

Persistent Innovation in Digital Government: Comparative Study of Ngofa Sedano and TERAS in Tidore Islands City

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Abstract

Digital innovation in local governments often stalls after launch, making sustainability more critical than production. This study analyzes two digital innovations in Tidore Islands City Government using the persistent innovation framework's four dimensions: cultural change, innovative leadership, capacity building, and institutional embedding. Using a qualitative comparative case study with interviews, observation, and document review, analyzed through Miles, Huberman, and Saldana's model, findings reveal contrasting outcomes. Ngofa Sedano at the Procurement Unit survived because all four dimensions integrated effectively: cultural shift embedded in daily routines, active leadership commitment, independent capacity building, and routine budget allocation. TERAS at the Communication Office stagnated despite formal decrees and procedures, lacking maintenance funding, continuous leadership support, and adequate capacity development. These findings demonstrate that digital innovation sustainability depends not on technological sophistication or regulatory completeness alone, but on how deeply innovations embed in work culture, leadership commitment, human resource capacity, and institutional structures simultaneously. Financial institutionalization proved crucial innovations without permanent budget allocation remain vulnerable to leadership changes and fiscal pressures. This research contributes to persistent innovation understanding in island local governance contexts.

Keywords: Digital Innovation, Institutional Embedding, Innovative Leadership, Persistent Innovation, Public Sector.

1 Introduction

Digital transformation has become the main direction of governance reform worldwide over the past two decades. Digitalization is no longer understood merely as the procurement of technological devices, but as a comprehensive strategy to build governments that are responsive, efficient, transparent, and inclusive (OECD, 2024; UNDESA, 2024). Digital innovation has become the main pathway for improving public service quality, expanding public access to government services, and strengthening the relationship between government and citizens. In Indonesia, the push to innovate has been reinforced through several national policies, including Law Number 23 of 2014, Government Regulation Number 38 of 2017, and Presidential Regulation Number 95 of 2018 on the Electronic-Based Government System, which affirm that innovation is no longer optional but an institutional obligation for local governments seeking to improve governance quality.

However, the growing institutional pressure to produce innovation has created a new problem in local bureaucratic practice. Many digital innovations are created as a response to regulatory demands, performance evaluation, or regional innovation competitions, but not all of them survive in the long run. Several studies show that public sector innovation often stops at the early implementation stage and fails to move into maintenance and institutionalization (Borins, 2014; Zuiderwijk and Janssen, 2014), revealing a gap between the ability to create innovation and the ability to sustain it. The main problem of digital innovation today is thus no longer how to produce new innovation, but how to keep it alive and relevant.

The failure of public sector innovation is generally driven by the absence of a sustainability strategy and by institutional barriers (Manar and Alfirdaus, 2023). A clear example is the discontinuation of the iJus Melon application in Semarang City due to weak institutional governance, including minimal budget transparency and excessive dependence on key individuals (Hanintya and Manar, 2020), a pattern also found in various integrated service and online complaint applications in other city governments, hindered by cross-agency coordination and unsustainable maintenance budgets (Manar and Alfirdaus, 2023). Another case is the e-parking innovation in Bandung City, which failed to optimize retribution revenue due to the digital divide, low quality and quantity of implementing human resources, the absence of a strategic regulatory foundation, and underperforming infrastructure (Rachmawati and Fitriyanti, 2021). More broadly, many regional programs, including leadership

training outcomes, fail to continue because of weak long-term commitment, unsynchronized regulation, and limited human resources (Manar and Alfirdaus, 2023; Wahyuni et al., 2026), showing that innovation sustainability is not only a practical field issue but also an important concern in academic studies on public sector innovation.

Studies on digital innovation in the public sector have so far been dominated by a focus on the early stage of technology adoption, the drivers of innovation, and digital system design (De Vries et al., 2016; Criado et al., 2013; Gil-Garcia et al., 2018). Several studies have begun to examine the sustainability aspect and show that factors such as leadership, institutionalization, financing, stakeholder participation, and organizational digital capability all contribute (Pradana et al., 2022; Sufianti et al., 2021; Adjei-Bamfo et al., 2022; Gariba et al., 2024). Even so, these studies generally stop at identifying the factors, while how these factors interact to form a sustainability mechanism in practice remains limited, especially in local governments with limited institutional capacity.

Based on this gap, this study uses the persistent innovation perspective as its main analytical framework. This approach views innovation as a long-term process that requires continuous evaluation, system updates, organizational capacity strengthening, and integration into the bureaucratic structure (Guenduez et al., 2025). The focus of analysis no longer stops at the success of early implementation but shifts to the mechanism that keeps innovation continuous, internalized as culture, and formally institutionalized within a public organization. Empirically, Tidore Islands City shows an interesting dynamic worth examining. Despite geographical limitations as an archipelagic region, this city has developed various innovations and gained recognition in the regional innovation evaluation conducted by the Ministry of Home Affairs from 2022 to 2025, with regional innovations increasing year by year alongside rising national recognition in the Regional Innovation Index ranking. However, behind this quantitative achievement, not all innovations survived with the same quality.

One innovation that has successfully survived, gaining recognition up to the national level, is Ngofa Sedano, developed by the Goods and Services Procurement Unit. It was not only implemented successfully at the outset but has continued to be used sustainably to support the goods and services procurement process, reflected in the stability of its use, its integration into daily work procedures, and civil servants' operational dependence on the platform. Its close attachment to the organization's administrative needs makes it relatively adaptive to change, supported by leadership commitment and regulatory compliance through standard operating procedures and budget support. Ngofa Sedano thus represents a practice of persistent innovation, one that does not stop as a temporary program but becomes institutionalized and continues to develop within the organizational system.

In contrast, TERAS, or Tidore Ragam Informasi, managed by the Office of Communication, Informatics, Encoding, and Statistics, shows signs of non-persistent innovation. Designed as a WhatsApp-based information dissemination medium to deliver verified government information quickly, counter hoaxes, and support regional data integration for representatives at the village level, TERAS in practice experienced a significant decline in activity, marked by minimal information distribution, a weakening of its role as a public communication channel, and constrained human resource coordination at the village level. This shows that the innovation did not become adequately institutionalized, so its existence depended on the initial momentum rather than developing into a sustainable bureaucratic practice.

This condition confirms that the main problem in this study is the phenomenon of short-lived innovation within the Tidore Islands City Government. Although the number of regional innovations has increased rapidly, there is a striking sustainability gap between agencies, and the difference between innovations that survive and those that decline to the point of operational stagnation is the key analytical problem here. This phenomenon indicates that innovation sustainability is not solely determined by initial design, regulatory support, or policy objectives, but by the internal organizational mechanism that forms, maintains, and institutionalizes innovation into bureaucratic practice.

Therefore, this study compares the Ngofa Sedano and TERAS innovations through a comparative case study approach within the same government environment, important for examining internal organizational dynamics through the four dimensions of persistent innovation. This comparison also matters because of the strategic character of each innovation's sector: Ngofa Sedano functions as an accountability instrument in the goods and services procurement sector, prone to inefficiency, while TERAS plays a role in public information openness and hoax mitigation in an archipelagic region. Initial data show that in Ngofa Sedano, cultural change and institutionalization run very strongly because its virtual work system has become a daily routine, fully supported by the innovative leadership of the Head of the Procurement Unit, up to receiving national recognition in the 2025 Innovative Government Award. TERAS, by contrast, experienced an institutionalization failure due to weak

capacity building among village-level operators; without leadership oversight and binding formal regulation after launch, it failed to form a new work culture, so its communication channel experienced total stagnation. This study is thus important for revealing how the four dimensions of persistent innovation, cultural change, innovative leadership, capacity building, and institutional embedding, operate and interact in determining the future of digital innovation in the public sector. Specifically, it aims to analyze and compare the sustainability mechanisms of digital innovation in Ngofa Sedano and TERAS, and to explain how the four dimensions operate and interact in sustaining these innovations. The findings are expected to contribute academically to public administration studies and to serve as a practical, data-based reference for the Tidore Islands City Government in designing and maintaining sustainable digital innovation governance.

2. LITERATURE REVIEW

2.1 The Concept of Innovation

In local government administration, innovation is understood as a renewal effort in carrying out government functions and authority to improve performance and the quality of public services. Law Number 23 of 2014 states that innovation must be oriented toward the public interest, efficiency, and effectiveness, and must be carried out transparently and with accountability (Republic of Indonesia, 2014). Theoretically, innovation in the public sector does not always mean something entirely new in a universal sense, but rather how an idea or practice is perceived as new by the adopting organization (Rogers, 2003), in line with Borins (2000), who emphasizes that innovation can take the form of the first application of an idea within a particular organizational context.

Beyond novelty, public innovation is also assessed by its impact on efficiency, effectiveness, and service quality. Mulgan and Albury (2003) affirm that innovation includes developing and applying new methods, services, or processes that bring real improvement to public organization performance. Innovation in the public sector can therefore be understood as the process of applying new ideas or practices within government organizations to improve performance and generate benefits for society.

2.2 The Concept of Digital Innovation

Digital innovation explicitly uses digital technology as the main element of change. Marion and Fixson (2021) explain that digital innovation is the use of digital technologies, whether new or already existing, to change how individuals, organizations, and societies operate, showing that it involves not only new technology but also the reuse of existing technology to create new ways of working and new value. Hund, Wagner, Beimborn and Weitzel (2021) add that digital innovation covers the creation, adoption, and use of value-adding ideas, such as products, services, processes, or business models, through the application of technology, an ongoing process that allows an organization to increase value, flexibility, and adaptability.

Digital innovation in the public sector can therefore be understood as a technology-based renewal effort aimed at improving the efficiency, effectiveness, and quality of public services by changing work processes and government service systems.

2.3 Persistent Innovation

The development of digital innovation in the public sector encourages governments not only to adopt new technology but also to ensure that it can survive and continue developing in organizational practice. Digitalization in bureaucracy is essentially an institutional change process requiring adjustment of structure, values, and work patterns among civil servants. Within institutional theory, Scott (2001) explains that innovation sustainability is influenced by the strength of three institutional pillars, regulative, normative, and cognitive, which together build the legitimacy that allows an innovation to be accepted and sustained within a public organization.

In line with this, the concept of persistent innovation developed by Guenduez, Demircioglu, Mueller, and Cinar (2025) is one of the digital innovation strategies in the public sector that has a transformational orientation with a main focus on internal value-creation activity within the organization. This strategy is understood as a systematic effort to anchor digital initiatives into the culture and structure of the organization to guarantee the sustainability of innovation over the long term. This approach positions innovation not as a temporary program or a stand-alone project, but as an ongoing effort to maintain the stability and relevance of innovation amid a changing bureaucratic environment. By internalizing innovative values into the foundation of the organization, persistent innovation functions as a defense mechanism so that digital transformation is not easily halted by political dynamics or changes in managerial leadership.

Guenduez et al. (2025) explain that the sustainability of digital innovation is supported by four main dimensions that interact with one another. The first is cultural change, which emphasizes the transformation of workflows and organizational hierarchy so that innovation can be adopted as part of employees' daily practice, minimizing internal resistance. The second is innovative leadership, which places leaders as a strategic anchor in driving the direction of change, guiding cross-functional collaboration, and maintaining the consistency of innovation policy amid external pressure. The third is capacity building, which focuses on developing digital skills and technical specialization among administrative staff to build internal organizational capacity independence, so that the innovation process can continue to run without high dependence on outside parties. The fourth is institutional embedding, which refers to efforts to formalize innovation into organizational regulation and standard operating procedures so that the innovation has a strong legal foundation and becomes a permanent part of bureaucratic practice. Through the integration of these four dimensions, persistent innovation allows public organizations not only to implement technology at the early stage but also to continuously maintain and adjust the value of that innovation to the changing dynamics of public service needs.

The conceptual framework of this study refers to the persistent innovation theory of Guenduez et al. (2025) as the main analytical instrument to examine the sustainability of digital innovation in the public sector. This line of thinking is designed to conduct a comparative analysis of two specific cases in the Tidore Islands City Government, namely Ngofa Sedano and TERAS, which are examined through the four interacting dimensions mentioned above, that is, cultural change, innovative leadership, capacity building, and institutional embedding.

3. METHOD

3.1 Type and Approach

This study uses a qualitative approach with a comparative case study design, chosen to gain an in-depth understanding of organizational dynamics in sustaining digital innovation through the persistent innovation perspective. The focus is not on quantitatively measuring innovation success, but on the process, mechanism, and institutional interaction that allow digital innovation to survive, develop, and become institutionalized within a local bureaucratic setting.

The design is used to compare two digital innovations that developed within different organizational contexts, namely Ngofa Sedano and TERAS in Tidore Islands City, so that similarities and differences in their sustainability mechanisms can be identified. According to Creswell and Poth (2018), a case study explores in depth a bounded system within a real-life context through detailed data collection from various sources. Here, each innovation is treated as a bounded system with clear boundaries in organization, service type, and institutional context.

Based on the conceptual framework of Guenduez et al. (2025), persistent innovation is operationally defined as an ongoing process of maintaining and developing digital innovation through routine evaluation, policy and system updates, civil servant capacity strengthening, and integration of the innovation into the organization's structure and practice. Operationally, cultural change is measured through the routine use of the system in daily tasks and the level of resistance to change; innovative leadership through strategic instructions and the intensity of regular monitoring; capacity building through active participation in digital training and staff independence in resolving system constraints; and institutional embedding through the existence of a legal basis, such as a local government decree, and the integration of the innovation into standard operating procedures and the unit's core functions.

3.2 Procedure, Location, and Informants

The research followed the stages of identifying the research focus, determining the boundaries of each case, collecting data from various sources, and analyzing data thematically and comparatively, using both within-case and cross-case analysis. It was conducted at the Goods and Services Procurement Unit of the Regional Secretariat and at the Office of Communication, Encoding, and Statistics of the Tidore Islands City Government, North Maluku Province.

Informants were selected purposively based on their direct involvement and strategic understanding of the two innovations, including unit leaders, the system management and development team, implementing staff, field operators, and local officials involved in innovation policy. The number of informants for each case was adjusted until data saturation was reached, that is, when the information obtained became repetitive and no longer produced significant new findings.

3.3 Data Sources and Data Collection Techniques

The data consisted of primary and secondary data. Primary data were obtained through in-depth interviews with key actors involved in developing and managing the innovation, and through observation of system use and maintenance in practice. Secondary data came from regional innovation policy documents, internal regulations, evaluation reports, standard operating procedures, and system development archives, used together to strengthen validity through triangulation.

Interviews explored the experiences, strategies, and mechanisms applied to sustain innovation, including evaluation, system updates, capacity strengthening, and leadership support. Observation examined the actual practice of system use and the organizational interaction that supports sustainability, while document review examined the formal aspects of institutionalization, such as regulations, policies, and procedures integrating the system into the organizational structure.

3.4 Data Analysis Technique

Data analysis followed the interactive model of Miles, Huberman, and Saldana (2014), consisting of data reduction, data display, and conclusion drawing and verification. Data reduction involved selecting, focusing, simplifying, and transforming the raw data collected. Data display took the form of descriptive narrative and thematic matrices to help identify patterns and relationships between categories. Conclusions were drawn gradually and verified continuously to ensure consistency and validity.

4. RESULTS

4.1 Cultural Change in Ngofa Sedano

The cultural change dimension emphasizes the extent to which a digital initiative can transform an organization's workflows and hierarchy, measured by whether it is adopted without meaningful internal resistance until it naturally becomes part of employees' daily routine. At the Goods and Services Procurement Unit of Tidore Islands City, the data show that Ngofa Sedano succeeded as the main catalyst for this shift. In the early phase, the transformation toward digital procurement caused some awkwardness by shifting a habit civil servants were accustomed to under the conventional method, but instead of triggering rejection, the innovation's ecosystem facilitated intensive habituation until virtual collaboration became a mandatory part of daily work. The Head of the Procurement Unit, Abdul Wahid Saraha, explained that the initial constraint of using the video conferencing application gradually resolved over time, until civil servants could use it independently and sustainably.

The process of internalizing this digital culture moved from mere compliance with instruction to becoming an operational need embedded in staff's personal awareness. The most significant impact is the reconstruction of workflows, where bureaucratic coordination that once relied on physical office visits has been replaced by daily virtual interaction. Operator Indra Herwinda stated that the discomfort of interacting through a screen gradually disappeared, until online meetings became preferable to physical visits. This new culture is also seen in the use of the platform as a daily tactical instrument to respond quickly to changes in procurement regulation. Implementing staff Andi Ahmad affirmed that the innovation has become a routine part of daily work because it helps communicate rule changes quickly to all regional agencies.

This cultural change is also supported by a broader innovation ecosystem at the city level, involving all levels of position, from the village up to the head of the department. Intensive information dissemination triggered a shift in bureaucratic mindset, marked by a positive competitive climate among agencies. Ramli Saraha, Head of Research and Innovation at BAPPERIDA, explained that a cross-agency digital collaboration group encouraged daily consolidation and progress reporting, so that a lack of innovation in one agency could be compensated for by another. Overall, these findings prove that Ngofa Sedano fulfilled the cultural change dimension, overcoming initial resistance and transforming a conventional workflow into a new value system within the bureaucracy.

4.2 Innovative Leadership in Ngofa Sedano

The innovative leadership dimension positions the leader as a strategic anchor for the organization. An innovative leader does not merely give formal orders but actively acts as a driver of the direction of change, a guide for cross-functional collaboration, and a guardian of the consistency of innovation policy. At the Procurement Unit of Tidore Islands City, this characteristic is visible in the direct involvement of the Head of the Unit in the digital ecosystem of Ngofa Sedano. The operator, Indra Herwinda, confirmed that the leader did not only act as a coordinator but also as a resource person, moderator, and participant, and was always ready to provide support for problem-solving, including budget constraints.

Innovative leadership is also demonstrated through a smart strategy for mobilizing cross-sector collaboration. Recognizing the potential for slow responses from other regional agencies, the Head of the Procurement Unit used informal communication channels with the Mayor to trigger formal attention in the public bureaucratic

space. Abdul Wahid Saraha explained that internal commitment and support from local leadership were the main reasons for the sustainability of this innovation, in addition to the routine evaluation mechanism carried out in the monthly internal meeting agenda. This managerial commitment is also realized through the rotating delegation of authority to all staff, including new employees, so that the sustainability of the innovation does not depend on a single leadership figure. Implementing staff, Andi Ahmad, affirmed that leadership support strongly determines subordinates' motivation to carry out this innovation.

Leadership at the unit level receives strong legitimacy from political commitment at the level of the city government. The Mayor acts as the main driver, providing room for local innovators without being hindered by bureaucratic layers. To ensure oversight runs consistently, local leadership built a tiered coordination structure by involving the Assistant Regional Secretary and Expert Staff as supervising coordinators. Ramli Saraha affirmed that the Mayor's commitment became the main trigger for the surge in regional innovation, which was then overseen in a tiered manner and reported directly to the Regional Secretary and the Mayor. Thus, the sustainability of Ngofa Sedano is maintained because of the harmonious combination of high-level political commitment from the Mayor and the managerial leadership of the Head of the Procurement Unit, who acts as the operational driving force and mentor for subordinates.

4.3 Capacity Building in Ngofa Sedano

The capacity building dimension emphasizes the independent development of digital skills and technical specialization among civil servants. Its main focus is to build internal capacity independence so that the operationalization of innovation can continue without high dependence on external parties. At the Procurement Unit, staff capacity strengthening was carried out through self-directed learning using open digital platforms such as YouTube, given the limited regional budget for formal training. Abdul Wahid Saraha explained that the principle held was to first strengthen internal capability before sharing it externally, without using the local government budget for training.

This process of competency improvement was followed up with a full month of internal training simulation before the platform was activated on a wider scale. As a result, all functional civil servants gained an even level of technical skill to take turns acting as host, moderator, or resource person, making the operational structure of the team adaptive and not vulnerable to collapse in the event of staff transfer. Indra Herwinda affirmed that the month of self-directed training allowed all team members to substitute for one another's roles without affecting the continuity of the innovation over the long term. This capacity independence is strengthened by a peer-learning ecosystem and a tiered mentoring mechanism for new employees, including staff under government employment contracts. Andi Ahmad explained that new employees are immediately given training related to this innovation, and any technical constraint is first resolved by staff themselves before being reported to the leader.

At the regional level, BAPPERIDA also built capacity in a structured manner to address civil servants' initial lack of knowledge about regional innovation regulation, by combining technical guidance from the Ministry of Home Affairs with the formation of an internal mentoring team that oversaw the technical and administrative aspects of dozens of regional agency innovations. Ramli Saraha explained that the initial lack of knowledge about innovation was addressed by inviting the Ministry of Home Affairs to provide technical guidance, as well as by forming an internal team that mentored dozens of innovations for three full months. Overall, the capacity building dimension in Ngofa Sedano has proven to contribute significantly to maintaining the persistence of the innovation, as it is supported by independent human resource readiness, flexible mastery of technical roles, and an established mechanism for knowledge regeneration.

4.4 Institutional Embedding in Ngofa Sedano

The institutional embedding dimension refers to the process of formalizing digital innovation into legal instruments, organizational structure, and standard operating procedures. This formalization aims to provide strong legal legitimacy and guarantee certainty in the allocation of financial resources on a permanent basis. At the Procurement Unit, the institutionalization of Ngofa Sedano began as a response to a regional innovation competition that pushed the operational team to prepare formal administrative instruments. The legal legitimacy of this innovation was strengthened through a Mayor's Decree and a Regional Secretary's Decree. Abdul Wahid Saraha affirmed that the sustainability of this innovation remains guaranteed even amid a change of officials, because the regulation in the form of the Mayor's Decree already serves as a strong legal umbrella. Beyond the affirmation of legal status, the sustainability of this innovation is also supported by budget certainty included in the annual routine budget implementation document. Although the nominal value for the paid video-conferencing service fee is relatively small, around three and a half million rupiah per year, the inclusion of this cost component in the budget document confirms that the innovation has been recognized as a formal part of

the organization's operational spending. The quality control of the forum's implementation is also managed through a standard operating procedure that governs planning, implementation, and evaluation of activities. Indra Herwinda explained that the annual subscription fee has been routinely budgeted, and the entire activity process has a clear procedural guideline, so that this innovation has become an inseparable part of efforts to advance the procurement of goods and services.

This budget certainty is also felt directly by implementing staff in the field. The absence of financial constraints allows staff to focus fully on the substance of procurement guidance services. Interestingly, the maturity of institutionalized procedures does not make the bureaucracy rigid, as staff are still given room to improvise outside the strict boundaries of the procedure in order to accelerate public service. Andi Ahmad affirmed that the budget for the digital service is already available every year, so there is no constraint, although in certain situations staff still improvise to speed up coordination.

Institutionalization at the unit level received strong institutional encouragement from the macro environment of the city government. BAPPERIDA designed a binding regional innovation ecosystem through the issuance of a Mayor's Instruction, which is equipped with a reward and punishment instrument, including the deduction of additional employee income for the heads of regional agencies that fail to meet the mandatory innovation quota, namely three innovations per agency and one innovation per village or community health center. To reinforce this rule permanently, the local government is even drafting a Regional Regulation on Innovation together with the Regional House of Representatives. Ramli Saraha explained that the sanction of deducting additional employee income became the initial trigger for agency compliance, and it is now being strengthened through a draft regional regulation that involves the legislative oversight function. Overall, the convergence of this data proves that Ngofa Sedano has reached a mature degree of institutional embedding, as it is bound legally at multiple levels, from the Mayor's Instruction and the draft regional regulation at the macro level, the Mayor's and Regional Secretary's Decrees at the internal level, procedural control through the standard operating procedure, to a financial guarantee through the routine annual budget.

4.5 Cultural Change in TERAS

Unlike Ngofa Sedano, empirical data at the Office of Communication, Informatics, Encoding, and Statistics show that TERAS has not managed to pass the critical phase of cultural shift, where its activity remains situational and oriented toward short-term momentum. The operator staff, Andi H. Muhammad, explained that information dissemination through this channel only runs actively when the innovation is being prepared for an official competition, and its activity has stalled since 2025. The Head of the Office of Communication, Informatics, Encoding, and Statistics also acknowledged that the bureaucracy in local government still tends to be trapped in a work culture oriented toward administrative completeness rather than the sustainability of public service value, driven by demands that are mainly about meeting a quota.

The root of this problem is further clarified by Ramli Saraha of BAPPERIDA, who explained that in the early phase since 2021, the local government deliberately pushed innovation quantity aggressively to break the comfort zone of a bureaucracy once considered less innovative. However, he emphasized that successfully embedding a digital innovation culture requires a gradual internalization process before demanding qualitative impact externally. Overall, the convergence of this data proves that TERAS failed to fulfill the cultural change dimension because the digital platform was not understood as a daily work necessity of the bureaucracy, but rather as an instrument merely for fulfilling a momentary competition obligation. Once the competition stimulus ended, the work culture of civil servants immediately regressed back to the conventional pattern.

4.6 Innovative Leadership in TERAS

In the case of TERAS, the leadership dimension faces a heavy challenge in the form of a leadership change that has a direct effect on shifting policy direction and organizational priority. The data show a disconnect in leadership vision resulting from the change of the Head of the Office. TERAS was initiated and began losing momentum during an earlier leadership era, well before the current Head of the Office. Across three different heads of office within roughly three and a half years, each newly appointed Head has rationally prioritized other innovations that carry more weight in the national evaluation, as well as new programs of his own, rather than reviving an already-stagnant predecessor's initiative. Andi H. Muhammad explained that because TERAS did not enter the city-level innovation competition last year, it was no longer prioritized, and after the competition ended, the innovation simply stopped running.

This condition is reinforced by the current Head of the Office's acknowledgment that the sustainability of an idea from a subordinate greatly depends on how the leader views that idea, as well as on how close the leader is to retirement, which affects motivation to keep innovating. Ramli Saraha also affirmed that although leadership commitment at the level of the local government head has been optimal since 2021, the sustainability

of innovation at the lower level is often interrupted when the leader of a regional agency fails to maintain consistent mentoring due to internal managerial dynamics. Thus, the innovative leadership dimension in TERAS is classified as fragile because it is highly dependent on a particular leadership figure. When the Head of the Office changed, TERAS lost its political protection, while the new management shifted its supervisory focus to another application, causing monitoring of TERAS to be completely discontinued.

4.7 Capacity Building in TERAS

In the case of TERAS, the capacity building dimension becomes the main bottleneck due to the limited competence of human resources at the field implementation level and the policy of cutting the regional training budget. This program is highly dependent on the Community Information Group at the village level as the agent of information dissemination. However, coaching and technical guidance for personnel in this group are very rarely conducted, causing technical confusion in the field. The absence of a cadre-regeneration system also makes the existence of this group vulnerable to disappearing due to political dynamics at the village level. Andi H. Muhammad explained that the community information group requires adequate training and human resource development, but when a village head changes every five years, this group often disappears or changes without notification to the office.

This scarcity of capacity-building programs was also confirmed by the Head of the Office, who explained that in the current budget year, the local government eliminated the entire budget allocation for civil servant competency training due to an efficiency policy. To address this condition, the leadership took an alternative step by forming external partnerships related to digital literacy, although the priority was directed first at strengthening the internal capacity of civil servants. Ramli Saraha of BAPPERIDA also affirmed that the root cause of the failure to sustain innovation in Tidore Islands City is the low level of civil servant literacy regarding innovation governance, which is being addressed through close mentoring, though its effectiveness remains constrained by the limited operational budget of each regional agency. Overall, the capacity building dimension in TERAS is at a very low level, because of the absence of a structured training program due to the elimination of the regional budget, compounded by the fragility of the community information group structure, which changes easily without coordination.

4.8 Institutional Embedding in TERAS

In the institutional embedding dimension, TERAS shows an anomaly in which formal institutionalization on paper was fulfilled, yet collapsed in terms of financial institutionalization. Administratively, TERAS actually met the formal requirements because it was supported by a written decree and a standard operating procedure document. However, the fulfillment of this dimension experienced total failure on the financial side. Since its establishment during the era of the previous Head of the Office, TERAS was not locked into a routine spending component of the budget implementation document for periodic maintenance and field operational costs, but was only budgeted briefly for the initial formation of the community information group. Andi H. Muhammad acknowledged that TERAS has a decree and a running standard operating procedure but has no routine budget, so its activity declined after the competition period ended.

The impact of TERAS's budget not being locked into the routine budget implementation document led to the total discontinuation of program operations when the relevant office faced regional fiscal pressure. The Head of the Office explained that the sharp decline in the Regional Revenue and Expenditure Budget forced the office to carry out strict efficiency measures, so innovations without a third-party contractual obligation or a national data integration requirement had to be sacrificed first. This clash between formal legal institutionalization and fiscal institutionalization was also criticized by Ramli Saraha, who regretted the attitude of the local government budget team that often overlooks the sustainability of financing internal innovation, even though self-made innovation is far more cost-efficient than a third-party procurement project. Based on this analysis, the degree of institutional embedding in TERAS is very limited. Formal legality in the form of a decree and a standard operating procedure proved to have no operational durability without being supported by financial institutionalization and a routine budget, so this innovation became stagnant and has not become a priority under the new leadership of the office.

4.9 Cross-Case Comparative Analysis

After analyzing each case separately, this section compares Ngofa Sedano and TERAS directly across the four dimensions of persistent innovation. In the cultural change dimension, Ngofa Sedano was successfully adapted into a new work culture because of the active role of the leader and the Procurement Unit team in translating the innovation into the language of daily administrative routine, in line with van Winden and Carvalho (2019), who affirm that innovation success in the public sector highly depends on internal actors who can align new innovation with existing routines. The emergence of innovative work behavior among staff was also driven by

real organizational support, as found by Maula et al. (2026) in Indonesia's public sector, since transforming work culture is difficult without organizational support accompanying staff adaptation, and a supportive leadership style has proven able to reduce work pressure and foster an innovative work culture (Kaymakci, Görener, and Toker, 2022).

By contrast, in TERAS the effort to reshape work culture failed, especially at the village level, as lower-level operators gradually abandoned the application and returned to manual methods. This can be explained through technostress: digital work demands imposed on public administration employees without resilience support and capacity mentoring trigger techno-stressors that lead to emotional exhaustion, causing employees to disregard the system and return to their comfort zone (Buzeti, Decman, and Kristl, 2026). Village staff's reluctance also reflects strong resistance stemming from a risk-averse bureaucratic structure, since innovation imposed without shared purpose and understanding always encounters implementation obstacles (Vassallo et al., 2023). Moreover, repeated changes of head of office during a budget crisis sustained policy uncertainty, causing lower-level civil servants to become passive and reluctant to fully invest in a routine initiated by an earlier leader, anticipating that priorities would shift again with each new appointment (Zhang et al., 2023).

In the innovative leadership dimension, leadership at the Procurement Unit reflects strong adaptive and transformational leadership, as the leader did not merely give administrative instructions but was directly involved in overseeing system implementation, in line with Matambo, Nyagadza, and Marembo (2026), who affirm that adaptive leadership at the local authority level is crucial for sustaining public service innovation amid organizational pressure and resistance. The leader also possesses what Benitez et al. (2022) call digital leadership capability, the visionary ability to integrate a digital platform into the core of the procurement process sustainably. Conversely, the vulnerability in TERAS is rooted in weak leadership oversight and disruption caused by repeated changes in structural officials, triggering what Cinar, Prodius, Sokoly, Ozcan, and Guenduez (2025) term policy uncertainty, in which each newly appointed official often brings a different orientation or adopts a survival stance due to budget limitations. Their study further shows that public sector innovation often triggers resource competition and institutional legacy challenges, so that without a consistent leader guarding its legitimacy, a digital program is easily sidelined, and leaders' reluctance to take risks is a major barrier clearly visible in TERAS (Vassallo et al., 2023).

In the capacity building dimension, Ngofa Sedano survived because the organization proactively built the independent internal capacity of its team rather than relying entirely on a third-party vendor, in line with Linaker and Muto (2026), who argue that institutional capacity independence is crucial for digital sovereignty and reducing dependence on external parties. This success was also achieved because staff combined new technological skills with domain expertise in the daily procurement routine (Sundberg and Holmstrom, 2024), producing synergy between digital leadership and human resource management (Mollah et al., 2026). By contrast, the failure in TERAS is rooted in the imbalance between building system infrastructure and neglecting user capacity at the village level. This stagnation proves that no matter how sophisticated a digital system is, the innovation will be paralyzed if field agents lack the readiness and technical capacity required (Zhang and Li, 2025; Martinez et al., 2025), since acceptance is far more determined by user literacy and perceived benefit (Ali et al., 2024). The failure was further worsened by the absence of a knowledge-transfer system from the parent office to the operational unit, causing a drastic loss of organizational capacity (AlMashaan and AlMaian, 2025; Selviaridis and Uyarra, 2025). This can be explained through the concept of a capability trap in the state capability reform framework of Pritchett, Woolcock, and Andrews (2013), where the local government displays isomorphic mimicry, launching an application merely to fulfill formal competition demands without adequate functional capacity, compounded by premature load bearing, in which under-mentored operators are expected to independently run the dissemination function from the outset.

In the institutional embedding dimension, Ngofa Sedano became permanent because its actors proactively acted as institutional entrepreneurs. As explained by Selviaridis, Hughes, and Spring (2023), successful institutional change requires actors willing to create new rules that adjust old institutions to fully support innovation execution. The leader of the Procurement Unit quickly locked the innovation into formal regulation, empirically proven to increase the chance of long-term survival (Arundel et al., 2019). By contrast, the institutionalization failure in TERAS can be analogized to the concept of liquid knowledge proposed by van Eck et al. (2025), innovation that appears technically but remains liquid and difficult to freeze into formal village-level governance. This failure is heavily influenced by local political power dynamics and the budget crisis, as public sector innovation is highly vulnerable to leadership change and budget crises that redistribute resources (Cinar et al., 2025). The absence of financial protection was a fatal blow, since digital transformation only succeeds in reaching peripheral areas with adequate fiscal decentralization (Chen et al., 2026), and sustainability heavily

depends on an organization's ability to access complementary resources through external partnerships when internal budget capacity is limited (Guggenberger et al., 2026). Without such a mechanism, TERAS depended entirely on a fragile internal budget, so once that item was cut, there was no alternative resource pathway, and the parent organization itself became the main disabler of knowledge transfer to its operational unit below (Mahura and Birollo, 2021).

Overall, this cross-case comparison confirms that the four dimensions of persistent innovation are closely interconnected and cannot stand alone. Ngofa Sedano survived because all four worked synergistically, while TERAS failed because it only fulfilled institutional embedding formally, without support from the other three dimensions, especially financing, which proved to be the crucial point of sustainability.

5. CONCLUSION

Based on the comparative analysis of digital innovation sustainability in Ngofa Sedano at the Goods and Services Procurement Unit and TERAS at the Office of Communication, Informatics, Encoding, and Statistics of the Tidore Islands City Government, it can be concluded that the success of digital innovation in local government is not determined by how sophisticated the application is or how complete its legal regulation is at launch, but by how deeply the innovation becomes integrated into the daily routine of bureaucratic work.

The findings show two contrasting poles of sustainability. Ngofa Sedano succeeded in transforming into a persistent innovation because it integrated all four sustainability dimensions in an aligned manner, from a shift in work culture locked into a daily routine and stable vertical leadership commitment, to human resource independence in learning and a guarantee of routine financial commitment in the budget implementation document supported by a formal regulatory umbrella. TERAS, by contrast, is classified as a non-persistent innovation due to a structural flaw at the institutionalization level. It experienced operational paralysis because there was no guarantee of a routine maintenance budget allocation, proving that formal bureaucratic legality alone is not sufficient. Without a financial anchor, an innovation remains fragile and easily collapses when hit by the dynamics of bureaucratic leadership change.

Based on these findings, several recommendations can be proposed. For future academic research, a multimethod approach involving a wider population of regional agencies across various areas is recommended to statistically test the causal relationship and significance among the innovation sustainability dimensions. A longitudinal study is also recommended to map the fluctuation of technology innovation budget commitment before, during, and after local political leadership transitions. Integrating cost-benefit analysis would help measure the budget efficiency generated by sustained innovations compared to the potential loss from discontinued technology investments, and future research could expand the study locus to sectors that directly interact with the public, such as regional hospitals or integrated licensing services, to test whether high public participation can act as a counterbalance that prevents discontinuation.

For the Tidore Islands City Government, the Regional Government Budget Team and BAPPERIDA need to make annual information technology maintenance budget allocation in the budget implementation document an absolute requirement before approving or launching a new digital innovation, to prevent innovations that are neither fully alive nor fully dead. Derivative regulation from the Regional Regulation on Innovation should also be drafted to specifically mitigate the risk of leadership turnover, so that every newly appointed Head of Office has an institutional obligation to continue and maintain innovation already running, rather than discontinuing it.

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