Digital Literacy as a Catalyst for Regional Innovation: A Case Study of Regional Governance and Smart Community Development in Jayapura Regency

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Digital transformation in the Society 5.0 era requires communities to utilize technology optimally. Jayapura Regency faces serious digital literacy problems, as reflected in the 2025 Indonesian Digital Society Index (IMDI) score of 39.60, which is below the national average of 44.53, with a decline in the digital literacy pillar of 17.97 points. The availability of infrastructure does not automatically improve community capacity, thereby hindering the achievement of SDG 9 and readiness toward Smart Society 5.0. The purpose of this study is to analyze digital literacy through the five pillars of the UNDP Digital Transformation Framework, identify local government governance policies, and formulate recommendations for strengthening digital literacy as a catalyst for innovation. This research uses a qualitative approach with a descriptive-exploratory case study method. Data were collected through in-depth interviews with informants, field observations, and documentation. Informants were selected using purposive sampling, and the data were analyzed through technique triangulation. The results show that Jayapura Regency is at a developing stage, but no pillar has yet reached optimal maturity. The study recommends establishing district-level digital literacy centers, mapping blank spot areas, developing a 5–10 year Digital Transformation Roadmap, and strengthening a digital ecosystem that is adaptive toward Smart Society 5.0.
Keywords: Digital Literacy, UNDP Digital Transformation Framework, Regional Innovation, Smart Society 5.0

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1. Introduction

Digital transformation is currently developing massively worldwide and has become a major indicator of socio-economic change in the Industrial 4.0 era. The utilization of digital technology has created a new lifestyle characterized by speed, efficiency, and interconnectedness, leading many countries to reorganize their public services, economies, and social interactions through technology-based systems. Ultimately, this global transformation not only accelerates innovation but also shapes the character of modern societies that are required to be adaptive, critical, and capable of utilizing technology optimally, characteristics that align with the concept of a smart society in Society 5.0. Considering the strong global trend of digital transformation, it is important to understand how these dynamics are reflected at the national level and how countries, including Indonesia, respond to these changing demands.

Indonesia has shown a positive response with an increase in the innovation index reported by the World Intellectual Property Organization (WIPO) from 27 points in 2020 to more than 30 points in 2024. This achievement also placed Indonesia at rank 77 with an index score of 70.2 according to the SDG Briefing Book (2023). However, these achievements face a critical paradox. Although innovation has increased, the Center for the Development of Communication and Digital Human Resources Ecosystems (2025) recorded

a national score of 44.53, categorized as moderate, with a decline of 8.97 points in the digital literacy pillar. This condition proves that the availability of technology does not automatically improve the capacity of society to access, understand, and utilize digital technology. Sustainable digital transformation is not solely determined by technological availability, but also by the quality of digital literacy within society, which serves as a fundamental aspect in creating an adaptive society as emphasized in the Society 5.0 concept (N. Aini & Afrilia, 2023).

Provinces in Eastern Indonesia tend to have lower digital literacy scores compared to regions in Western and Central Indonesia, where geographical factors limit the achievement of regional innovation and readiness for the smart society 5.0 era. Papua, as one of the easternmost provinces in Indonesia, faces even more complex challenges in the context of digital literacy. The digital literacy gap in Papua Province reaches its highest level of complexity due to challenging geographical conditions such as mountainous regions, tropical forests, and scattered islands that limit internet accessibility and digital infrastructure.

Based on data from the Ministry of Communication and Digital Affairs (Komdigi, 2025), Jayapura Regency, despite being geographically close to Jayapura City as the governmental and economic center of Papua, faces very serious digital literacy challenges (Kowira & Ernawati, 2025). According to the Indonesian Digital Society Index (IMDI) 2025, Jayapura Regency recorded a score of 39.60, categorized as low and significantly below the national average of 44.53. This finding is particularly concerning due to the decline in digital literacy by 17.97 points, representing the largest decrease compared to other pillars. In addition, the empowerment pillar decreased by 6.03 points, indicating low levels of active participation and community engagement. Therefore, low literacy and empowerment levels suggest that infrastructure development alone does not automatically improve community capacity. Low digital literacy affects various aspects of life, including access to digital government services, the utilization of technology for education and economic activities, and the ability to filter information in the era of digital transformation. More critically, this condition hinders the achievement of SDG 9 related to innovation and the readiness of society to move toward Smart Society 5.0.

In the context of digital transformation in regions with structural challenges such as Jayapura Regency, a comprehensive and adaptive framework is required. The United Nations Development Programme (UNDP), through its Digital Transformation Framework, emphasizes that inclusive and sustainable digital transformation requires a holistic approach that not only focuses on technological infrastructure development but also on strengthening human capacity, responsive governance, and participatory and equitable digital ecosystems (UNDP, 2023). This framework identifies five major pillars that must work synergistically: the People pillar refers to community digital capacity and literacy; Connectivity refers to infrastructure and internet access; Government refers to digital public services and leadership; Regulation refers to inclusive and protective policies; and Economy refers to innovation ecosystems and the digital economy. This framework is highly relevant for regions such as Jayapura Regency, where digital transformation needs to be evaluated based on the UNDP pillars, as demonstrated in the study by Makoza (2025).

Bibliometric analysis using VOSviewer shows that research topics related to sustainable development dominate the literature, as indicated by large primary nodes connected to various keywords such as education, region, and strategy. The theme of Smart Society 5.0 appears in a separate cluster, but discussions remain largely conceptual and are rarely directed toward specific regional contexts in Indonesia. Interestingly, the keyword Papua Province appears in a separate cluster with low connectivity, indicating that studies on digital literacy, regional innovation, and digital transformation in Papua remain very limited. Previous literature has focused more on sustainable development issues and regional inequality rather than community-based digital literacy and its relationship with the UNDP Digital Transformation Framework and

SDGs. This condition demonstrates a significant research gap, particularly regarding the role of digital literacy in preparing society for the Smart Society 5.0 era in underdeveloped regions.

Based on these findings, this study offers significant novelty by examining the digital literacy of communities in Jayapura Regency through the integration of the five pillars of the UNDP Digital Transformation Framework, similar to the approach used by Makoza (2025) to assess the Malawian government's readiness in facing the digital transformation era. The difference in this study lies in the incorporation of SDG innovation indicators. Furthermore, this approach has rarely been applied in the context of Eastern Indonesia, particularly in regions with severe geographical challenges and digital divides. Therefore, Jayapura Regency was selected as the research locus because it has a low IMDI score of 39.60, far below the national average of 44.53, with significant declines in the digital literacy and empowerment pillars. This condition reflects low community participation in the digital ecosystem and inadequate preparedness for the transition toward Smart Society 5.0. Moreover, the limited number of studies examining digital literacy in Papua in depth further strengthens the urgency of selecting this location as a new contribution to the development of science and regional innovation in Jayapura Regency. The objectives of this study are as follows:

1. To determine the level of digital literacy in Jayapura Regency based on the People, Connectivity, Government, Regulation, and Economy pillars within the UNDP Digital Transformation Framework.
2. To identify the policies and governance strategies implemented by the Jayapura Regency government in supporting digital literacy improvement and regional innovation.
3. To identify relevant strategies for strengthening community digital literacy as a catalyst for innovation toward Smart Society 5.0.

2. Method

This study employed a qualitative approach aimed at analyzing and understanding the phenomena occurring through descriptive and narrative data. The qualitative research method in social science was based on the framework proposed by the United Nations Development Programme (UNDP, 2023), which positions interviews, observations, and documentation of descriptive and narrative data as the primary instruments for exploring the subjective experiences of research participants (Patton & Broward, 2023).

The data sources in this study consisted of both primary and secondary data. The informants were individuals who understood the indicators of the UNDP Digital Transformation Framework as well as the factors contributing to the lack of digital literacy and technology adoption among communities and civil servants. These informants included the Head of the Communication and Information Office (Diskominfo), Diskominfo staff members, digital divide actors, and MSME actors.

Within the qualitative approach, data collection techniques included observation, interviews, and documentation, each contributing significantly to the generation of comprehensive data. Data analysis consisted of three stages: data reduction, data presentation, and conclusion verification. The filtered data were organized according to the pillars of the UNDP Digital Transformation Framework. This presentation aimed to reveal patterns and relationships among the pillars, such as the relationship between digital literacy and the impact of infrastructure on technology adoption.

3. Results and Discussion

Research Results and Discussion

The results and discussion are presented based on the operational concepts of the UNDP Digital Transformation Framework, namely People, Connectivity, Government, Regulation, and Economy, through

which the condition of digital literacy in supporting smart society development in Jayapura Regency can be identified.

Results

This section presents the findings of the study based on the Digital Transformation Framework pillars: People, Connectivity, Government, Regulation, and Economy, each of which has its own indicators that provide analytical guidance for evaluating the pillars. This research was conducted not only at the Office of Communication and Informatics (Diskominfo) of Jayapura Regency but also within the broader community, which constitutes the target group of the Digital Transformation Framework pillars. The findings were obtained through interviews, observations, and documentation, and were analyzed using data triangulation techniques.

People Pillar

The People pillar serves as an indicator of community capability and readiness in utilizing digital technology. This pillar focuses on how prepared and capable the community is in using digital technology, including accessing technology easily, understanding how it works, and utilizing it in daily activities. This pillar is crucial in the digital transformation era because digital transformation is not solely about advanced technology; more importantly, it concerns society itself as the primary user that must possess sufficient skills and understanding. If society is not prepared or lacks the knowledge to use technology, then investments in technology will not produce optimal outcomes. In short, the success of digital transformation depends on two key factors: the availability of technology and the community's ability to use it effectively.

Table 1 Results of the People Pillar

People Dimension	Findings / Interview Results
Usage and Adoption	The community uses digital devices in daily activities, has internet access for productive purposes, and perceives technology as beneficial for work and administrative activities.
Digital Literacy Skills	Community members stated that they are capable of using basic digital applications, understand the benefits of technology, and consider digital literacy important for regional development.
Civic Engagement	The community is aware of government digital services and believes that digital platforms facilitate public participation; however, they have never used digital media to express aspirations or complaints.
Cultural Norms and Trust	The community stated that the social environment is open to technology, receives support from families and community leaders, and views technology as an opportunity for prosperity that aligns with local values.

Based on the field observation results, it was found that the community has been able to use digital devices as part of their daily activities. In the observation, informants demonstrated the use of smartphones to access digital applications. This condition indicates that digital devices are not only owned by the community, but are also actively utilized to obtain information, communicate, conduct online shopping, and fulfill other daily needs.

These findings are consistent with the interview results, which revealed that the community has used digital devices as primary tools to support everyday activities. The use of smartphones by informants demonstrates a relatively good level of technology adoption within the People pillar, indicating that the community has become increasingly accustomed to utilizing digital technology in daily life.

Connectivity Pillar

Meaningful and inclusive digital connectivity is an essential foundation in the process of digital transformation. This category includes the assessment of two main aspects: physical infrastructure such as networks and hardware, and social infrastructure that is more non-technical in nature. Both aspects are necessary to ensure that all levels of society can obtain adequate and equitable digital access.

Table 2 Results of the Connectivity Pillar

Connectivity Dimension	Interview Results
Physical Infrastructure	Internet networks have reached several public service areas and sufficiently support digital services. However, blank spot areas have not yet been clearly mapped, and network limitations remain a major obstacle.
Access Enablers	There is support for public internet access, outreach to low-income communities, and assistance and socialization programs. However, there are differing views regarding internet subsidy programs or public Wi-Fi availability.

Source: Processed by the author

a. Physical Infrastructure

Based on interviews with two informants, the physical infrastructure dimension revealed that internet networks in Jayapura Regency have reached most areas associated with public services. Both informants also stated that the network infrastructure in several regions has sufficiently supported the use of government digital services in a relatively stable manner. However, both informants explained that internet network blank spot areas have not yet been clearly mapped by the local government. In addition, internet network limitations are still perceived as the main obstacle in utilizing digital services within the community. This finding indicates that although connectivity has improved, the equal distribution of network quality remains a challenge.

b. Access Enablers Dimension

Informants explained that the local government has made efforts to expand public internet access, including outreach to low-income communities. Informants also stated that there is non-infrastructure support in the form of assistance and socialization regarding the utilization of internet access. Regarding internet subsidy programs or public Wi-Fi, there were differences in responses between informants. One informant stated that such programs were available, while another informant stated that they were unaware of or had not experienced the existence of such programs. This difference indicates that information regarding public internet access programs and their benefits has not yet been distributed evenly throughout the community.

Overall, the findings within the Connectivity pillar show that Jayapura Regency has experienced progress in infrastructure development and internet access that is sufficiently supportive of digital transformation. However, challenges remain, including network limitations in several areas, the lack of optimal mapping of blank spot regions, and the unequal distribution of information and benefits from internet access support programs for the community.

Government Pillar

The government plays a highly important role, although not the sole actor responsible, in encouraging digital transformation within a country. This pillar examines various functions, procedures, and human resources at both central and regional government levels, particularly those related to the implementation of digital technology in governance. Its scope includes the extent of government commitment, available capacities, and the effectiveness of functions and procedures in supporting digital transformation.

Table 3 Results of the Government Pillar

Government Dimension	Interview Results
Implementation Capacity and System	Informants considered that civil servants possess basic digital capabilities and that government systems function relatively well. However, ICT training for employees is considered not yet optimally available.
Digital Public Services and Platform	The government has provided digital public services and these are considered to improve efficiency. However, these services are not yet fully easy for the public to understand and use.
Leadership and Strategy	Informants stated that the government has a strategic direction for digitalization and support from regional leaders. However, some digital initiatives are considered unsustainable and still short-term in nature.
Open Government	Public information is considered relatively easy to access through official platforms, and technology is believed to increase public trust. However, digital information request channels and the speed of government responses are still not optimal.

Source: Processed by the author

Regulation Pillar

Regulation plays a role in creating conditions that are conducive to the development of a dynamic and empowering digital ecosystem that benefits all communities and stakeholders. Regulation is also one of the key pillars of digital transformation, functioning to establish legal and policy frameworks that support a healthy, fair, and productive digital ecosystem. This pillar encompasses various aspects of protection and governance that are interconnected with one another.

Table 4 Results of the Regulation Pillar

Regulation Dimension	Interview Results
Human Rights	Digital services are considered sufficiently inclusive, providing equal access opportunities, paying attention to vulnerable groups, and supporting the fulfillment of basic community rights.
Consumer Protection	Protection for digital service users is not yet fully optimal, particularly regarding complaint mechanisms, handling digital threats, and public reporting channels, although digital security has begun to receive attention.
Data and Privacy	Data management is considered relatively responsible; however, literacy regarding personal data protection, data security education, and the clarity of data protection policies still need to be strengthened.
Technologies	The government is considered relatively open to new technologies, conducts socialization activities, and existing regulations are not viewed as barriers to digital innovation.
Fair Market Competition	Digital transformation is viewed as creating new business opportunities, supporting local MSMEs, and establishing relatively fair business competition through digital platforms.
Cybersecurity	Awareness of digital security has begun to grow; however, the preparedness of cyber threat management systems, security education, and institutional responses remains suboptimal.

Source: Processed by the author (2026)

Based on the observation results, the Government of Jayapura Regency has conducted digital literacy socialization activities for the community as an effort to increase awareness, understanding, and the safe and responsible use of digital technology. These activities indicate support for the Regulation pillar, particularly in the dimensions of Cybersecurity, Consumer Protection, and Human Rights, through community education regarding digital risks, user protection, and the proper utilization of digital access.

Economy Pillar

Digital transformation creates broad and diverse economic opportunities. This pillar focuses on assessing economic activities that emerge from the optimal utilization of digital technology by MSMEs and other stakeholders. Its scope includes various networks, transactions, and professional interactions that are largely driven by the private sector with the support of digital technology acceleration. This pillar also examines the extent to which digital technology has been integrated into business activities and financial services, as well as how strong the local ecosystem is in encouraging innovation and promoting responsible practices within the economy.

Discussion

This discussion section presents an in-depth analysis of the research findings described in the results section (4.2.1), referring to the three research questions that constitute the main focus of this study. The discussion is conducted systematically to answer: first, the level of digital literacy in Jayapura Regency based on the five pillars of the UNDP Digital Transformation Framework; second, the policies and governance of the local government in supporting digital literacy improvement and regional innovation; and third, the strategies relevant to strengthening community digital literacy as a catalyst for innovation toward Smart Society 5.0.

The Level of Digital Literacy in Jayapura Regency Based on the UNDP Digital Transformation Framework Pillars

Based on the research findings, the level of digital literacy in Jayapura Regency shows meaningful progress in several aspects, although it has not yet been evenly distributed across all pillars of digital transformation. Jayapura Regency recorded an Indonesian Digital Society Index (IMDI) score of 39.60 in 2025, far below the national average of 44.53, with the most significant decline occurring in the digital literacy pillar by 17.97 points Ministry of Communication and Digital Affairs of Indonesia. This condition reflects that although digital infrastructure has begun to emerge, the community's capacity to actively and meaningfully utilize technology has not developed proportionally. These findings indicate that low digital literacy is not merely an issue of access, but also of the community's capacity to utilize technology, which constitutes a fundamental challenge in realizing inclusive digital transformation in Jayapura Regency. This aligns with the perspective of United Nations Development Programme that sustainable digital transformation requires a holistic approach encompassing all five pillars synergistically, rather than relying solely on infrastructure development.

Within the People pillar, field findings indicate that communities in Jayapura Regency have started using smartphones and the internet in their daily activities, although advanced digital capabilities remain highly limited. In general, the community is capable of operating basic digital applications such as social media and simple information searches and understands the general benefits of technology. However, more complex abilities, such as utilizing e-government services, digital security literacy, and the use of technology for economic productivity, have not yet developed evenly. Digital Literacy is not merely the technical ability to operate devices but also includes critical thinking and the ability to integrate various forms of information from the digital ecosystem. The weakness of the People pillar is also confirmed by the decline of the

empowerment indicator by 6.03 points in IMDI 2025, reflecting the limited active participation of the community within the regional digital ecosystem.

Within the Connectivity pillar, the availability of internet networks in Jayapura Regency has experienced noticeable development, especially in urban areas and districts that are geographically easier to access. The local government has even distributed 30 Starlink units to areas categorized as blank spots, including Airu District as a 3T area (underdeveloped, frontier, and outermost region). However, comprehensive mapping of blank spot areas has not yet been systematically implemented across all 19 districts of Jayapura Regency, resulting in connectivity infrastructure development priorities that are not yet based on comprehensive data. In addition, supporting internet access programs such as public Wi-Fi and subsidized internet have not been evenly socialized to all levels of society. United Nations Development Programme emphasizes that a strong Connectivity pillar is not solely about the availability of physical infrastructure, but also about the community's ability to access and optimally utilize it, which remains a real challenge in Jayapura Regency.

Within the Government pillar, the local government of Jayapura Regency has initiated the implementation of digital services through the Communication and Information Office (Diskominfo) and various technology-based services at the regency level. Diskominfo, which has undergone institutional transformation since 2008 before becoming a definitive institution in 2017, reflects institutional seriousness in responding to digital transformation demands. Existing digital public services are considered to improve bureaucratic efficiency and transparency, and regional leaders have actively encouraged technology-based service innovation. However, the research findings also identify that specialized information and communication technology training for civil servants has not yet been optimally available, thereby slowing the improvement of digital capacities among government officials. The accessibility of digital services for communities with limited literacy also remains a challenge, and several digital initiatives are still short-term and lack structured sustainability, as emphasized by research stating that successful digital transformation requires visionary and consistent digital leadership in the long term.

Within the Regulation pillar, there is relatively adequate regulatory support as a foundation for digital transformation in Jayapura Regency. At the national level, Presidential Regulation Number 95 of 2018 concerning Electronic-Based Government Systems and Law Number 14 of 2008 concerning Public Information Disclosure provide a conducive policy framework. At the provincial level, Papua Provincial Regulation Number 50 of 2021 concerning One Data Integration strengthens the legal basis for integrated digital data management. Digital security socialization has been conducted by the local government, and existing regulations are not considered barriers to innovation. However, field findings identify significant weaknesses in the dimensions of digital consumer protection and public data privacy literacy, which remain very limited. Complaint mechanisms regarding digital crimes are not yet optimal, and public understanding of personal data protection remains low. Weaknesses in the Cybersecurity dimension are also identified, where institutional readiness to address cyber threats at the regional level still requires serious and structured strengthening.

Within the Economy pillar, the utilization of digital technology has begun to be experienced by MSME actors and the general public in Jayapura Regency, particularly through the use of QRIS in digital payment transactions and the online promotion of products and services through social media and marketplace platforms. Government programs that assist business actors in utilizing digital technology indicate an initial commitment to building an inclusive digital innovation ecosystem. Digitalization has also started to encourage operational transparency and accountability while expanding market reach that was previously geographically limited. Nevertheless, digital business training for MSMEs has not yet been conducted routinely and evenly, meaning the community's ability to utilize technology for more productive business activities remains suboptimal. This condition directly hinders the achievement of United Nations Sustainable

Development Goals Goal 9 concerning innovation and inclusive industry, which serves as one of the primary references of this research.

Overall, Jayapura Regency is in a developmental stage toward inclusive digital transformation, with initial achievements identified across all pillars of the UNDP Digital Transformation Framework, although none of the pillars have yet reached optimal maturity. The five pillars are interconnected and mutually influential, where weaknesses in one pillar, such as low public literacy in the People pillar, directly hinder the effectiveness of other pillars such as Government and Economy. Therefore, strengthening digital literacy in Jayapura Regency requires a systematic and sustainable approach across all pillars simultaneously as a solid foundation for preparing society toward an adaptive and competitive Smart Society 5.0 era.

Policies and Governance of the Jayapura Regency Local Government in Supporting the Improvement of Digital Literacy and Regional Innovation

The commitment of the local government of Jayapura Regency in promoting digital literacy improvement and regional innovation has shown tangible progress, although it still faces various structural challenges requiring systematic solutions. Based on the research findings, local government digital governance is generally in a phase of institutional transition, where regulatory foundations, organizational structures, and digital services are already available, but implementation capacity and program sustainability still need significant strengthening. The existence of Diskominfo Jayapura Regency as an institution that has evolved since 2008 reflects an institutional response to digital transformation demands, while the national policy framework such as Presidential Regulation Number 95 of 2018 concerning Electronic-Based Government Systems provides a relatively strong normative foundation for implementing e-government at the regional level.

In terms of programs and services, the local government of Jayapura Regency has implemented several initiatives directly related to improving digital literacy and regional innovation. Digital security socialization programs have been conducted to increase public awareness regarding safe and responsible internet use. In the field of connectivity, the distribution of 30 Starlink units to blank spot areas such as Airu District represents a tangible effort to reduce the digital access gap. Regarding public services, the local government has provided various digital-based services considered to improve bureaucratic efficiency and transparency while supporting the realization of open government aligned with Law Number 14 of 2008 concerning Public Information Disclosure. Assistance programs for MSMEs in utilizing digital technology for business development have also been implemented, although not yet on a large scale or evenly distributed across all districts. These achievements represent tangible contributions by the local government toward achieving United Nations Sustainable Development Goals Goal 9 concerning innovation and inclusive infrastructure.

Regarding inter-agency collaboration, the research findings indicate that digital transformation in Jayapura Regency has not yet fully operated as a coordinated cross-sectoral program. Diskominfo, as the primary regional agency responsible for information and communication technology management, has not yet optimally built formal synergies with the Education Office for school digital literacy programs, with the Cooperative and MSME Office for local business digitalization, or with the Regional Development Planning Agency (Bappeda) for integrating digital transformation plans into medium-term regional development planning documents. Consequently, existing digital literacy programs remain sectoral and partial, limiting their overall impact on improving community digital capacities.

Several bureaucratic and structural obstacles consistently hinder the effectiveness of digital governance in Jayapura Regency. First, the human resource capacity of Diskominfo, consisting of only 22 employees, is considered insufficient to support comprehensive digital transformation across 19 districts and 47 work

units. Second, operational budget limitations for digital literacy programs cause most initiatives to remain small-scale and unsustainable. Third, inconsistencies in digital program implementation due to leadership changes represent recurring challenges, where programs initiated during one administration period are not always consistently continued in subsequent periods. Fourth, digital channels for public information requests are not yet optimally available, and government response speed to community inquiries still requires improvement.

Overall, the policies and governance of the local government of Jayapura Regency in supporting digital literacy and regional innovation have demonstrated concrete commitment, reflected in the presence of relevant institutions, adequate regulatory support, digital service provision, and openness to technological innovation. However, to become a true catalyst for sustainable digital literacy improvement and regional innovation, the local government must simultaneously strengthen four main dimensions: civil servant human resource capacity, sustainability and consistency of programs, accessibility of digital services for all levels of society, and the development of a structured multi-stakeholder innovation ecosystem.

Recommendations for Community Digital Literacy as a Catalyst for Innovation toward Smart Society 5.0

Based on a comprehensive analysis of the five pillars of the UNDP Digital Transformation Framework and the condition of digital governance in Jayapura Regency, the primary conclusion that should serve as the foundation for future digital literacy strengthening efforts is that the challenges faced by Jayapura Regency are not merely infrastructure issues but rather issues of an incomplete digital ecosystem. Low community capacity in utilizing technology, weak governance synergy among stakeholders, and the immaturity of the local innovation ecosystem constitute interconnected structural barriers.

Within the People pillar, the primary recommendation is the establishment of community-based digital literacy programs rooted in local wisdom and involving community leaders as agents of digital change. This research recommends the establishment of District Digital Literacy Centers (PLDD) in every district, functioning as training spaces, public internet access centers, and forums for sharing digital knowledge among citizens. Training programs should include progressive stages ranging from basic digital literacy, information and media literacy, digital participation literacy, to digital entrepreneurship literacy.

Within the Connectivity pillar, recommendations focus on accelerating comprehensive blank spot mapping and implementing data-based infrastructure development. The local government needs to systematically map blank spot areas across all 19 districts using geospatial technology, producing accurate data for targeted and efficient digital infrastructure planning. Existing public Wi-Fi and subsidized internet programs should also be more widely socialized so that their benefits can be felt evenly across society.

Within the Government pillar and governance dimension, this research emphasizes the importance of strengthening internal government capacity as a prerequisite for sustainable digital transformation. Structured and continuous ICT training programs for civil servants are required, alongside redesigning digital public services using inclusive user-centered design principles. Furthermore, the local government is recommended to formulate a comprehensive Digital Transformation Roadmap for Jayapura Regency covering the next 5–10 years, integrated into regional development planning documents to ensure policy continuity beyond political leadership cycles.

Within the Economy pillar, recommendations focus on strengthening the innovation ecosystem and digital economy by empowering local business actors as the backbone of inclusive regional economic growth. The local government needs to expand structured digital business training programs for MSMEs, establish a Digital Innovation Hub for local startups and digital innovators, and strengthen digital promotion programs for local Papuan products through collaborations with national e-commerce platforms and media.

All recommendations formulated across these pillars are interconnected and mutually reinforcing within a broader vision of digital transformation aimed at guiding Jayapura Regency toward an adaptive, innovative, and competitive Smart Society 5.0. The Smart Society 5.0 concept, which places humans at the center of technological advancement, is highly relevant to the context of Jayapura Regency, where social capital, local wisdom, and community spirit must become the primary foundation of digital transformation rather than merely technological adoption targets. Through the consistent implementation of these recommendations, Jayapura Regency has a significant opportunity to transform its current below-average digital literacy condition into a regional innovation strength that promotes sustainable welfare for the Papuan community while serving as a model for inclusive digital transformation in 3T regions across Eastern Indonesia.

4. Conclusion

Based on the research findings, the condition of digital literacy in Jayapura Regency demonstrates meaningful progress in several aspects, although it has not yet been evenly distributed across all pillars of digital transformation. Within the People pillar, the community has already utilized smartphones and the internet in daily life, although more advanced digital capabilities remain limited. Within the Connectivity pillar, network infrastructure has begun to develop, including the distribution of 30 Starlink units in blank spot areas; however, the mapping of remote regions has not yet been comprehensive. Within the Government pillar, digital public services have begun to be implemented and have improved service efficiency, although the capacity of government personnel and program sustainability still need to be strengthened. Within the Regulation pillar, regulatory foundations are already available and digital security socialization has begun to be implemented, although consumer protection and public literacy regarding data privacy still require improvement. Within the Economy pillar, the use of technology in business activities has begun to develop through QRIS and digital platforms, although digital entrepreneurship capacity remains uneven. Overall, digital literacy in Jayapura Regency has developed but remains uneven and still requires continuous strengthening.

Based on the research findings, the role of the local government in supporting digital literacy demonstrates a tangible commitment through the provision of digital public services, dissemination of information through official platforms, implementation of technology socialization activities, and support for more efficient and transparent public services. However, digital governance still faces obstacles, including limited human resource capacity among government officials, digital literacy programs that have not yet reached all districts evenly, and inconsistencies in implementation due to budget limitations. Local government governance has been functioning, although improvements in implementation and more optimal handling of blank spot areas are still required.

Based on the research findings, efforts to strengthen community digital literacy require a comprehensive approach, including the enhancement of education based on local wisdom, equitable internet access through structured blank spot mapping, improved capabilities in utilizing digital services accompanied by assistance, the utilization of technology in economic activities especially for MSME actors, and strengthening public understanding regarding safe and productive technology use. These efforts are important to implement in an integrated manner to build a society that is more prepared to face digital developments.

Digital literacy is an important factor in encouraging regional innovation, improving the quality of public services, and creating a society that is more adaptive to technological developments. In the context of Jayapura Regency, strengthening digital literacy is part of a broader regional development effort to prepare society for the Smart Society 5.0 era, where humans become the center of technological advancement that is adaptive, innovative, and capable of utilizing technology to sustainably improve welfare.

Based on the research findings, it is recommended that the local government of Jayapura Regency design sustainable digital literacy programs that reach all districts, accelerate the mapping and handling of blank spot areas using structured data, strengthen the capacity of government officials in information technology, simplify digital service interfaces to make them more accessible to the public, and increase the frequency of socialization regarding responsible technology use, particularly related to personal data protection and awareness of digital crimes.

Based on the research findings, it is recommended that the community utilize digital technology positively and productively, make use of digital services provided by the local government, improve digital capabilities independently or through available training programs, and apply wise awareness in technology use, including maintaining personal data security and filtering received information so that technology utilization provides tangible benefits for everyday life.

It is also recommended that future researchers expand the research scope to other regions in Papua and other areas in Eastern Indonesia by applying different research methods, exploring each pillar of the UNDP Digital Transformation Framework more specifically, and developing digital literacy themes related to the empowerment of vulnerable groups and Papuan local wisdom as new contributions to the development of regional governance studies in Eastern Indonesia.

5. References

Pegawai Diskominfo Kabupaten jayapura. (2026). *PEGAWAI DISKOMINFO KABUPATEN JAYAPURA*.

SDG Briefing Book. (2023). *Briefing Book 2023*.

Sugiyono. (2020). *Metodologi Penelitian Kuantitatif, Kualitatif dan R & D*.

Sutirman, Kusuma, C. S. D., & Ramadhan, A. N. (2022). *Youth Empowerment Through Digital Literacy Education*. 285–293. https://doi.org/10.2991/978-2-494069-67-1_31

UNDP. (2022). *Digital Strategy 2022-2025: United Nations Development Program Full Report*.

United Nations Development Programme (UNDP). (2023). *From Vision to Action: Explaining UNDP's Digital Transformation Framework*. *November*.

Abdussamad, Z. (2022). *Buku Metode Penelitian Kualitatif*. https://doi.org/10.31219/osf.io/juwxn

Aini, D. N. (2023). *Improving Civic Intelligence Through Citizenship Education Based on Digital Literature Curriculum*. 126–136. https://doi.org/10.2991/978-2-38476-096-1_15

Aini, N., & Afrilia, N. S. (2023). Adopting Mobile Assisted Language Learning to Improve Digital Literacy in the Era of Society 5.0. *E3s Web of Conferences*, *440*, 5006.
https://doi.org/10.1051/e3sconf/202344005006

Anggraini, N., Suana, W., & Sesunan, F. (2020). Pengaruh Penerapan Blended Learning Pada Materi Hukum Newton Tentang Gerak Terhadap Motivasi Belajar Dan Kemampuan Pemecahan Masalah. *Tarbawi Jurnal Ilmu Pendidikan*, *16*(1), 22–36. https://doi.org/10.32939/tarbawi.v16i01.520

Araujo, W. S., & Andrade, C. (2022). *EGOV Strategy Formulation Taking Into Account International Rankings: Application of a Method in an African Country*. https://doi.org/10.1145/3560107.3560316

Budiartiningsih, R., Ekwarso, H., & Kurniasih, C. E. (2025). Mewujudkan smart society 5.0 melalui edukasi literasi cerdas bermedia bagi perempuan. *JMM (Jurnal Masyarakat Mandiri)*, *9*(1), 11–12.

ERGÜN, C. (2025). *University Libraries Are Supporters of Digital Literacy in Universities*. 213–246. https://doi.org/10.4018/979-8-3373-0004-7.ch008

Fatimah, S., & Mukarramah, S. K. (2023). Model Konseptual Untuk Transformasi Digital UKM Selama Pandemi Covid-19 Di Indonesia (R-Model Transformasi Digital). *Journal Social Society*, *3*(1), 11–20. https://doi.org/10.54065/jss.3.1.2023.341

Hariyanto, M. D., Yuliana, P., Kamali, S. R., & Sanjaya, V. F. (2024). Pengaruh Harga Terhadap Loyalitas

Pelanggan (Studi Kasus Pada Konsumen Toko Darussalam Computer Center). *Global.J.L.Bitep*, *2*(01), 1–6. https://doi.org/10.59422/global.v2i01.199

Indrawati, R. A. (2024). *Digitalization and Education Equity in Remote Areas : Challenges and Strategic Solutions*. *7*(2), 376–383. https://doi.org/10.34007/jehss.v7i2.2356

Kowira, G. C., & Ernawati, P. (2025). The impact of digital technology on traditions and social life in Papua. *Digital Theory, Culture & Society*, *3*(1), 9–14. https://doi.org/10.61126/dtcs.v3i1.88

Liu, S., Jiang, G., Chang, L., & Wang, L. (2022). Can the Smart City Pilot Policy Promote High-Quality Economic Development? A Quasi-Natural Experiment Based on 239 Cities in China. *Sustainability*. https://doi.org/10.3390/su142316005

Makoza, F. (2025). (2025). *Exploring the maturity of inclusive digital transformation : Case of Malawi*. *08*.

Mappisabbi, F., Haris, A., & Zuhri, W. (2024). Strategi Digital Transformation Pemerintah Daerah: Studi Komparatif Adopsi Teknologi Smart City di Indonesia. *Jurnal Integrasi Ilmu Sosial Dan Politik*, *1*, 266–282. https://doi.org/10.62383/sosial.v1i4.2048

Medeiros, E. (2020). The Territorial Dimension of the United Nations Sustainable Development Goals. *Area*. https://doi.org/10.1111/area.12681

Muhammad akbar dan Mohammad Rezza Fahlevvi. (2023). *CEGAH PENYEBARAN MISINFORMASI DI MEDIA SOSIAL*. *1*(1), 15–20.

Muhsam, J., Putrayasa, I. B., & Sudiana, I. N. (2023). Pengaruh Model Direct Reading Activities Berbantuan Media Permainan Teka-Teki Silang Pada Minat Membaca Siswa Sekolah Dasar. *Jurnal Ilmiah Pendidikan Citra Bakti*, *10*(4), 773–783. https://doi.org/10.38048/jipcb.v10i4.2342

Nauli, B. P. (2022). Sustainable Development Goals (SDGs) 9: Industry, innovation, and infrastructure during the COVID-19 pandemic in Indonesia. In *Jurnal Hubungan Internasional*. pdfs.semanticscholar.org. https://pdfs.semanticscholar.org/a60c/647f1a3c4b445d0d0c172ce1bc56d028ff45.pdf

Netesova, M. V. (2021). *To The Issue Of Smart Society: From Approaches To World Programs*. 2797–2805. https://doi.org/10.15405/epsbs.2021.09.02.312

Patton, C. M., & Broward, J. (2023). The Giants and Forerunners of Phenomenology: Husserl, Heidegger, and Their Predecessors. *American Journal of Qualitative Research*, *7*(4), 79–94. https://doi.org/10.29333/ajqr/13600

Payo, F. (2015). Husserl and Stein on Empathy: Paving a Way Towards Integration. *Philippiniana Sacra*, *50*(150), 247–262. https://doi.org/10.55997/ps2003l150a2

Pin, P., & Lubis, M. A. R. (2022). Partisipasi Masyarakat Dalam Perencanaan Pembangunan Desa Di Desa Citaman Jernih Kecamatan Perbaungan Kabupaten Serdang Bedagai. *Jurnal Ilmiah Metadata*, *4*(1), 395–414. https://doi.org/10.47652/metadata.v4i1.296

Pujiyanto, R., & Muslihudin, M. (2023). Tradisi Muludan Serta Implikasinya Terhadap Kehidupan Sosial Dan Keagamaan Perspektif Fenomenologi Edmund Husserl. *Yumary Jurnal Pengabdian Kepada Masyarakat*, *4*(1), 9–17. https://doi.org/10.35912/yumary.v4i1.2355

Revinova, S. (2021). E-Commerce Effects for the Sustainable Development Goals. *SHS Web of Conferences*. https://doi.org/10.1051/shsconf/202111401013

Rumetna, M. S., Ninia Lina, T., Ferdinandus, W., Santoso, A. B., Karay, J., & Barreto, C. (2024). Transformasi Digital UMKM Papua: Meningkatkan Daya Saing Melalui Website Berbasis Wix. *Digital Transformation Technology*, *4*(2), 839–847. https://doi.org/10.47709/digitech.v4i2.4917

Rusdiaman Rauf, Syam, A., & Randy, M. F. (2024). Optimalisasi Transformasi Digital Dalam Mendorong Pertumbuhan Usaha Mikro, Kecil Dan Menengah Di Indonesia. *Bongaya Journal for Research in Management (BJRM)*, *7*(1), 95–102. https://doi.org/10.37888/bjrm.v7i1.594

Wahyuni, S., Novitasari, Y., Suharni, S., & Reswita, R. (2023). The Effect of Digital Literacy-Based Learning on Student Motivation and Socialization Ability. *Consilium Berkala Kajian Konseling Dan Ilmu*

Keagamaan, *9*(2), 88. https://doi.org/10.37064/consilium.v9i2.13454

Wan Nailah, Abdullah Syahiza, A., Hasnisah, H., & Rahayati, Ahmad Muhammad, A. (2023). Influence of Psychological Well-Being and School Factors on Delinquency , During the Covid-19 Period Among Secondary School Students in Selected Schools in Nakuru County : Kenya. *International Journal of Research and Innovation in Social Science (IJRISS)*, *VII*(2454), 1175–1189. https://doi.org/10.47772/IJRISS

Xie, X., Alnafrah, I., & Dagestani, A. A. (2025). Tokenizing Innovation: A Blockchain-Based Innovation System as a Step Toward Achieving Sustainable Development. *Sustainable Development*. https://doi.org/10.1002/sd.3325

Yanuar, F., Sugiarti, C., & Atthahara, H. (2020). Manajemen Pemerintah Dalam Penanganan dan Pengelolaan Sampah. *Societas : Jurnal Ilmu Administrasi Dan Sosial*, *9*(2), 76–87. https://doi.org/10.35724/sjias.v9i2.3058

jayapurakab.go.id. (2019). *Geografis kebupaten jayapura*. Jayapura.Go.Id. https://jayapurakab.go.id/geografis/

kabupaten jayapura dalam angka. (2017). *Kabupaten Jayapura Dalam Angka*.

kabupaten jayapura dalam angka. (2025). *Kabupaten Jayapura Dalam Angka*. 282.

Kementerian Komunikasi dan Digital (Komdigi). (2025). *Indeks Masyarakat*

Pusat Pengembangan Ekosistem SDM Komunikasi dan Digital. (2025). *Indeks masyarakat digital indonesia (IMDI)*. BPSDM Komdigi. https://imdi.sdmdigital.id/home

Digital Indonesia (IMDI) pada 2025. Data Books. https://databoks.katadata.co.id/internet/statistik/68e36d508d423/skor-indeks-masyarakat-digital-indonesia-meningkat-pada-2025

World Intellectual Property Organization (WIPO). (2024). *Indeks Inovasi DIgital Indonesia*. https://www.wipo.i