marketing and green innovation in relation to MSME performance has developed, some studies still examine these two factors separately. In fact, digitalization and green innovation can be viewed as two complementary capabilities in facing changes in the business environment. Ardito et al. (2020) showed that digital orientation and environmental orientation are related to innovation capability among MSMEs, so that the integration of these two orientations is important for understanding how companies achieve better performance. Research in Indonesia has also shown that green market orientation and green innovation are related to MSME business performance. This indicates a research opportunity to empirically test the simultaneous effect of digital marketing and green innovation on business performance, particularly in the context of MSMEs in the City of Surakarta.

Based on the description above, it can be seen that the development of digital technology provides opportunities for MSMEs to expand their markets and improve marketing effectiveness, while green innovation provides opportunities to create value through more environmentally friendly products and business processes. However, the level of digital marketing utilization and green innovation implementation among MSMEs does not necessarily produce the same business performance, as it is influenced by each business actor's ability to implement them. Therefore, empirical testing is needed to determine the extent of the influence of these two variables on MSME business performance. This research was conducted under the title "The Effect of Digital Marketing and Green Innovation on MSME Business Performance in Surakarta." This research is expected to make an academic contribution by enriching the study of MSME digitalization and sustainability, while also providing practical input for MSME actors and policymakers in improving business performance through digital marketing strategies and environmentally oriented innovation.

2. Literature Review

Resource-Based View (RBV)

Resource-Based View (RBV) is one of the theories that can be used to explain the relationship between a company's resources and the achievement of business performance. The RBV perspective holds that a company's competitive advantage can be built through the

ownership and utilization of resources and capabilities that are valuable and difficult for competitors to imitate. In the context of MSMEs, these resources are not limited to physical assets and financial capital but also include knowledge, human resource capability, technology, information, marketing capability, and innovation capability. Ardito et al. (2021) used the RBV perspective to explain that digital orientation and environmental orientation can influence a company's ability to develop innovation through the availability, accumulation, and utilization of company resources.

In this study, RBV is used as a foundation to explain that MSMEs' ability to utilize digital technology through digital marketing, and their ability to create environmentally oriented innovation through green innovation, constitute strategic resources and capabilities. Digital marketing can provide MSMEs with the ability to obtain market information, communicate with consumers, build brands, and expand market reach. Meanwhile, green innovation can become a capability that enables MSMEs to produce more efficient and environmentally friendly products and business processes. Both capabilities are then expected to improve MSME business performance.

Digital Marketing

Digital marketing is a marketing activity that utilizes digital technology and internet-based media to convey information, promote products, build relationships with consumers, and create value for customers. The development of digital technology has changed the way companies carry out marketing activities. For MSMEs, the use of social media, marketplaces, websites, search engines, and digital communication applications provides opportunities to reach consumers more broadly at a relatively more flexible cost compared to conventional marketing.

Digital marketing is not only related to the use of digital media as a means of promotion but also encompasses a company's ability to manage consumer interaction and information through technology. In the context of MSMEs, digital marketing can help business actors introduce products to a wider market, improve communication with consumers, obtain feedback, and build customer relationships. Research on MSMEs in Indonesia shows that the use of social media marketing is related to MSME performance and has become an important strategy in facing the development of the digital business environment.

Conceptually, digital marketing in this study can be measured through several indicators: the use of social media, the use of marketplaces or digital platforms, digital interaction with consumers, digital delivery of information/promotion, and the ability to expand market reach through digital media. The better an MSME's ability to utilize these various digital channels, the greater its opportunity to acquire new customers and retain existing ones. Recent research on food-sector MSEs in Indonesia has also specifically examined the implementation of digital marketing and its impact on business performance using a quantitative approach.

Thus, digital marketing can be viewed as one of the marketing capabilities that can support the improvement of MSME business performance. Through the use of digital technology, MSMEs can reduce geographical limitations in marketing, increase product visibility, and interact more quickly with consumers. Research by Arista and Hermawan shows that digital marketing is one of the factors that can be used to improve MSME performance, together with product innovation and competitive advantage.

Green Innovation

Green innovation is innovation directed at producing products, processes, methods, or business practices that have a lower environmental impact compared to previous practices. Green innovation can be realized through the use of more environmentally friendly raw materials, reduced resource use, energy savings, waste reduction, the use of cleaner production technology, and the development of products with environmentally friendly characteristics.

Green innovation is becoming increasingly important for MSMEs because demands for business sustainability come not only from the government but also from consumers, suppliers, the community, and various other stakeholders. Rustiarini et al. (2022) explained that environmental damage is a challenge for companies, including MSMEs in developing countries such as Indonesia, so that green innovation can become a strategy for responding to environmental problems while also improving the sustainability and financial performance of companies.

In this study, green innovation can be understood through two main aspects: green product innovation and green process innovation. Green product innovation relates to MSMEs' ability to create or develop more environmentally friendly products, while green process innovation relates to changes in production or operational processes to reduce the use of energy, raw materials, and waste, as well as negative environmental impacts. In addition, green innovation can be a source of product differentiation, as consumers are increasingly concerned about sustainability.

Singh's (2022) research on MSMEs shows that green innovation influences firm performance. The study found that green dynamic capabilities can drive green innovation, and green innovation subsequently affects firm performance. This reinforces the view that green innovation is not only an activity related to environmental protection but can also be part of a company's strategy to improve performance.

MSME Business Performance

Business performance is the level of achievement a company attains in carrying out its business activities based on predetermined goals. Business performance can reflect a company's ability to sustain its business, increase sales, generate profit, expand its market, and increase its number of customers. For MSMEs, performance measurement cannot always be based solely on financial indicators, as some MSME actors do not keep complete financial records. Therefore, performance measurement can use a combination of financial and non-financial indicators.

In this study, MSME business performance can be measured through several indicators: sales growth, profit growth, customer growth, market share growth, and the ability to sustain business continuity. The use of these indicators allows researchers to obtain a picture of changes in business performance from the perspective of MSME actors. Research on digital marketing among Indonesian MSMEs also shows that performance can be examined through various aspects of the business, not only through financial measures alone.

Business performance is the dependent variable in this study because, ultimately, the implementation of digital marketing and green innovation is expected to provide tangible benefits for business development. Digital marketing has the potential to improve performance through market expansion, increased communication with customers, and improved marketing effectiveness. Meanwhile, green innovation has the potential to improve performance through efficient resource use, product differentiation, improved business image, and the ability to meet consumer demands for more environmentally friendly products.

The Relationship between Digital Marketing and MSME Business Performance

The relationship between digital marketing and business performance can be explained through the ability of digital technology to improve the effectiveness of marketing activities. The use of digital media enables MSMEs to reach a wider range of consumers, convey product information quickly, and build two-way communication with consumers. As market reach and the intensity of consumer interaction increase, the opportunity for transactions and sales growth can also increase.

Empirically, research on MSMEs in Indonesia shows a relationship between the use of digital marketing and business performance. Recent research on food-sector MSEs in Indonesia specifically examines the impact of digital marketing implementation on business performance, while research on social media marketing among Indonesian MSMEs also positions MSME performance as one of the consequences of social media marketing use. Based on this theoretical argument and empirical findings, it can be hypothesized that the better the implementation of digital marketing, the better MSME business performance will be.

The Relationship between Green Innovation and MSME Business Performance

Green innovation can contribute to business performance through two mechanisms: improved efficiency and the creation of new value for consumers. From an efficiency standpoint, innovation in the production process can reduce the use of raw materials, energy, and waste management costs. From a market standpoint, products with environmentally friendly characteristics can provide differentiation and increase product attractiveness for consumers.

Rustiarini et al. (2022) showed that green innovation is a strategy MSMEs can use to improve sustainability and financial performance. In addition, Singh (2022) found that green innovation affects firm performance among MSMEs. Therefore, green innovation, both theoretically and empirically, has the potential to improve MSME business performance.

Theoretical Framework of the Study

Based on the Resource-Based View, digital marketing and green innovation can be viewed as strategic capabilities owned and developed by MSMEs to gain advantages and improve performance. Digital marketing provides MSMEs with the ability to utilize digital resources for marketing, while green innovation provides the ability to create more environmentally friendly products and business processes. Ardito et al. (2021) showed that digital and environmental orientation has a positive relationship with innovation capability among SMEs, making the integration of digital and environmental aspects an important issue in the development of small and medium enterprises.

Thus, this study positions Digital Marketing (X1) and Green Innovation (X2) as independent variables that are expected to influence MSME Business Performance (Y).

3. Research Method

This study uses a quantitative approach with a survey method to analyze the effect of Digital Marketing (X1) and Green Innovation (X2) on MSME Business Performance (Y) in Surakarta. Primary data were obtained through a questionnaire using a 1–5 Likert scale, distributed to MSME owners or managers who met the research criteria. Sampling was conducted using a random sampling technique. The sample in this study consisted of 90 MSMEs in Surakarta, while data analysis was performed using SPSS through validity, reliability, classical assumption, and multiple linear regression tests. Hypothesis testing was carried out using the t-test, F-test, and coefficient of determination (R^2) to determine the partial and simultaneous effects of the independent variables on MSME business performance (Sugiyono, 2019).

4. Results and Discussion

Research Results

Table 1. Validity Test Results.

Question Item	P value	Sign α	Description
X1.1	0.000	0.05	Valid
X1.2	0.000	0.05	Valid
X1.3	0.000	0.05	Valid
X1.4	0.000	0.05	Valid
X1.5	0.000	0.05	Valid
X1.6	0.000	0.05	Valid
X2.1	0.000	0.05	Valid
X2.2	0.000	0.05	Valid
X2.3	0.000	0.05	Valid
X2.4	0.000	0.05	Valid
X2.5	0.000	0.05	Valid
X2.6	0.000	0.05	Valid
Y1	0.000	0.05	Valid
Y2	0.000	0.05	Valid
Y3	0.000	0.05	Valid
Y4	0.000	0.05	Valid
Y5	0.000	0.05	Valid
Y6	0.000	0.05	Valid
Y7	0.000	0.05	Valid
Y8	0.000	0.05	Valid

Source: Primary Data, processed 2026

The validity test table results show that all question items for every variable in this study are declared valid. This is evidenced by the correlation p-values, all of which are < 0.05 , meaning that all questionnaire items are valid.

Table 2. Reliability Test Results.

No	Variable	Cronbach's Alpha	Description
1	Digital Marketing	0.700	Reliable
2	Green Innovation	0.879	Reliable
3	MSME Performance	0.945	Reliable

Source: Primary Data, processed 2026

Based on the reliability test table results, all variables are declared reliable because the Cronbach's alpha value for every variable is greater than 0.60.

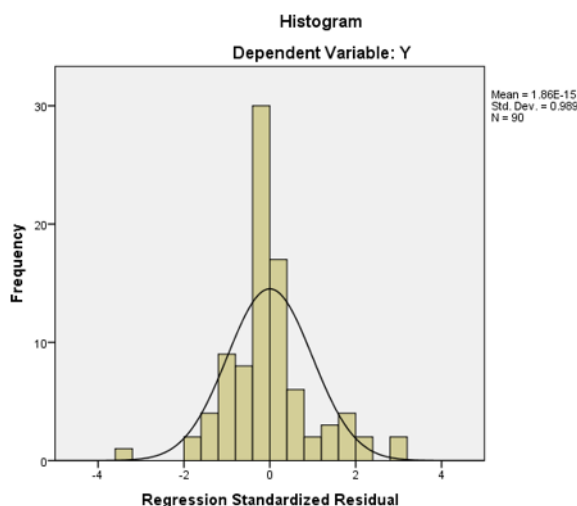


Figure 1. Normality Test Results (Histogram Chart).

Source: SPSS processed data, 2026

Based on the chart above, the height of the histogram bars follows the line, so the data is concluded to be normally distributed.

Table 3. Multicollinearity Test Results.

Model	Unstandardized B	Std. Error	Standardized Beta	t	Sig.	Tolerance	VIF
(Constant)	4.810	.970		4.958	.000		
X1	.240	.095	.184	2.526	.013	.337	2.965
X2	.874	.084	.754	10.372	.000	.337	2.965

a. Dependent Variable: Y

Source: SPSS processed data, 2026

Based on the Coefficients table, the Tolerance value for X1 and X2 is 0.622, while the VIF value is 1.608. Because the Tolerance value is > 0.10 and the VIF value is < 10 , it can be concluded that no multicollinearity occurs between variables X1 and X2.

Table 4. Autocorrelation Test (Runs Test).

Runs Test	Unstandardized Residual
Test Value	-.24295
Cases $<$ Test Value	33
Cases $\geq$ Test Value	57
Total Cases	90
Number of Runs	38
Z	-1.097
Asymp. Sig. (2-tailed)	.273

Source: SPSS processed data, 2026

Based on the Runs Test results, the Asymp. Sig. (2-tailed) value obtained is 0.273. Because the significance value of $0.273 > 0.05$, it can be concluded that no autocorrelation occurs, meaning the residuals in the research model are random.

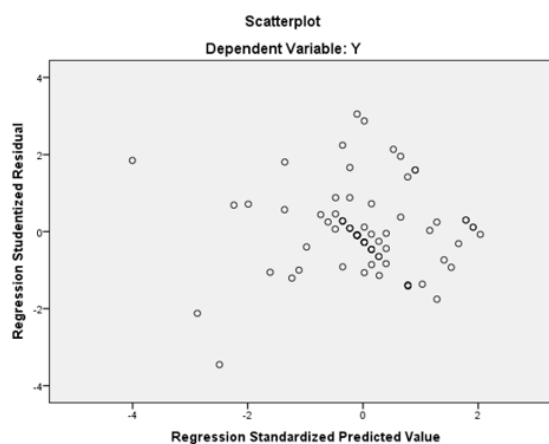


Figure 2. Heteroscedasticity Test Results (Scatterplot).

Source: SPSS processed data, 2026

Based on the chart above, there is no discernible pattern in the scatterplot (the points are randomly scattered above and below the zero axis). This means the regression model satisfies the classical assumptions and is suitable for further analysis.

Table 5. Multiple Linear Regression Test Results.

Model	Unstandardized B	Std. Error	Standardized Beta	t	Sig.	Tolerance	VIF
(Constant)	-1.373	2.680		-.512	.610		
X1	.464	.135	.264	3.447	.001	.622	1.608
X2	.936	.112	.638	8.329	.000	.622	1.608

a. Dependent Variable: Y

Source: SPSS processed data, 2026

The results of the multiple linear regression can be seen from the following multiple linear regression equation:

$$Y = a + b_1X_1 + b_2X_2 + e$$

$$Y = -1.373 + 0.464X_1 + 0.936X_2 + e$$

Table 6. F-Test Results (ANOVA).

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1226.181	2	613.091	93.746	.000
Residual	568.974	87	6.540		
Total	1795.156	89			

a. Dependent Variable: Y; Predictors: (Constant), X2, X1

Source: SPSS processed data, 2026

The results of the F-test show a significance value for the simultaneous effect on Y of $0.000 < 0.05$, so it can be concluded that Digital Marketing (X1) and Green Innovation (X2) simultaneously affect MSME Performance (Y).

Table 7. t-Test Results.

Model	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
(Constant)	-1.373	2.680		-.512	.610
X1	.464	.135	.264	3.447	.001
X2	.936	.112	.638	8.329	.000

a. Dependent Variable: Y

Source: SPSS processed data, 2026

The results of the t-test show the following:

a. Digital Marketing (X1)

The Digital Marketing variable has a significance value of 0.001, which is smaller than the significance level of 0.05. Based on the decision-making criteria, H0 is rejected and H1 is accepted. This means that the Digital Marketing variable has a significant effect on MSME Performance.

b. Green Innovation (X2)

The Green Innovation variable has a significance value of 0.000, which is smaller than the significance level of 0.05. Based on the decision-making criteria, H0 is rejected and H1 is accepted. This means that the Green Innovation variable has a significant effect on MSME Performance.

Table 8. Coefficient of Determination Test Results (Model Summary).

Model	R	R Square	Adjusted R Square	Std. Error	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.826	.683	.676	2.55733	93.746	2	87	.000	1.909

a. Predictors: (Constant), X2, X1

b. Dependent Variable: Y

Source: SPSS processed data, 2026

Based on the Model Summary table, the Adjusted R Square value is 0.676, or 67.6%. This means that variables X1 and X2 can explain 67.6% of the variation in variable Y, while the remaining 32.4% is explained by other factors outside the research model.

Discussion

The Effect of Digital Marketing on MSME Performance in Surakarta

The Digital Marketing variable (X1) has a significance value of 0.001, which is smaller than 0.05. This indicates that H0 is rejected and H1 is accepted, meaning Digital Marketing has a significant effect on MSME Performance. Thus, the better the implementation of digital marketing carried out by MSME actors, the greater the opportunity for improved business performance.

These results indicate that the use of digital marketing can help MSMEs expand their marketing reach, make it easier to interact with consumers, and introduce products to a wider

market. Through digital media, MSME actors can carry out promotions more effectively and efficiently, which has the potential to increase sales and business growth.

Thus, Digital Marketing is an important factor in improving MSME Performance. MSME actors need to optimize the use of digital media in marketing activities, whether through social media or other digital platforms. The consistent use of digital marketing is expected to improve competitiveness and support the sustainability of MSME businesses.

This finding is in line with the research of Andriani, Kartika, and Pangesti (2023), who found that digital marketing has a significant effect on MSME performance in Malang Regency. Similar results were also found by Hili (2022), who showed that digital marketing has a positive and significant effect on MSME performance in the City of Ambon. In addition, research by Yanti, Telagawathi, and Widiastini (2024) also proved that digital marketing has a significant effect on MSME performance. Thus, this study's findings reinforce previous research that the implementation of digital-based marketing strategies can be a factor that supports improved MSME performance.

Practically, this finding indicates that MSME actors need to increase their use of digital technology as part of their marketing strategy. Digital marketing enables MSMEs to reach a wider range of consumers at a relatively efficient marketing cost while also increasing the likelihood of transactions. This finding is also supported by the recent research of Apriadin and Khairunnisah (2026), who found that digital marketing has a positive and significant effect on MSME performance. Therefore, the results of this study can be said to be in line with previous research, while also reinforcing empirical evidence that digital marketing plays an important role in improving MSME performance.

The Effect of Green Innovation on MSME Performance in Surakarta

Based on the partial test results (t-test), the Green Innovation variable (X2) obtained a significance value of 0.000, which is smaller than the significance level of 0.05. Thus, H0 is rejected and H1 is accepted, so it can be concluded that Green Innovation has a significant effect on MSME Performance. These results indicate that the better the implementation of environmentally oriented innovation, the better the performance MSMEs can achieve. Green innovation can be realized through the development of environmentally friendly products, the use of more efficient materials, waste reduction, and improvements to production processes that can reduce negative environmental impacts.

Conceptually, Green Innovation is not only related to efforts to reduce environmental impact but can also be a strategy for improving business effectiveness and sustainability. The implementation of green innovation can help MSMEs use resources more efficiently, reduce waste in the production process, and produce products that align with growing consumer concern for the environment. Thus, green innovation can provide both economic and environmental benefits for MSMEs.

This finding is in line with the research of Rustiarini, Bhagawati, and Mendra (2022), conducted on 336 MSMEs in Bali. That study showed that green innovation plays a role in improving MSME sustainability and financial performance. These findings show that the implementation of green innovation is aimed not only at fulfilling environmental responsibility but can also provide economic benefits for business actors. Thus, this study's findings reinforce evidence that green innovation has a positive relationship with the achievement of MSME performance.

This finding is also in line with the research of Achmad et al. (2025) on batik MSMEs in Rembang Regency, Central Java. That study found that green innovation has a positive effect on organizational performance, with a coefficient of 0.508 and a significance value of less than 0.05. These findings indicate that the implementation of green innovation can help MSMEs improve organizational performance while also strengthening their competitiveness. This consistency of results reinforces the view that innovation that considers environmental aspects can be a strategic capability for MSMEs in improving performance.

This finding is also supported by the research of Fatkhurahman et al. (2025) on Green Innovation, Financial Access, and Sustainable Performance of SMEs in Indonesia. That study found that green innovation has a direct effect on MSME performance and can also improve performance indirectly through access to sustainable financing. This shows that the implementation of green innovation can provide added value for businesses, both through improved efficiency and through opportunities to obtain financing sources that support business sustainability.

Based on the above discussion, the research results can be stated to be in line with previous research and reinforce the finding that Green Innovation is one of the factors that can improve MSME Performance. The implementation of green innovation can provide benefits through efficient resource use, the development of more environmentally friendly products, waste reduction, and improved business competitiveness.

Therefore, MSME actors need to make green innovation part of their business strategy in order to not only meet environmental demands but also improve business performance and sustainability in the long term.

5. Conclusion

Based on the research results, it can be concluded that Digital Marketing and Green Innovation have a significant effect on MSME Performance in Surakarta. Digital Marketing, with a significance value of $0.001 < 0.05$, shows that the use of digital marketing can support improved MSME performance through expanded market reach, promotion, and interaction with consumers. Meanwhile, Green Innovation, with a significance value of $0.000 < 0.05$, shows that the implementation of environmentally friendly innovation can improve MSME performance through efficient resource use, waste reduction, product development, and improved competitiveness. Thus, both variables are important factors in supporting improved performance and sustainability of MSMEs in Surakarta.

Recommendations

Based on the research results, MSME actors in Surakarta are advised to further optimize the use of Digital Marketing through social media, marketplaces, and other digital platforms in order to expand market reach and increase sales. In addition, MSME actors need to increase the implementation of Green Innovation through the use of environmentally friendly materials, resource efficiency, waste reduction, and the development of environmentally conscious products. For future researchers, it is recommended to add other variables that may potentially affect MSME performance, as well as to expand the research area and number of respondents so that the results obtained can provide a broader picture.

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References

- Achmad, F., Kurniawati, A., Hasanudin, F. H., & Wiratmadja, I. I. (2025). Mapping performance of batik SMEs: A perspective on green innovation, green culture, and green employee behavior through clustering algorithm. *Journal Industrial Services*, 11(2). <https://doi.org/10.62870/jiss.v11i2.33093>
- Andriani, W. S., Kartika, K., & Pangesti, R. D. A. (2023). Pengaruh dana BPUM, human capital, dan digital marketing terhadap kinerja UMKM: Studi pada usaha mikro kecil dan menengah di Kabupaten Malang. *Jurnal Manajemen dan Profesional*, 4(2), 161–172. <https://doi.org/10.32815/jpro.v4i2.1775>
- Apriadin, A., & Khairunnisah, N. A. (2026). Pengaruh digital marketing dan e-commerce terhadap kinerja UMKM. *DIGIBIZ: Journal of Digital Business*, 1(1). <https://doi.org/10.58258/f25qzf77>
- Ardito, L., Raby, S., Albino, V., & Bertoldi, B. (2021). The duality of digital and environmental orientations in the context of SMEs: Implications for innovation performance. *Journal of Business Research*, 123, 44–56. <https://doi.org/10.1016/j.jbusres.2020.09.022>
- Arista, S. W., & Hermawan, S. (2025). Improving MSME performance based on digital marketing, intellectual capital, product innovation and competitive advantage. *Jurnal Manajemen Bisnis*, 16(2). <https://doi.org/10.18196/mb.v16i2.25192>
- Badan Pusat Statistik. (2024). Profil industri mikro dan kecil 2024.
- Baeshen, Y., Soomro, Y. A., & Bhutto, M. Y. (2021). Determinants of green innovation to achieve sustainable business performance: Evidence from SMEs. *Frontiers in Psychology*, 12, Article 767968. <https://doi.org/10.3389/fpsyg.2021.767968>
- Budiyono, B., & Sutianingsih, S. (2021). Peran kepuasan pelanggan dalam memoderasi pengaruh perceived value terhadap loyalitas pelanggan. *EKUITAS: Jurnal Ekonomi dan Keuangan*, 5(4), 445–469. <https://doi.org/10.24034/j25485024.y2021.v5.i4.5104>
- Budiyono, S. A. R. P., & Andini, S. (2021). The influence of total taxpayer of personnel and per capita income on income tax in Indonesia 2017–2019. *Annals of the Romanian Society for Cell Biology*.
- Fatkhurrahman, Waldelmi, I., Novita, & Hadiyati. (2025). Green innovation, financial access, and sustainable performance of SMEs in Indonesia. *E3S Web of Conferences*, 678, Article 06001. <https://doi.org/10.1051/e3sconf/202567806001>

- Haq, M. G. (2020). The effect of digital marketing and media promotion utilization to a Bakpia Patok Yogyakarta SMEs' sales performance. *Jurnal Ilmiah Ilmu Administrasi Publik*, 10(1). <https://doi.org/10.26858/jiap.v10i1.14336>
- Herwiyanto, Rokhmah, I. N., Baizuri, A., Prastiwi, I. E., & Salsabila, N. U. (2026). Analysis of the development potential of thematic creative economy sectors to support economic growth and community welfare in Surakarta City. *International Journal of Economics, Business and Accounting Research (IJEBAR)*, 10(2). <https://doi.org/10.29040/ijebar.v10i2.20227>
- Hili, P. (2022). Pengaruh digital marketing terhadap keunggulan bersaing dan kinerja usaha mikro kecil menengah (UMKM) di Kota Ambon. *HIPOTESA: Jurnal Ilmu-Ilmu Sosial*.
- Islami, N. N., Wahyuni, S., & Tiara, T. (2020). The effect of digital marketing on organizational performance through intellectual capital and perceived quality in micro, small and medium enterprises. *Jurnal Organisasi dan Manajemen*, 16(1), 59–70. <https://doi.org/10.33830/jom.v16i1.718.2020>
- Moy, M. M., Cahyadi, E. R., & Anggraeni, E. (2020). The impact of social media on knowledge creation, innovation, and performance in small and medium enterprises. *Indonesian Journal of Business and Entrepreneurship*, 6(1), 23. <https://doi.org/10.17358/ijbe.6.1.23>
- Prastiwi, I. E., & Anik, A. (2020). The impact of credit diversification on credit risk and performance of Indonesian banks. *Global Review of Islamic Economics and Business*, 8(1), 13–21. <https://doi.org/10.14421/grieb.2020.081-02>
- Prastiwi, I. E., Suprihati, & Akkapin, S. (2025). The influence of digital payment technology, service speed, and transaction security on online repurchase decisions (case study in Central Java, Indonesia). *International Journal of Economics, Business and Accounting Research (IJEBAR)*, 9(2). <https://doi.org/10.29040/ijebar.v9i2.18268>
- Putra, P. O. H., & Santoso, H. B. (2020). Contextual factors and performance impact of e-business use in Indonesian small and medium enterprises (SMEs). *Heliyon*, 6(3), Article e03568. <https://doi.org/10.1016/j.heliyon.2020.e03568>
- Rustiarini, N. W., Bhagawati, D. A. S., & Mendra, N. P. Y. (2022). Does green innovation improve SME performance? *Economics*, 10(12), Article 316. <https://doi.org/10.3390/economics10120316>
- Septiyanti, R., Rosiana, N., & Maryono. (2026). Faktor yang memengaruhi penerapan digital marketing serta dampaknya terhadap kinerja usaha mikro dan kecil (UMK) pangan di Indonesia. *Jurnal Agribisnis Indonesia*, 14(1), 142–154. <https://doi.org/10.29244/jai.2026.14.01.142-154>
- Singh, S. K. (2022). Stakeholder pressure, green innovation, and performance in small and medium-sized enterprises: The role of green dynamic capabilities. *Business Strategy and the Environment*, 31(1), 500–514. <https://doi.org/10.1002/bse.2906>
- Sugiyono. (2019). *Metode penelitian kuantitatif*. Alfabeta.
- Syafri, W., Prabowo, H., Nur, S. A., & Muafi, M. (2021). The impact of workplace green behavior and green innovation on green performance of SMEs: A case study in Indonesia. *The Journal of Asian Finance, Economics and Business*, 8(5), 365–374.
- Tatik, & Setiawan, D. (2025). Does social media marketing important for MSMEs performance in Indonesia? *Asia Pacific Journal of Marketing and Logistics*, 37(1), 99–114. <https://doi.org/10.1108/APJML-01-2024-0090>
- Wibowo, S. F., Ahmad, G. N., & Fauzi, A. (2019). Does green innovation matter? A study on Indonesia's SMEs. *Jurnal Manajemen*, 23(1). <https://doi.org/10.24912/jm.v23i1.447>
- Yanti, N. P. Y. P., Telagawathi, N. L. W. S., & Widiastini, N. M. (2024). Peran mediasi digital marketing pada pengaruh literasi digital dan inovasi produk terhadap kinerja UMKM. *E-Jurnal Ekonomi dan Bisnis Universitas Udayana*, 13(2), 282–299. <https://doi.org/10.24843/EEB.2024.v13.i02.p08>
- Yustian, O. R., Ratnapuri, C. I., & Indrawati, D. (2026). Digital intelligence and sustainable SME performance: The mediating role of green innovation in Indonesia. *Image: Jurnal Riset Manajemen*, 14(1), 47–59. <https://doi.org/10.17509/image.2026.242>