

DIGITAL INNOVATION AND THE BLUE ECONOMY: ENHANCING THE COMPETITIVENESS OF COASTAL MICRO, SMALL, AND MEDIUM ENTERPRISES

Syamsul Arifin¹, Abdul Talib Bon² Miftahul Jannah S³

Lecture Sekolah Tinggi Ilmu Ekonomi Pemuda¹

Lecture Universiti Tun Hussein Onn Malaysia (UTHM)²

Jl. Bung Tomo Kav.8, East Java, Indonesia. 60246¹

Persiaran Tun Dr. Ismail, 86400 Parit Raja, Johor Darul Ta'zim, Malaysia²

Jl. Gunung Anyar Indah No E 150-154 Gunung Anyar Kecamatan Gunung Anyar Surabaya, Indonesia 60295³

Correspondence Author Email: syamsularifin@stiepemuda.ac.id

ABSTRACT

Purpose: This article aims to examine the role of digital innovation in enhancing the competitiveness of coastal Micro, Small, and Medium Enterprises (MSMEs) within the framework of the blue economy. Coastal MSMEs play an important role in generating employment, supporting local livelihoods, and utilizing marine and coastal resources. However, these enterprises frequently face challenges related to limited market access, low technological capabilities, inadequate infrastructure, environmental pressures, and intense competition.

Design/methodology/approach: This study employs a qualitative literature-based approach to examine the relationship between digital innovation, MSME competitiveness, and blue economy development. The analysis is based on relevant academic literature, policy reports, and recent studies concerning digital transformation, innovation, MSMEs, sustainability, and the blue economy. The analytical framework focuses on digital marketing, digital platforms, process innovation, data utilization, digital capabilities, and sustainable business practices.

Findings: The literature indicates that digital innovation can strengthen coastal MSME competitiveness through broader market access, improved operational efficiency, enhanced customer engagement, product innovation, and stronger business networks. Digital technologies can also support blue economy objectives by improving resource efficiency, traceability, waste reduction, and environmentally responsible production. However, digital adoption is constrained by digital literacy, financial limitations, technological infrastructure, cybersecurity concerns, and unequal access to digital ecosystems.

Research limitations/implications: This article is based on secondary literature and does not provide primary empirical evidence from specific coastal MSMEs. Future studies should employ quantitative, qualitative, or mixed-method approaches involving coastal entrepreneurs across different regions.

Originality/value: This article contributes to the discussion by integrating digital innovation and blue economy perspectives into the competitiveness of coastal MSMEs. Rather than viewing digitalization solely as a technological process, the article positions digital innovation as a strategic capability that can simultaneously generate economic value, strengthen social inclusion, and support environmental sustainability.

Paper type: Literature Review.

Keywords: Digital Innovation, Blue Economy, Coastal MSMEs, Competitiveness, Digital Transformation, Sustainability

A.INTRODUCTION

The development of coastal economies has traditionally depended on activities such as fisheries, aquaculture, marine tourism, seafood processing, transportation, handicrafts, and other businesses that utilize marine and coastal resources. These activities provide important sources of income and employment for coastal communities. In Indonesia, the importance of the ocean and coastal areas is particularly significant because the country's geography and economic activities are closely connected to marine resources. The World Bank emphasizes that a sustainable ocean economy can generate three interconnected benefits: healthy oceans, thriving economies, and resilient coastal livelihoods ((Bank, 2021)). The blue economy has therefore emerged as an important development approach that seeks to balance economic utilization of marine resources with environmental

sustainability and social inclusion. The concept does not simply focus on increasing economic output from oceans. Instead, it emphasizes the sustainable and integrated development of ocean-related sectors while maintaining healthy marine ecosystems ((Bank, 2022)). OECD also emphasizes that blue economy development should consider resilience, inclusiveness, sustainability, and circularity because economic activities in coastal and marine areas are closely connected to ecosystem conditions and climate-related risks. Within this context, Micro, Small, and Medium Enterprises (MSMEs) are important actors. Coastal MSMEs are involved in many economic activities, including fish processing, seafood products, traditional food, handicrafts, marine tourism, aquaculture, transportation, and small-scale trading. Their contribution extends beyond business performance because they provide employment opportunities and support household livelihoods. However, coastal MSMEs often operate with limited financial resources, technology, managerial capabilities, and market access. Digitalization creates new opportunities to overcome some of these limitations. Digital platforms allow small businesses to communicate with consumers, promote products, receive payments, manage transactions, and access markets beyond their geographical locations. (Bharadwaj et al., 2013)) argue that digital technologies increasingly transform business processes, organizational capabilities, products, services, and relationships between firms.

Digital business strategy consequently becomes closely integrated with business strategy rather than being merely a supporting information technology function. For coastal MSMEs, digital innovation can be particularly important because geographical distance has historically limited access to consumers and markets. Through social media, e-commerce platforms, digital payment systems, online marketplaces, and digital logistics, coastal entrepreneurs can potentially connect local products with regional, national, and international consumers. Recent research also indicates that digital transformation can improve coastal MSME performance through operational efficiency, market access, innovation, and competitiveness, while digital literacy, human resource capability, government support, and technological infrastructure are important enabling factors ((Firdaus et al., 2026)). Nevertheless, digital innovation should not be understood as an automatic solution to all problems faced by coastal MSMEs. Digital adoption may create new challenges, including investment costs, lack of digital skills, cybersecurity risks, dependence on digital platforms, and difficulties adapting traditional business models to rapidly changing markets. Therefore, digital innovation needs to be integrated with sustainable business practices and the principles of the blue economy. This article addresses this issue by examining how digital innovation can enhance the competitiveness of coastal MSMEs while supporting sustainable blue economy development. The novelty of the article lies in connecting three perspectives: digital innovation, MSME competitiveness, and blue economy sustainability. The discussion emphasizes that competitiveness should not only be measured through sales and profit but also through innovation capability, resource efficiency, market resilience, social inclusion, and environmental responsibility.

B. LITERATURE REVIEW

Digital Innovation

Digital innovation refers to the development or improvement of products, services, processes, and business models through the utilization of digital technologies. Digital innovation differs from simple technology adoption because it involves the creation of new value through the combination of technology, organizational capabilities, and business activities.(Bharadwaj et al., 2013)) explain that digital technologies increasingly influence business strategy, processes, products, services, and interorganizational relationships. This perspective suggests that digital innovation should be viewed as a strategic organizational capability rather than merely the implementation of software or hardware.

For MSMEs, digital innovation can take relatively simple forms. Examples include using social media for marketing, digital payment applications for transactions, e-commerce platforms for sales, cloud-based applications for record keeping, and digital communication tools for customer relationships. More advanced forms may include data analytics, artificial intelligence, Internet of Things applications, digital supply-chain management, and technology-based traceability.Digital

innovation can therefore provide MSMEs with opportunities to overcome traditional limitations associated with small business size. Research on Indonesian MSMEs shows that innovation and digital adoption can improve efficiency, customer engagement, and market reach ((Akbar & Amir, 2024)).

Blue Economy

The blue economy emphasizes the sustainable use of ocean and coastal resources to generate economic, social, and environmental benefits. The World Bank defines a blue economy approach around sustainable and integrated development of ocean sectors while maintaining a healthy ocean ecosystem. The concept is particularly relevant to coastal communities because economic activities depend directly or indirectly on marine ecosystems. Fisheries, aquaculture, tourism, seafood processing, and coastal trade can generate income, but unsustainable practices may result in overfishing, pollution, ecosystem degradation, and resource depletion. OECD highlights that sustainable ocean economies need to integrate economic development, environmental sustainability, social inclusion, and resilience. Therefore, competitiveness within the blue economy should not encourage businesses to maximize short-term profit at the expense of marine ecosystems.

Coastal MSME Competitiveness

Competitiveness refers to the ability of a business to create value and compete effectively in its target market. For MSMEs, competitiveness may involve product quality, price, innovation, customer relationships, market access, operational efficiency, and adaptability. (Barney, 1991)) resource-based view argues that firms can achieve sustained competitive advantage through valuable, rare, difficult-to-imitate, and organizationally embedded resources. In the digital era, technological knowledge, digital skills, customer data, digital networks, and innovation capabilities can become strategic resources. For coastal MSMEs, competitiveness can therefore be strengthened when entrepreneurs are able to combine local resources and knowledge with digital capabilities. For example, a traditional seafood product can gain wider market access when its producer uses digital branding, attractive online content, e-commerce, digital payment systems, and reliable logistics.

Digital Innovation and Blue Economy

Digital innovation and blue economy development can reinforce each other. Digital technologies can improve economic performance while simultaneously supporting environmental management. For example, digital inventory systems can help businesses reduce excess stock and food waste. Digital traceability can provide information regarding product origin and supply chains. Online marketing can reduce dependence on physical intermediaries. Digital platforms can connect producers with consumers directly. Meanwhile, data technologies can potentially improve monitoring of resource use. Recent literature specifically examining coastal MSMEs indicates that digital transformation can improve market access, operational efficiency, innovation, and business competitiveness while supporting blue economy principles ((Firdaus et al., 2026)

C. METHODOLOGY

This article uses a qualitative literature-based research approach. The approach is appropriate because the purpose of the study is to synthesize existing knowledge concerning digital innovation, coastal MSMEs, competitiveness, and blue economy development rather than to test a specific statistical hypothesis.

The literature analysis focuses on four major themes:

1. digital technologies and innovation among MSMEs
2. competitiveness and business performance
3. blue economy and coastal sustainability
4. the interaction between digitalization and sustainable coastal development.

Relevant academic publications, institutional reports, and recent studies were examined to identify recurring arguments and relationships between the concepts. Particular attention was given to literature concerning digital business strategy, innovation capabilities, MSME competitiveness, sustainable ocean economies, and digital transformation of coastal enterprises. The analytical process consisted of three

Digital Innovation And The Blue Economy: Enhancing The Competitiveness Of Coastal Micro, Small, And Medium Enterprises
Arifin dkk.

stages. First, relevant literature was identified according to the research themes. Second, the literature was categorized according to digital innovation, competitiveness, sustainability, and blue economy dimensions. Third, the findings were synthesized to develop an integrated conceptual explanation of how digital innovation can support coastal MSMEs. This approach follows the general principle of qualitative thematic analysis, in which information is organized into categories and interpreted to identify meaningful relationships between concepts

D. RESULTS AND DISCUSSION

Digital Innovation as a Driver of Market Expansion

The first major theme is the ability of digital innovation to expand the market reach of coastal MSMEs. Coastal businesses frequently operate within geographically limited markets because of their distance from major urban centers and consumers. Digital platforms can reduce this geographical limitation. Through social media and e-commerce, a small seafood producer, handicraft business, or coastal tourism operator can communicate directly with consumers in other regions. Digital marketing also allows businesses to display product information, customer reviews, photographs, videos, and promotional content. This mechanism is important because market access is one of the major challenges faced by small enterprises. Digitalization enables coastal entrepreneurs to shift from relying entirely on traditional intermediaries toward more direct consumer relationships. The development of digital business strategy supports this argument. (Bharadwaj et al., 2013) explain that digital technologies transform business relationships and create new opportunities for value creation and value capture. Therefore, digital innovation can transform a local coastal business into a business capable of reaching national and potentially international consumers.

Digital Technology and Operational Efficiency

The second theme concerns operational efficiency. Coastal MSMEs often face problems involving production planning, inventory management, distribution, payment processing, and record keeping. Simple digital tools can improve these activities. Digital accounting applications can help entrepreneurs record income and expenses. Inventory applications can assist businesses in monitoring stock. Digital payment systems can make transactions faster and easier. Online communication can improve coordination with suppliers and customers. Efficiency is particularly important for small businesses because their resources are limited. Reducing unnecessary costs can directly improve profitability and resilience. Recent research on coastal MSMEs identifies operational efficiency as one of the important outcomes associated with digital transformation ((Firdaus et al., 2026)). Thus, digital innovation does not necessarily require sophisticated technologies. Even relatively simple digital tools can generate significant improvements when they address real operational problems.

Product and Service Innovation

The third theme is product and service innovation. Digital technologies provide opportunities for MSMEs to understand consumer preferences and develop products that better match market demand. For example, a seafood processor can use customer feedback from social media and online reviews to improve packaging, flavor, product size, or delivery services. A coastal tourism business can use digital platforms to develop customized travel packages. A handicraft business can create new designs based on customer preferences observed through digital interactions. Innovation therefore becomes a continuous process rather than a one-time activity. (Akbar & Amir, 2024)) found that innovation and digital adoption can improve customer engagement and market reach among Indonesian MSMEs. This suggests that digital innovation can strengthen competitiveness by allowing coastal MSMEs to respond more quickly to changes in consumer behavior.

Digital Innovation and Sustainable Resource Use

A particularly important dimension of digital innovation in the blue economy is resource sustainability. Coastal enterprises depend on marine ecosystems, meaning that environmental degradation can directly threaten their long-term survival. Digital systems can support more efficient resource management. For example, inventory data can help reduce food waste, while digital monitoring can support better production planning. Digital traceability can also increase transparency regarding product origins and supply chains. The blue economy requires economic activities to generate value without destroying the ecological systems on which those activities depend. OECD emphasizes

that sustainable ocean economies must integrate economic, environmental, and social dimensions. Consequently, digital innovation should not only be evaluated based on its contribution to sales and profit. Its ability to reduce waste, improve resource efficiency, and support responsible production is also important.

Digital Capabilities as a Source of Competitive Advantage

The fifth theme concerns digital capabilities. Technology itself does not automatically create competitive advantage. Entrepreneurs need knowledge and capabilities to use technology effectively. (Barney, 1991)) resource-based view suggests that valuable and difficult-to-imitate resources can become sources of competitive advantage. In the context of coastal MSMEs, digital literacy, entrepreneurial knowledge, customer data, digital networks, and innovation capabilities can become strategic resources. This means that two businesses may have access to the same digital platform but achieve different outcomes because their digital capabilities differ. Recent research on coastal MSMEs also identifies digital literacy and human resource capabilities as important factors supporting successful digital transformation ((Firdaus et al., 2026)(Pratama & Farida, 2025)(Arifin et al., 2026)(Verhoef et al., 2021)). Therefore, policies supporting coastal MSMEs should not focus solely on providing technology. Training, mentoring, digital literacy, business management skills, and continuous learning are equally important.

Barriers to Digital Innovation

Despite its potential benefits, digital innovation also presents several barriers. The first barrier is limited digital literacy. Some entrepreneurs may understand the basic functions of social media but lack the skills required for digital analytics, cybersecurity, online advertising, or e-commerce management. The second barrier is financial capability. Advanced digital systems may require investment in hardware, software, internet services, training, and professional assistance. The third barrier is infrastructure. Coastal areas may experience weaker internet connectivity and limited access to reliable digital infrastructure compared with urban areas. The fourth barrier involves cybersecurity and data protection. Increased digital activity exposes MSMEs to risks involving fraud, account theft, data breaches, and online scams. The fifth barrier is platform dependency. When MSMEs rely heavily on a particular digital platform, changes in algorithms, fees, policies, or consumer behavior can affect their businesses. Therefore, digital transformation needs to be accompanied by institutional support and appropriate risk management.

Government and Community Support

Government and community institutions have an important role in enabling digital innovation among coastal MSMEs. Support can include internet infrastructure, digital training, financing, business mentoring, market facilitation, certification, and assistance in accessing e-commerce platforms. The government should also encourage collaboration among MSMEs, universities, technology providers, financial institutions, and coastal communities. Recent studies emphasize government support and technological infrastructure as important enabling factors for digital transformation among coastal MSMEs. Community-based approaches are particularly important because coastal economies are often characterized by strong social networks and shared natural resources. Digital transformation should therefore strengthen not replace local networks and community cooperation.

An Integrative Framework

Based on the literature, the relationship between digital innovation and coastal MSME competitiveness can be understood through several interconnected mechanisms:

1. Digital adoption provides access to new technologies and platforms.
2. Digital capabilities allow entrepreneurs to use those technologies effectively.
3. Digital innovation improves marketing, products, services, and business processes.
4. Market expansion increases access to consumers and business networks.
5. Operational efficiency reduces costs and improves resource utilization.
6. Sustainable practices reduce environmental impacts and support responsible resource use.
7. Competitive advantage emerges through improved value creation, innovation, resilience, and sustainability.

Digital Innovation And The Blue Economy: Enhancing The Competitiveness Of Coastal Micro, Small, And Medium Enterprises
Arifin dkk.

This framework demonstrates that digital innovation should be viewed as a process connecting technology, entrepreneurial capabilities, market opportunities, and sustainability.

Theoretical Contribution

This article contributes to the literature in three ways. First, it connects digital innovation research with blue economy research. Digitalization is often examined from a business or technological perspective, while blue economy research frequently emphasizes environmental sustainability. Integrating both perspectives provides a broader understanding of coastal enterprise development. Second, the article extends the discussion of MSME competitiveness by emphasizing that competitiveness in coastal areas should include sustainability and resilience. Profitability is important, but long-term competitiveness depends on the continued availability of healthy marine and coastal resources. Third, the article positions digital capability as a strategic resource. Consistent with the resource-based view, digital knowledge, skills, networks, and innovation capabilities can become valuable resources that help coastal MSMEs differentiate themselves from competitors.

Practical Implications

Several practical implications can be identified. First, coastal MSMEs should develop basic digital capabilities, particularly in digital marketing, e-commerce, digital payment, financial management, and customer relationship management. Second, entrepreneurs should use digital technologies not only for promotion but also for improving internal business processes. Third, digital innovation should be connected to environmental sustainability. Businesses should consider digital solutions that reduce waste, improve resource efficiency, and support responsible production. Fourth, government programs should provide integrated support that combines digital infrastructure, training, financing, mentoring, and market access. Fifth, educational institutions can contribute by developing digital entrepreneurship programs specifically designed for coastal communities. Finally, digital platforms should be used to strengthen the identity and uniqueness of local coastal products. Local knowledge, traditional products, seafood, handicrafts, and cultural experiences can become competitive advantages when supported by effective digital branding.

E. CONCLUSION

Digital innovation has significant potential to enhance the competitiveness of coastal Micro, Small, and Medium Enterprises while supporting the development of a sustainable blue economy. Digital technologies can help coastal MSMEs overcome geographical market limitations, improve operational efficiency, strengthen customer relationships, develop new products and services, and create new business opportunities. However, digital innovation should not be understood simply as the adoption of technology. Its effectiveness depends on digital capabilities, entrepreneurial knowledge, infrastructure, financial resources, institutional support, and the ability of entrepreneurs to integrate technology into their business strategies. From the perspective of the blue economy, digital innovation also has an important environmental dimension. Digital tools can support resource efficiency, waste reduction, traceability, and more responsible production. Consequently, the competitiveness of coastal MSMEs should be evaluated not only through financial performance but also through their ability to build resilience, maintain environmental sustainability, and contribute to coastal community development. The integrated perspective presented in this article suggests that digital innovation can become a strategic bridge between economic competitiveness and blue economy sustainability. Coastal MSMEs that are able to combine local resources and knowledge with digital capabilities may have greater opportunities to access wider markets and create sustainable value. Nevertheless, barriers such as limited digital literacy, inadequate infrastructure, financial constraints, cybersecurity risks, and unequal access to digital ecosystems remain important challenges. Future research should therefore

Digital Innovation And The Blue Economy: Enhancing The Competitiveness Of Coastal Micro, Small, And Medium Enterprises
Arifin dkk.

examine these relationships empirically through surveys, interviews, case studies, or mixed-method approaches involving coastal MSMEs across different regions. Ultimately, strengthening coastal MSMEs through digital innovation requires collaboration among entrepreneurs, government, universities, financial institutions, technology providers, and local communities. Such collaboration can help ensure that digital transformation does not merely create more profitable businesses but contributes to a more inclusive, resilient, and environmentally sustainable blue economy.

REFERENCE

- Akbar, T., & Amir, H. (2024). The role of innovation in enhancing MSME competitiveness in the digital era: A case study of MSMEs in Indonesia. *Journal of Business Administration and Entrepreneurship Innovation*, 1(1). <https://doi.org/10.32722/baei.v1i01.7323>
- Arfah, A. (2026). Conceptual Design of a Maritime Startup Incubation Center: An Innovative Initiative to Promote the Blue Economy in Indonesia's Coastal Region. *IOP Conference Series: Earth and Environmental Science*, 1585(1), 12049.
- Arifin, S., Yudhotomo, I., Sam, T. H., & Jannah, M. (2026). Blue Economy Implementation As A Strategy For Sustainable Coastal Economic Development. *International Journal of Economics, Science, and Education*, 3(3), 127–135.
- Arzakiyah, M. M., Yuliandari, P., Nasution, F. B., Hadibrata, M., & Sofia, M. (n.d.). *Transformation toward a Smart Maritime Economy: An Analysis of Entrepreneurial Strategies in Supporting Digital Trade in Bintan*.
- Bank, W. (2021). *A sustainable ocean economy is key to Indonesia's prosperity*. World Bank.
- Bank, W. (2022). *The World Bank's Blue Economy Program and PROBLUE: Supporting integrated and sustainable economic development in a healthy ocean*. World Bank.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120.
- Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital business strategy: Toward a next generation of insights. *MIS Quarterly*, 37(2), 471–482. <https://doi.org/10.25300/MISQ/2013/37:2.3>
- Blue economy implementation and sustainability in coastal MSMEs. (2026). *Marine Economics and Management*. <https://doi.org/10.1108/MAEM-03-2026-0003>
- Firdaus, F., Yacob, S., Octavia, A., & Indrawijaya, S. (2026). Digital Transformation and the Performance of Coastal MSMEs in Blue Economy Perspective: Systematic Literature Review. *Inovbiz: Jurnal Inovasi Bisnis*, 14(1), 137–147.
- Fitrianti, R., Fatmawati, F., & Zaenal, M. (2026). The Blue Economy in Indonesia: Analyzing Digital Literacy and Economic Resilience Among Fisheries MSMEs in Gowa Regency, South Sulawesi. *Egyptian Journal of Aquatic Biology and Fisheries*, 30(1), 2399–2417.
- Handoko, L., Sihombing, S. O., & Layman, C. V. (2022). *Promoting blue economy: factor identification and model development for micro small & medium enterprises (msme) in bitung, north sulawesi: a research proposal*. 57–61.
- Mappatunru, M. M., Rusli, A. M., & Syamsu, S. (2026). Digitalization and sustainability synergies: Empowering coastal SMEs in the blue economy era. *KOMPLEKSITAS: Jurnal Ilmiah Manajemen, Organisasi Dan Bisnis*, 15(1).
- OECD. (2024). *The blue economy in cities and regions: A territorial approach*. OECD Publishing.
- Perdana, T. A., Purusa, N. A., Kurniawan, R., & Suryawijaya, T. W. E. (2025). E-Blue: Implementation Of An Integrated Blue Economy Ecosystem To Increase Coastal Msmes Competitiveness. *Journal of Indonesian Economy & Business*, 40(2), 256.
- Digital Innovation And The Blue Economy: Enhancing The Competitiveness Of Coastal Micro, Small, And Medium Enterprises
Arifin dkk.

- Pratama, D. P. A., & Farida, N. (2025). Unveiling the Interplay of Triple Bottom Line and Blue Economy in Empowering Coastal MSMEs of East Java towards Sustainable Export Capacity (SDGs). *JPEKA: Jurnal Pendidikan Ekonomi, Manajemen Dan Keuangan*, 9(2), 145–162.
- Rifa'i, A. (2026). Governance Model for Blue Economy Policy Implementation Developing Marine MSMEs Based on Processed Fishery Products to Foster Self-Reliance Among the Coastal Community of Karangantu, Serang Regency. *CARONG: Jurnal Pendidikan, Sosial Dan Humaniora*, 3(3), 410–420.
- Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901. <https://doi.org/10.1016/j.jbusres.2019.09.022>
- Yudistia, T. T., Hasrullah, H., Yahya, M., & Rahmadiansyah, A. (2025). Strategic Integration of Creative and Blue Economies through Digital Media: A Case Study of PT Digipedia Karya Pratama in Indonesia's Maritime Region. *CHANNEL: Jurnal Komunikasi*, 13(1), 100–112.