Local Government Readiness for Digital Transformastion Enhancing Fisheries MSMES Performance in Maluku

Christy Clayde Latupeirissa[1*], Paskanova Christi Gainau[1], Senda Yunita Leatemia[1]

[1] *Accounting, Faculty Economy and Business, Universitas Pattimura, Maluku, Indonesia*

[*]Corresponding author's e-mail: christy.clayde@lecturer.unpatti.ac.id

ABSTRACT

Digital transformation is a fundamental requirement for achieving effective, efficient, and transparent governance. In the local government context, readiness for digital transformation involves more than technological capability; it requires supporting policies, adequate human resources, organizational cultural alignment, and strong leadership commitment. This study analyzes the readiness of local governments to support digital transformation in the fisheries sector in Maluku Province and Ambon City. A descriptive qualitative approach with purposive sampling was used, and data were collected through in-depth interviews with section-head-level officials from five regional agencies. Data were analyzed using the Miles and Huberman framework through data reduction, data display, and conclusion drawing, verified through source triangulation. The findings show that digitalization initiatives remain limited, unstructured, and still at the planning stage, mainly focused on market retribution and fish auction site management to increase local revenue rather than improving public services. There are no specific policies or budget allocations, and fishing communities face limited device access and internet connectivity. Based on the Capability Maturity Model Integration, the digital maturity level is at Level 1 (initial). The study concludes that strategic policies, improved human resource capacity, infrastructure support, and digital literacy are essential to achieve sustainable digital transformation.

Keywords: CMMI, Digital Transformation, Fisheries Sector, Local Government Readiness

Introduction

The rapid development of technology and information in recent years has significantly influenced government governance systems. In Indonesia, the percentage of citizens accessing mobile phones and the internet continues to increase, with 68.65% having mobile access and 72.78% actively using the internet in 2024 (Badan Pusat Statistik (2024). Digital transformation in public administration is mandated through the Electronic-Based Government System (SPBE) Policy under Presidential Regulation (Kementerian Dalam Negeri, 2024) which aims to promote effective, efficient, transparent, and accountable governance. For local governments, digital transformation requires not only technological readiness, but also supportive policies, adequate human resources, organizational cultural alignment, and strong leadership commitment. It includes modernization of government accounting systems, integration of public services, and data-driven decision-making.

Readiness at the local government level is essential to support smart governance, an important component of smart city development. Previous studies (Bousdekis and Kardaras,

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2020; Del Vecchio, Secundo, and Garzoni, 2024) focus on the influence of IT infrastructure, digital literacy, and managerial and leadership readiness on digital transformation success. However, research also identifies persistent challenges including infrastructure disparities, low digital literacy, weak regulatory frameworks, and limited inter-agency coordination Gasco-hernandez et al. (2022). These challenges are more pronounced in archipelagic regions where geographic characteristics impose additional limitations. Studies such as (Susilawati and Yanti, 2023) emphasize geographical barriers to e-government implementation, yet comparative research remains limited, particularly regarding managerial readiness and digital leadership within local governments.

Maluku, as an archipelagic province, faces significant challenges related to uneven telecommunications infrastructure, limited internet access, and high development costs. Internet access in Maluku in 2024 reached 59.17%; however, disparities remain between urban and rural areas (Figure 1). These conditions affect the capacity of the government and local communities to adopt digital systems. The fisheries sector is a strategic priority for Maluku's economy, and digital transformation has the potential to improve data management, supply chain efficiency, financing access, and market expansion through digital platforms such as e-logbooks and online marketplaces. Yet successful implementation requires government readiness to provide integrated and user-centered digital services Aldhi et al. 2025; Puspitasari, Chasanah, and Masitha (2022).
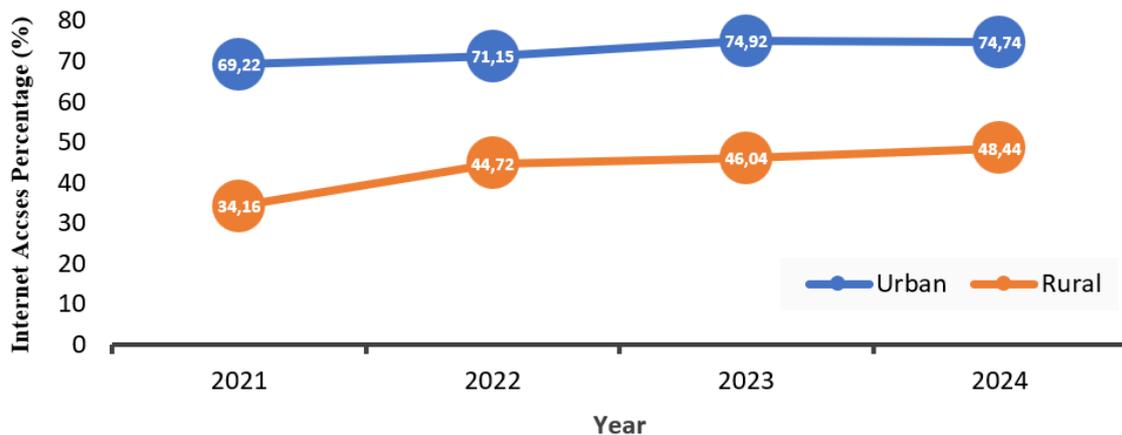

Figure 1.
Internet Access Percentage in Urban and Rural Areas of Maluku Province in 2021-2024 (BPS, 2024)

Existing studies have not sufficiently examined the linkage between government readiness, digital transformation, modernization of public sector accounting, and impacts on the fisheries business ecosystem, particularly in archipelagic contexts. Therefore, this research aims to analyze local government readiness in supporting digital transformation in the fisheries sector in Maluku Province and Ambon City; identify key enabling and inhibiting factors; and formulate strategic recommendations to enhance readiness. The study contributes practically by serving as a reference for regional policymakers in developing a digital transformation roadmap and strengthening institutional capacity, and theoretically by enriching literature on digital governance and smart cities through a comprehensive perspective on organizational readiness.

Theoretical Framework and Hypothesis

To analyze the readiness of local governments using the Capability Maturity Model Integration (CMMI) with 5 levels, as proposed by Scientific & Engineering Index (2002). CMMI is a framework developed by the Software Engineering Institute (SEI), Carnegie Mellon University in 2002 to measure the maturity and capability of an organization in managing its processes. Initially developed in the context of software engineering, it has since expanded to various sectors, including government and digital transformation, and was adapted by Kim and Grant (2010). Kim and Grant (2010) adapted this model to assess organizational readiness in the context of e-government and public sector digital transformation.

This adaptation emphasizes the integration of technology and organizational processes, not just project management, focusing on institutional capability and leadership commitment, managerial aspects, organizational culture, and environmental support as determinants of digital maturity.

With this adaptation, the CMMI model can be used to assess the readiness of local governments in terms of technology (infrastructure, system integration, data security), organization (governance, policy, human resource competencies), service processes (digitization of procedures and public accountability), and digital culture and leadership (drive for innovation, commitment to change, and inter-agency collaboration).

Figure 2 illustrates the five levels of the Capability Maturity Model Integration (CMMI) from Initial to Optimizing, the conceptual progression of organizational maturity provides a structured foundation for assessing local government readiness. To operationalize this framework in the context of this study, each maturity level is translated into measurable dimensions and indicators relevant to local government digital transformation. Therefore, Table 1 presents the detailed operationalization of the CMMI levels, including the corresponding dimensions, indicators, and assessment criteria used to evaluate the readiness of local governments.
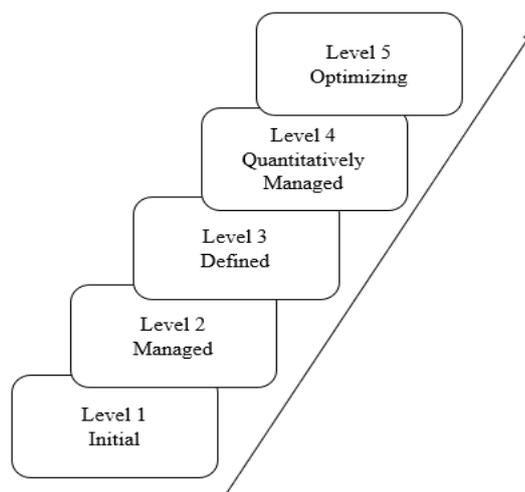
Figure 2.
Five Levels of CMMI Model for Assessing Organizational Digital Capability

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Table 1.
Level of Digital Transformation Readiness

Nama	Level Name	Characteristics of Digital Transformation
1	Initial : Awarenes Stage, awal/adhoc	- Digital transformation is not yet a priority for local governments. - Digitization is limited to basic computerization. - There is no digital strategy, roadmap, or regulation. - The use of technology depends on individual initiatives, not systems.
2	Managed : Digitalization of basic service	- Local governments have begun to provide basic digital services, but these are still partial and limited to individual regional work units. - Some digital SOPs have begun to be implemented, but they are inconsistent. - There are already IT staff/teams, but human resource capacity is still limited. - Technology is used only for internal efficiency, not yet for integration.
3	Defined : Strategy & Organizational Alignment	- Local governments have clear digital transformation strategies or roadmaps. - Digital policies and regulations are beginning to take effect, such as data security. - Human resource development is becoming systematic (training, certification, digital literacy). - Collaboration between local government work units is beginning to take shape, and digital processes are becoming standardized.
4	Quantitatively Managed	- The digital system between regional work units is integrated (integrated digital governance). - Local government decision-making is based on data and analytics. - Digital transformation performance is evaluated using KPIs/indicators of the electronic-based government system. - Collaboration with the public, private sector, and academics is already taking place.
5	Optimizing	- Digital transformation becomes part of the organizational culture (continuous transformation). - Local governments proactively innovate with new technologies (AI, IoT, Cloud, Big Data). - Digital public services are not only efficient, but also user-centric and adaptive. - There are continuous improvements, innovations, and responsive services to the needs of the community.

Research Methods

Samples and Sampling Techniques

The population in this study consisted of local government officials and staff relevant to the implementation of digital services in the fisheries sector in Maluku Province and Ambon City. Sampling was determined using purposive sampling, with the following criteria:

Table 2.
Respondent Criteria

Criteria	Description
Organization	From local government agencies that have authority or direct involvement in the fisheries sector.
Position/Role	Structural officials or functional staff.
Experience and Competence	Involved in the planning, implementation, or evaluation of public service digitization programs in the fisheries sector.
Availability and Participation	Responsible for data management, information systems, or digital-based public services.

The data used in this study is primary data sourced from in-depth interviews with officials and staff from relevant agencies. Data analysis uses thematic analysis of interview transcripts with stages carried out by (Miles and Michael 1994), namely data reduction, data presentation, and conclusion drawing and verification. To ensure the validity of the data, triangulation was carried out by comparing and combining data from all informants to obtain a more complete and objective picture.

Results and Discussion

Overview of Respondents

The respondents in this study were structural officials at the level of Section Heads from several regional agencies involved in the management and development of the fisheries, trade, and small and medium enterprises sectors in the province of Maluku and the city of Ambon. Respondents were selected purposively, based on their positions and responsibilities in implementing programs and policies relevant to the focus of the study.

The first respondent was from 'Dinas Perindustrian dan Perdagangan Provinsi Maluku' (Maluku Province Industry and Trade Department), whose main tasks are to guide, supervise, and develop industrial and trade activities at the provincial level. This respondent plays a role in ensuring the smooth running of trade activities and strengthening the potential of leading regional sectors, including fishery commodities.

The second respondent was an official from the 'Dinas Perikanan Kota' (Ambon City Department of Fisheries), who was responsible for the processing and marketing of fishery products. This respondent had direct understanding of the condition of the fishery sector at the city level, including the challenges in managing catches and increasing added value for fishermen and fishery business actors.

Furthermore, the third respondent is from 'Dinas Kelautan dan Perikanan Provinsi Maluku' (Maluku Province Marine and Fisheries Department), which plays a role in planning, implementing, and evaluating fisheries development programs at the provincial level. This

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respondent is experienced in data collection, policy formulation, and inter-agency coordination related to fisheries resource management.

The fourth respondent is from 'Dinas Koperasi dan UMKM Provinsi' (Maluku Province Cooperative and MSME Department), which is tasked with fostering and empowering micro, small, and medium enterprises to increase their business capacity and competitiveness. This respondent has a broad view of the dynamics of small businesses in the region, including those engaged in the marine products and fisheries sectors.

The last respondent is 'Dinas Perindustrian dan Perdagangan Kota' (Ambon City Industry and Trade Department), who is responsible for fostering small and medium industries and developing trade potential in the city. This respondent understands the conditions of business actors in the field, including issues of marketing and regional product development.

In general, the respondents have considerable work experience in government, ranging from 5 to 15 years. They have a deep understanding of the mechanisms of local bureaucracy, the conditions of the fisheries and trade sectors, and the dynamics of business actors in their respective regions. The diversity of the respondents' institutional backgrounds and fields of work provides a comprehensive picture of the management of the fisheries sector and the regional economy in Maluku Province and Ambon City.

Government Readiness for Digital Transformation

Based on interviews with respondents, it was found that the application of digitalization in government services is still very limited. All respondents said that the digitization program was still only in the planning stage, especially in areas related to market retribution collection and fish auction site (TPI) management. The digitization plan is aimed at improving the effectiveness and transparency of regional financial management, so that the retribution collection process is no longer done manually. Through the digital system, it is hoped that local revenue (PAD) can increase because revenue leakage can be minimized and the financial recording process becomes more accurate.

In addition, the respondents also acknowledged that the planned digitization is more oriented towards increasing local revenue, rather than expanding or improving public services and community facilities. In other words, digitization has not been directed towards supporting the convenience of direct services to the community, such as access to information, online licensing, or public service complaints. This shows that the understanding and orientation towards the benefits of digitization are still limited to the administrative and revenue sides, and have not touched on the broader dimensions of public services.

From interviews with the Maluku Province Industry and Trade Department, it is known that they have an official website that is used to update and publish commodity prices in regional markets. However, the use of this platform is still not optimal, because the number of users and visitors is still very limited. Many businesses and members of the community are not yet aware of the existence of this website, so its main function as a means of market information is not yet effective.

Meanwhile, the Ambon City Fisheries Agency stated that efforts to implement a digital system in the fisheries sector still face major challenges. Most fishermen in the region still use simple mobile phones (not smartphones), and their limited economic capacity makes access to the internet and the purchase of data credit a major obstacle. This condition makes the implementation of a digital system at the field user level difficult to accept without the support of facilities and assistance from the government.

Overall, the interview results show that the implementation of digitalization in local government, particularly in the fisheries and trade sectors in Maluku Province and Ambon City, is still in its early stages and has not been comprehensively directed. Budget constraints,

infrastructure, and human resource readiness are the main factors hindering the implementation of this transformation.

In addition, the orientation of digitization, which focuses more on increasing regional revenue than improving public services, shows that the digital implementation strategy still needs to be adjusted to be in line with the main objectives of modern governance, namely providing convenience, efficiency, and transparency for the community. Therefore, in the future, stronger policy commitments, adequate budget allocations, and increased capacity of the apparatus and digital literacy of the community are needed so that digitization can function not only as a fiscal instrument, but also as an inclusive and sustainable public service tool.

Table 3.
CMMI-Based Evaluation of Local Government Digital Readiness

CMMI Aspects/Indicators	Actual Conditions Based on Interview Results	CMMI Level Achieved
Digital Policy and Strategy	There are no specific regional policies or strategies for digitization. The new plan is limited to the market levy and fish auction site (TPI) billing systems.	Level 1 (Initial)
Technology Infrastructure and Systems	ICT infrastructure is still limited. Most services are still manual. Market price websites are not yet widely used.	Level 1 (Initial)
Human Resources	Employees do not yet have specific digital training or skills. There is no ICT technical team in the fisheries or trade sector.	Level 1 (Initial)
Digitalization Orientation	The focus of digitization is still on increasing local revenue (levy collection), rather than on improving the quality of public services.	Level 1 (Initial)
Budget and Financial Support	There is no budget allocation for digitalization programs in the relevant government agencies	Level 1 (Initial)
Community and User Engagement	Community participation remains low. Most fishermen have not obtained adequate technological devices and still face limited internet access.	Level 1 (Initial)

Based on Table 3, the level of digital maturity of local governments in Maluku Province and Ambon City is at Level 1 (Initial) according to the CMMI model. This indicates that digitization activities remain ad hoc, are not yet standardized, and have not been integrated into the overall organizational strategy. At this level, digitalization is primarily driven by individual or sectoral initiatives rather than being integrated across regional agencies. Furthermore, there are no formal policy documents, standard operating procedures (SOPs), or roadmaps to guide digital transformation. The current focus of digitalization is largely limited to fiscal aspects, such as the collection of levies, rather than broader public services and community empowerment. In addition, infrastructure and human resources are not yet adequate to support digital transformation, and community access to technology remains low.

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Conclusion, Implications, Suggestions, and Limitations

Based on the results of research obtained through interviews with officials and staff from several regional, it can be concluded that the implementation of public service digitalization in the fisheries and trade sectors remains at an early stage and has not yet been implemented in a tangible manner. All respondents stated that public services are still carried out manually, while digitalization efforts remain in the planning stage, particularly in relation to market retribution billing and fish auction site management. These plans are primarily aimed at increasing local revenue and improving administrative efficiency rather than enhancing public service quality or facilitating community empowerment. Furthermore, there are no specific policies, strategies, or budget allocations governing digital transformation within regional institutions, indicating that digitization has not yet become a regional policy priority.

Although the Maluku Provincial Industry and Trade Department operates a website displaying market prices, its utilization remains low because the community and business actors are not yet accustomed to using online platforms. From the community perspective, particularly among fishermen in Ambon City, the implementation of digital public services is still constrained by limited access to adequate devices, many still rely on conventional mobile phones and limited economic capacity to purchase mobile data and access the internet. Based on the Capability Maturity Integration for Innovation (CMMI) model, the level of digital readiness of local governments in Maluku Province and Ambon City is categorized at Level 1 (Initial), where digitization activities are still ad hoc, unstructured, and not yet integrated into the overall organizational strategy.

Overall, these conditions indicate that digital transformation in the fisheries and trade sectors in Maluku and Ambon is still in its early stages and requires systematic efforts to develop towards targeted and sustainable implementation. Therefore, several recommendations are proposed to improve the level of digital readiness. Local governments need to develop comprehensive policies and roadmaps for regional digitization that clearly outline the direction, stages, targets, and performance indicators for each sector, including fisheries and trade. In addition, an inter-agency ICT coordination team should be established to ensure that digitization efforts are implemented in an integrated manner rather than on a sectoral basis, with responsibilities to plan, monitor, and evaluate digital initiatives in the region. A specific budget allocation for digitization must also be incorporated into the Regional Budget Plan of each regional, covering infrastructure procurement, human resource training, and information system development. Enhancing human resource capacity is another crucial step to ensure that employees are capable of operating digital systems and understanding their role in improving performance and public service delivery. Furthermore, the government should formulate a digital literacy strategy targeting the community, particularly fishermen and MSME actors, through simple training programs, provision of public internet access, and community-based outreach to prepare them as users of digital services. The orientation of digitization should also be broadened beyond increasing local revenue to strengthening transparency, accountability, and service quality based on community needs. Finally, collaboration with the private sector and academic institutions can serve as an alternative strategy to accelerate digital infrastructure development and promote technology based public service innovation at the regional level.

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