

Effects of digitalization on business models and sustainability of the fishing industry

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Abstract

Purpose: Describe the development of digital business models of fishing companies in the city of Mar del Plata and their relationship with the sustainability of production processes.

Methodology: The research is based on a descriptive-correlational quantitative methodology, with the application of a multivariate analysis technique, cluster analysis, to identify groupings of companies based on secondary sources of information.

Results: Mar del Plata fishing companies offer different asymmetries in the development of their business model through digital marketing channels, with few representations of current technological advances in the final stretch of the value chain.

Research limitations: The limitation of the work lies in the lack of longitudinal data that prevents evaluating long-term changes in the integration of digitalization and sustainability.

Originality: The study on business models and environmental commitment in the fishing industry in the southeast of the province of Buenos Aires reveals a predominant emphasis on commercial innovation, often to the detriment of comprehensive approaches. This approach decouples digitalization from sustainability, particularly among the sector's pioneers.

Keywords: *digital transformation; marketing channels; value chain; environmental commitment; southeastern Buenos Aires*

1. Introduction

The challenges imposed by sustainability and globalization affect both the food production industry and consumers. For the former, the increasing interconnection of global markets allows for production and commercialization in different countries with inputs from multiple origins, adding complexity to logistics along with greater competition and resource depletion. Consumers, at the other end of the value chain, demand higher quality standards, which are implemented through certifications and traceability systems. One of the industrial sector's responses to these requirements is to design diversification strategies, particularly those related to market expansion and the development of new and complementary products.

Leveraging the global demand for fishery products and capturing various customer segments involves adopting innovative options offered by technologies through e-commerce and platform economies, thereby generating added value for customers through new services and greater operational efficiency. The purpose of this study is to describe the effects of digitalization on the development of new business models and the commitment to sustainability in fishery companies in the city of Mar del Plata. The approach focused on a quantitative, descriptive-correlational investigation, using multivariate techniques such as cluster analysis, based on official information sources and digital content from the companies, providing a profile of the industry regarding sustainability and technological advancements.

2. Literature Review

The rapid advancement of digital transformation has profoundly changed organizational practices, improving the efficiency of production processes and optimizing resource allocation. In the fishery sector, digitalization improvements are observed at different stages of the chain: from mobile applications that allow identifying the origin of the catch based on location recognition and promoting sustainable management of bycatch species, to the establishment of new and innovative business models with content monetization and platform economies. (Ji & Li, 2021) show that the informatization of fishing has a long-term positive effect on economic efficiency, encouraging the incorporation of technologies.

Digitalization in the fishery industry is a process that employs enabling technologies such as robotics, additive manufacturing, cloud computing, artificial intelligence, and the Industrial Internet of Things, among others, to effectively support the improvement of productivity and economic efficiency of operations (Ji & Li, 2021). The increasing pressure on the fishery sector for sustainability and the adherence to high-quality standards for exports present companies with a central challenge: how to create value at different stages of their production cycle sustainably.

Digital transformation can contribute to the sector's expansion and offer significant benefits in terms of efficiency and productivity, waste reduction, and pollution (Rowan, 2023). Value capture for customers finds an appropriate vehicle in digital business models to reach a globalized market, with substantial expansion in recent years, extending the traditional format with technological support towards creative and innovative ways to generate value for users (Venkatraman, 2017). These new technologies provide transparency for

consumers and regulatory compliance through the provision of information about their origin and production.

3. Methodology

A quantitative methodology was adopted, through a descriptive-correlational, cross-sectional, non-experimental study, using multivariate techniques such as cluster analysis, based on secondary information sources. The study was conducted from august to september 2023 on active companies engaged in the processing and preservation of fish, crustaceans, and mollusks in the city of Mar del Plata. Company selection was based on published content in their digital media and official organizational information to identify their economic activity and tax status, determining the entity's validity.

The sample of selected companies presents the following characteristics: 90% conduct their commercial activity in international markets through the export of fishery products, and 73% are micro and small enterprises. To describe the digital business model of fishery industry companies, four variables were defined: (i) value chain (quality and origin certifications of the catch), (ii) products (indicator: digital catalog), (iii) processes (indicator: traceability system), and (iv) business model (indicator: digital commercialization channel). The research question addressed is: how does digitalization affect the development of new business models and the commitment to sustainability?

4. Results

The first result of interest to the study's objective addresses the degree of penetration of new digital business models: only 10% of the entities have online commercialization strategies, ranging from specific channels to the possibility of interaction with clients and wholesalers for product distribution. This proportion shows the low degree of penetration of new digital business models in the fishery product processing companies in the city of Mar del Plata. The most commonly used strategy by the entities studied to develop a direct sales channel with consumers and retailers is the development of proprietary e-commerce platforms, eliminating intermediaries and improving market access.

While 90% of the companies offer their product catalogs online, only 27% provide information on certifications, mostly those corresponding to standards required for exports to the European Union, the USA, Brazil, and other markets. Regarding traceability systems, 31% publish training instances on the topic for their staff and characteristics of the product batch labeling.

Cluster analysis reveals three groupings: the first, a small number with online orders and e-commerce platforms; the second, the majority of companies, which do not offer information about products, certifications, traceability, nor do they have digital channels; and finally, a small group with information on traceability and certifications, but without specific product information.

The analysis distinguishes company groupings with differentiated behaviors: a small number with early technology adoption and limited sustainability information; a small group with information on certifications and traceability but not integrating these practices into digital business proposals; and a large number

of laggards with low commitment to both environmental sustainability and transparency, and the adoption of new business models.

5. Discussion

The companies in Mar del Plata dedicated to fishery product processing possess a predominantly export-oriented nature, facing challenges associated with obtaining sustainable catch certifications and increasing demands for transparency in their operations through traceability systems.

In the context of the fourth industrial revolution, only a limited number of these companies have integrated new digital commercialization channels into their traditional business models. This integration has allowed for the elimination of intermediaries in product distribution and has provided significant advantages for accessing international markets. The small number of entities that have adopted this business model indicates an initial phase in the development of this technology within the sector. This contrasts with the more consolidated and widely disseminated digital presence model defined by content publication.

Digital transformation contributes to the expansion of the sector through online marketing, providing information on consumer preferences and shorter channels to access products, innovating in the way of generating value. Given the predominance of commercial innovation in pioneering entities, the content publication model widely adopted by the sector and the importance that consumers give to transparency, the development of new models that have information on the origin and preparation of the products is imperative for capturing value in terms of efficiency and productivity.

6. Conclusions

The development of digital business models facilitates access to new markets while promoting operational efficiency and cost reduction, thereby contributing to greater competitiveness and positioning at the forefront of the sector. The empirical work conducted provides evidence on the evolution in the incorporation of technologies in the fishery industry, indicating that these advances transcend their function as mere operational tools and induce significant changes in business models.

Digitalization allows new ways to generate value for the customer in a globalized context. However, these diversification strategies must be implemented together with a firm commitment to sustainability, offering relevant information to its stakeholders. This will reinforce organizational practices oriented towards transparency and offer guarantees to ensure consumer trust. Future research will address a study of primary sources of information that allow us to overcome the current limitation of work in the current digitalization and sustainability situation and enable the evaluation of long-term changes in the trajectory of companies, as a factor of impact on the organizational evolution.

References

- Ji, J. & Li, Y. (2021). The development of China's fishery informatization and its impact on fishery economic efficiency *Marine Policy*, 133. <https://doi.org/10.1016/j.marpol.2021.104711>
- Rowan, N. (2023). The role of digital technologies in supporting and improving fishery and aquaculture across the supply chain – Quo Vadis?. *Aquaculture and Fisheries*, 8(4), 365-374.
- Venkatraman, V. (2017). *The digital matrix: new rules for business transformation through technology*. LifeTree Media.