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BUREAUCRATIC ADAPTABILITY IN DIGITAL PUBLIC SERVICE TRANSFORMATION IN THE BANDA ISLANDS

Iriane Sosiawaty Ponto[1a*], Jeanly Waisapy[2], Indah Cahyani[3]

[123]Department of Public Administration, Faculty of Social and Political Sciences, Universitas Pattimura, Ambon, Indonesia

[a]*E-mail: iriane.ponto20@gmail.com*

(*) Corresponding Author
iriane.ponto20@gmail.com

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ABSTRACT

Digital transformation in archipelagic regions depends not only on technology availability but also on the ability of public bureaucracy to adjust procedures, resources, service channels, and organizational learning to geographic constraints. This study examines bureaucratic adaptability in digital public service transformation in the Banda Islands, Central Maluku Regency. A qualitative case-study design was used. Empirical evidence consisted of five sets of written open-ended responses coded W01-W05 and supporting research documents. Analysis was organized around four dimensions: responsiveness, flexibility, innovation capacity, and learning ability, under an adaptive-governance lens. The findings identify uneven and unstable internet connectivity, limited human resources, low digital literacy, concerns about data security and privacy, and incomplete system integration as key constraints. Responsiveness requires proactive information and multichannel assistance; flexibility is associated with manual or semi-digital alternatives and, based on one respondent proposal, an offline-first option; innovation capacity is strengthened by interoperability, user-centered design, and contextual solutions rather than by adding applications; and learning ability depends on competency mapping, documentation, evaluation, and knowledge sharing. The study proposes an archipelagic adaptive bureaucracy framework linking island conditions to these four dimensions. The empirical evidence supports the need for continuity-oriented and inclusive service arrangements, while the framework and its expected outcomes require validation with broader informants and administrative performance data.

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INTRODUCTION

Digital transformation has become an important component of contemporary public-sector reform. Governments increasingly use information and communication technologies to shorten administrative processes, improve transparency, broaden service reach, and provide citizens with new channels for interacting with public institutions (Gil-Garcia et al., 2018). In Indonesia, this direction is supported by Law No. 25 of 2009 on Public Services and Presidential Regulation No. 95 of 2018 on Electronic-Based Government Systems (PERPRES No. 95 Tahun 2018 tentang Sistem Pemerintahan Berbasis Elektronik, 2018; UU No. 25 Tahun 2009 tentang Pelayanan Publik, 2009). The latter places business-process integration, data, applications, infrastructure, and security within a common framework for digital government. Yet the existence of

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digital infrastructure does not by itself make public services adaptive. Organizational structures, procedures, leadership, employee competence, learning mechanisms, and the capacity to understand user needs determine whether technology becomes a meaningful service capability (Cordella & Tempini, 2015).

The distinction is particularly important in archipelagic regions. Digital services are often expected to overcome distance because they can reduce the need for citizens to travel to administrative centers. In island settings, however, the same technology may produce new barriers when service design assumes stable internet access, uniform device ownership, and similar levels of digital literacy across settlements. The Banda Islands provide a clear context for this tension. Official statistics describe Banda District as comprising eight villages across 55.14 km², with a 2024 population of 11,826 in the administrative dataset reported by BPS; inter-village transport combines water-only access in two villages and land-and-water access in six villages (BPS-Statistics Indonesia Maluku Tengah Regency, 2025). These conditions confirm that administrative access is shaped by dispersed settlement patterns and dependence on sea mobility. Geographic dispersion, uneven network quality reported by respondents, and differences in digital capability mean that digitalization can simultaneously reduce and reproduce administrative distance. A citizen may avoid a costly sea trip when a service functions online, but may also face exclusion if the online channel becomes the only route and connectivity fails.

Adaptive governance provides the principal conceptual lens for this study. (Janssen & Van Der Voort, 2016) define adaptive governance as the capacity to respond to uncertainty and complexity while maintaining stability and accountability. This lens is suitable for digital public services in archipelagic settings because adaptation is not treated as unrestricted discretion; it requires organizational arrangements that can adjust when infrastructure, user conditions, or service demands change (Ansell et al., 2021, 2023; Ansell & Trondal, 2018). Public-management reform literature similarly emphasizes that institutional change occurs within shifting political, administrative, economic, and social environments (Pollitt & Bouckaert, 2011, 2017), while (Peters, 2018) highlights the institutional capacity required to translate policy design into practice. Digital Era Governance adds the need for reintegration, needs-based holism, and digital simplification rather than merely reproducing existing administrative processes (Dunleavy et al., 2006).

Within this adaptive-governance framework, bureaucratic adaptability is operationalized through four mutually related dimensions. Responsiveness concerns the ability to recognize and respond to citizen needs, information gaps, complaints, and service problems (Liao, 2018). Flexibility concerns the capacity to adjust procedures, channels, schedules, and decision arrangements when standard procedures become unsuitable (Howlett et al., 2018; Janssen & Van Der Voort, 2016). Innovation capacity refers to the ability to develop and apply context-sensitive solutions, including interoperability, user-centered design, and purposeful use of digital technology (Mergel et al., 2019). Learning ability refers to the organizational capacity to evaluate experience, retain knowledge, develop competencies, and convert lessons into service improvement (Visser & Van Der Togt, 2016). These dimensions are therefore not presented as a separate theory; they function as analytical manifestations of adaptive governance at the bureaucratic-organizational level.

The research is grounded in evidence from the Banda Islands, where five written open-ended responses consistently point to a set of interrelated challenges: insufficient and unstable telecommunications networks, limited human resources, low digital literacy, concerns about data security and privacy, and incomplete integration between systems. One informant explicitly proposed an offline-first approach in which service functions remain available during network interruption and data are synchronized after connectivity is restored. Another emphasized the potential of digital service to reduce sea travel, time, and costs in processing population documents. These responses indicate that the central question is not whether digitalization should proceed, but how the bureaucracy can organize digital services so that they remain usable under island conditions.

Previous research cited in the study provides important points of comparison. (Ly et al., 2026) associate digital transformation with service flexibility when it is supported by knowledge, organizational culture, and digital infrastructure. (Uang et al., 2023) show that public-service transformation in another Indonesian archipelagic setting remains affected by dependence on sea mobility and unequal technology adoption. (Natika, 2025) highlights the contribution of digital innovation to service efficiency and accessibility. These studies support the relevance of technology and innovation, but they leave room for a more integrated analysis of how different dimensions of bureaucratic adaptability work together in a geographically fragmented setting.

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The contribution of this article is therefore twofold. Analytically, it combines responsiveness, flexibility, innovation capacity, and learning ability within one framework for interpreting digital public-service transformation. Practically, it develops an archipelagic adaptive bureaucracy model that begins with island conditions rather than with assumptions of continuous connectivity. The model connects user needs and service constraints to offline-first continuity, multichannel assistance, interoperability, human-resource development, and continuous evaluation. This article asks: how do the four dimensions of bureaucratic adaptability appear in the transformation of digital public services in the Banda Islands, and what organizational arrangements are required to make digitalization more inclusive, continuous, and context-sensitive?

METHOD

This study employed a qualitative case-study design with a descriptive-analytical orientation. The bounded case is the adaptation of digital public-service processes in Banda District (Kecamatan Banda), Central Maluku Regency, as documented in the 2026 research materials used for this article. Geographically, the case is limited to the Banda Islands; substantively, it concerns digital public-service access, administration, and organizational responses to island-specific constraints; institutionally, it is limited to the service processes represented in the verified respondent records and supporting project documents. The available records do not preserve a precise month-by-month fieldwork calendar, so the study does not infer dates that cannot be verified. A case-study approach was appropriate because the research sought to understand how geography, infrastructure, organizational capacity, and user conditions shape service adaptation in a specific archipelagic setting rather than to produce statistical generalization.

The main empirical material consisted of five sets of written responses to open-ended questions, coded W01-W05. The questions asked respondents to identify the main constraints encountered in accessing or administering digital public services, the innovations or changes considered most necessary, and their assessment of government efforts in digital service transformation. Supporting evidence included the research proposal, research instruments, and related project documents. The available documentation did not contain detailed job titles for all informants, exact dates for each response, or a complete list of agencies represented. Consequently, the analysis retains anonymous codes, reports only characteristics that are documented in the response content, and does not infer identities or institutional affiliations. For research ethics and confidentiality, no personal identifiers are reproduced, the respondents are cited only by code, and unverified or synthetic records are excluded from analysis.

A questionnaire instrument containing 28 statements across the four dimensions was also available in the research documentation. It was excluded from the empirical findings in this article because only one completed questionnaire could be verified as an actual response, while the remaining rows were demonstration or synthetic data used to illustrate data processing. This decision prevents simulated values from being presented as evidence about conditions in the Banda Islands. The article therefore relies on the qualitative evidence and document analysis.

Analysis followed four stages. First, the written responses were transcribed and read repeatedly to preserve the meaning of each statement. Second, meaning units were assigned initial codes such as network infrastructure, human resources, digital literacy, data security, interoperability, offline-first service, efficiency, and access equity. Third, the codes were grouped into broader themes and mapped to responsiveness, flexibility, innovation capacity, and learning ability. Fourth, patterns across informants were synthesized to identify connections between constraints, adaptive practices, and policy implications. The four dimensions served as an initial analytical framework, while emerging themes were retained when they added context not fully captured by the original categories.

The validity strategy was conservative. Interpretations were compared across responses and research documents, and recurring themes were given greater analytical weight than isolated claims. Missing evidence was not treated as negative performance. For example, the documentation does not provide measured response times, complaint volumes, or service-transaction records; the article therefore does not claim numerical performance levels for those aspects. The small number of written responses and the absence of direct observation limit the breadth of inference. Findings are presented as an exploratory institutional diagnosis and model-building exercise rather than as a representative survey of all residents or agencies in the Banda Islands.

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Table 1. Profile of Verified Written Respondent Records

Code	Respondent Category	Role/Position	Documented Relevance to the Study	Collection Date
W01	Written respondent	Not recorded in available documents	Human resources; public information; service improvement	Not recorded
W02	Written respondent	Not recorded in available documents	Infrastructure inequality; digital literacy; signal access	Not recorded
W03	Written respondent	Not recorded in available documents	Digital literacy; privacy/security; interoperability; user-centered design	Not recorded
W04	Written respondent	Not recorded in available documents	Code	Not recorded
W05	Written respondent	Not recorded in available documents	Network quality; service information; local problem identification	Not recorded

Source: Authors' Reconstruction from the Five Verified Written Responses; Undocumented Identities, Positions, and Dates Are Not Inferred (2026)

Table 2. Analytical Framework and Evidence Used in the Study

Dimension	Analytical Focus	Primary Evidence	Interpretive Question
Responsiveness	Information, complaints, needs, follow-up, assistance	W01, W05; cross-informant comments on access	Does the bureaucracy recognize and respond to user needs and constraints?
Flexibility	Procedure adjustment, offline/manual alternatives, service continuity	W02, W04; network-related evidence	Can service continue when standard digital arrangements fail?
Innovation capacity	Interoperability, integration, user-centered design, contextual solutions	W03, W04; human-resource evidence	Does innovation solve island-specific service problems rather than add technology alone?
Learning ability	Evaluation, skills, documentation, knowledge sharing, improvement	W01 and themes inferred across W01-W05	Does the organization convert problems and experience into institutional learning?

Source: Authors' Analytical Framework Based on the Verified Qualitative Evidence in the Research Report (2026)

RESULT AND DISCUSSION

Archipelagic Constraints as the Institutional Context of Digital Service

The strongest pattern across the available responses is the persistence of connectivity constraints. W02, W03, W04, and W05 independently identify network or infrastructure problems. In the verified response set, W02 describes unequal technology infrastructure, low digital literacy, uneven internet coverage, and difficulty obtaining signals on smaller islands; W04 describes telecommunications networks as uneven and unstable because of archipelagic geography; and W05 characterizes network quality as inadequate. Because the current article file contains coded summaries rather than full verbatim transcripts, these statements are presented as respondent-attributed evidence rather than reconstructed quotations. The recurrence of this theme across four of the five responses makes connectivity the most consistently documented constraint in the case.

Connectivity should not be interpreted as a purely technical problem. Its administrative significance lies in the way it shapes access to procedures, response times, and continuity. A service that requires real-time connection may work well at an administrative center but fail for users in locations with intermittent signals. Under such conditions, a formally uniform digital procedure can produce unequal practical access. This confirms the need to evaluate digital government in terms of functional accessibility, not merely system availability.

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The analytical chain is therefore explicit: respondent statements about signal difficulty and unstable networks were coded as network infrastructure; recurrence across W02-W05 formed the connectivity theme; and that theme was interpreted through adaptive governance as a continuity problem requiring organizational adjustment. This cross-informant comparison is used throughout the results section so that interpretations remain traceable to the verified written evidence.

Human capacity is the second recurring constraint. W01 identifies lack of human resources as the primary difficulty and places improvement in the quality of human resources as the most urgent change. W02 and W03 also mention low digital literacy. These responses show two distinct capacity problems. The first concerns bureaucratic capability to manage and assist digital services; the second concerns user capability to understand and use them. Treating both as a single 'literacy' problem would obscure the different interventions required. Employees may need technical, data, security, and problem-solving skills, while users may need simple instructions, assisted-service points, and alternative channels.

W03 adds concerns about data security and privacy together with the need for interoperability and data integration. These themes move the diagnosis beyond access toward institutional architecture. Interoperability can reduce repeated data entry and fragmented procedures, but it also increases the importance of access control, privacy protection, and clear responsibility for data management. Digital transformation in an archipelagic setting therefore combines three layers of challenge: infrastructure, human capacity, and governance of integrated systems.

The evidence also identifies potential public value. W04 notes that digital service can reduce sea travel, costs, and the time required to process population documents. This is especially important in an island setting, where physical administrative access may require transportation across water. (Moore, 1995) concept of public value is useful here: the value of digital service lies not in the presence of an application, but in the practical benefits citizens obtain from it. Those benefits, however, are conditional. If connectivity is unreliable or assistance is unavailable, digitalization can replace geographic distance with technological exclusion.

Table 3. Cross-Informant Themes from Verified Open-Ended Responses

Theme	Evidence source	What the evidence indicates	Adaptive implication
Network and infrastructure	W02, W03, W04, W05	Coverage and stability are uneven; geography intensifies dependence on connectivity.	Service continuity cannot depend on permanent real-time connection.
Human resources and digital literacy	W01, W02, W03	Administrative capacity and user capability both require strengthening.	Training, assisted service, and differentiated support are necessary.
Security and system integration	W03	Privacy concerns coexist with demand for interoperability and integrated data.	Integration must be paired with data governance and security controls.
Contextual/offline-first service	W03, W04	Users need services designed for unstable network conditions and local realities.	W04 indicates an offline-first option; fallback procedures and synchronization should be assessed for feasibility.
Efficiency and equitable access	W03, W04, W05	Digitalization can reduce travel, time, and cost but benefits are not automatically even.	Performance measures should include continuity and distribution of access.

Source: Synthesis of W01-W05; Only Verified Written Responses Are Used as Empirical Evidence (2026)

Responsiveness: From Reactive Answers to Proactive Service Communication

Responsiveness refers to the capacity of bureaucracy to recognize needs, provide clear information, act on problems, and ensure that users can obtain help. The available responses show that information remains a central need. W01 expects government to inform the public about the importance of digital public services. W05 similarly asks for more complete information and a system that helps identify and address problems in the Banda area. These statements suggest that responsiveness begins before a complaint is filed. Citizens need to know what services exist, how to use them, what requirements apply, what risks are involved, and what alternatives are available when the digital channel fails.

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A responsive bureaucracy in an island context must therefore be proactive and multichannel. Reliance on a single application for service information would reproduce the same connectivity problem that affects the service itself. Information and assistance can be distributed through combinations of web pages, messaging platforms, telephone contact, village or negeri offices, printed guidance, and assisted-service points. The purpose is not to multiply channels without coordination, but to ensure that a citizen with weak connectivity can still obtain authoritative information and guidance.

Network disruption also changes the meaning of response time. Slow service may result from infrastructure beyond the immediate control of frontline staff. Nevertheless, bureaucracy can respond institutionally by providing outage information, escalation procedures, alternative submission mechanisms, and estimated recovery or follow-up arrangements. The adaptive issue is whether the organization transforms a recurring technical disturbance into a predictable service protocol. Without such a protocol, each disruption becomes an ad hoc problem and places the burden of adaptation on the citizen.

The available documentation does not include measured complaint volumes, response-time records, or formal service-level data. It would therefore be inappropriate to rate current responsiveness numerically. The evidence instead identifies what needs to be institutionalized: understandable information, multichannel assistance, explicit follow-up responsibilities, and measurable standards such as time to first response and time to resolution. These elements would allow future evaluation to distinguish between the existence of an information channel and its actual responsiveness.

Flexibility: Offline-First Design and Continuity of Service

Flexibility is the dimension most directly connected to the distinctive conditions of the Banda Islands. W04 explicitly proposes an offline-first system that remains usable when the internet is interrupted and synchronizes automatically after connection is restored. Because this proposal appears explicitly in one respondent record, it is treated as a context-sensitive option to be assessed rather than as an established requirement across the entire case. It nevertheless illustrates the central contradiction of digital service in an unstable network environment: citizens may benefit from digital efficiency but cannot always rely on uninterrupted connectivity to access basic administrative functions.

Offline-first should be understood as an organizational principle rather than as a software feature alone. A flexible service system determines which stages can be completed locally, what data can be temporarily stored, how identity and document authenticity are verified, when synchronization occurs, and what happens if two records conflict after reconnection. It also requires clear accountability. Employees must know which fallback steps are authorized, how to record transactions during disruption, and how to reconcile offline records with the central system. Without these rules, flexibility can become inconsistency.

Manual or semi-digital alternatives also remain relevant. Their availability should not be interpreted as a reversal of transformation. In a resilient service design, alternative channels function as continuity mechanisms for exceptional conditions. A user may submit documents at an assisted point, receive proof of submission, and have the data entered or synchronized when connectivity returns. Such arrangements preserve service rights while allowing the organization to continue its digital transition.

Geography also creates a need for flexibility in time and place. Service schedules and assistance points may need to consider transportation availability and the distribution of settlements. Mobile or periodic service points, collaboration with local government units, and shared digital assistance facilities are possible organizational responses. These options are consistent with the broader logic of administrative adaptability: standardization should establish service guarantees, while flexibility allows those guarantees to be delivered under diverse local conditions.

This finding aligns with Pollitt and Bouckaert's emphasis on the need for administrative systems to respond to changing environments. It also extends the logic of Digital Era Governance. Reintegration and digital simplification have limited value if service design remains dependent on conditions that do not exist uniformly across the territory. In the Banda Islands, flexibility is not an optional convenience; it is a condition for continuity and equal access.

Innovation Capacity: Integration, User-Centered Design, and Contextual Solutions

The evidence shows that innovation needs are broader than the creation of new applications. W03 emphasizes interoperability, data integration across institutions, and user-centered service design. W04 proposes offline-first operation, while W05 seeks a system that helps identify local problems. Together, these responses suggest that innovation capacity should be judged by the ability to solve recurring service problems, not by the number of platforms launched.

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Interoperability is particularly important because fragmented digital services can transfer administrative complexity to citizens. When systems cannot exchange relevant data, users may repeatedly enter or submit the same information. Integration can reduce this burden and support faster verification. At the same time, W03's concern with security and privacy indicates that integration must be governed. Data access should be limited to legitimate purposes, responsibilities should be clear, and protection measures should be incorporated into system design rather than added after implementation.

User-centered design provides another route to innovation. In an archipelagic context, design should begin with the user's service journey: where connectivity drops, which instructions are difficult to understand, what devices people actually use, which documents are repeatedly requested, and when physical assistance remains necessary. A system that performs well under office conditions may not perform well in a small island settlement. Prototyping with users can reveal such mismatches before full implementation.

Innovation capacity also depends on organizational resources. W01's emphasis on human-resource quality is therefore part of the innovation problem. If only external vendors understand a system, the public organization may lack the capacity to modify workflows, diagnose failures, or evaluate whether a technical solution fits service objective. Internal capability, collaboration with universities and communities, and clear ownership of service design can make innovation more sustainable.

(Natika, 2025) shows that digital public-service innovation can contribute to accessibility and efficiency. The Banda case adds a contextual qualification: innovation has the greatest administrative value when it increases continuity, reduces unnecessary travel, and makes services usable under fluctuating connectivity. The appropriate innovation may therefore be a simpler workflow, a synchronized offline module, a shared data architecture, or a better assistance mechanism rather than an additional standalone application.

Learning Ability: Converting Disruptions into Organizational Knowledge

Learning ability is less explicitly stated by informants than the infrastructure and flexibility themes, yet it is essential to explaining whether adaptation can be sustained. The demand for stronger human resources, better information, problem identification, and service improvement implies that the bureaucracy needs mechanisms for converting recurring experience into organizational knowledge. Network failures, user complaints, synchronization problems, security incidents, and successful local workarounds should become inputs for future service design.

Organizational learning can be institutionalized through periodic evaluation, after-action review, incident logs, knowledge sharing, competency mapping, and training linked to actual service problems. Documentation is important in public organizations because staff rotation can otherwise cause operational knowledge to disappear. A clear record of disruptions, temporary solutions, decisions, and recovery procedures allows new personnel to learn from earlier experience instead of repeating the same diagnostic process.

Training also needs to be differentiated. Frontline employees require communication and user-assistance capability, while system managers require technical, security, data-management, and troubleshooting skills. A generic training count says little about whether these needs have been met. A stronger learning system would begin with a competency map, connect training to documented gaps, and assess whether service performance changes after capacity-building activities.

Learning ability completes the adaptive cycle. Responsiveness generates information about user needs and problems. That information motivates procedural flexibility and innovation. The results of those changes then require evaluation. Lessons from evaluation return to the organization and reshape how it responds to the next problem. When this cycle is supported by leadership, resources, documentation, and collaboration, adaptability becomes an institutional capability rather than a series of individual improvisations.

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Table 4. Synthesis of the Four Dimensions of Bureaucratic Adaptability

Dimension	Main finding	Priority strengthening	Illustrative indicators for future evaluation
Responsiveness	Users still need clearer information, assistance, and problem identification.	Multichannel help; proactive information; defined follow-up responsibilities.	Time to first response; clarity of information; complaint resolution; assisted-use satisfaction.
Flexibility	Unstable networks require alternative mechanisms and service continuity.	Assess offline-first feasibility; formalize fallback SOPs; flexible service points; data reconciliation.	Availability during outages; share of cases completed through fallback; synchronization success.
Innovation capacity	Needed innovation concerns integration, user-centered design, security, and context.	Interoperability; privacy-by-design; prototyping; internal capability and collaboration.	Repeated-data reduction; transaction completion; user testing; security incidents.
Learning ability	Recurring problems need to be converted into knowledge and capability.	Competency maps; targeted training; incident documentation; periodic evaluation.	Documented lessons; training linked to gaps; implemented corrective actions; knowledge-sharing frequency.

Source: Authors' Synthesis of the Qualitative Findings; Proposed Indicators Are for Subsequent Validation (2026)

An Archipelagic Adaptive Bureaucracy Model

The findings support a proposed model in which the archipelagic context is treated as the starting condition of digital-service design. Uneven networks, dispersed geography, digital-literacy gaps, and limited human resources are not conditions that can be ignored after a platform is deployed; they shape the institutional requirements of the service itself. Responsiveness, flexibility, innovation capacity, and learning ability are therefore treated as connected analytical dimensions whose relationships require further empirical validation.

Responsiveness provides information about needs and constraints; flexibility translates that information into adjustments in procedures and channels; innovation capacity develops context-sensitive solutions; and learning ability evaluates experience and feeds documented lessons back into subsequent responsiveness, flexibility, and innovation. The proposed relationship is cyclical and contains a feedback loop rather than a one-way sequence. Figure 1 has been revised to represent this feedback logic explicitly.

The proposed framework points to five outcomes for future validation rather than measured findings: more equitable access, service continuity, secure data integration, stronger digital capacity, and continuous evaluation. These outcomes are derived from the analytical implications of the respondent evidence and literature, but the present dataset does not measure their achievement. Subsequent research should test whether the proposed dimensions are associated with these outcomes using broader qualitative evidence and verified administrative performance data.

The model is intentionally presented as a provisional governance framework rather than as a validated application blueprint. Different services may translate its logic differently. Population administration may assess offline data capture and later synchronization; licensing services may prioritize status information and consultation channels; and social-service programs may emphasize data integration and cross-unit verification. What remains to be tested is whether adaptation to island conditions can preserve accountability and service rights across specific service domains.

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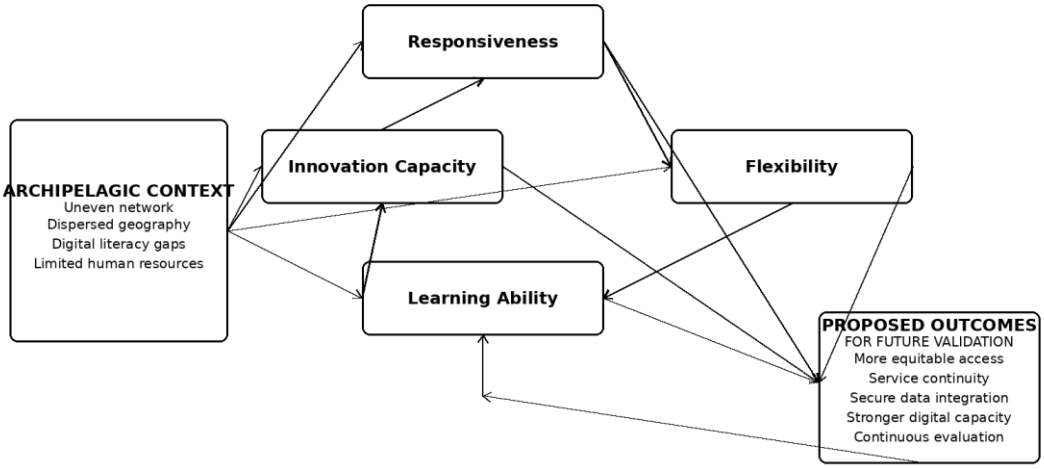


Figure 1. Proposed archipelagic adaptive bureaucracy framework for future validation
Source: Authors' Proposed Framework Derived from the Verified Findings And Adaptive-Governance Literature; Outcomes Require Future Validation (2026)

Policy Recommendations Derived from the Findings

The following points are recommendations derived from the findings, not additional empirical findings. They translate the documented constraints and the proposed adaptive-governance framework into operational options for local government. The first is to map weak-connectivity locations and identify service stages most vulnerable to interruption. This mapping can guide assessment of which services may require fallback procedures, assisted points, or, where technically and legally feasible, offline-first functions. A connectivity problem becomes more manageable when the organization knows where it occurs, which transactions it affects, and what authorized alternative can be activated.

The second priority is to formalize information and complaint management. Citizens need simple guidance on procedures, status, outages, and alternative channels. A multichannel model should have a single logic of responsibility so that messages received through different channels enter the same follow-up process. This reduces the risk that adding communication platforms creates fragmentation rather than responsiveness.

The third priority concerns digital capability. Human-resource development should be linked to specific service roles and recurring problems. Community assistance should also be considered part of service design, particularly for users with limited digital literacy. Local government offices, village or negeri structures, community organizations, and universities can become partners in assisted access and user education when responsibilities are clearly defined.

The fourth priority is secure integration. The demand for interoperability should be translated into data standards, access rules, responsibility for data quality, privacy protection, and audit mechanisms. Integration that lacks governance can increase risk even while improving convenience. Security and privacy should therefore be treated as design requirements of innovation rather than as barriers to integration.

The fifth priority is institutional learning. Every major outage, complaint pattern, security issue, or workaround should leave an organizational record. Periodic evaluation can ask whether a response reduced service interruption, whether users understood new procedures, and whether the solution created new problems. This creates a cumulative evidence base for adaptation and supports the movement from one-off improvisation toward repeatable organizational capability.

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Table 4. Priority Actions for Strengthening Adaptive Digital Public Services

Policy pillar	Priority action	Expected administrative result
Infrastructure and continuity	Map weak-network points; prepare offline-first mechanisms and outage/recovery SOPs.	Service remains available when real-time connectivity is unstable.
Information and complaints	Provide simple information, outage status, multichannel assistance, and measurable follow-up.	Higher responsiveness and clearer user expectations.
Human resources and literacy	Develop competency maps, needs-based training, user assistance, and practical guidance.	Stronger capability among employees and service users.
Integration and security	Develop interoperability with access governance, privacy protection, and security review.	Less repeated data submission with controlled information risk.
User-centered innovation	Map user journeys, test prototypes, and involve users in evaluation.	Services better aligned with island conditions and user capability.
Organizational learning	Document disruptions, solutions, changes, and good practices; conduct periodic reviews.	Continuous improvement and retention of institutional knowledge.

Source: Adapted from the Policy Recommendations in the Research Report (2026)

Public Value, Equity, and Administrative Distance

The Banda evidence also clarifies why effectiveness in digital public service should be assessed through public value and equity rather than through digital adoption alone. W04 links digital service to reduced sea travel, lower costs, and shorter processing time. These benefits are substantial in a geographically dispersed area because administrative transactions may otherwise require transport, waiting time, and repeated physical visits. Digitalization can therefore create value by changing the cost structure of access for citizens, especially when a transaction that previously required movement between islands can be completed locally or remotely.

At the same time, public value is uneven if the service can only be used by citizens who possess stable connectivity, appropriate devices, and sufficient digital capability. This produces an important distinction between formal availability and effective accessibility. A service may be technically online and still be inaccessible to a resident at the moment the service is needed. The adaptive bureaucracy model addresses this problem by treating continuity mechanisms, assisted access, and user capability as part of the service itself rather than as supplementary arrangements.

Equity also requires attention to where the burden of adaptation is located. When a digital service fails because of connectivity or integration problems, citizens should not be expected to solve institutional fragmentation on their own by repeatedly visiting offices, resubmitting the same information, or searching across unrelated channels. Adaptive administration shifts part of this burden back to the organization through integrated data, clear escalation procedures, alternative channels, and documented responsibility. In this sense, bureaucratic adaptability is not simply organizational flexibility; it is also a mechanism for protecting equal access to administrative rights under unequal geographic conditions.

This perspective has implications for performance measurement. Counting the number of digital applications, accounts, or online forms says little about whether administrative distance has actually been reduced. More relevant indicators would include the proportion of transactions completed without inter-island travel, the availability of fallback channels during outages, the number of repeated submissions required, successful synchronization after offline processing, time to resolve access problems, and differences in service completion across locations. Such indicators connect digital transformation to the citizen experience without assuming that high online usage is always the appropriate objective.

The combination of public value and adaptability also explains why a hybrid service arrangement may be more advanced than a fully online arrangement in an archipelagic context. A hybrid design can use digital processing wherever it improves speed and integration while retaining assisted or offline options where infrastructure conditions require them. The

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objective is not to preserve manual procedures indefinitely, but to prevent technology from becoming a new gatekeeper. As infrastructure and capability improve, the balance of channels can change. What should remain constant is the requirement that service design respond to the actual conditions under which citizens seek public services.

CONCLUSION

Digital public-service transformation in the Banda Islands is constrained by uneven and unstable internet and telecommunications networks, limited human resources, low digital literacy, concerns about data security and privacy, and incomplete system integration. Across the verified written responses, connectivity is the most recurrent constraint, while human capacity, integration, security, information, and continuity appear as connected organizational issues. The evidence indicates that digitalization in an archipelagic region is an organizational and governance problem as well as a technological one, because service benefits depend on whether administrative access can be maintained under uneven island conditions.
The theoretical implication is that adaptive governance can be made more operational at the bureaucratic level by examining four linked dimensions: responsiveness, flexibility, innovation capacity, and learning ability. Responsiveness identifies user needs and problems; flexibility enables procedural adjustment; innovation capacity supports context-sensitive solutions; and learning ability feeds experience back into later adaptation. This interpretation extends adaptive-governance reasoning to digital public services where stability and accountability must be retained while service arrangements adjust to geographic and infrastructural uncertainty. Policy recommendations—such as multichannel assistance, formal fallback procedures, secure interoperability, competency development, and systematic evaluation—should therefore be understood as implications derived from the findings rather than as observed achievements.

The archipelagic adaptive bureaucracy framework proposed in this article remains provisional. Its five proposed outcomes—more equitable access, continuity of service, secure data integration, stronger digital capacity, and continuous evaluation—were not measured in the present study and require future validation. The main limitations are the small number of written responses, incomplete respondent-profile metadata, the absence of exact collection dates in the available records, the lack of direct observation, and the absence of verified service-performance data. The source file also does not preserve full verbatim transcripts for every coded statement, limiting the use of direct quotation. Future research should broaden the informant base, document respondent roles and collection dates prospectively, observe specific service processes, incorporate administrative performance records, and test the proposed relationships across concrete digital services. The questionnaire simulation contained in the research documentation should not be used as empirical evidence unless replaced by verified respondent data.

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