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Strategic capabilities in management system on competitive advantage and its impact on fisheries small and medium enterprises' (SMEs) performance in Indonesia

Abstract

Research background and purpose: The fisheries SMEs sector in Indonesia, particularly on the island of Java is currently facing critical challenges stemming from limited digital adoption, weak networking capabilities, and inefficient supply chain practices. The current research focuses on understanding the impact of digital marketing innovation, network capabilities, and supply chain management systems on the competitive advantage and performance of SMEs fisheries sector. The aim of this research is to analyze the effect of strategic capabilities in SMEs performance.

Design/methodology/approach: A quantitative research design was employed using structured questionnaires distributed to 398 fishery SMEs across the island of Java, Indonesia. The study sample utilized a stratified random sampling method to ensure proportional representation across all provinces and business categories. Data were analyzed using SEM-PLS.

Findings: The research results that networking capability exerts the strongest influence on competitive advantage ($\beta = 0.42$; $p < 0.001$), followed by supply chain management systems ($\beta = 0.31$; $p < 0.01$), while digital marketing innovation demonstrates a weaker yet significant influence ($\beta = 0.18$; $p < 0.05$). Competitive advantage significantly predicts SMEs performance ($\beta = 0.47$; $p < 0.001$). Furthermore, regarding mediation, the findings confirm that competitive advantage partially mediates all three of these relationships. The model demonstrates substantial explanatory power, with R^2 value of 0.61 for competitive advantage and $R^2 = 0.73$ for SMEs performance.

Value added and limitations: This study has several limitations, the sample of 398 SMEs may not be representative of the entire fisheries sector in Indonesia. The focus of this research only at Java Island limits the generalizability of the findings to other regions.

Keywords: *digital marketing innovation, networking capability, supply chain management system, competitive advantage, SMEs fisheries performance*

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Classification: O32, M14, M20, M51, O12, O31

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1. Introduction

In advancing the blue economy, one of them is through digital transformation, especially sustainable improvement in the fisheries sector through innovation, supply chain efficiency, and the competitiveness of SMEs. Digital Twin of the Ocean's digital transformation facilitates real-time monitoring and decision-making, digital integration with the coordination of economic growth and ecological preservation (Chai et al., 2026). European study states the impact of sustainable marine resource performance through improved e-commerce and digital public services (Ha, 2024). In addition, the significance of ecosystem innovation causes a relationship between global competitiveness factors and fisheries sustainability, especially in developing countries (Alsaleh et al., 2024). In China, digitalization has been proven to accelerate sustainable development in the fisheries sector (Ji & Li, 2024). Overall, innovation can be an important driver in the sustainability of the blue economy, although there are some obstacles (Elston et al., 2024).

As the largest maritime country, Indonesia, has significant growth potential in the fisheries sector, especially through small-scale fisheries (SSF), which contributes greatly to the local economy and food security. The national fishery production is projected to increase from 2019 to 2024, strengthening SMEs that function as the economic backbone for coastal communities (Basurto et al., 2025) (Canty & Deichmann, 2022). In developing countries such as Indonesia, SSF accounts for about 40% of global fish catches (Basurto et al., 2025). However, the challenge is that it requires effective governance and management strategies to protect marine resources (Soeparna & Taofiqurohman, 2024). Such as the use of environmentally friendly fishing gear which shows that the growth of the fisheries sector is in line with environmental goals (Yulisti et al., 2024).

The fisheries sector is a key pillar of the Indonesian national economy, contributing not only to food security but also to job creation and the growth of fisheries SMEs in Indonesia. National fisheries production data from 2019 to 2024 shows a relatively stable growth trend despite various external challenges, such as climate fluctuations, and changes in marine resource management regulations. Total fisheries production volume increased from 22,760,946.74 tons in 2019 to 23,566,113.79 tons in 2024, reflecting cumulative growth of 3.54% over the six-year period. The average annual growth rate (Compound Annual Growth Rate) can be calculated at approximately 0.69%, indicating the sector's resilience to external disruptions.

Fisheries SMEs in Central Indonesia face structural challenges that hinder their competitive advantage and business performance, mainly due to low digital marketing capabilities, weak networks, and sub-optimal supply chain management. Research shows that many SMEs struggle with resource constraints that limit technology adoption

even though increased digital entrepreneurship marketing can significantly improve marketing performance (Nurbasari et al., 2025). Digital transformation strategies are needed to foster resilience and adaptability in a rapidly changing market environment (Sagala & Öri, 2025). Integrating a strong supply chain management strategy with a company's digital competencies can affect operational excellence, as these elements directly affect performance outcomes (Umari Abdurrahim Abi Anwar et al., 2024). In addition, the development of market-based dynamic capabilities is essential for SMEs to thrive in a competitive sector (Tarihoran et al., 2023). Finally, the digital marketing utilization index in Indonesia has medium-level digital marketing capabilities, which shows the need to increase managerial innovation and digital transformation efforts (Masrianto et al., 2022).

It is seen that the integration of innovation in digital marketing, business networking, and supply chain management has a significant influence on small and medium-sized enterprises (SMEs) in improving their competitive advantage and performance, as seen through resource-based views (RBV) and dynamic capability theory (DCT). Research shows that SMEs will achieve sustainable market gains by leveraging innovative marketing practices and dynamic capabilities, such as product design and digital orientation (Quaye & Mensah, 2019a; Escoc Barragan & Becker, 2025). Furthermore, optimizing performance results requires the interaction between digitalization, environmental policies, and innovation (Hernan Ramirez et al., 2026), the importance of integrating digital platforms and network capabilities for the development of data analysis capabilities (Bhatti et al., 2025). Collectively, for defense and sustainable growth in a competitive landscape, a priority of resource integration is required (Rodrigues et al., 2021).

Networking capabilities are crucial for SMEs to build strong relationships with stakeholders, access essential resources, and drive innovation and internationalization efforts. Yet many fisheries SMEs struggle due to limited access to communication technologies, insufficient knowledge of networking strategies, and inadequate institutional support (Karami & Tang, 2019). Furthermore, ineffective supply chain management reduces operational efficiency, product quality, and responsiveness to market dynamics. The COVID-19 pandemic has also exposed the vulnerability of these SMEs to external shocks, emphasizing the need to enhance their resilience and adaptability (Syamsari et al., 2022; Nazry & Mapjabil, 2021).

Addressing these challenges requires an integrated strategic approach focusing on improving access to technology, digital marketing capabilities, networking skills, supply chain management, financial support, entrepreneurial competencies, and regulatory simplification (Endris & Kassegn, 2022). By enhancing these areas, fisheries SMEs in Indonesia can strengthen their competitiveness, sustain growth, and contribute more effectively to the economy (Namotemo et al., 2021).

Furthermore, international comparative studies examining similar relationships in fisheries sectors across different developing countries (e.g. Vietnam, Thailand, Philippines, Ghana, Nigeria) remain scarce, creating a significant gap in understanding how contextual factors influence the effectiveness of strategic capabilities (Marcano Nieves et al., 2025; Tukamuhabwa et al., 2023).

2. Literature review and hypothesis

This research is based on the theoretical frameworks of the Resource-Based View (RBV) and Dynamic Capability Theory (DCT). According to the RBV, a company's competitive advantage stems from resources and capabilities that are valuable, rare, difficult to imitate, and non-substitutable. Meanwhile, DCT emphasizes a company's ability to integrate, build, and reconfigure internal and external competencies to address rapid environmental change. Based on these two frameworks and a comprehensive literature review, this study develops hypotheses that examine the role of digital marketing innovation, networking capabilities, and supply chain management systems on the competitive advantage and performance of SMEs in the fisheries sector.

Digital marketing innovation includes the adoption of digital technology, the quality of digital content, customer interaction through online platforms, the use of data analytics, and the development of innovative marketing strategies. Various empirical studies have shown that digital marketing innovation can increase competitive advantage by expanding market reach, reducing marketing costs, and improving personalized customer service (Leão & da Silva, 2021; Okorie et al., 2023; Quaye & Mensah, 2019). However, in the fisheries sector, which still faces a significant digital divide, the impact of this innovation on competitive advantage still needs to be empirically tested. Therefore, the following hypothesis is formulated:

H1: Digital Marketing Innovation has a positive and significant impact on Competitive Advantage.

Networking capability is a dynamic capability that encompasses building and maintaining relationships with suppliers, customers, government agencies, industry associations, and collaboration among SMEs. Previous research consistently finds that strong networking capabilities enable SMEs to access resources, market information, technical knowledge, and collaboration opportunities that are difficult to obtain individually (Karami et al., 2023; L. L. Wang & Gao, 2021; Marcano Nieves et al., 2025). In the context of the fisheries industry, which relies heavily on complex value chains, networking capabilities are a critical factor in building competitive advantage. Therefore:

H2: Networking Capability has a positive and significant effect on Competitive Advantage.

Supply chain management systems (SCM) encompass raw material procurement, production process efficiency, logistics distribution, and customer demand management. Empirical studies show that good SCM practices can improve operational efficiency, product quality, and responsiveness to market changes, ultimately creating a sustainable competitive advantage (Sanaei et al., 2023; Tukamuhabwa et al., 2023; Erdebilli & Sıcakyüz, 2024). Thus:

H3: Supply Chain Management System has a positive and significant effect on Competitive Advantage.

Adopting digital marketing innovations not only impacts competitive advantage but also has the potential to improve SME performance through increased sales volume, operational cost efficiency, and customer loyalty (Masrianto et al., 2022; Usai et al., 2021). However, the effectiveness of digital marketing is highly dependent on the level of organizational readiness, the availability of technological infrastructure, and the digital literacy of business actors (Räisänen & Tuovinen, 2020; Thompson & Rust, 2023). Therefore:

H4: Digital Marketing Innovation has a positive and significant impact on Fisheries SME Performance.

Networking capabilities enable fisheries SMEs to access the latest market information, the latest technology, financing sources, and various new business opportunities that can improve the company's financial and operational performance (Dhameria et al., 2021; Prashantham et al., 2020; Rodrigues et al., 2021). Therefore:

H5: Networking Capability has a positive and significant impact on Fisheries SME Performance.

Supply chain efficiency directly impacts SME performance by reducing operational costs, improving the quality and freshness of fishery products, and increasing customer satisfaction (Lu et al., 2021; Oyeyemi et al., 2023; Ugrinov et al., 2024). Therefore:

H6: Supply Chain Management Systems have a positive and significant effect on SME Fisheries Performance.

SMEs' competitive advantage enables them to survive, grow, and excel in increasingly fierce market competition, ultimately improving overall business performance (Gao et al., 2023; Hernan Ramirez et al., 2026; Setyowarni & Prihatiningtyas, 2022). Therefore:

H7: Competitive Advantage has a positive and significant effect on SME Fisheries Performance.

Based on the RBV and DCT perspectives, competitive advantage acts as a transmission mechanism (mediator) linking a company's strategic capabilities to business performance. Capabilities such as digital marketing innovation, networking capabilities, and supply chain management systems do not directly generate superior performance, but rather through the prior creation of competitive advantage (Alkhatib & Valeri, 2024; Rodrigues et al., 2021; H. Wang & Zhang, 2021). Therefore, this study formulates the following mediation hypotheses:

H8: Competitive Advantage mediates the relationship between Digital Marketing Innovation and SME Fisheries Performance.

H9: Competitive Advantage mediates the relationship between Networking Capability and SME Fisheries Performance.

H10: Competitive Advantage mediates the relationship between Supply Chain Management Systems and SME Fisheries Performance.

3. Methods

This study specifically focuses on small and medium enterprises (SMEs) in the fisheries sector located in Java Island. This is because Java island is the most advanced and developing island in Indonesia, both in terms of economy and infrastructure. In addition, the majority of fisheries SMEs in Indonesia operate in Java, making it the center of fisheries economic activities.

Data was collected through distributing questionnaires, surveys, and case studies from several SMEs on the island of Java which is the epicenter of all economic activities spread across Indonesia (Figure 1). The aim is to understand the challenges and opportunities faced and identify best practices that can be adopted by other SMEs fisheries in Indonesia.

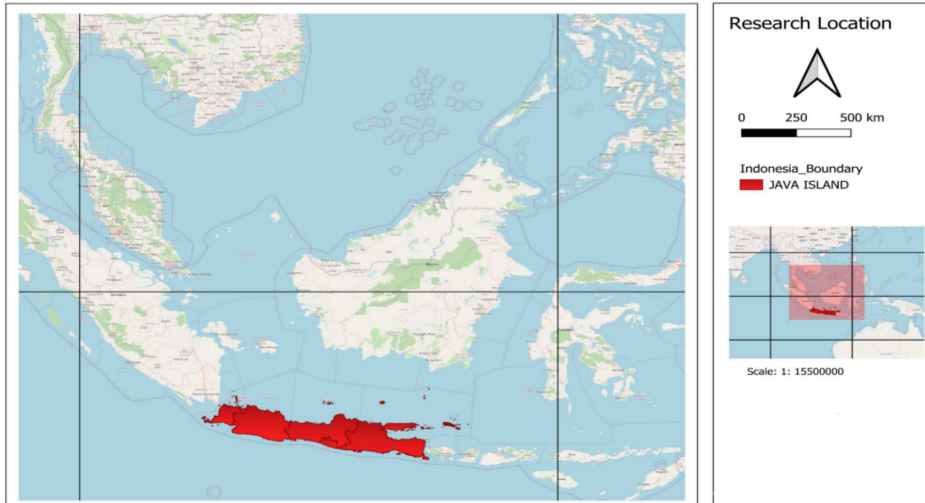


Figure 1. Location of the study area

Source: Author's processing using QGIS software, based on (OSM) basemap and Indonesian administrative boundary data (2025)

This study uses measurement analysis of data research, so this study uses quantitative. The time of this research ranged from July 2024 to 2025. The research population is the whole of the object or subject that has certain characteristics that are determined by the researcher to be studied and then drawn conclusions. In the context of this study, the research population includes all SMEs fisheries industry in Java island Indonesia which used digital for their operational such as website, e-commerce and mobile applications related to fisheries sector. The estimated population is $\pm 50,000$ SMEs. Samples were found 398 sample using the solvin technique, with a margin of error = 0.05. The study sample utilized a *stratified random sampling* method to ensure proportional representation across all provinces and business categories.

The data collection technique used in this study is questionnaire. The measurement scale used is a Likert scale of 1-5. The independent variables (X) in this study are Digital Marketing Innovation (X1); Networking Capability (X2); Supply Chain Management System (X3). And the dependent variable in this study is the performance of SMEs (Y). Meanwhile, the mediation variable in this study is Competitive Advantage (Z). Details on each variable and indicator are as follows (Table 1).

Table 1. Research variables and indicators

Variables	Dimension	Indicators	Sources
Digital Marketing Innovation (X1)	Adoption of digital technology	a. Use website, APP or e-commerce platforms for selling fishery products. b. Percentage of social media usage (Facebook, Instagram, Youtube, X) for product promotion. c. Implementation of a digital customer management system (CRM).	El-Haddadeh (2020)
	Digital content quality	a. Number and quality of social media posts (images, videos, infographics). b. Frequency of website content updates. c. Variety of content types used (articles, blogs, vlogs, podcasts). d. Assessment of attractive and informative product visuals and descriptions	Masrianto et al. (2022)
	Customer interaction and engagement	a. The level of interaction (likes, comments, shares) on social media. b. Number of customer reviews and ratings on website or e-commerce platforms. c. Timely response to customer inquiries and complaints through digital channels. d. Customer satisfaction level based on digital feedback	Guerola-Navarro et al. (2021)
	Use of data and analytics	a. Use of analytics tools (Google Analytics, Youtube, Instagram, Facebook Insights, etc.) to track digital marketing performance. b. Analyze sales data to identify customer trends and patterns in fishery. c. Measurement and analysis of <i>Return on Investment</i> (ROI) from digital campaigns	Bhatti et al. (2025)
	Innovation in marketing strategy	a. Applying <i>influencer</i> marketing to increase reach market. b. Use of paid ad campaigns on social media (Facebook Ads, Instagram Ads, Youtube, etc.)	Quaye & Mensah (2019)
Network Capabilities (x2)	Connections business and customers	a. Number of suppliers and customers working cooperation with SMEs. b. Frequency of communication with business stakeholders c. Trust and Sustainability of business relationships (supplier loyalty). d. Customer loyalty and satisfaction level (frequency of repurchases).	Karami, Wooliscroft & McNeill (2023)
	Relationship with institutional and industry associations	a. Participation in government programs or industry associations b. Sustainability of relationships with business support institutions (government or/and industry associations) c. Institutional support level towards business sustainability d. The level of activity in the association or community of the fisheries industry (liveliness)	Alsaleh et al. (2024)

Network Capabilities (x2)	Participation in business networking and industry associations	a. Number of other SMEs invited to cooperate. b. The level of activity in the association or community of the fisheries industry. c. Frequency of collaboration in co-marketing or promotional activities. d. Successful collaborative projects with other SMEs (e.g., increased sales or reduced costs).	Marcano Nieves et al. (2025)
	Institutional capacity development and training	a. Frequency in training activities or business development workshops. b. Participation in digital and managerial competency improvement programs. c. the implementation of the results of training in fisheries business activities. d. Institutional support for human resource capacity development.	Rodrigues et al. (2021)
	Networking of entrepreneurial learning and knowledge sharing	a. Frequency of knowledge sharing between SMEs fisheries b. Utilization of digital platforms for entrepreneurial learning and business marketing c. Access to fisheries business information and innovation d. Entrepreneurial learning collaboration through communities or digital media.	Shi et al. (2020)
Supply chain management system (X3)	Procurement of raw materials	a. Availability of Raw Materials b. Quality of Raw Materials c. Raw Material Prices. d. Relationship with Suppliers	Nurhayati et al. (2023)
	Production and processing	a. Production Process Efficiency b. Quality Control. c. Use of Technology	Umari Abdurrahim Abi Anwar et al. (2024)
	Distribution and logistics	a. Distribution Speed b. Availability of Transportation Facilities c. Safety products. d. Market Reach	Tukamuhabwa et al. (2023)
	Demand and customer management	a. Demand Prediction b. Customer Satisfaction c. Customer Service d. Customer Retention	Sanaei et al. (2023)

SMEs fisheries performance (Y)	Financial dimension	a. Revenue: Total sales of fishery products in a given period. b. Profitability: Net profit, profit margin, and return on assets ratio. c. Cash Flow: Cash inflows and outflows that reflect the liquidity of the business	Setyowarni & Prihatiningtyas (2022)
	Production and operational dimensions	a. Productivity: The amount of catch or production per business unit or per worker. b. Operational Efficiency: The ratio between inputs (such as fuel, labor) and outputs (production output)). c. Product Quality: The level of customer satisfaction with the product, the rate of product damage or rejection	Tarihoran et al. (2023)
	Market and customer dimensions	a. Customer Satisfaction: Customer satisfaction surveys, product return rates, customer reviews and feedback. b. Market Share: The proportion of the market controlled by SMEs compared to competitors c. Customer Loyalty: Customer retention rate, frequency of repurchases.	Oyeyemi et al. (2023)
	Innovation and technology dimensions	a. Product Development: Number of new products introduced, investment in R&D. b. Technology Adoption: The use of new technologies in production or management, such as catching or processing technologies. c. Training and Development: The amount of training attended by employees, the improvement of skills and technical knowledge	Usai et al. (2021)
Competitive Advantage (Z)	Product and process innovation	a. The rate of adoption of new technologies in the production process. b. Number of new products launched in a given period. c. The level of customer satisfaction with product innovation	Gao et al. (2023)
	Human Resource Management and skills	a. HR skill level in operational management. b. Structured employee training and development programs. c. Employee retention and job satisfaction rates	Setyowarni & Prihatiningtyas (2022)
	Access and management of fishery resources	a. Access to sustainable fisheries resources. b. Compliance with regulations and principles of sustainable fisheries management. c. Partnerships with relevant stakeholders	Soeparna & Taofiqurohman (2024)
	Marketing and distribution networks	a. Effectiveness of marketing strategies b. Cooperation with distribution channels c. Local market penetration rate and expansion into regional/ national/ international markets	Dhameria et al. (2021)
	Finance and risk management	a. Financial performance b. Structured risk management policies c. Ability to access external funding sources	Lu et al. (2021)

Source: own study

Data were analyzed using *Structural Equation Modeling–Partial Least Squares* (SEM-PLS) to examine the interrelationships whether direct, indirect, or mediated among the variables under investigation. It began by analyzing the evaluation of the measurement model (outer model) to test the validity and reliability of the research construct, with the criteria of outer loading value > 0.70 and AVE > 0.50 . Reliability tests were conducted using Cronbach's Alpha and Composite Reliability with a minimum recommended value of 0.70. The structural model test was carried out through the analysis of the values of R-Square (R^2), F-Square (f^2), and Q-Square (Q^2). In addition, hypothesis testing uses bootstrapping techniques to obtain t-statistics and p-values. In this study, the authors sought to analyze the relationships among digital marketing innovation (X1), networking capability (X2), and supply chain management systems (X3), as well as their impact on competitive advantage (Z) within the fishery SME sector, by hypothesizing that competitive advantage plays a mediating role in the relationship between the independent variables and SME performance (Y).

4. Results

4.1. SMEs actors in the fisheries sector

This study involved a total of 398 respondents who are micro, small, and medium enterprises (MSMEs) actors in the fisheries sector, distributed across the Java Island region, Indonesia. The characteristics examined include gender, age, education level of the owner or manager, and the province location where the business operates. This information is essential as contextual background to understand the dynamics of fisheries business actors and to assess the relevance of the research findings to real-world conditions.

Table 2. Characteristics of research respondents

Category	Subcategory	Frequency	Percentage
Gender	Male	328	82.4%
	Female	70	17.6%
Age	<25 years	10	2.5%
	25–34 years	40	10.1%
	35–44 years	158	39.7%
	45–54 years	166	41.7%
	≥ 55 years	24	6.0%

Education of owner/manager	Elementary to Junior High (SD–SMP)	20	5.0%
	Senior High/Vocational (SMA/SMK)	176	44.2%
	Diploma	52	13.1%
	Bachelor (S1)	122	30.7%
	Master/Doctorate (S2/S3)	28	7.0%
Province location	East Java	132	33.2%
	West Java	108	27.1%
	Central Java	92	23.1%
	Banten	28	7.0%
	Yogyakarta Special Region	20	5.0%
	DKI Jakarta	18	4.5%

Source: own study

4.2. Outer loading

The conceptual model presented summarized the factors affecting the performance of SMEs within the fisheries industry. To understand the interlinked nature of these components variable will further support opportunities for SMEs fishery sector, policymakers, and researchers to better contextualize points of attention and devise methods aimed at the development and sustainability of enterprises within the fisheries sector.

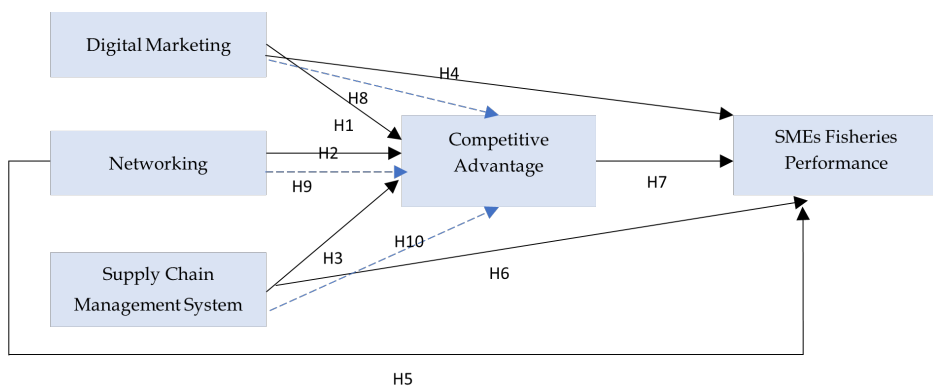
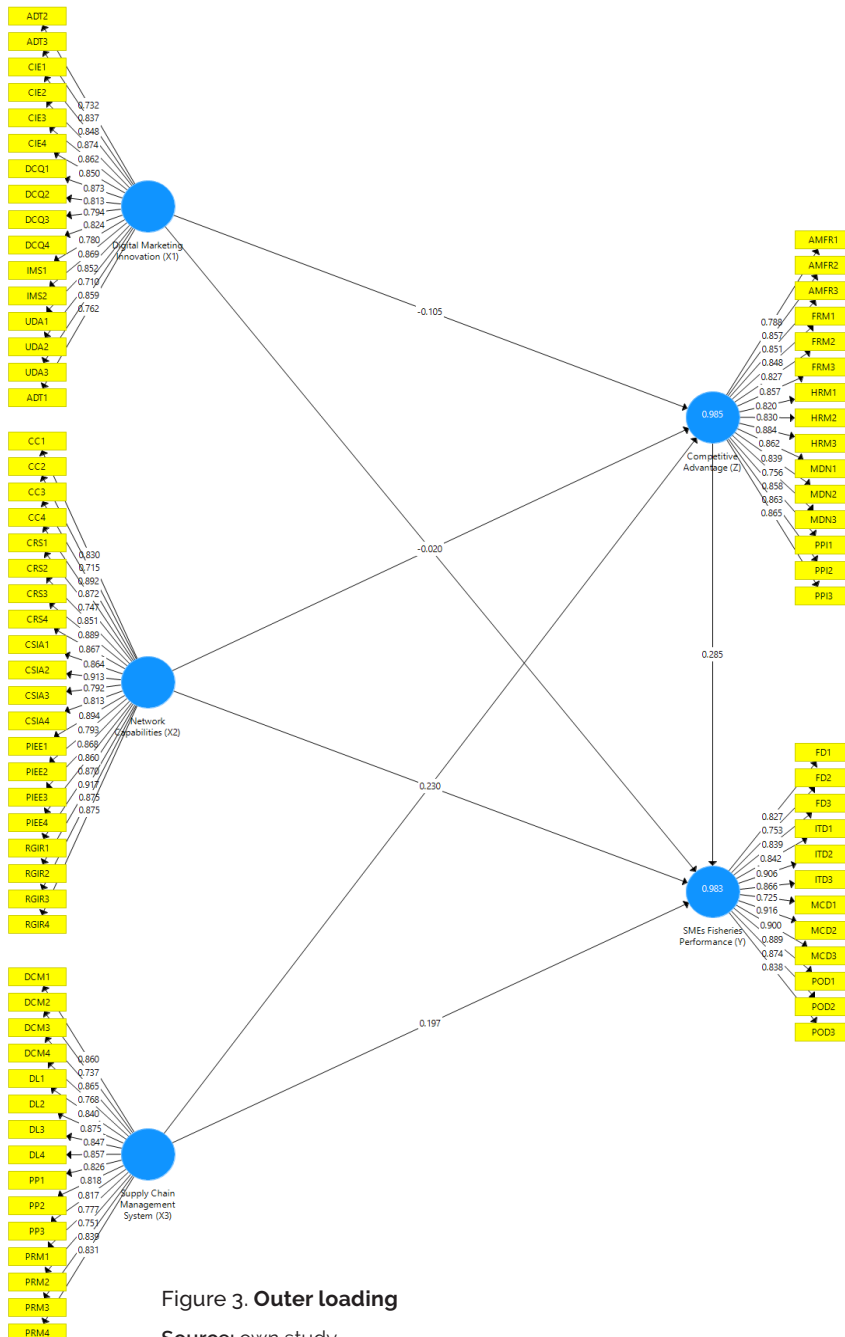


Figure 2. Research variable and hypothesis

Source: own study



Outer loading is a statistical measure indicating the strength of association that indicates how strong the correlation is between an indicator (an observed variable, such as a question item in a questionnaire) and a latent variable (a construct that cannot be measured directly). Simply put, outer loading measures the validity or accuracy of an indicator in measuring the construct attributed to it. The primary use of outer loading is to evaluate convergent validity, namely, the extent to which the indicators of a construct actually measure that construct. Based on the results of the analysis of the measurement model that has been conducted (Figure 3). Loading factor is an important indicator in testing convergent validity in the measurement model (outer model). The ideal loading factor value is ≥ 0.70 , indicating that the indicator has a strong contribution in measuring its construct. However, in the context of early exploratory research, loading factor values between 0.60 and 0.70 are still acceptable if other validity criteria such as AVE and reliability are met. The following table presents the loading factor values based on the modeling results in PLS.

4.3. Construct validity and reliability

Based on the test results, it is stated that the level of validity and reliability is so good that it is suitable for use in further structural model analysis. All variables are above 0.50, Cronbach's Alpha is above 0.90, rho_A values are above 0.90, Composite Reliability values exceed the threshold of 0.70, and Average Variance Extracted (AVE) values. Thus, all indicators in each construct are able to measure latent variables consistently and have strong convergent validity.

The Digital Marketing Innovation (X1) variable has a Cronbach's Alpha value of 0.968, rho_A of 0.970, Composite Reliability of 0.971, and AVE of 0.677. This shows that the digital marketing innovation construct has a very high level of internal consistency and is able to explain 67.7% of the variance of its forming indicators. The Networking Capability (X2) variable obtained Cronbach's Alpha value of 0.980, rho_A of 0.981, Composite Reliability of 0.981, and AVE of 0.725. This shows that network capabilities are a construct with a very strong level of reliability and have the ability to explain indicators of 72.5%, which is also the highest AVE value in this study.

Meanwhile, the Supply Chain Management System (X3) variable showed Cronbach's Alpha value of 0.965, rho_A of 0.967, Composite Reliability of 0.969, and AVE of 0.675. This shows that supply chain management systems have an excellent level of internal consistency and are valid in representing research constructs. The Competitive Advantage (Z) variable has a Cronbach's Alpha value of 0.970, rho_A of 0.971, Composite Reliability of 0.973, and AVE of 0.707. In addition, an R^2 value of 0.985 indicates that 98.5% of the variation in competitive advantage can be explained by independent variables in the research model, while a Q^2 value of 0.999 indicates a very high predictive relevance of the model.

In the SME Fisheries Performance (Y) variable, Cronbach's Alpha value was 0.964, rho_A 0.966, Composite Reliability was 0.969, and AVE was 0.722, which shows that the fishery MSME performance construct has very strong validity and reliability. An R² value of 0.983 indicates that 98.3% of the variation in the performance of fisheries MSMEs can be explained by predictive variables in the model, while a Q² value of 0.999 indicates that the research model has excellent predictive capabilities.

Table 3. **Validity and reliability**

Construct	Cronbach's Alpha	rho_A	Composite Reliability	AVE	R ²	Q ²
X1 (Digital Marketing Innovation)	0.968	0.970	0.971	0.677	–	–
X2 (Networking Capability)	0.980	0.981	0.981	0.725	–	–
X3 (Supply Chain Management System)	0.965	0.967	0.969	0.675	–	–
Z (Competitive Advantage)	0.970	0.971	0.973	0.707	0.985	0.999
Y(SMEs Fisheries Performance)	0.964	0.966	0.969	0.722	0.983	0.999

Source: own study

It can be concluded from the results of the construct validity and reliability test that all of the above constructs have met the criteria of convergent validity, internal reliability, and predictive relevance. Therefore, the research model is declared robust, reliable, and feasible to use for hypothesis testing and structural relationship analysis between research variables.

4.4. Estimate for path coefficients

The path significance test analysis in the structural model aims to determine whether the influence between variables is statistically significant. The T Statistic value is used to measure the strength of the influence, while the P Value shows the statistical significance level of the relationship. A relationship is considered significant if the P Value < 0.05, with a T table value ≥ 1.96 at a 5% significance level.

Table 4. Summary of direct effect testing results

Hypothesis	Relationship between variables	Beta coefficient	T-statistics	P-value	Result	Decision
H1	Digital Marketing Innovation (X1) → Competitive Advantage (Z)	-0.105	1.622	0.105	Not significant	Rejected
H2	Network Capabilities (X2) → Competitive Advantage (Z)	0.869	26.692	0.000	Significant positive effect	Accepted
H3	Supply Chain Management System (X3) → Competitive Advantage (Z)	0.230	3.875	0.000	Significant positive effect	Accepted
H4	Digital Marketing Innovation (X1) → SMEs Fisheries Performance (Y)	-0.020	0.350	0.726	Not significant	Rejected
H5	Network Capabilities (X2) → SMEs Fisheries Performance (Y)	0.534	7.238	0.000	Significant positive effect	Accepted
H6	Supply Chain Management System (X3) → SMEs Fisheries Performance (Y)	0.197	3.664	0.000	Significant positive effect	Accepted
H7	Competitive Advantage (Z) → SMEs Fisheries Performance (Y)	0.285	3.973	0.000	Significant positive effect	Accepted

Source: own study

The hypothesis testing results show that the P value of 0.105 > the standard alpha of 5% (0.105 > 0.05), and the Beta (Coefficient Estimate) of -0.105, as well as the T statistic value < T table (1.622 < 1.96), indicate no significant influence of Digital Marketing Innovation (X1) on Competitive Advantage (Z). The negative path coefficient indicates a negative influence of Digital Marketing Innovation (X1) on Competitive Advantage (Z). In other words, it can be concluded that Digital Marketing Innovation (X1) does not affect Competitive Advantage (Z), and Hypothesis 1 (H1) is rejected.

The hypothesis testing results show that the P value of 0.000 < the standard alpha of 5% (0.000 < 0.05), and the Beta (Coefficient Estimate) of 0.869, as well as the T statistic value > T table (26.692 > 1.96), indicate a significant influence of Network Capabilities (X2) on Competitive Advantage (Z). The positive path coefficient indicates a positive influence of Network Capabilities (X2) on Competitive Advantage (Z). In other words, Network Capabilities (X2) significantly affect Competitive Advantage (Z), and Hypothesis 2 (H2) is accepted.

The hypothesis testing results show that the P value of 0.000 < the standard alpha of 5% (0.000 < 0.05), and the Beta (Coefficient Estimate) of 0.230, as well as the T statistic value > T table (3.875 > 1.96), indicate a significant influence of Supply

Chain Management System (X3) on Competitive Advantage (Z). The positive path coefficient indicates a positive influence of Supply Chain Management System (X3) on Competitive Advantage (Z). In other words, Supply Chain Management System (X3) significantly affects Competitive Advantage (Z), and Hypothesis 3 (H3) is accepted.

The hypothesis testing results show that the P value of $0.726 >$ the standard alpha of 5% ($0.726 > 0.05$), and the Beta (Coefficient Estimate) of -0.020 , as well as the T statistic value $<$ T table ($0.350 < 1.96$), indicate no significant influence of Digital Marketing Innovation (X1) on SMEs Fisheries Performance (Y). The negative path coefficient indicates a negative influence of Digital Marketing Innovation (X1) on SMEs Fisheries Performance (Y). In other words, it can be concluded that Digital Marketing Innovation does not affect SMEs Fisheries Performance (Y), and Hypothesis 4 (H4) is rejected.

The hypothesis testing results show that the P value of $0.000 <$ the standard alpha of 5% ($0.000 < 0.05$), and the Beta (Coefficient Estimate) of 0.534 , as well as the T statistic value $>$ T table ($7.238 > 1.96$), indicate a significant influence of Network Capabilities (X2) on SMEs Fisheries Performance (Y). The positive path coefficient indicates a positive influence of Network Capabilities (X2) on SMEs Fisheries Performance (Y). In other words, Network Capabilities (X2) significantly affect SMEs Fisheries Performance (Y), and Hypothesis 5 (H5) is accepted.

The hypothesis testing results show that the P value of $0.000 <$ the standard alpha of 5% ($0.000 < 0.05$), and the Beta (Coefficient Estimate) of 0.197 , as well as the T statistic value $>$ T table ($3.664 > 1.96$), indicate a significant influence of Supply Chain Management System (X3) on SMEs Fisheries Performance (Y). The positive path coefficient indicates a positive influence of Supply Chain Management System (X3) on SMEs Fisheries Performance (Y). In other words, Supply Chain Management System (X3) significantly affects SMEs Fisheries Performance (Y), and Hypothesis 6 (H6) is accepted.

The hypothesis testing results show that the P value of $0.000 <$ the standard alpha of 5% ($0.000 < 0.05$), and the Beta (Coefficient Estimate) of 0.285 , as well as the T statistic value $>$ T table ($3.973 > 1.96$), indicate a significant influence of Competitive Advantage (Z) on SMEs Fisheries Performance (Y). The positive path coefficient indicates a positive influence of Competitive Advantage (Z) on SMEs Fisheries Performance (Y). In other words, Competitive Advantage (Z) significantly affects SMEs Fisheries Performance (Y), and Hypothesis 7 (H7) is accepted.

Table 5. Summary of indirect effect testing results

Hypothesis	Indirect relationship	Beta coefficient	T-statistics	P-value	Mediation result	Decision
H8	Digital Marketing Innovation (X1) → Competitive Advantage (Z) → SMEs Fisheries Performance (Y)	0.030	1.464	0.144	No mediation effect	Rejected
H9	Network Capabilities (X2) → Competitive Advantage (Z) → SMEs Fisheries Performance (Y)	0.248	4.044	0.000	Significant mediation effect	Accepted
H10	Supply Chain Management System (X3) → Competitive Advantage (Z) → SMEs Fisheries Performance (Y)	0.066	2.581	0.010	Significant mediation effect	Accepted

Source: own study

The hypothesis test results show that the P value is $0.144 >$ the standard alpha of 5% ($0.144 > 0.05$), and the Beta coefficient value is -0.030 , with a T statistic value $<$ T table ($1.464 < 1.96$), indicating no mediating effect of Competitive Advantage (Z) on the relationship between Digital Marketing Innovation (X1) and SMEs Fisheries Performance (Y). In other words, it can be concluded that Competitive Advantage (Z) does not mediate the relationship between Digital Marketing Innovation (X1) and SMEs Fisheries Performance (Y), or in other words, Hypothesis eight (H8) is rejected.

The hypothesis test results show that the P value is $0.000 <$ the standard alpha of 5% ($0.000 < 0.05$), and the Beta coefficient value is 0.248 , with a T statistic value $>$ T table ($4.044 > 1.96$), indicating a significant mediating effect of Competitive Advantage (Z) on the relationship between Network Capabilities (X2) and SMEs Fisheries Performance (Y). In other words, it can be concluded that Competitive Advantage (Z) mediates the relationship between Network Capabilities (X2) and SMEs Fisheries Performance (Y), or in other words, Hypothesis nine (H9) is accepted.

The hypothesis test results show that the P value is $0.010 <$ the standard alpha of 5% ($0.010 < 0.05$), and the Beta coefficient value is 0.066 , with a T statistic value $>$ T table ($2.581 > 1.96$), indicating a significant mediating effect of Competitive Advantage (Z) on the relationship between Supply Chain Management System (X3) and SMEs Fisheries Performance (Y). In other words, it can be concluded that Competitive Advantage (Z) mediates the relationship between Supply Chain Management System (X3) and SMEs Fisheries Performance (Y), or in other words, Hypothesis ten (H10) is accepted.

5. Discussion

The results of hypothesis testing indicate that Digital Marketing Innovation (X1) has no significant effect on either Competitive Advantage (P value = 0.105 > 0.05 Beta = -0.105, T-statistic 1.622 < 1.96, so H1 is rejected) or on the Performance of Fisheries SMEs (P value = 0.726 > 0.05, Beta = -0.020 T-statistic 0.350 < 1.96, so H4 is rejected). The negative path coefficients in both relationships indicate that the current implementation of digital marketing innovation has not been able to provide a real contribution to competitiveness or business performance. This finding is in line with the results of the descriptive analysis which shows that although fisheries SMEs have utilized digital marketing strategies, the quality of digital content (Digital Content Quality) is still relatively low compared to other dimensions, indicating that digital platforms have not been optimally utilized. This confirms the view that the adoption of digital technology alone does not automatically result in competitive advantage if it is not accompanied by quality content, organizational readiness, and an integrated marketing strategy.

In contrast to Digital Marketing Innovation, Network Capabilities (X2) are proven to have a positive and significant effect on both Competitive Advantage (P value = 0.000 < 0.05, Beta = 0.869, T-statistic 26.692 > 1.96, so H2 is accepted) and on the Performance of Fisheries SMEs (P value = 0.000 < 0.05 Beta = 0.534 T-statistic 7.238 > 1.96, so H5 is accepted). The magnitude of path coefficient in relationship between X2 and Z indicates that network capabilities are the most dominant predictor in this research model. This finding is supported by the results of descriptive analysis which show that fisheries SMEs actively build business networks, especially with suppliers, customers, and industry associations, as reflected in the high score on the Collaboration with Other SMEs and Industry Associations dimension. These results strengthen the perspective of the Resource-Based View (RBV) and Dynamic Capability Theory (DCT) that in the context of the fisheries sector with limited natural resources, relational capabilities (networks) are the most critical dynamic capabilities compared to other capabilities, because they enable MSMEs to access market information, technology, and financing sources that are not available internally.

The Supply Chain Management System (X3) has also been proven to have a positive and significant effect on Competitive Advantage (P value = 0.000 < 0.05, Beta = 0.230, T-statistic 3.875 > 1.96, so H3 is accepted) and on the Performance of Fisheries SMEs (P value = 0.000 < 0.05, Beta = 0.197, T-statistic 3.664 > 1.96, so H6 is accepted). These findings confirm that the efficiency of supply chain management, especially distribution and logistics, is one of the main strengths of fisheries SMEs at Java Island, as shown by high scores on distribution and logistics dimensions. However, the production and processing dimensions still show considerable room for improvement, indicating the need to increase operational efficiency at upstream stage of supply chain so that the benefits of supply chain management system can be optimized as a whole.

Overall, in terms of performance, fishery SMEs demonstrate sound financial stability, achieving their highest scores in the Financial Dimension (FD). However, operational performance particularly regarding production remains relatively low, highlighting an area that requires intervention to boost productivity and efficiency. The competitive advantage of these SMEs is driven primarily by product and process innovation, as well as human resource management. While performance results are positive across various dimensions, the finding that digital marketing innovation has no significant impact on either competitive advantage or SME performance underscores the need for a more integrated and strategic approach to digital marketing within this sector.

The overall path coefficient analysis reveals that networking capabilities and supply chain management systems significantly influence both the competitive advantage and performance of fishery SMEs, whereas digital marketing innovation shows a weak or insignificant impact on these variables. Furthermore, the study confirms that networking capabilities and supply chain management systems exert a significant indirect influence on fishery SMEs performance, with competitive advantage acting as a mediating variable. Overall, these findings underscore the importance of strengthening business networks and optimizing supply chain systems to drive the success and sustainability of fishery SMEs in Java. Although digital marketing innovation holds great potential, its impact remains limited unless accompanied by simultaneous improvements in organizational readiness, technological infrastructure, and market strategies. Therefore, the key to enhancing the competitiveness and performance of fishery SMEs lies in strengthening network relationships, optimizing supply chains, and addressing gaps in digital marketing practices.

The findings of this study are also highly relevant in an international context, particularly for other developing nations with small-scale fisheries sectors. Comparisons with research in Southeast Asia reveal similar patterns, where networking capabilities and supply chain efficiency rather than mere digital adoption are the dominant factors driving the competitiveness of small and medium-sized fishery enterprises in Thailand and Vietnam. In Sub-Saharan Africa, the primary challenges facing small-scale fisheries (SSF) are access to markets and technology, necessitating an integrated approach that combines network capacity building with digital infrastructure development. Conversely, in developed nations such as Norway, Iceland, and Japan, the digitalization of fisheries has reached a more advanced stage through the utilization of IoT, blockchain for traceability, and artificial intelligence for catch prediction. These disparities highlight a digital divide that needs to be bridged through policies focused on technology transfer and capacity building in developing countries.

Regarding implications for the Sustainable Development Goals (SDGs), the findings of this study contribute to the achievement of SDG 8 (Decent Work and Economic Growth),

SDG 9 (Industry, Innovation, and Infrastructure), SDG 12 (Responsible Consumption and Production), and SDG 14 (Life Below Water). Strengthening network capabilities and effective supply chain management supports global food security as well as the sustainability of coastal communities livelihoods.

6. Conclusions

This study provides an in-depth analysis of the factors influencing the performance of fisheries SMEs in Java, Indonesia. The study revealed that Digital Marketing Innovation (X1), although somewhat adopted, has a limited impact on competitive advantage and overall business performance. The most significant drivers of success for fisheries SMEs are Network Capabilities (X2) and Supply Chain Management (X3). These factors play a crucial role in enhancing business competitiveness by enabling better market access, operational efficiency, and collaboration with suppliers, customers, and other industry stakeholders. While many businesses have adopted digital technologies like social media (74.9%) and websites (73.9%), there is still underutilization of advanced digital tools like e-commerce (36.7%) and CRM systems (16.1%), highlighting a need for further integration of digital technologies. Additionally, most businesses demonstrate stable financial performance, yet operational challenges, particularly in production efficiency (with a mean score of 3.48 for Production and Operational Dimensions), suggest the need for improvements in production processes and technology adoption.

This research gives contribution to the development of science, in the field of strategic management and entrepreneurship in the fisheries sector, enriches the empirical literature by being one of the few studies to simultaneously test the impact of digital marketing innovation, network capabilities, and supply chain management on the performance of fisheries SMEs in developing countries, thus filling a previously rarely explored empirical gap. Further, the study provides empirical evidence reinforcing the validity of Resource-Based View (RBV) and Dynamic Capability Theory (DCT) in the context of the fisheries sector, while offering a theoretical modification that in the context of limited natural resources, network capabilities become the most critical dynamic capabilities compared to other capabilities. By linking research findings on the concepts of blue economy and Sustainable Development Goals (SDGs), this research contributes to a global discussion on how digitalization and organizational capabilities can support the sustainability of maritime economies, especially in developing countries that are still struggling with the challenges of technology adoption and infrastructure constraints.

In addition, the study provides an important warning that digital marketing without backed by strong network capabilities and supply chain management systems will not be effective in improving SMEs performance, thus offering new nuances in the SMEs

digital transformation literature that has long tended to be optimistic about technology adoption without considering the readiness of the supporting organization and ecosystem. Overall, these findings not only provide a theoretical contribution to the development of a strategic capacity model in the fisheries sector, but also offer valuable practical implications for policymakers, SMEs guidance institutions, and entrepreneurs in formulating more effective and sustainable development strategies for the fisheries sector.

This research has some limitations that need to be acknowledged. First, the geographical coverage is limited, as it focuses only on fishing SMEs on the island of Java, which is the center of economic activity in Indonesia. This makes the results of the research may not be generalizable to other regions such as Sumatra, Kalimantan, Sulawesi, or Papua that have different ecosystem, infrastructure, and business culture characteristics. Second, the sample size used, namely 398 respondents, despite meeting the statistical criteria, is still relatively small compared to the total population of fishing SMEs in Indonesia reaching about 50,000. The predominance of male respondents (82.4%) and respondents aged 35-54 (81.4%) indicates that the perspectives of women and the younger generation in the fisheries sector are not adequately represented. Third, the study used a cross-sectional design that only measured the relationship between variables at one point in time, so it could not capture the dynamics of change and long-term causal relationships. Longitudinal research in the future is needed to observe how the impact of strategic variables on fisheries SME performance evolves over time. Fourth, data collection methods that use self-reported questionnaires have the potential to cause bias, especially in assessing financial and operational performance. Therefore, further research is recommended to combine survey data with secondary data such as financial reports and production data from the Fisheries Service to improve the validity and objectivity of measurements.

Authors' contribution

D.R.: article conception, theoretical content of the article, research methods applied, conducting the research, data collection, analysis and interpretation of results, draft manuscript preparation. **L.Ch.:** article conception, research methods applied, conducting the research. **I.R.:** analysis and interpretation of results. **F.W.:** data collection, draft manuscript preparation. **M.I.B.:** data collection.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the research process to writing the article, the authors did not use AI.

References

- Alkhatib, A. W., & Valeri, M. (2024). Can intellectual capital promote the competitive advantage? Service innovation and big data analytics capabilities in a moderated mediation model. *European Journal of Innovation Management*, 27(1), 263–289. <https://doi.org/10.1108/EJIM-04-2022-0186>
- Alsaleh, M., Yuan, Y., & Longqi, S. (2024). Do global competitiveness factors impact the marine sustainability practices? An empirical evidence from fisheries sector. *Business Strategy and the Environment*, 33(7), 6671–6688. <https://doi.org/10.1002/bse.3839>
- Arvel Liwang Savero, & Aria Ganna Henryanto. (2024). Membangun Keunggulan Kompetitif UKM melalui Ketangkasan Strategis dan Kemampuan Jaringan dalam Menghadapi Tantangan Lingkungan Bisnis yang Berfluktuasi. *El-Mal: Jurnal Kajian Ekonomi & Bisnis Islam*, 5(6), 3599–3622. <https://doi.org/10.47467/elmal.v5i6.2890>
- Basurto, X., Gutierrez, N. L., Franz, N., Mancha-Cisneros, M. del M., Gorelli, G., Aguión, A., Funge-Smith, S., Harper, S., Mills, D. J., Nico, G., Tilley, A., Vannuccini, S., Virdin, J., Westlund, L., Allison, E. H., Anderson, C. M., Baio, A., Cinner, J., Fabinyi, M., ... Thilsted, S. H. (2025). Illuminating the multidimensional contributions of small-scale fisheries. *Nature*, 637(8047), 875–884. <https://doi.org/10.1038/s41586-024-08448-z>
- Bhatti, S. H., Ahmed, A., Ferraris, A., Hirwani Wan Hussain, W. M., & Wamba, S. F. (2025). Big data analytics capabilities and MSME innovation and performance: A double mediation model of digital platform and network capabilities. *Annals of Operations Research*, 350(2), 729–752. <https://doi.org/10.1007/s10479-022-05002-w>
- Bolivar, L. M., Castro-Abancéns, I., Casanueva, C., & Gallego, A. (2021). Network resource mobilisation limitations and the alliance portfolio network. *Baltic Journal of Management*, 16(3), 424–445. <https://doi.org/10.1108/BJM-06-2020-0206>
- Bresciani, S., Huarng, K.-H., Malhotra, A., & Ferraris, A. (2021). Digital transformation as a springboard for product, process and business model innovation. *Journal of Business Research*, 128, 204–210. <https://doi.org/10.1016/j.jbusres.2021.02.003>
- Canty, S. W. J., & Deichmann, J. L. (2022). Do small-scale fisheries have the capacity to provide food security to coastal populations? *Fish and Fisheries*, 23(3), 708–718. <https://doi.org/10.1111/faf.12643>
- Chai, F., Deng, Q., Dai, M., Wang, X., Staneva, J., Behera, S. K., Tonani, M., Liu, J., Yu, Z., & Peng, Z. (2026). Digital twin of the ocean as a catalyst for blue economy innovation. *National Science Review*, 13(3). <https://doi.org/10.1093/nsr/nwag012>
- Cheng, S., Fan, Q., & Song, Y. (2023). Performance Gap and Innovation Ambidexterity: A Moderated Mediation Model. *Sustainability*, 15(5), 3994. <https://doi.org/10.3390/su15053994>
- Dhameria, V., Ghazali, I., Hidayat, A., & Aryanto, V. D. W. (2021). Networking capability, entrepreneurial marketing, competitive advantage, and marketing performance. *Uncertain Supply Chain Management*, 9(4), 941–948. <https://doi.org/10.5267/j.uscm.2021.7.007>
- El-Haddadeh, R. (2020). Digital Innovation Dynamics Influence on Organisational Adoption: The Case of Cloud Computing Services. *Information Systems Frontiers*, 22(4), 985–999. <https://doi.org/10.1007/s10796-019-09912-2>
- Elston, J., Pinto, H., & Nogueira, C. (2024). Tides of Change for a Sustainable Blue Economy: A Systematic Literature Review of Innovation in Maritime Activities. *Sustainability*, 16(24), 11141. <https://doi.org/10.3390/su162411141>

- Erdebilli, B., & Sıcakyüz, Ç. (2024). An Integrated Q-Rung Orthopair Fuzzy (Q-ROF) for the Selection of Supply-Chain Management. *Sustainability*, 16(12), 4901. <https://doi.org/10.3390/su16124901>
- Escobz Barragan, K., & Becker, F. S. R. (2025). Keeping pace with the digital transformation — exploring the digital orientation of SMEs. *Small Business Economics*, 64(3), 1361–1385. <https://doi.org/10.1007/s11187-024-00947-7>
- Gao, J., Zhang, W., Guan, T., Feng, Q., & Mardani, A. (2023). The effect of manufacturing agent heterogeneity on enterprise innovation performance and competitive advantage in the era of digital transformation. *Journal of Business Research*, 155, 113387. <https://doi.org/10.1016/j.jbusres.2022.113387>
- Guerola-Navarro, V., Oltra-Badenes, R., Gil-Gomez, H., & Iturricha Fernández, A. (2021). Customer relationship management (CRM) and Innovation: A qualitative comparative analysis (QCA) in the search for improvements on the firm performance in winery sector. *Technological Forecasting and Social Change*, 169, 120838. <https://doi.org/10.1016/j.techfore.2021.120838>
- Ha, L. T. (2024). A transition to sustainable marine living resources: Why does digital transformation matter? *Technological Forecasting and Social Change*, 203, 123336. <https://doi.org/10.1016/j.techfore.2024.123336>
- Hernan Ramirez, E., Huerta-Soto, M., Villanueva-Calderón, J., Ajour El Zein, S., & Clemente-Almendros, J. A. (2026). Understanding the Competitiveness of Small and Medium-Sized Enterprises: The Positive Nonlinear Influence of Digitalization, Environmental Policies, and Innovation. *American Behavioral Scientist*. Advance online publication. <https://doi.org/10.1177/00027642251413967>
- Ji, J., & Li, Y. (2024). Does fishery digitalization matter in the sustainable development of fisheries? Evidence from China. *Sustainable Development*, 32(6), 7382–7396. <https://doi.org/10.1002/sd.3091>
- Karami, M., Wooliscroft, B., & McNeill, L. (2023). Effectual networking capability and SME performance in international B2B markets. *Journal of Business & Industrial Marketing*, 38(12), 2655–2672. <https://doi.org/10.1108/JBIM-01-2022-0020>
- Leão, P., & da Silva, M. M. (2021). Impacts of digital transformation on firms' competitive advantages: A systematic literature review. *Strategic Change*, 30(5), 421–441. <https://doi.org/10.1002/jsc.2459>
- Lu, Q., Deng, Y., Yu, M., Song, H., & Liu, B. (2021). Supply chain network and financing performance of small and medium enterprises in China: a survey and quasi-replication using fuzzy-set qualitative comparative analysis. *Baltic Journal of Management*, 16(5), 785–803. <https://doi.org/10.1108/BJM-09-2020-0331>
- Marcano Nieves, L. M., Sosa-Varela, J. C., Ortiz, M., & Montalvo, F. (2025). Networking capabilities on organizational networking in entrepreneurial SMEs. *Management Research: Journal of the Iberoamerican Academy of Management*, 23(4), 361–385. <https://doi.org/10.1108/MRJI-AM-11-2023-1485>
- Masrianto, A., Hartoyo, H., Hubeis, A. V. S., & Hasanah, N. (2022). Digital Marketing Utilization Index for Evaluating and Improving Company Digital Marketing Capability. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(3), 153. <https://doi.org/10.3390/joitmc8030153>
- Mlambo, G., Sibanda, Dr. V., & Munuhwa, S. (2020). The Effect of Supply Chain Management on the Competitiveness of the Telecommunications Industry in Zimbabwe. *International Journal of Engineering and Management Research*, 10(4), 164–177. <https://doi.org/10.31033/ijemr.10.4.24>

- Nurbasari, A., Machmud, A., Aribowo, A., & Megawati, S. (2025). Digital Entrepreneurial Marketing and Industrial Transformation: Evidence from Food and Beverage Small and Medium Industries in Indonesia toward Sustainable Development Goals (SDGs). *Indonesian Journal of Science and Technology*, 11(2), 217–232. <https://doi.org/10.17509/ijost.v11i2.89774>
- Nurhayati, A., Handaka, A. A., Herawati, T., Yustiati, A., & Iskandar. (2023). The resilience of fishery production supply chain in West Java Province, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 1289(1), 012016. <https://doi.org/10.1088/1755-1315/1289/1/012016>
- Okorie, O., Russell, J., Cherrington, R., Fisher, O., & Charnley, F. (2023). Digital transformation and the circular economy: Creating a competitive advantage from the transition towards Net Zero Manufacturing. *Resources, Conservation and Recycling*, 189, 106756. <https://doi.org/10.1016/j.resconrec.2022.106756>
- Oyeyemi, O. P., Anjorin, K. F., Ewim, S. E., Igwe, A. N., & Sam-Bulya, N. J. (2023). The role of supply chain collaboration in boosting FMCG SME brand competitiveness. *Global Journal of Research in Multidisciplinary Studies*, 1(2), 13–23. <https://doi.org/10.58175/gjrms.2023.1.2.0043>
- Prashantham, S., Zhou, A. J., & Dhanaraj, C. (2020). Depth vs. Breadth: Network Strategy in Emerging Markets. *Management and Organization Review*, 16(2), 229–260. <https://doi.org/10.1017/mor.2019.54>
- Quaye, D., & Mensah, I. (2019). Marketing innovation and sustainable competitive advantage of manufacturing SMEs in Ghana. *Management Decision*, 57(7), 1535–1553. <https://doi.org/10.1108/MD-08-2017-0784>
- Räsänen, J., & Tuovinen, T. (2020). Digital innovations in rural micro-enterprises. *Journal of Rural Studies*, 73, 56–67. <https://doi.org/10.1016/j.jrurstud.2019.09.010>
- Rodrigues, M., Franco, M., Silva, R., & Oliveira, C. (2021). Success Factors of SMEs: Empirical Study Guided by Dynamic Capabilities and Resources-Based View. *Sustainability*, 13(21), 12301. <https://doi.org/10.3390/su132112301>
- Sagala, G. H., & Öri, D. (2025). Exploring digital transformation strategy to achieve SMEs resilience and antifragility: a systematic literature review. *Journal of Small Business & Entrepreneurship*, 37(3), 495–524. <https://doi.org/10.1080/08276331.2024.2392080>
- Sanaei, S., Manna, M., Bozorgkhoh, H., Heidari, S., & Mehregan, E. (2023). The Role of SCM practices in Competitive Advantage and Firm Performance: A Mediating Role of Supply Chain Innovation and TQM. *Tehnički Glasnik*, 17(4), 516–523. <https://doi.org/10.31803/tg-20221223200658>
- Setyowarni, S. H., & Prihatiningtyas, S. (2022). Analysis of Financial Capital, Human Capital, Capability Innovation on MSME Performance. *International Journal of Scientific and Management Research*, 05(10), 207–215. <https://doi.org/10.37502/IJSMR.2022.51014>
- Shi, X., Zheng, Z., Zhang, Q., & Liang, H. (2020). External knowledge search and firms' incremental innovation capability: the joint moderating effect of technological proximity and network embeddedness. *Management Decision*, 58(9), 2049–2072. <https://doi.org/10.1108/MD-08-2019-1078>
- Soeparna, I. I., & Taofiqurohman, A. (2024). Transversal policy between the protection of marine fishery resources and fisheries subsidies to address overfishing in Indonesia. *Marine Policy*, 163, 106112. <https://doi.org/10.1016/j.marpol.2024.106112>
- Tarihoran, A. D. B., Hubeis, M., Jahroh, S., & Zulbainarni, N. (2023). Market-based dynamic capabilities for MSMEs: Evidence from Indonesia's ornamental fish industry. *Journal of Open Innovation: Technology, Market, and Complexity*, 9(3), 100123. <https://doi.org/10.1016/j.joitmc.2023.100123>

- Ter Wal, A. L. J., Criscuolo, P., McEvily, B., & Salter, A. (2020). Dual Networking: How Collaborators Network in Their Quest for Innovation. *Administrative Science Quarterly*, 65(4), 887–930. <https://doi.org/10.1177/0001839219893691>
- Thompson, B. S., & Rust, S. (2023). Blocking blockchain: Examining the social, cultural, and institutional factors causing innovation resistance to digital technology in seafood supply chains. *Technology in Society*, 73, 102235. <https://doi.org/10.1016/j.techsoc.2023.102235>
- Tukamuhabwa, B., Mutebi, H., & Kyomuhendo, R. (2023). Competitive advantage in SMEs: effect of supply chain management practices, logistics capabilities and logistics integration in a developing country. *Journal of Business and Socio-Economic Development*, 3(4), 353–371. <https://doi.org/10.1108/JBSED-04-2021-0051>
- Ugrinov, S., Čočkaló, D., Kavalić, M., Bakator, M., Stanisavljev, S., & Đorđević, L. (2024). SCM and SME: achieving competitive advantage through improving supply chain. *BizInfo Blace*, 15(2), 49–58. <https://doi.org/10.5937/bizinfo2402049U>
- Umari Abdurrahim Abi Anwar, Agus Rahayu, Lili Adi Wibowo, Mokh Adib Sultan, & Mokh Adib Sultan. (2024). Forging Competitive Edge: Synergizing Digital Competencies with Strategic Supply Chain Management for Operational Excellence. *Evolutionary Studies in Imaginative Culture*, 278–288. <https://doi.org/10.70082/esiculture.vi.688>
- Usai, A., Fiano, F., Messeni Petruzzelli, A., Paoloni, P., Farina Briamonte, M., & Orlando, B. (2021). Unveiling the impact of the adoption of digital technologies on firms' innovation performance. *Journal of Business Research*, 133, 327–336. <https://doi.org/10.1016/j.jbusres.2021.04.035>
- Wang, H., & Zhang, Z. (2021). The Influence of Corporate Networks on the Competitive Advantage of High Technology Enterprises in China: The Mediating Effects of Dynamic Capacities and Ambidextrous Combination. *International Journal of Financial Studies*, 9(3), 42. <https://doi.org/10.3390/ijfs9030042>
- Wang, L. L., & Gao, Y. (2021). Competition network as a source of competitive advantage: The dynamic capability perspective and evidence from China. *Long Range Planning*, 54(2), 102052. <https://doi.org/10.1016/j.lrp.2020.102052>
- Yulisti, M., Hidayat, A. S., Firdausy, C. M., Mu'awanah, U., Kurniasari, N., & Nurjati, E. (2024). Effects of eco-friendly fishing gears on fishermen's welfare and sustainable fisheries: Lessons learned from Indonesia. *Marine Pollution Bulletin*, 198, 115888. <https://doi.org/10.1016/j.marpolbul.2023.115888>