

Understanding Consumer Needs in the Digital Era: Digital Technology, Consumer Insight, and Blue Economy Productivity

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ABSTRACT

The blue economy sector has become one of the strategic drivers of sustainable economic growth, particularly in maritime countries such as Indonesia. Despite its substantial marine resources and fisheries potential, the sector's contribution to national economic productivity remains below its expected capacity. Digital technologies have emerged as important enablers for enhancing operational efficiency, improving market access, and generating consumer insights that support strategic decision-making. This study develops a conceptual framework integrating Social Capital Theory and Transaction Cost Economics (TCE) to explain how digital technology adoption enhances productivity within the blue economy sector. The framework proposes that digital technologies facilitate information sharing, strengthen supply chain collaboration, reduce transaction costs, and improve responsiveness to consumer needs. Consequently, organizations are expected to achieve higher levels of business performance and productivity. The study contributes to the literature by linking consumer insights, digital transformation, social capital, and transaction cost efficiency within the context of blue economy development. The findings provide strategic implications for policymakers, fisheries entrepreneurs, and digital platform providers seeking to improve competitiveness and sustainability in marine-based industries.

Keywords: *Blue Economy Productivity, Consumer Insights, Digital Technology, Social Capital, Transaction Cost Economics.*

1. INTRODUCTION

The blue economy has emerged as a strategic pillar for sustainable economic development worldwide. Indonesia possesses enormous marine resources, supported by more than 17,000 islands and extensive fisheries potential. The fisheries and marine sectors contribute significantly to employment and food security. However, their contribution to national economic productivity remains relatively limited compared to other sectors. The increasing adoption of digital technology presents opportunities to improve the competitiveness of blue economy businesses. Digital platforms such as eFishery, Aruna, and FishLog have transformed fisheries operations by facilitating production management, financing, logistics, and market access. Beyond operational efficiency, digital technologies also generate valuable consumer insights that help businesses understand changing customer preferences and market demands.

Consumer insights have become critical resources in the digital era. Organizations capable of understanding customer expectations are better positioned to develop innovations, improve service quality, and make strategic business decisions. In the blue economy sector, consumer information can help producers respond more effectively to quality requirements, sustainability concerns, traceability demands, and purchasing behavior. From a theoretical perspective, Transaction Cost Economics (TCE) argues that organizations seek mechanisms that minimize transaction-related costs, including information search, monitoring, negotiation, and enforcement costs. Digital technologies can significantly reduce these costs by increasing transparency and facilitating communication. Simultaneously, Social Capital Theory emphasizes the importance of trust, information sharing, and collaborative relationships in creating economic value.

Existing studies on the blue economy primarily focus on digital transformation, sustainability, operational efficiency, and competitive advantage. However, limited research has examined how digital technologies enable organizations to

generate consumer insights and transform those insights into productivity gains. Furthermore, prior studies often investigate transaction cost efficiency and supply chain collaboration independently, while little attention has been given to integrating Consumer Insights Capability, Transaction Cost Economics (TCE), and Social Capital Theory within a unified framework for explaining productivity enhancement in the blue economy sector. This study addresses this gap by proposing an integrated model in which digital technology not only improves operational efficiency and collaboration but also strengthens consumer insights capability, ultimately contributing to business performance and productivity.

2. RESEARCH METHODS

This study adopts a quantitative research design. The target population consists of actors operating within Indonesia's blue economy sector, including fishermen, aquaculture operators, seafood processors, fish distributors, and marine tourism entrepreneurs. Data collection is planned through online and offline surveys using structured questionnaires. The study targets approximately 300 respondents, consistent with recommendations for Structural Equation Modeling (SEM) analysis. In addition, Consumer Insights Capability is incorporated as a strategic outcome of digital technology utilization and an important mechanism supporting productivity enhancement. Consumer Insights Capability (CIC) refers to an organization's ability to collect, analyze, interpret, and utilize consumer-related information to support strategic decision-making and innovation. In the blue economy context, CIC enables firms to:

- Understand customer preferences regarding seafood products and marine services;
- Identify emerging market trends and demand patterns;
- Respond to consumer concerns regarding quality, food safety, traceability, and sustainability;
- Develop customer-oriented innovations and value propositions.

Digital technologies serve as critical enablers of CIC by facilitating access to real-time consumer data through digital platforms, e-commerce systems, social media, and online marketplaces. Digital technologies enable firms to collect and process consumer information more efficiently, thereby enhancing their ability to understand market needs and customer preferences, so the hypothesis is:

H1: Digital Technology positively influences Consumer Insights Capability.

Organizations that effectively understand consumer needs are better positioned to develop market-oriented products, improve service quality, and increase operational productivity, so the hypothesis is:

H2: Consumer Insights Capability positively influences Business Performance and Productivity.

The adoption of digital technologies reduces information search costs, monitoring costs, coordination costs, and negotiation costs, leading to greater transaction efficiency, so the hypothesis is:

H3: Digital Technology positively influences Transaction Cost Efficiency.

Lower transaction costs allow firms to allocate resources more effectively toward productive and value-creating activities, so the hypothesis is:

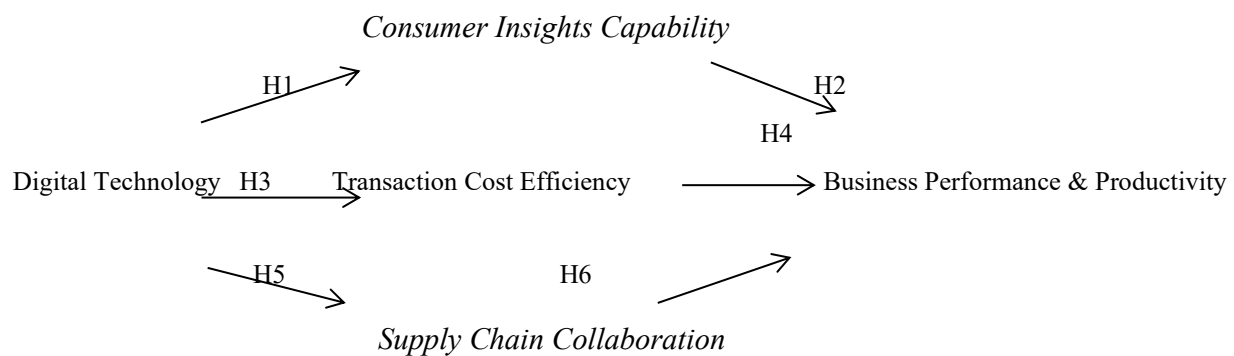
H4: Transaction Cost Efficiency positively influences Business Performance and Productivity.

Digital technologies facilitate information sharing, communication, and coordination among supply chain partners, thereby strengthening collaborative relationships, so the hypothesis is:

H5: Digital Technology positively influences Supply Chain Collaboration.

Effective collaboration among supply chain members improves operational efficiency, responsiveness, service quality, and overall business productivity, so the hypothesis is:

H6: Supply Chain Collaboration positively influences Business Performance and Productivity.



Data analysis will be conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM).

3. 3. RESULTS AND DISCUSSIONS

3.1. Digital Technology and Consumer Insights Capability

Digital technology has fundamentally transformed how organizations collect, process, and utilize information. In the blue economy sector, digital platforms such as e-commerce systems, fisheries marketplaces, mobile applications, social media, and cloud-based information systems provide access to real-time consumer data. These technologies enable firms to better understand customer preferences, purchasing behavior, quality expectations, and emerging market trends.

Consumer Insights Capability refers to an organization's ability to transform raw consumer data into actionable knowledge that supports strategic decision-making. Through digital technologies, firms can identify changes in consumer demand, predict future market opportunities, and develop products that align with customer expectations.

The proposed model suggests that Digital Technology positively influences Consumer Insights Capability (H1). This relationship is consistent with prior studies indicating that digital technologies improve organizational learning and knowledge acquisition by facilitating information access and analytics capabilities. In the blue economy context, stronger consumer insights enable fisheries businesses and marine-based enterprises to adapt their products and services according to market needs, thereby improving competitiveness and productivity.

Furthermore, Consumer Insights Capability is expected to positively influence Business Performance and Productivity (H2). Organizations that possess superior consumer understanding are more capable of developing innovative offerings, improving service quality, reducing market uncertainty, and increasing customer satisfaction. As a result, firms can achieve higher productivity and sustainable growth.

3.2. Digital Technology and Transaction Cost Efficiency

Transaction Cost Economics (TCE) emphasizes that organizations seek governance mechanisms that minimize costs associated with economic transactions. These costs include information search costs, monitoring costs, coordination costs, and contract enforcement costs.

Digital technology serves as an effective mechanism for reducing transaction costs. Digital platforms provide transparent information regarding prices, product availability, supplier performance, and customer requirements. Consequently, businesses can make decisions more efficiently while reducing uncertainty and opportunistic behavior.

The proposed model argues that Digital Technology positively influences Transaction Cost Efficiency (H3). In the blue economy sector, digital technologies simplify interactions among fishermen, suppliers, distributors, processors, and customers. Improved information availability reduces search and monitoring costs while enhancing coordination across business activities.

Transaction Cost Efficiency is also expected to positively affect Business Performance and Productivity (H4). Lower transaction costs enable firms to allocate more resources toward productive activities, innovation, and market expansion. Reduced operational inefficiencies contribute directly to improved organizational performance and productivity outcomes.

3.3. Digital Technology and Supply Chain Collaboration

Supply Chain Collaboration represents one of the key dimensions of Social Capital Theory. Social capital emphasizes the importance of trust, information sharing, resource sharing, and collaborative communication among organizational actors.

Digital technologies facilitate collaboration by enabling continuous communication and information exchange among supply chain members. In the blue economy sector, digital platforms connect fishermen, aquaculture operators, processors, distributors, retailers, and consumers within a more integrated ecosystem.

The proposed framework suggests that Digital Technology positively influences Supply Chain Collaboration (H5). Through digital tools, organizations can improve transparency, strengthen relationships, and coordinate activities more effectively across the supply chain.

Supply Chain Collaboration is further expected to positively influence Business Performance and Productivity (H6). Effective collaboration reduces uncertainty, improves resource utilization, enhances responsiveness to customer needs, and strengthens operational efficiency. These benefits ultimately contribute to higher productivity and better business outcomes.

3.4. Integrated Perspective of Consumer Insights, Transaction Cost Efficiency, and Supply Chain Collaboration

This study proposes that Digital Technology enhances Business Performance and Productivity through three complementary pathways.

The first pathway is strategic and market-oriented. Digital technology enables organizations to generate Consumer Insights Capability, allowing firms to better understand consumer needs and market dynamics. This capability supports innovation and strategic decision-making.

The second pathway is efficiency-oriented. Through Transaction Cost Efficiency, digital technology reduces costs associated with information searching, monitoring, coordination, and governance. These efficiencies improve resource allocation and organizational productivity.

The third pathway is relationship-oriented. Digital technology strengthens Supply Chain Collaboration by facilitating information sharing, communication, and trust among stakeholders. Stronger collaboration improves operational performance and responsiveness throughout the supply chain.

Together, these three mechanisms provide a comprehensive explanation of how digital transformation contributes to productivity enhancement within the blue economy sector. While Transaction Cost Economics explains efficiency improvements and Social Capital Theory explains collaborative advantages, Consumer Insights Capability introduces a market-driven perspective that aligns organizational activities with consumer expectations.

3.5. Theoretical and Practical Implications

Theoretically, this study extends the literature by integrating Transaction Cost Economics, Social Capital Theory, and Consumer Insights Capability into a unified framework for explaining productivity enhancement in the blue economy sector. Previous studies have largely examined operational efficiency and collaboration independently, whereas this framework highlights the strategic role of consumer understanding in generating business value.

Practically, the findings suggest that policymakers and industry practitioners should not view digital technology solely as an operational tool. Instead, digital technologies should be strategically leveraged to generate consumer insights, strengthen collaborative relationships, and improve transaction efficiency.

For fisheries businesses, aquaculture operators, and marine tourism enterprises, investments in digital platforms can provide multiple benefits, including enhanced customer understanding, reduced operational costs, stronger supply chain integration, and improved productivity. These outcomes are expected to contribute to sustainable growth and competitiveness within the blue economy sector.

4. CONCLUSION

The digital transformation of the blue economy sector creates significant opportunities for enhancing productivity and competitiveness. This study proposes that digital technology contributes to productivity through two complementary

mechanisms: transaction cost efficiency and social capital development. Furthermore, digital technologies enable organizations to generate valuable consumer insights that support innovation and strategic business decisions. By integrating Social Capital Theory and Transaction Cost Economics, this study provides a comprehensive framework for understanding how digital transformation can strengthen sustainable productivity within the blue economy sector. Among the three mechanisms, Consumer Insights Capability represents the primary strategic contribution of this study because it directly aligns digital transformation initiatives with market needs and customer expectations, consistent with the conference theme “Harnessing Consumer Insights: Driving Innovation in Strategic Business Decisions.” Future empirical studies are needed to validate the proposed model using data collected from fisheries and marine industry stakeholders across Indonesia.

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