

From Social Media Marketing to Business Sustainability: Unpacking the Mediating Roles of Segmentation Strategy and Innovation Management in MSMEs

Lies Hendrawan Krisnawati^A, Indra Siswanti^B, Yanto Ramli^C, Catur Widayati^D

Abstract

This study examines how Social Media Marketing is associated with Business Sustainability in micro, small, and medium enterprises (MSMEs) through the parallel mediating roles of Segmentation Strategy and Innovation Management. Drawing on the Resource-Based View (RBV), Social Media Marketing is conceptualized as a valuable digital-organizational resource, while Segmentation Strategy and Innovation Management represent distinct complementary organizational capabilities. Data were collected through a cross-sectional survey of 330 MSME owners and managers who actively used social media for marketing, customer communication, or business promotion and were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that Social Media Marketing is positively and significantly associated with Segmentation Strategy, Innovation Management, and Business Sustainability. Both Segmentation Strategy and Innovation Management are also positively associated with Business Sustainability, and the model explains 59.7% of its variance. Mediation analysis indicates complementary partial mediation through both Segmentation Strategy and Innovation Management. These findings refine the resource-capability conversion mechanism within RBV by specifying two distinct parallel capability pathways through which digital-organizational resources are associated with Business Sustainability. Given the cross-sectional and self-reported design, the findings are interpreted as associative rather than causal.

Keywords: Business Sustainability, Innovation Management, Resource-Based View (RBV), Segmentation Strategy, Social Media Marketing.

INTRODUCTION

The wave of digital transformation has reshaped how micro, small, and medium enterprises (MSMEs) understand their markets, engage with customers, and pursue long-term business sustainability. In increasingly

^AFaculty of Economics and Business, Universitas Mercu Buana, Jakarta, Indonesia, Email: 67124010006@student.mercubuana.ac.id

^BFaculty of Economics and Business, Universitas Mercu Buana, Jakarta, Indonesia, Email: indra.siswanti@mercubuana.ac.id

^CFaculty of Economics and Business, Universitas Mercu Buana, Jakarta, Indonesia, Email: yanto.ramli@mercubuana.ac.id

^DFaculty of Economics and Business, Universitas Mercu Buana, Jakarta, Indonesia, Email: catur.widayati@mercubuana.ac.id

competitive markets, long-term business continuity can no longer depend solely on product quality, competitive pricing, or physical accessibility. Firms are increasingly expected to use digital tools to monitor changing customer preferences, develop market intelligence, and support strategic decision-making. This challenge is particularly relevant in emerging economies, where many MSMEs have adopted digital platforms but continue to face difficulties in translating digital engagement into sustainable business outcomes (Abid et al., 2024; Amoah et al., 2023; Gao et al., 2023; Munandar et al., 2025; Qalati et al., 2022). Moreover, MSMEs operate under considerable environmental and market uncertainty, increasing the importance of organizational capabilities for maintaining long-term sustainability (Tarigan et al., 2026).

Among available digital tools, Social Media Marketing represents one of the most accessible and affordable resources for MSMEs. Its strategic relevance extends beyond product promotion and customer reach by facilitating customer interaction, market-information acquisition, and access to customer knowledge. From a Resource-Based View (RBV) perspective, however, social media platforms themselves are not inherently rare or inimitable resources because they are widely accessible. Rather, the strategic value associated with Social Media Marketing depends on how effectively firms interpret and deploy customer and market information through organizational capabilities (Alghamdi, 2024; Ali Abbasi et al., 2022; Borah et al., 2022; Ghazwani & Alzahrani, 2024; Yu et al., 2022).

Nevertheless, existing evidence remains inconclusive regarding how Social Media Marketing is associated with Business Sustainability. Maintaining an active social-media presence alone does not necessarily ensure stronger customer relationships, improved organizational responsiveness, or long-term business continuity. Many MSMEs still experience difficulties in identifying relevant customer segments, responding to changing market needs, and translating digital information into strategic action. Existing studies have frequently examined Social Media Marketing as a promotional instrument or a direct antecedent of business performance, while comparatively less attention has been given to the organizational capabilities through which digital resources are associated with sustainable business outcomes (Fu et al., 2024; Haque et al., 2024; Marolt et al., 2022; Sharabati et al., 2024).

Drawing on RBV, this study examines whether Social Media Marketing is associated with Business Sustainability through two distinct but complementary organizational capabilities operating in parallel: Segmentation Strategy and Innovation Management. Segmentation Strategy enables firms to identify and prioritize relevant customer groups, whereas Innovation Management supports the use of market and customer information in product, service, process, and marketing improvements. Accordingly, the study focuses on the resource-capability mechanism linking Social Media Marketing with

Business Sustainability rather than treating access to digital platforms as a sufficient condition for sustainable outcomes.

This study contributes in three ways. First, it conceptually distinguishes widely accessible social media platforms from Social Media Marketing as a valuable digital-organizational resource and from customer knowledge as a knowledge resource. Second, it specifies Segmentation Strategy and Innovation Management as distinct but complementary organizational capabilities operating through parallel pathways, thereby refining the resource-capability conversion mechanism within RBV in the context of digitally active MSMEs. Third, it provides practical insight into how MSMEs can organize customer information obtained through social media into more focused segmentation decisions and feasible innovation-management routines.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Resource-Based View (RBV)

The Resource-Based View (RBV) proposes that firms may achieve sustained competitive advantage when they effectively deploy valuable, rare, inimitable, and non-substitutable (VRIN) resources through organizational capabilities that are difficult to replicate (Barney, 1991). Rather than explaining performance differences solely through external market conditions, RBV emphasizes differences in firms' abilities to acquire, organize, integrate, and deploy strategic resources. From this perspective, resources are more likely to create value when they are combined with complementary organizational capabilities that enable firms to use those resources effectively.

In this study, social media platforms are not positioned as VRIN resources because they are widely accessible. Instead, Social Media Marketing is conceptualized as a valuable digital-organizational resource that facilitates customer interaction, market-information acquisition, and access to customer knowledge. Customer knowledge is treated as a knowledge resource whose strategic relevance depends on the firm's ability to interpret and use it effectively. Segmentation Strategy and Innovation Management are therefore conceptualized as distinct but complementary organizational capabilities through which such knowledge may be organized and deployed in support of Business Sustainability.

Social Media Marketing

Social Media Marketing refers to the use of digital platforms to communicate product value, engage customers, build brand visibility, gather market intelligence, and support business communication. For MSMEs, social media extends beyond a promotional function by providing continuing access to customer information, market trends, competitor activity, and consumer feedback. Information obtained through digital interaction can support managerial decision-making and help firms respond to changing market conditions (Bruce et al., 2023; Laradi et al., 2024; Sharabati et al., 2024). More broadly, digital

transformation enables firms to use technologies such as social media to enhance competitiveness and support sustainable business value (Kraus et al., 2022), while digitalization is increasingly associated with changes in business processes, customer engagement, and sustainable development (Calderon-Monge & Ribeiro-Soriano, 2024).

Recent evidence from fast-food MSMEs also indicates that social media is positively associated with customer satisfaction and may be indirectly associated with customer loyalty through satisfaction, suggesting that its strategic relevance extends beyond direct promotional effects (Marzuki & Imaningsih, 2026). From an RBV perspective, the strategic relevance of Social Media Marketing lies not in access to the platform itself, but in how firms use digital interactions and customer knowledge. Its value is therefore associated with firms' abilities to interpret, integrate, and deploy such knowledge through complementary capabilities, including Segmentation Strategy and Innovation Management (Alghamdi, 2024; Basit et al., 2024; Borah et al., 2022; Ghazwani & Alzahrani, 2024).

Segmentation Strategy

Segmentation Strategy refers to a firm's organizational capability to identify, assess, and prioritize customer groups according to demographic, geographic, psychographic, behavioural, and benefit-related characteristics. Social media provides MSMEs with access to customer information derived from interactions, purchasing patterns, online engagement, and feedback, which may enhance their understanding of market heterogeneity (Serrano-Malebrán et al., 2023).

Within an RBV framework, Segmentation Strategy functions as a complementary organizational capability through which customer knowledge may be translated into more focused resource allocation and targeting decisions. Rather than serving only as a marketing technique, segmentation may help firms direct limited organizational resources toward customer groups with greater strategic relevance. Stronger segmentation capability may therefore be associated with more focused marketing activities, more relevant value propositions, stronger customer relationships, and improved conditions for long-term Business Sustainability.

Innovation Management

Innovation Management refers to the organizational capability to develop and implement improvements in products, services, operational processes, marketing approaches, and business models. In MSMEs, innovation is often incremental and may be informed by continuous learning from customer interactions and market feedback. Digital transformation has been associated with sustainable innovation and improved SME performance (Wang & Zhang, 2025), while social media can provide customer and market information that may assist firms in identifying opportunities for product, service, process, and marketing improvements (Cadden et al., 2023; Chen et al., 2024; Ghazwani &

Alzahrani, 2024; Jaaffar et al., 2024). Digital capabilities have also been associated with sustainable competitive advantage and organizational performance among SMEs (Hoang et al., 2025), while the integration of technology, people, and organizational processes is increasingly linked to innovation and sustainability within MSMEs (Machado et al., 2024).

From an RBV perspective, Innovation Management represents a complementary organizational capability through which valuable resources and customer knowledge may be used to support adaptation and organizational improvement. Firms that systematically use customer knowledge in refining products, services, processes, and marketing activities may be better positioned to respond to market change and maintain long-term performance. Prior studies have reported positive associations between innovation capability, organizational performance, and business sustainability in SMEs (Bhatti et al., 2023; Heenkenda et al., 2022; Zhang et al., 2022), while digital resources and organizational capabilities are frequently identified as important conditions associated with innovation and sustainable growth (Estensoro et al., 2022).

Business Sustainability

Business Sustainability refers to the ability of MSMEs to maintain long-term business continuity through economic continuity, social responsibility, environmental responsibility, and adaptation to technological and business-environment changes. In this study, Business Sustainability is used consistently as the dependent construct and is distinguished from sustainable performance and sustainable competitive advantage, which represent related but conceptually distinct outcomes (Alojail & Khan, 2023; Costa Melo et al., 2023; Guandalini, 2022; Machado et al., 2024).

Consistent with RBV, Business Sustainability is examined as an outcome associated with the effective deployment of organizational resources and capabilities rather than with possession of digital resources alone. Social Media Marketing may provide access to customer interactions and market information, while Segmentation Strategy and Innovation Management represent distinct capability pathways through which such information may be organized and used in support of long-term business continuity.

Hypothesis Development

Based on the preceding theoretical reasoning, the following hypotheses are proposed. Social Media Marketing provides MSMEs with access to customer interaction, market information, and digital feedback that may support strategic decision-making and long-term business continuity. When such information is effectively interpreted and used, Social Media Marketing may be associated with stronger Business Sustainability.

H₁: Social media marketing is positively associated with the business sustainability of MSMEs.

Social Media Marketing also provides information that may help firms understand how their markets are structured. Customer comments, engagement patterns, product inquiries, and reactions to content can reveal differences in needs, preferences, and behavioural characteristics across customer groups.

H₂: Social media marketing is positively associated with segmentation strategy.

Social-media interactions may also provide customer feedback, trend information, and competitor signals that can be used in innovation-related activities. Such information may support adjustments in products, services, processes, and marketing practices.

H₃: Social media marketing is positively associated with innovation management.

Segmentation Strategy may support Business Sustainability by helping firms identify relevant customer groups and align marketing resources, offers, and value propositions more closely with customer needs. More focused segmentation may therefore be associated with improved marketing efficiency, stronger customer relationships, and more sustainable business continuity.

H₄: Segmentation strategy is positively associated with the business sustainability of MSMEs.

Innovation Management may also be associated with Business Sustainability because it enables firms to continuously improve products, services, processes, and market responses in changing environments. Firms with stronger innovation-management capability may therefore be better positioned to adapt and maintain long-term business continuity.

H₅: Innovation management is positively associated with the business sustainability of MSMEs.

Social Media Marketing may also be indirectly associated with Business Sustainability through Segmentation Strategy. Customer and market information obtained through social-media interaction can support the identification and prioritization of relevant customer segments, which may in turn be associated with more focused strategic decisions and sustainable business outcomes.

H₆: Segmentation strategy mediates the relationship between social media marketing and the business sustainability of MSMEs.

Similarly, Social Media Marketing may be indirectly associated with Business Sustainability through Innovation Management. Customer feedback, interaction data, and market signals obtained through social media may support innovation-related decision-making, which may subsequently be associated with improved long-term business continuity.

H₇: Innovation management mediates the relationship between social media marketing and the business sustainability of MSMEs.

Taken together, the proposed model conceptualizes Social Media Marketing as a valuable digital-organizational resource and Segmentation Strategy and Innovation Management as distinct but complementary organizational capabilities operating through parallel

pathways. The model does not assume or test a sequential relationship between the two mediators. The proposed relationships are illustrated in Figure 1.

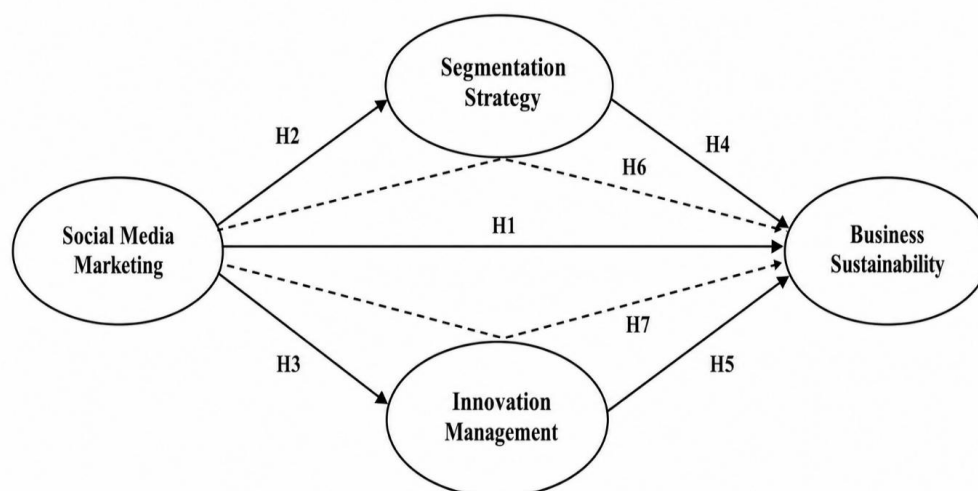


Figure 1. Conceptual Framework and Hypothesis Structure

Figure 1 illustrates the proposed relationships among Social Media Marketing, Segmentation Strategy, Innovation Management, and Business Sustainability. Segmentation Strategy and Innovation Management are specified as distinct parallel mediators, and no sequential relationship between the two mediators is assumed or tested.

METHOD

Research Design and Sample

This study adopted a quantitative explanatory design using a cross-sectional survey to examine the associations among Social Media Marketing, Segmentation Strategy, Innovation Management, and Business Sustainability. Purposive sampling was used to recruit MSME owners or managers whose businesses had operated for at least one year and who actively used social media for marketing, customer communication, or business promotion. Active social-media use was a mandatory eligibility criterion, while other digital platforms, when used, were treated only as supplementary channels. Respondent eligibility was verified through screening questions at the beginning of the questionnaire, and incomplete responses were excluded from the final analysis.

An a priori G*Power analysis was conducted using F tests–linear multiple regression (fixed model, R^2 deviation from zero), with three predictors, a medium effect size ($f^2 = 0.15$), $\alpha = 0.05$, and statistical power of 0.80. The analysis indicated a minimum sample requirement of approximately 77 respondents. The final sample comprised 330 valid responses, substantially exceeding the minimum requirement and providing an adequate basis for estimating the PLS-SEM model and its parallel mediation pathways.

The final sample consisted of digitally active MSME owners or managers from DKI Jakarta, Bogor, Depok, Tangerang, and Bekasi.

Micro enterprises represented 59.4% of the sample, small enterprises 32.1%, and medium enterprises 8.5%. Male respondents accounted for 55.0% and female respondents for 45.0%. The largest age group was 41-50 years (28.0%), followed by 31-40 years (27.0%) and 18-30 years (24.0%). Because information on business sector, business age, number of employees, specific managerial position, and principal social-media platform was not systematically documented, these characteristics were not reconstructed retrospectively. Accordingly, the findings should be generalized primarily to digitally active micro and small MSMEs in the Greater Jakarta area.

Measurement and Data Collection

Primary data were collected using a structured self-administered questionnaire measured on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The measurement items were adapted from established sources and adjusted to the MSME context. Social Media Marketing items were informed by Kakar et al. (2023), Segmentation Strategy by Kitunen et al. (2023), Innovation Management by Ramli (2020), and Business Sustainability by Munandar et al. (2025). The initial instrument comprised ten Social Media Marketing indicators, eight Segmentation Strategy indicators, eight Innovation Management indicators, and eight Business Sustainability indicators. The questionnaire was reviewed before administration to improve wording clarity, content alignment, and contextual relevance.

The initial Social Media Marketing item pool captured entertainment, interaction, trendiness, customization, and word-of-mouth. Segmentation Strategy initially covered demographic, geographic, psychographic, behavioural. Innovation Management included product, process, position, and paradigm. Business Sustainability was initially represented by profit, people, planet and phenotechnology. Because several indicators were subsequently removed during measurement-model refinement, interpretation of the final empirical constructs is based on the indicators retained in the final measurement model. Participation was voluntary, and informed consent was obtained before questionnaire completion. Respondents were informed about the purpose of the study, the academic use of their responses, and their rights regarding participation. Anonymity and confidentiality were maintained throughout data collection and analysis, and no personally identifiable information was reported.

Table 1. Measurement Constructs and Indicators

Construct	Role in Model	Main Indicators	Scale
Social Media Marketing	Independent variable	Entertainment, interaction, trendiness, customization, word of mouth	Likert 1–5
Segmentation Strategy	Mediator	Demographic, geographic, psychographic, behavioural	Likert 1–5

Innovation Management	Mediator	Product, process, position, paradigm	Likert 1–5
Business Sustainability	Dependent variable	Profit, People, Planet, Phenotechnology	Likert 1–5

Source: Authors' Construct Operationalization (2026)

Data Analysis

The hypothesized model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4. Measurement-model assessment included indicator reliability through outer loadings, internal consistency reliability through Cronbach's alpha and composite reliability, convergent validity through Average Variance Extracted (AVE), and discriminant validity through cross-loadings, the Fornell-Larcker criterion, and the Heterotrait–Monotrait ratio (HTMT). Because the initial measurement model revealed construct-overlap and discriminant-validity concerns, indicator purification was performed before the final structural model was evaluated.

The structural model was assessed using path-level inner VIF values, coefficients of determination (R^2), effect sizes (f^2), Stone-Geisser Q^2 values obtained through blindfolding, standardized path coefficients, t-statistics, p-values, and indirect effects. Bootstrapping was used to evaluate the statistical significance of the structural relationships. Q^2 values were interpreted exclusively as evidence of in-sample predictive relevance and not as evidence of out-of-sample predictive performance because PLSpredict or an external holdout procedure was not employed.

RESULTS

Measurement Model Assessment

The initial measurement model revealed discriminant-validity concerns, particularly between Innovation Management and Segmentation Strategy. In the initial model, the HTMT value between these constructs reached 1.018, while several indicators also exhibited substantial cross-construct overlap. Indicator purification was therefore undertaken to improve construct distinctiveness. Eight indicators-BS07, BS08, SS01, SS03, SS08, IM02, IM07, and IM08-were removed from the initial model because of overlapping loadings and discriminant-validity concerns. Following refinement, the final model retained six Business Sustainability indicators, five Innovation Management indicators, five Segmentation Strategy indicators, and all ten Social Media Marketing indicators.

In the refined model, outer loadings ranged from 0.617 to 0.831 for Business Sustainability, 0.826 to 0.916 for Innovation Management, 0.734 to 0.885 for Segmentation Strategy, and 0.830 to 0.908 for Social Media Marketing. Most retained indicators exceeded the recommended threshold of 0.70. BS05 (0.621) and BS06 (0.617) were retained because they preserved substantively important environmental content within the Business Sustainability construct, while overall construct quality remained acceptable. Business Sustainability achieved a composite

reliability of 0.878 and an AVE of 0.549; Innovation Management achieved CR = 0.939 and AVE = 0.756; Segmentation Strategy achieved CR = 0.904 and AVE = 0.655; and Social Media Marketing achieved CR = 0.969 and AVE = 0.758.

Discriminant validity improved substantially after indicator purification. The final Fornell–Larcker results showed that the square root of AVE for each construct exceeded its corresponding inter-construct correlations. Final HTMT values were 0.791 for Innovation Management–Business Sustainability, 0.797 for Segmentation Strategy–Business Sustainability, 0.836 for Segmentation Strategy–Innovation Management, 0.750 for Social Media Marketing–Business Sustainability, 0.814 for Social Media Marketing–Innovation Management, and 0.679 for Social Media Marketing–Segmentation Strategy. All point estimates were below 0.90, supporting acceptable discriminant validity in the refined measurement model. The HTMT value of 0.836 between Segmentation Strategy and Innovation Management nevertheless indicates conceptual proximity and is therefore interpreted cautiously.

Because the technology-related Business Sustainability indicators (BS07 and BS08) were removed during refinement, the final empirical operationalization of Business Sustainability is represented primarily by the retained economic, social, and environmental indicators. The broader conceptual definition of Business Sustainability therefore should be interpreted more cautiously than the initial item pool suggests, and this measurement limitation is acknowledged when interpreting the findings.

Table 2. Measurement Model Results

Construct	Outer Loading Range	Cronbach's Alpha	Composite Reliability	AVE
Business Sustainability	0.617–0.831	0.833	0.878	0.549
Innovation Management	0.826–0.916	0.919	0.939	0.756
Segmentation Strategy	0.734–0.885	0.869	0.904	0.655
Social Media Marketing	0.830–0.908	0.965	0.969	0.758

Source: SmartPLS output (2026)

Table 3. Discriminant Validity Based on HTMT

Pair of Constructs	HTMT
Innovation Management - Business Sustainability	0.791
Segmentation Strategy - Business Sustainability	0.797
Segmentation Strategy - Innovation Management	0.836
Social Media Marketing - Business Sustainability	0.750
Social Media Marketing - Innovation Management	0.814
Social Media Marketing - Segmentation Strategy	0.679

Source: SmartPLS output (2026)

Structural Model Assessment

The refined structural model showed no serious collinearity concerns. Path-level inner VIF values were 3.638 for Innovation Management → Business Sustainability, 2.587 for Segmentation Strategy → Business Sustainability, 2.503 for Social Media Marketing → Business Sustainability, and 1.000 for both Social Media Marketing → Innovation Management and Social Media Marketing → Segmentation Strategy. All values remained below the commonly used threshold of

5.00, indicating that structural collinearity was not sufficiently high to threaten interpretation of the path estimates.

The model demonstrated meaningful explanatory power for the endogenous constructs. Social Media Marketing, Segmentation Strategy, and Innovation Management jointly explained 59.7% of the variance in Business Sustainability ($R^2 = 0.597$; adjusted $R^2 = 0.594$). Social Media Marketing explained 59.3% of the variance in Innovation Management ($R^2 = 0.593$; adjusted $R^2 = 0.592$) and 42.8% of the variance in Segmentation Strategy ($R^2 = 0.428$; adjusted $R^2 = 0.426$). These results indicate moderate explanatory power for the principal endogenous constructs.

Effect-size analysis provided additional evidence regarding the substantive contribution of individual predictors. Social Media Marketing showed a large effect on Innovation Management ($f^2 = 1.457$) and Segmentation Strategy ($f^2 = 0.747$), while its direct effect size on Business Sustainability was small ($f^2 = 0.083$). Segmentation Strategy showed a small-to-moderate effect size on Business Sustainability ($f^2 = 0.128$), whereas Innovation Management showed a small effect size ($f^2 = 0.027$). Thus, the largest effect sizes associated with Social Media Marketing were observed for its relationships with the two mediating capabilities rather than for its direct relationship with Business Sustainability. Differences among these effect sizes are interpreted descriptively because no formal statistical comparison of the effect-size estimates was conducted. All endogenous constructs produced positive Stone-Geisser Q^2 values. Innovation Management had $Q^2 = 0.444$, Business Sustainability $Q^2 = 0.319$, and Segmentation Strategy $Q^2 = 0.257$, indicating predictive relevance within the analyzed sample. These values are not interpreted as evidence of out-of-sample predictive performance because PLSpredict or an external validation sample was not used.

Table 4. Explanatory Power and Predictive Relevance

Outcome Construct	R^2	Adjusted R^2	Q^2
Business Sustainability	0.597	0.594	0.319
Innovation Management	0.593	0.592	0.444
Segmentation Strategy	0.428	0.426	0.257

Source: SmartPLS output (2026)

Direct Effects

Bootstrapping supported all five direct hypotheses. Social Media Marketing was positively and significantly associated with Business Sustainability ($\beta = 0.289$, $SE = 0.062$, $t = 4.649$, $p < 0.001$), Segmentation Strategy ($\beta = 0.654$, $SE = 0.032$, $t = 20.397$, $p < 0.001$), and Innovation Management ($\beta = 0.770$, $SE = 0.032$, $t = 24.137$, $p < 0.001$). Segmentation Strategy was positively and significantly associated with Business Sustainability ($\beta = 0.365$, $SE = 0.060$, $t = 6.099$, $p < 0.001$), while Innovation Management was also positively and significantly associated with Business Sustainability ($\beta = 0.200$, $SE = 0.078$, $t = 2.551$, $p = 0.005$). Accordingly, H1–H5 were supported.

Although the observed coefficient for Segmentation Strategy $\rightarrow$ Business Sustainability was numerically larger than that for Innovation

Management → Business Sustainability, no formal statistical test comparing the two coefficients was conducted. Consequently, the difference is interpreted only as a difference in observed magnitude and not as evidence that Segmentation Strategy has a statistically stronger association with Business Sustainability than Innovation Management.

Indirect Effects and Mediation

The total indirect association between Social Media Marketing and Business Sustainability through Segmentation Strategy and Innovation Management was positive and statistically significant ($\beta = 0.393$, $SE = 0.048$, $t = 8.227$, $p < 0.001$). The specific indirect association through Segmentation Strategy was $\beta = 0.239$ ($SE = 0.040$, $t = 5.926$, $p < 0.001$), while the specific indirect association through Innovation Management was $\beta = 0.154$ ($SE = 0.061$, $t = 2.505$, $p = 0.006$). These results support H6 and H7 and demonstrate two statistically significant parallel mediation pathways.

Because the direct association between Social Media Marketing and Business Sustainability remained statistically significant and both specific indirect associations were positive and significant in the same direction, the mediation pattern is consistent with complementary partial mediation. The observed indirect coefficient through Segmentation Strategy was numerically larger than that through Innovation Management; however, no formal bootstrap contrast or coefficient-difference test was conducted. Accordingly, the difference should be interpreted only descriptively and not as evidence that one mediation pathway is statistically stronger than the other. The results therefore support two distinct parallel mediation mechanisms linking Social Media Marketing with Business Sustainability through Segmentation Strategy and Innovation Management. The model does not test or imply a sequential relationship between the two mediators.

Table 5. Direct and Indirect Effects

Hypothesis	Relationship	β / Indirect Effect	t-statistic	p-value	Decision	SE
H1	SMM → BS	0.289	4.649	<0.001	Accepted	0.062
H2	SMM → SS	0.654	20.397	<0.001	Accepted	0.032
H3	SMM → IM	0.770	24.137	<0.001	Accepted	0.032
H4	SS → BS	0.365	6.099	<0.001	Accepted	0.060
H5	IM → BS	0.200	2.551	0.005	Accepted	0.078
H6	SMM → SS → BS	0.239	5.926	<0.001	Accepted	0.040
H7	SMM → IM → BS	0.154	2.505	0.006	Accepted	0.061

Note. SMM = Social Media Marketing; SS = Segmentation Strategy; IM = Innovation Management; BS = Business Sustainability.

Source: SmartPLS output (2026)

The structural model therefore supports two distinct parallel mediation pathways linking Social Media Marketing with Business Sustainability through Segmentation Strategy and Innovation Management. The model does not test a sequential relationship between the two mediators.

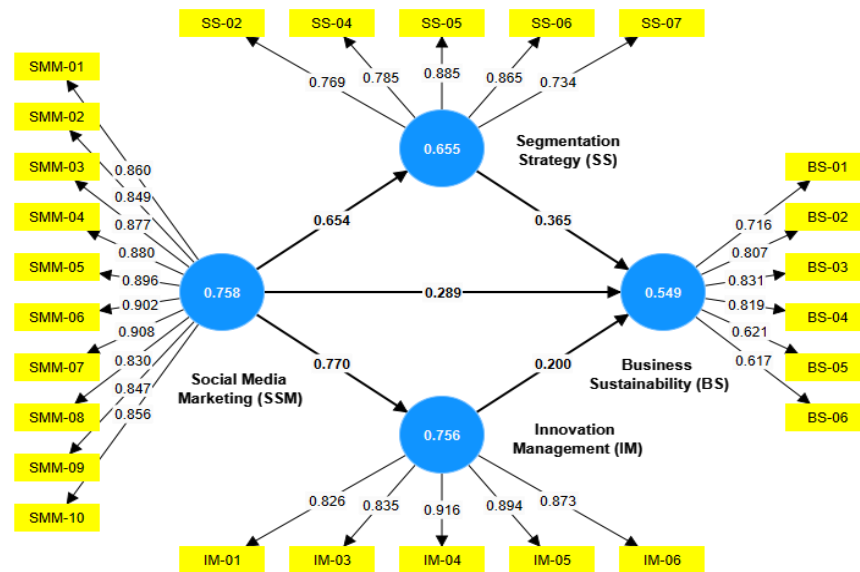


Figure 2. PLS Algorithm Model Showing Outer Loadings, Path Coefficients, and AVE Values

Source: SmartPLS output (2026)

DISCUSSION

The findings indicate that Social Media Marketing is positively associated with Business Sustainability both directly and indirectly through Segmentation Strategy and Innovation Management. Consistent with the Resource-Based View (RBV), the results support a resource-capability explanation in which Social Media Marketing functions as a valuable digital-organizational resource, while Segmentation Strategy and Innovation Management represent distinct organizational capabilities through which customer and market knowledge may be deployed. This interpretation is consistent with prior evidence showing that the strategic value of social media in SMEs depends not merely on platform adoption, but on firms' ability to combine digital resources with organizational and innovation capabilities (Borah et al., 2022; Ghazwani & Alzahrani, 2024; Yu et al., 2022). Because the study is cross-sectional and self-reported, these relationships are interpreted as associative rather than causal.

The largest structural coefficient in the model was observed for the association between Social Media Marketing and Innovation Management ($\beta = 0.770$), accompanied by a large effect size ($f^2 = 1.457$). Social Media Marketing was also strongly associated with Segmentation Strategy ($\beta = 0.654$; $f^2 = 0.747$). These findings suggest that the main explanatory role of Social Media Marketing lies in its association with organizational capabilities rather than solely in its direct relationship with Business Sustainability. Prior studies similarly show that digital interaction, customer knowledge, marketing analytics, and social-media-based information can support innovation, organizational learning, and competitive adaptation in SMEs (Cadden et al., 2023; Ghazwani & Alzahrani, 2024; Jaaffar et al., 2024; Wang & Zhang, 2025).

Social Media Marketing was also positively associated with Business Sustainability directly ($\beta = 0.289$; $f^2 = 0.083$), although the corresponding effect size was small. This pattern suggests that being active on social media alone may be insufficient to explain sustainable business outcomes unless digital information is integrated into organizational decision-making. This interpretation is consistent with studies reporting that social-media adoption and digital marketing are associated with SME performance and sustainability, while their strategic contribution depends on complementary organizational conditions and capabilities (Alghamdi, 2024; Amoah et al., 2023; Borah et al., 2022; Haque et al., 2024).

Both Segmentation Strategy and Innovation Management were positively associated with Business Sustainability, although their observed contributions differed in magnitude. Segmentation Strategy showed a larger path coefficient ($\beta = 0.365$) and a small-to-moderate effect size ($f^2 = 0.128$), whereas Innovation Management showed a smaller coefficient ($\beta = 0.200$) and a small effect size ($f^2 = 0.027$). These differences are interpreted descriptively because no formal statistical comparison between the coefficients or effect sizes was conducted. Accordingly, the results do not establish that Segmentation Strategy is statistically stronger than Innovation Management.

Segmentation Strategy significantly mediated the relationship between Social Media Marketing and Business Sustainability ($\beta = 0.239$). For resource-constrained MSMEs, this pathway suggests that customer and market information obtained through social media may support clearer identification of customer groups, more relevant value propositions, and more focused allocation of marketing resources. This interpretation is consistent with evidence that social media can function as a segmentation tool by providing information about heterogeneous customer characteristics, preferences, and behavioural patterns (Serrano-Malebrán et al., 2023).

Innovation Management also significantly mediated the relationship between Social Media Marketing and Business Sustainability ($\beta = 0.154$). This finding supports a separate innovation pathway in which customer and market information obtained through social media may be associated with improvements in products, services, processes, and marketing practices. Previous research has similarly linked innovation capability with SME sustainability, performance, and the effective use of digital resources (Heenkenda et al., 2022; Hoang et al., 2025; Zhang et al., 2022). The model does not establish that Segmentation Strategy precedes, enables, or strengthens Innovation Management; rather, the two mediators operate as distinct parallel mechanisms.

Because the direct association between Social Media Marketing and Business Sustainability remained significant while both specific indirect associations were positive and significant in the same direction, the overall mediation pattern is consistent with complementary partial mediation. The observed indirect association through Segmentation

Strategy was numerically larger than that through Innovation Management, but this difference should not be interpreted as statistical superiority because no formal bootstrap contrast or pairwise coefficient-difference test was conducted.

Overall, the findings refine rather than extend the core assumptions of RBV. The study contributes by clarifying the resource-capability conversion mechanism through a distinction among widely accessible social media platforms, Social Media Marketing as a valuable digital-organizational resource, customer knowledge as a knowledge resource, and Segmentation Strategy and Innovation Management as distinct but complementary organizational capabilities. This interpretation remains consistent with the original RBV proposition that strategic outcomes depend on how firms organize and deploy resources rather than merely possess them (Barney, 1991), while refining its empirical specification in digitally active MSMEs through parallel capability pathways (Borah et al., 2022; Estensoro et al., 2022).

This study does not extend the core assumptions of the Resource-Based View (RBV); rather, it provides a mechanism-level refinement by clarifying how digital-organizational resources are associated with Business Sustainability. Specifically, the study distinguishes Social Media Marketing as a valuable digital-organizational resource, customer knowledge as a knowledge resource, and Segmentation Strategy and Innovation Management as distinct but complementary organizational capabilities. This distinction is consistent with the foundational RBV proposition that strategic value depends on the effective organization and deployment of firm resources (Barney, 1991) and with more recent research emphasizing the importance of combining digital resources with organizational capabilities in SMEs (Borah et al., 2022; Estensoro et al., 2022).

The theoretical contribution therefore lies in conceptual clarification and mechanism specification within RBV rather than in proposing a new theoretical assumption. The findings support the established proposition that organizational resources are associated with value when effectively deployed through relevant capabilities, while specifying how this process appears in digitally active MSMEs. In particular, the model identifies two parallel capability pathways through which Social Media Marketing is associated with Business Sustainability, consistent with studies emphasizing innovation capability, digital capability, and knowledge integration as mechanisms linking digitalization with SME outcomes (Cadden et al., 2023; Hoang et al., 2025; Wang & Zhang, 2025).

Segmentation Strategy and Innovation Management should therefore be interpreted as distinct but complementary capabilities within the same resource-capability framework rather than as sequential capabilities. Their complementarity refers to their separate contributions to the association between Social Media Marketing and Business Sustainability. Because the model does not test a causal relationship or

dependency between the two mediators, no sequential ordering is inferred from the findings.

The findings indicate that MSMEs should move beyond using social media primarily as a promotional channel and instead treat it as a source of actionable market intelligence. Managers can extract value from interaction patterns, content responses, product inquiries, complaints, purchase behaviour, customer location, and recurring expressions of need. These signals can then be translated into clearer customer segments and used to guide targeting, communication, product positioning, and the allocation of limited marketing resources. This recommendation is consistent with evidence that social media can support market segmentation and provide SMEs with strategically useful customer information (Ghazwani & Alzahrani, 2024; Serrano-Malebrán et al., 2023).

The managerial value of social-media information also depends on whether firms translate it into structured innovation routines. MSMEs can adopt low-cost practices such as recording customer feedback, identifying recurring problems, ranking improvement ideas according to frequency and potential impact, testing selected changes on a small scale, and evaluating customer responses before wider implementation. Such routines are particularly relevant to resource-constrained MSMEs because innovation does not necessarily require large formal R&D investments; it can also emerge through systematic use of customer knowledge and incremental organizational learning (Cadden et al., 2023; Heenkenda et al., 2022; Zhang et al., 2022).

From a broader support perspective, government agencies, business incubators, universities, and MSME-development programs should not focus exclusively on digital-adoption training. Capacity-building initiatives should also strengthen firms' abilities to interpret customer data, identify meaningful market segments, and translate digital information into practical innovation decisions. This approach is consistent with evidence that digital transformation is most valuable when technological adoption is integrated with organizational processes and capabilities (Kraus et al., 2022; Machado et al., 2024; Wang & Zhang, 2025).

A further managerial implication is that digital capability development should be understood as a sequence of managerial tasks rather than as platform adoption alone. MSMEs need to collect relevant information, interpret it, identify priorities, test market responses, and learn from outcomes. This capability-building logic is particularly important for firms with limited financial and human resources because it emphasizes disciplined use of existing digital information rather than additional technological investment (Abid et al., 2024; Estensoro et al., 2022).

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional and self-reported design does not establish temporal ordering or causality. Although the hypothesized relationships are theoretically grounded in RBV, the

empirical results should be interpreted as associations rather than causal effects. Reverse causality remains plausible because MSMEs with stronger sustainability outcomes or more developed organizational capabilities may also be more likely to invest in Social Media Marketing, customer segmentation, and innovation-related activities. Future research should therefore employ longitudinal, panel, or experimental designs to examine temporal sequencing and provide stronger evidence regarding causal direction.

Second, the study relies primarily on perceptual measures reported by owners or managers. Although such measures are useful for capturing managerial assessments of organizational capabilities, single-source and self-reported data may be susceptible to common-method bias, recall limitations, and subjective interpretation (Podsakoff et al., 2012). Future studies should therefore combine perceptual indicators with objective or archival measures such as sales growth, customer retention, innovation outcomes, market expansion, productivity, and financial performance. Multi-source data from customers, employees, digital-platform analytics, or transaction records could further strengthen measurement robustness.

Third, the empirical context limits the generalizability of the findings. The sample consists primarily of digitally active micro and small MSMEs in Greater Jakarta, and the results may not fully represent firms operating in other regions, industries, business sizes, or stages of digital maturity. Future research should explicitly incorporate sector, business age, number of employees, managerial position, and principal social-media platform and investigate whether structural relationships differ across organizational and technological contexts.

Fourth, the measurement refinement improved discriminant validity but narrowed the empirical content of several constructs. The removal of selected indicators means that the final operationalization may not capture the full breadth of the original multidimensional domains. Future research should therefore reassess Business Sustainability, Segmentation Strategy, and Innovation Management using theoretically justified higher-order, formative, or hierarchical component specifications where appropriate. Such work would strengthen alignment between conceptual definitions and empirical measurement.

Finally, this study models Segmentation Strategy and Innovation Management as distinct parallel mediators. Future studies may examine theoretically justified sequential or conditional relationships, including whether segmentation capability facilitates innovation decisions or whether innovation capability strengthens the effectiveness of segmentation. Other organizational capabilities, including dynamic capabilities, digital analytics capability, customer-relationship capability, and organizational learning, could also be incorporated. Prior research on dynamic capabilities and digital transformation provides a useful basis for developing these extensions (Basit et al., 2024; Soluk, 2023).

CONCLUSION

This study examined how Social Media Marketing is associated with Business Sustainability through the parallel mediating roles of Segmentation Strategy and Innovation Management among digitally active MSMEs. The findings show that Social Media Marketing is positively associated with Business Sustainability, Segmentation Strategy, and Innovation Management, while both organizational capabilities are also positively associated with Business Sustainability. Together, the model explains 59.7% of the variance in Business Sustainability, indicating meaningful explanatory power within the empirical context examined.

The mediation results provide further insight into the mechanism underlying these relationships. Both Segmentation Strategy and Innovation Management significantly mediate the association between Social Media Marketing and Business Sustainability, while the direct relationship remains statistically significant. This pattern is consistent with complementary partial mediation and indicates two distinct parallel capability pathways. Although the observed indirect association through Segmentation Strategy was numerically larger than that through Innovation Management, the study does not infer statistical superiority because no formal comparison between the indirect effects was conducted.

From an RBV perspective, the study contributes through mechanism-level refinement rather than theoretical extension. It distinguishes widely accessible social media platforms from Social Media Marketing as a valuable digital-organizational resource, customer knowledge as a knowledge resource, and Segmentation Strategy and Innovation Management as distinct but complementary organizational capabilities. In doing so, the study clarifies how digital-organizational resources are associated with Business Sustainability through separate capability pathways rather than through digital-platform access alone.

These findings should be interpreted within the boundaries of the research design. Because the data are cross-sectional and self-reported, the results establish associations rather than causal relationships, and reverse causality cannot be ruled out. The conclusions are therefore most applicable to digitally active MSMEs in Greater Jakarta. Within these boundaries, the study highlights that the strategic relevance of social media lies not merely in digital presence, but in how customer and market information is organized and used through segmentation and innovation capabilities to support long-term business continuity.

REFERENCES

- Abid, N., Ceci, F., & Aftab, J. (2024). Attaining sustainable business performance under resource constraints: Insights from an emerging economy. *Sustainable Development*, 32(3), 2031-2048. <https://doi.org/10.1002/sd.2763>
- Alghamdi, O. A. (2024). Exploring the link between social media adoption and Saudi Arabia SMEs' sustainable performance: The moderating

- role of COVID-19. *SAGE Open*, 14(4). <https://doi.org/10.1177/21582440241293043>
- Ali Abbasi, G., Abdul Rahim, N. F., Wu, H., Iranmanesh, M., & Keong, B. N. C. (2022). Determinants of SMEs' social media marketing adoption: Competitive industry as a moderator. *SAGE Open*, 12(1). <https://doi.org/10.1177/21582440211067220>
- Alojail, M., & Khan, S. B. (2023). Impact of digital transformation on sustainable development. *Sustainability*, 15(20), 14697. <https://doi.org/10.3390/su152014697>
- Amoah, J., Bruce, E., Shurong, Z., Egala, S. B., & Kwarteng, K. (2023). Social media adoption in SMEs' sustainability: Evidence from an emerging economy. *Cogent Business & Management*, 10(1), 2183573. <https://doi.org/10.1080/23311975.2023.2183573>
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120. <https://doi.org/10.1177/014920639101700108>
- Basit, A., Javed, A., Ejaz, S., Nasir, A., Ridwan, A. R., & Ahmed, S. (2024). Social media usage and sustainable performance in manufacturing supply chains: Exploring dynamic capabilities. *Discover Sustainability*, 5(1). <https://doi.org/10.1007/s43621-024-00348-6>
- Bhatti, S. H., Rashid, M., Arslan, A., Tarba, S., & Liu, Y. (2023). Servitized SMEs' performance and the influences of sustainable procurement, packaging, and distribution: The mediating role of eco-innovation. *Technovation*, 127, 102831. <https://doi.org/10.1016/j.technovation.2023.102831>
- Borah, P. S., Iqbal, S., & Akhtar, S. (2022). Linking social media usage and SMEs' sustainable performance: The role of digital leadership and innovation capabilities. *Technology in Society*, 68, 101900. <https://doi.org/10.1016/j.techsoc.2022.101900>
- Bruce, E., Keelson, S., Amoah, J., & Egala, S. B. (2023). Social media integration: An opportunity for SMEs' sustainability. *Cogent Business & Management*, 10(1), 2173859. <https://doi.org/10.1080/23311975.2023.2173859>
- Cadden, T., Weerawardena, J., Cao, G., Duan, Y., & McIvor, R. (2023). Examining the role of big data and marketing analytics in SMEs' innovation and competitive advantage: A knowledge integration perspective. *Journal of Business Research*, 168, 114225. <https://doi.org/10.1016/j.jbusres.2023.114225>
- Calderon-Monge, E., & Ribeiro-Soriano, D. (2024). The role of digitalization in business and management: A systematic literature review. *Review of Managerial Science*, 18(2), 449-491. <https://doi.org/10.1007/s11846-023-00647-8>
- Chen, G., Sabir, A., Rasheed, M. F., Belascu, L., & Su, C. W. (2024). Green marketing horizon: Industry sustainability through marketing and innovation. *Journal of Innovation & Knowledge*, 9(4), 100606. <https://doi.org/10.1016/j.jik.2024.100606>

- Costa Melo, I., Alves Junior, P. N., Queiroz, G. A., Yushimito, W., & Pereira, J. (2023). Do we consider sustainability when we measure small and medium enterprises' performance passing through digital transformation? *Sustainability*, 15(6), 4917. <https://doi.org/10.3390/su15064917>
- Estensoro, M., Larrea, M., Müller, J. M., & Sisti, E. (2022). A resource-based view on SMEs regarding the transition to more sophisticated stages of Industry 4.0. *European Management Journal*, 40(5), 778–792. <https://doi.org/10.1016/j.emj.2021.10.001>
- Fu, C. J., Silalahi, A. D. K., Yang, L. W., & Eunike, I. J. (2024). Advancing SME performance: A novel application of the technological-organizational-environment framework in social media marketing adoption. *Cogent Business & Management*, 11(1). <https://doi.org/10.1080/23311975.2024.2360509>
- Gao, J., Siddik, A. B., Khawar Abbas, S., Hamayun, M., Masukujjaman, M., & Alam, S. S. (2023). Impact of e-commerce and digital marketing adoption on the financial and sustainability performance of MSMEs during the COVID-19 pandemic: An empirical study. *Sustainability*, 15(2), 1594. <https://doi.org/10.3390/su15021594>
- Ghazwani, S. S., & Alzahrani, S. (2024). The use of social media platforms for competitive information and knowledge sharing and its effect on SMEs' profitability and growth through innovation. *Sustainability*, 16(1), 106. <https://doi.org/10.3390/su16010106>
- Guandalini, I. (2022). Sustainability through digital transformation: A systematic literature review for research guidance. *Journal of Business Research*, 148, 456–471. <https://doi.org/10.1016/j.jbusres.2022.05.003>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modelling (PLS-SEM)*. Sage.
- Haque, R., Senathirajah, A. R. B. S., Khalil, M. I., Qazi, S. Z., & Ahmed, S. (2024). A structural path analysis of Bangladeshi SMEs' sustainability through social media marketing. *Sustainability*, 16(13), 5433. <https://doi.org/10.3390/su16135433>
- Heenkenda, H. M. J. C. B., Xu, F., Kulathunga, K. M. M. C. B., & Senevirathne, W. A. R. (2022). The role of innovation capability in enhancing sustainability in SMEs: An emerging economy perspective. *Sustainability*, 14(17), 10832. <https://doi.org/10.3390/su141710832>
- Hoang, D. V., Hien, N. T., Thang, H. V., Phuong, P. N. T., & Duong, T. T.-T. (2025). Digital capabilities and sustainable competitive advantages: The case of emerging market manufacturing SMEs. *SAGE Open*, 15(2). <https://doi.org/10.1177/21582440251329967>
- Jaaffar, A. H., Abd Majid, N., Kasavan, S., Isa, A., Alwi, M. N. R., & Zahari, A. R. (2024). The effect of innovative mindset and behaviour on innovation performance and competitive advantage: A case of halal SMEs owner-managers from the Malaysian energy-intensive

- industry. *Journal of Innovation and Entrepreneurship*, 13(1). <https://doi.org/10.1186/s13731-023-00359-z>
- Kakar, R. A., Shahzad, S., & Babar, A. M. (2023). The impact of social media marketing dimensions: Interaction, entertainment, customization, trendiness, and word of mouth on purchase intention with the mediating role of brand image and brand trust for smartphone users in Quetta City. *International Journal of Contemporary Issues in Social Sciences*, 2(4), 1249–1261.
- Kitunen, A., Rundle-Thiele, S., Carins, J., & Deshpande, S. (2023). Can motivation, opportunity and ability theory informed segments be validated in the Australian Defence Force? *Social Marketing Quarterly*, 29(2), 127–144. <https://doi.org/10.1177/15245004231173194>
- Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital transformation in business and management research: An overview of the current status quo. *International Journal of Information Management*, 63, 102466. <https://doi.org/10.1016/j.ijinfomgt.2021.102466>
- Laradi, S., Elfekair, A., Alrawad, M., Hashim, M., & Derouez, F. (2024). Leveraging the capabilities of social media marketing for business success. *Computers in Human Behaviour Reports*, 16, 100524. <https://doi.org/10.1016/j.chbr.2024.100524>
- Machado, E. A., Scavarda, L. F., Caiado, R. G. G., & Santos, R. S. (2024). Industry 4.0 and sustainability integration in the supply chains of micro, small, and medium enterprises through people, process, and technology within the triple bottom line perspective. *Sustainability*, 16(3), 1141. <https://doi.org/10.3390/su16031141>
- Marolt, M., Zimmermann, H.-D., & Pucihar, A. (2022). Social media use and business performance in SMEs: The mediating roles of relational social commerce capability and competitive advantage. *Sustainability*, 14(22), 15029. <https://doi.org/10.3390/su142215029>
- Marzuki, M., & Imaningsih, E. S. (2026). Customer satisfaction and loyalty in fast-food MSMEs influenced by CSR, social media, and perceived value. *Journal of Sustainable Economic and Business*, 3(2), 279–293. <https://doi.org/10.70550/joseb.v3i2.390>
- Munandar, J. M., Cahyadi, E. R., & Andrianto, M. S. (2025). The impacts of business sustainability factors on competitiveness and marketing performance: An exploratory approach to the case of Indonesian micro-, small, and medium enterprises. *Sustainability*, 17(10), 4593. <https://doi.org/10.3390/su17104593>
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63, 539–569.
- Qalati, S. A., Ostic, D., Sulaiman, M. A. B. A., Gopang, A. A., & Khan, A. (2022). Social media and SMEs' performance in developing countries: Effects of technological-organizational-environmental

- factors on the adoption of social media. *SAGE Open*, 12(2). <https://doi.org/10.1177/21582440221094594>
- Ramli, Y. (2020). The implication of innovation management against unique resources to enhance the business performance of small and medium enterprises (SME) in Pasar Tanah Abang, Jakarta, Indonesia. *European Journal of Business and Management Research*, 5(4). <https://doi.org/10.24018/ejbmr.2020.5.4.448>
- Serrano-Malebrán, J., Arenas-Gaitán, J., & Sanz-Altamira, B. (2023). Social media marketing as a segmentation tool. *Sustainability*, 15(4), 3288. <https://doi.org/10.3390/su15043288>
- Sharabati, A.-A. A., Ali, A. A. A., Allahham, M. I., Hussein, A. A., Alheet, A. F., & Mohammad, A. S. (2024). The impact of digital marketing on the performance of SMEs: An analytical study in light of modern digital transformations. *Sustainability*, 16(19), 8667. <https://doi.org/10.3390/su16198667>
- Soluk, J. (2023). Small steps for the big hit: A dynamic capabilities perspective on business networks and SME competitive advantage. *Technological Forecasting and Social Change*, 194, 122490. <https://doi.org/10.1016/j.techfore.2023.122490>
- Tarigan, E. S., Muharam, H., & Mawardi, W. (2026). Assessing the moderating role of intellectual capital on the relationship between natural disasters, enterprise risk management, and performance in Indonesian MSMEs. *Tec Empresarial*, 21(1), 795-812.
- Wang, S., & Zhang, H. (2025). Enhancing SMEs' sustainable innovation and performance through digital transformation: Insights from strategic technology, organizational dynamics, and environmental adaptation. *Socio-Economic Planning Sciences*, 98, 102124. <https://doi.org/10.1016/j.seps.2024.102124>
- Yu, J., Pauleen, D. J., Taskin, N., & Jafarzadeh, H. (2022). Building social media-based knowledge ecosystems for enhancing business resilience through mass collaboration. *International Journal of Organizational Analysis*, 30(5), 1063–1084. <https://doi.org/10.1108/IJOA-12-2020-2542>
- Zhang, Z., Zhu, H., Zhou, Z., & Zou, K. (2022). How does innovation matter for sustainable performance? Evidence from small and medium-sized enterprises. *Journal of Business Research*, 153, 251–265. <https://doi.org/10.1016/j.jbusres.2022.08.034>