

Designing a Digital Marketing Information System Strategy for MSMEs in the Fisheries Sector: A Contextual Framework from Eastern Indonesia

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ABSTRACT

Introduction: Micro, small, and medium enterprises (MSMEs) in the fisheries sector face increasing pressure to adopt digital strategies to enhance market reach, operational efficiency, and resilience. However, many of these enterprises, particularly in emerging regions like Eastern Indonesia, struggle to integrate digital marketing tools into a cohesive system. This study addresses the need for a context-specific digital marketing information system (DMIS) tailored to the realities of resource-constrained MSMEs.

Objectives: This research aims to design a contextual strategy framework for digital marketing information systems by identifying the enabling factors, technological barriers, and actor collaborations influencing DMIS adoption among fisheries-based MSMEs.

Methods: Using a qualitative exploratory approach, the study involved in-depth interviews with MSME owners, government officials, academic experts, and digital marketing practitioners in Kupang, Indonesia. Thematic analysis was applied to extract patterns, and findings were structured into a conceptual framework that integrates insights from actor-network theory and the triple helix model.

Results: Findings reveal that while most MSMEs demonstrate enthusiasm for digital tools, low digital literacy and the absence of integrated systems hinder full adoption. The research identifies four core components for designing a DMIS strategy: platform readiness, actor collaboration, digital capability development, and adaptive information flows. The resulting framework proposes a multi-actor, scalable system tailored to local constraints.

Conclusions: A digital marketing information system for MSMEs in the fisheries sector must be adaptive, actor-driven, and rooted in local realities. Collaboration among stakeholders and systematic capability building are essential for sustainable implementation. The study offers practical insights for policymakers and IS practitioners aiming to accelerate MSME digital transformation.

Keywords: Digital marketing systems, MSMEs, information systems strategy, actor-network theory, triple helix, fisheries sector, emerging economies.

INTRODUCTION

In the current digital era, information systems play a vital role in shaping the marketing strategies of micro, small, and medium enterprises (MSMEs), particularly in resource-constrained sectors like fisheries. Digital marketing information systems (DMIS) enable small enterprises to expand market reach, foster customer engagement, and enhance competitiveness. However, MSMEs in emerging economies such as Indonesia often struggle to adopt such systems due to infrastructure limitations, low digital literacy, and weak institutional support.

Digital marketing has transformed how businesses operate, enabling even small-scale firms to connect directly with consumers through personalized platforms and social engagement tools (Shankar et al., 2022; Busca & Bertrandias, 2020; Höflinger et al., 2018). Tools such as social media, e-commerce, and web analytics allow MSMEs to interact

with dynamic market environments, yet the majority of these enterprises in Indonesia lack integration across their digital channels (Zalsadilla et al., 2023). Despite using platforms such as Instagram, WhatsApp, and Tokopedia, many MSMEs operate without a cohesive information system, resulting in fragmented digital efforts and low return on marketing investment.

Research on digital marketing strategies has shown that electronic word-of-mouth (e-WOM), content personalization, and digital presence are powerful drivers of decision-making in both commercial and non-commercial sectors (HR et al., 2025). These insights highlight the need for a systematic, user-centered approach to DMIS development for MSMEs.

The transformation of MSMEs requires not only technological access but also systemic frameworks that align organizational goals, actor collaboration, and strategic planning. Actor-network theory (ANT) offers a socio-technical lens for understanding the interaction between digital tools and institutional actors, while the triple helix model underscores the importance of synergy among government, industry, and academia in supporting digital innovation (Etzkowitz & Leydesdorff, 2000). In line with this, Sudaria and Bagares (2025) emphasize that enabling environments—driven by multi-actor collaboration—are essential for MSME resilience and innovation in developing regions.

This study seeks to address a critical research gap by designing a contextual strategy for digital marketing information systems tailored to fisheries-based MSMEs in Eastern Indonesia. It contributes to the information systems literature by proposing a practical framework grounded in local realities and actor collaboration, aimed at enabling inclusive and sustainable digital transformation.

OBJECTIVES

The primary objective of this study is to design a contextual digital marketing information system (DMIS) strategy tailored for fisheries-based micro, small, and medium enterprises (MSMEs) in Eastern Indonesia. Specifically, the study aims to:

1. Assess the digital readiness and marketing practices of fisheries-based MSMEs in peripheral regions;
2. Examine the role of institutional actors—government, academia, and the private sector—in enabling collaborative digital strategy development;
3. Identify challenges in adopting integrated digital marketing systems; and
4. Develop a strategic framework that combines actor collaboration with system components to improve MSME competitiveness and sustainability.

This study responds to the need for a system-oriented strategy that reflects local realities and multi-actor collaboration (Sudaria & Bagares, 2025). Additionally, recent evidence highlights the importance of user-centered digital approaches to increase market engagement and decision-making effectiveness (Shankar et al., 2022).

METHODS

This research applied a qualitative exploratory approach to design a digital marketing information system (DMIS) strategy suited to fisheries-based micro, small, and medium enterprises (MSMEs) in Eastern Indonesia. The study took place in Kupang City, where MSMEs face limited digital capabilities yet demonstrate entrepreneurial potential in the fisheries sector.

3.1 Research Design

A case study method was employed to explore contextual conditions and actor interactions in depth. The qualitative design was selected to capture the complexities of technological adaptation and inter-actor dynamics within local MSME ecosystems.

3.2 Participants and Data Collection

Participants included 24 informants selected through purposive and snowball sampling. They consisted of MSME owners (10), local government officials (4), academics (3), digital marketing consultants (3), platform facilitators (2), and fisheries cooperative representatives (2). Data were collected through semi-structured interviews conducted face-to-face and via phone calls. Interview guides were structured around themes of digital readiness, actor collaboration, and system needs.

3.3 Data Analysis

Data analysis was conducted using manual thematic coding. The process involved three stages: open coding (identifying key concepts), axial coding (linking categories), and selective coding (integrating themes into a strategic framework). All transcripts were reviewed iteratively to ensure consistency and depth of interpretation.

3.4 Trustworthiness

To ensure data credibility and trustworthiness, the study applied triangulation across informant groups, conducted member checking for selected participants, and maintained a manual audit trail of coding decisions.

3.5 Ethical Considerations

All participants provided informed consent. Their identities were anonymized to protect confidentiality. Ethical clearance was obtained from the research ethics committee of Universitas 17 Agustus 1945 Surabaya.

RESULTS

The findings of this study reveal four major themes that shape the development of a digital marketing information system (DMIS) strategy for fisheries-based MSMEs in Eastern Indonesia:

4.1 Fragmented Use of Digital Platforms

MSMEs in the fisheries sector have adopted various digital tools—such as WhatsApp, Facebook, and Shopee—but usage remains fragmented and unintegrated. Most businesses rely on personal intuition rather than systematic digital marketing strategies. The lack of a unified system results in low customer retention and weak data utilization.

4.2 Actor Collaboration Gap

Despite efforts from local government and academic institutions, collaboration among key stakeholders remains informal and ad hoc. MSME owners report limited access to structured digital marketing training or coordinated support. This gap underscores the absence of a collaborative governance model to sustain digital ecosystem development.

4.3 Resource and Capability Constraints

Limited digital literacy, time, and capital hinder MSMEs from fully engaging with digital platforms. While some business owners express willingness to adopt more advanced tools, they lack the capacity to manage social media content, analyze digital metrics, or invest in system integration.

4.4 Framework Components for DMIS Strategy

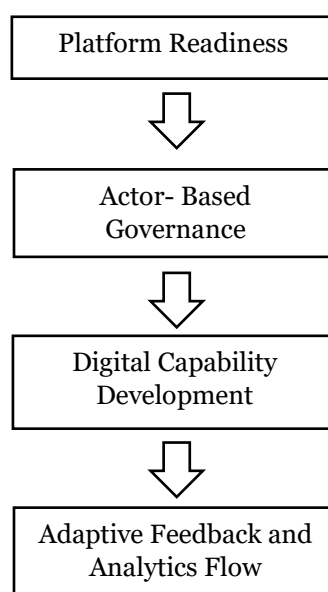
From cross-actor perspectives, the study identifies four essential components for a contextual DMIS strategy:

- (1) platform readiness,
- (2) actor-based governance,
- (3) digital capability development, and
- (4) adaptive feedback and analytics flow.

These components form the basis of a strategic framework that aligns system design with the social and institutional realities of peripheral MSMEs.

Table 1. Summary of Key Themes Identified in the Study

No.	Theme	Key Findings
1	Fragmented Use of Digital Platforms	Unintegrated use of WhatsApp, Facebook, Shopee; low systemization.
2	Actor Collaboration Gap	Lack of structured collaboration among government, academia, MSMEs.
3	Resource and Capability Constraints	Low digital literacy and financial/operational limitations.
4	Framework Components for DMIS Strategy	Proposed strategy includes platform readiness, governance, capability development, and adaptive analytics.

Figure 1. Proposed DMIS Strategic Framework for Fisheries-Based MSMEs

This framework outlines a sequential structure for enabling digital transformation among MSMEs through systemic readiness, actor synergy, skill development, and data-informed adaptation.

DISCUSSION

The findings of this study highlight critical factors influencing the formulation of a contextual digital marketing information system (DMIS) strategy for fisheries-based MSMEs in peripheral regions. First, the fragmented use of digital platforms reflects what Höflinger et al. (2018) describe as the "island effect" of disconnected digital practices, common among enterprises lacking strategic orientation. This supports the view that digital adoption alone is insufficient without system-level integration (Busca & Bertrandias, 2020).

The observed gap in actor collaboration reinforces the argument by Sudaria and Bagares (2025) that institutional support structures remain weak in decentralized MSME ecosystems. While government programs exist, the absence of coordinated platforms for knowledge transfer and co-design has limited their impact. This aligns with the triple helix model (Etzkowitz & Leydesdorff, 2000), which emphasizes synergy among government, academia, and industry as essential for sustainable innovation.

Furthermore, resource and capability constraints, particularly digital literacy and access to training, echo the findings of Zalsadilla et al. (2023) on the uneven digital readiness of Indonesian MSMEs. These constraints inhibit businesses from progressing beyond basic digital presence into strategic digital marketing operations.

The proposed DMIS framework offers a structured response to these challenges by embedding four key components: platform readiness, actor-based governance, capability development, and adaptive analytics. This

aligns with Shankar et al. (2022), who emphasize the need for user-centered, feedback-driven systems to ensure relevance and responsiveness in digital marketing efforts.

Overall, this study contributes to the information systems literature by integrating socio-technical theory (ANT) with practical marketing needs, emphasizing that strategic digital transformation for MSMEs must be rooted in local realities and actor alignment. The framework is particularly relevant for resource-constrained sectors where informal practices dominate and institutional coordination is weak.

CONCLUSION

This study developed a contextual digital marketing information system (DMIS) strategy for fisheries-based MSMEs in Eastern Indonesia, grounded in qualitative insights from diverse stakeholders. The findings reveal that despite the growing use of digital tools, MSMEs in peripheral areas still operate without integrated systems, limiting their ability to compete and scale. Fragmented digital practices, weak institutional collaboration, and low digital capability continue to hinder strategic transformation.

The proposed DMIS framework addresses these gaps by combining four core components: platform readiness, actor-based governance, capability development, and adaptive analytics. This framework emphasizes the need for systemic alignment between digital tools and socio-institutional structures, especially in regions with limited infrastructure and support.

The study offers theoretical contributions by integrating socio-technical perspectives (via Actor-Network Theory) with practical elements from digital marketing and MSME development. Practically, it provides a roadmap for policymakers, universities, and MSMEs to collaboratively build sustainable digital ecosystems.

Future research may refine this framework through comparative case studies or action research to test its applicability in different contexts and sectors.

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