

The Effectiveness of Digital Personnel Administration Services in an Archipelagic Region: a Case Study of the Regional Civil Service and Human Resources Development Agency of Meranti Islands Regency

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ABSTRACT

This study analyzes the effectiveness of digital personnel administration services in an archipelagic region by examining the interplay among technological quality, service capacity, user experience, and geographical conditions. A qualitative evaluative case study was conducted at the Regional Civil Service and Human Resources Development Agency (BKPSDM) of Meranti Islands Regency. The DeLone and McLean framework was employed to examine system quality, information quality, service quality, use, user satisfaction, and net benefits, while the archipelagic setting was treated as a cross-cutting context. The empirical analysis drew on 20 informants and 168 service-request records. The comparison of interview, documentary, and observational evidence generated six principal themes. Digital channels reduced initial office visits and accelerated the completion of fully documented requests; however, their effectiveness was constrained by connectivity problems, inconsistent requirements information, reliance on informal communication, and the continued use of physical documents. Mandatory or frequent use did not, in itself, indicate success. Effectiveness emerged when reliable systems and actionable information were reinforced by responsive operators, recovery mechanisms, and end-to-end digital processes. The study proposes a conditional effectiveness model for archipelagic regions: an enabling configuration produces equitable access, process certainty, and sustainable benefits, whereas a constraining configuration produces hybrid bureaucracy and uneven benefits. Practical implications include low-bandwidth design, consolidated requirements, corrective notifications, standardized escalation procedures, and location-sensitive performance evaluation.

INTRODUCTION

Digital transformation in government should not be understood merely as transferring forms from a service desk to a computer screen. It requires the redesign of entire processes, authority structures, competencies, and relationships between public organizations and service users. Mergel et al (2019) conceptualize digital transformation as change driven by user needs and technology, while Vial (2019) argues that digital value emerges when technology alters an organization's value-creation pathways. In personnel administration, the practical implications are clear: systems must accelerate verification, preserve document traceability, reduce dependence on face-to-face encounters, and provide civil servants with process certainty. Digitalization that merely adds a new channel without correcting legacy procedures risks creating a dual bureaucracy in which documents are submitted online while verification and decision-making remain dependent on manual workflows.

The impetus for digital public services has intensified as governments are expected to operate rapidly, transparently, and responsively under resource constraints. Such transformation is not a stand-alone technology project, but a cross-functional organizational change requiring leadership, capacity, and the orchestration of multiple actors (Eom & Lee, 2022; Verhoef et al., 2021). Evidence from public organizations indicates that external pressure may accelerate adoption but does not necessarily produce stable institutionalization unless procedures, employee capabilities, and managerial support evolve concurrently (Moser-Plautz & Schmidhuber, 2023). Evaluations of digital services must therefore move beyond asking whether an application exists to more substantive questions: whether the system can be used reliably, whether the information it produces is trustworthy, whether support is available when users encounter problems, and whether the resulting benefits are distributed equitably.

These demands have particular significance in personnel administration. Services involving transfers, promotions, data updates, career advancement, and personnel records affect civil servants' rights, career mobility, and administrative certainty. Data errors or delays not only diminish user convenience but may also create institutional and personal consequences. Digitalization should reduce waiting times, travel costs, repeated document submission, and the risk of misplaced files.

The relationship between digital systems and service outcomes, however, is not automatic. Research on public-service digitalization shows that user experience is produced through the interaction of technology, organizational processes, and frontline action; failure in any one component can negate the benefits of the others (Lindgren et al., 2019). Effectiveness is therefore understood as the capacity of a service system to achieve administrative objectives while providing users with a valuable service experience.

This issue is especially salient in Meranti Islands Regency. Its multi-island geography makes distance more than a spatial measure: it becomes a source of cost, time, and uncertainty of access. Civil servants stationed far from the administrative center may need to

travel by sea and land merely to submit, correct, or check the status of documents. In this context, digital services can serve as an instrument of administrative equity by ensuring that work location no longer determines the burden required to obtain the same service.

Technology may nevertheless shift inequality from physical to digital space when network quality, devices, literacy, or technical assistance are unevenly distributed. Lythreathis et al (2022) show that the digital divide encompasses access, capabilities, patterns of use, and outcomes, while Larsson (2021) warns that government automation may increase efficiency for some users while excluding others. The archipelagic setting is therefore theoretically relevant, rather than merely an administrative backdrop. The effectiveness of digital services in a geographically fragmented region depends on their capacity to convert spatial barriers into consistent access. If users must still travel with physical documents, repeat data entry, or rely on informal communication to determine the status of a request, digitalization has not yet transformed the underlying process.

Conversely, even a relatively simple system can create substantial value when it ensures access, accuracy, responsiveness, and completion. The value of e-government includes improved service quality, administrative efficiency, openness, and trust; these outcomes must be evaluated through their consequences for stakeholders rather than through technological sophistication alone MacLean & Titah (2022); Twizeyimana & Andersson (2019). This perspective shifts evaluation from technological outputs to tangible benefits.

Studies in Indonesia indicate that e-government continues to expand, although implementation quality and utilization remain uneven. Budi et al (2020) show that Indonesian public institutions vary in their use of Government 2.0, while Roziqin et al (2022) identify the continuing need to integrate research agendas with context-sensitive evaluation. Transparency also influences e-government adoption in Indonesia (Sabani, 2021), suggesting that users consider not only convenience but also the openness and credibility of service providers. This is particularly important in personnel services because users are government employees familiar with bureaucratic procedures, yet they still require clear information regarding status, processing standards, responsible officials, and the rationale for decisions.

The digital-government literature has developed along two broad streams. The first examines adoption and behavioral intention, including the role of trust and risk in the use of electronic services (Li, 2021) and the influence of privacy concerns on willingness to adopt government applications (Lin et al., 2021). The second evaluates broader outcomes, such as satisfaction, efficiency, transparency, and public value. Both are important, but neither fully explains how internal administrative services operate in archipelagic regions. An adoption focus may overlook the fact that civil servants often have no alternative service channel, whereas aggregate measures of benefit may conceal the experiences of users constrained by connectivity, skills, and hybrid procedures. In-depth inquiry is therefore required to identify the mechanisms linking system quality to service outcomes.

Optimism surrounding GovTech must also be approached critically. Technology providers may accelerate innovation, but their involvement may also generate dependency, fragmented solutions, and data-governance challenges (Bharosa, 2022). The use of artificial intelligence and automation further raises questions concerning accountability, competence, security, and the legitimacy of decisions (Wirtz et al., 2019). Although district-level personnel services may not yet employ advanced technologies, the underlying lesson remains relevant: success cannot be reduced to technical functionality. Clear process ownership, protection of civil servants' personal data, continuity of support, operator capacity, and failure-management procedures are integral to service effectiveness.

This synthesis reveals three research gaps. First, existing studies predominantly assess success through adoption or quantitative perceptions, leaving the processes that explain why a service is considered effective or ineffective insufficiently explored. Second, internal government personnel administration has received less attention than citizen-facing services. Third, archipelagic characteristics are often treated as a description of location rather than as conditions shaping access, use, and the benefits of digital services. This study addresses these gaps through an evaluative case study of the interaction among system quality, information quality, service quality, use, user satisfaction, and net benefits within the geographical realities of the Meranti Islands.

Accordingly, this study aims to analyze the effectiveness of digital personnel administration services at BKPSDM Meranti Islands Regency; explain how technological and service quality shape civil servants' experiences; identify the organizational, technological, and geographical factors that enable or constrain effectiveness; and formulate a strengthening model suited to an archipelagic region. The study extends the information systems success model by incorporating spatial access and outcome equity. Its practical contribution lies in recommendations for improving procedures, user support, data governance, and service-channel integration. By placing user experience and administrative benefits at the center of evaluation, the study examines not simply whether services have become digital, but whether digitalization has transformed service quality.

Digital-service effectiveness is defined as the capacity of a configuration of technology, information, service, and organizational processes to produce administrative completion that is accurate, accessible, trustworthy, and valuable to users. A system may be used because it is mandatory, yet remain ineffective when it is difficult to access, produces inconsistent information, or requires repeated manual processing. The De Lone & McLead (2003) framework provides an evaluative logic through system quality, information quality, service quality, use, user satisfaction, and net benefits. The relationships among these dimensions are processual: quality attributes shape the experience of use, that experience influences user evaluations, and the process ultimately generates organizational benefits.

System quality refers to reliability, ease of use, security, response time, and interface accessibility. In an archipelagic region, this dimension must also be assessed in terms of

system resilience under unstable connectivity and the extent to which the system eliminates physical visits. Evaluations of government channels underscore the importance of a user-centered orientation in assessing digital service delivery (Jiang et al., 2021). Information quality, by contrast, concerns the accuracy, completeness, relevance, timeliness, and comprehensibility of information. In personnel administration, these attributes determine whether users can prepare requirements correctly, track status, and understand decisions without relying on informal explanations.

Service quality represents the responsiveness, competence, empathy, and assurance that connect users to the system. Technology does not eliminate the role of personnel; rather, it shifts their role from document processors to facilitators, verifiers, and handlers of exceptions. Evidence indicates that e-government adoption and satisfaction remain influenced by support and user experience (Shuib et al., 2019). Qualitative inquiry should therefore examine the points at which digital procedures cease to function and users turn to operators, personal communication, and physical documents. These transitions reveal organizational capacities that usage statistics may not capture.

Use is understood as the depth to which digital services are integrated into task completion, rather than merely the frequency of access. User satisfaction is a reflective evaluation of the alignment among expectations, experiences, and outcomes. Net benefits include savings in time and cost, fewer errors and losses, faster decisions, greater transparency, and more equitable access. Tests of the information systems success model in Indonesian village financial systems demonstrate the relevance of quality, trust, use, satisfaction, and benefits in governmental settings (Ariyanto et al., 2022).

Evidence from Thai e-government confirms the relationship between system attributes and behavioral intention (Nookhao & Kiattisin, 2023), while an Indonesian study demonstrates the model's usefulness for assessing the success of digital public services (Varastika et al., 2025). More recent research involving Indonesian government employees further reinforces the importance of satisfaction and net benefits as outcomes of e-government success (Rahmatullah et al., 2025).

The framework is not, however, applied mechanically. Government digital transformation is a socio-technical change involving structures, rules, competencies, and service values (Liva et al., 2020). The archipelagic setting is therefore positioned as a context capable of strengthening or weakening the relationships among dimensions. A system assessed as adequate in the regency center may produce different benefits for civil servants on outlying islands. The analysis focuses on alignments and discrepancies among formal service design, operator practices, user experience, and administrative outcomes, thereby explaining effectiveness, its mechanisms, and the conditions under which it emerges.

The analytical framework employs the information systems success model as a set of sensitizing concepts. Its six dimensions guide the examination of how technical and organizational quality is translated into service experience and benefits. This approach is

consistent with an evaluative case study because relationships among dimensions are interpreted through processes, contexts, and informants' explanations. The analysis does not assume that use automatically signifies success: use may arise from administrative obligation, whereas effectiveness becomes evident only when services deliver accurate, accessible, transparent completion while reducing users' burdens.

Archipelagic characteristics are treated as cross-cutting conditions. Distance, connectivity, travel costs, device distribution, and the availability of technical assistance may influence perceived system quality, access to information, intensity of use, and benefits. The framework also accommodates emergent themes, including informal practices, hybrid procedures, operator dependence, and forms of exclusion not captured by the original categories. The analysis thus proceeds deductively from theory and inductively from empirical experience.

Table 1. Analytical Framework for the Effectiveness of Digital Personnel Administration Services

Dimension	Analytical Focus	Empirical Indicators	Analytical Question
System quality	Reliability and accessibility of digital channels	Ease of use; stability; speed; device security; access under limited connectivity	Do the system's technical characteristics facilitate or hinder services across different islands?
Information quality	Quality of information used for action	Accuracy; completeness; timeliness; consistency; clarity; status information	Can users obtain trustworthy information without repeated clarification?
Service quality	Organizational service capacity	Responsiveness; competence; assurance; complaint-handling mechanisms	How do personnel address questions, errors, and delays?
Use	Integration of digital channels into administrative processes	Depth and continuity of use; functional fit; channel switching	Are services completed digitally, or do users remain dependent on visits and informal communication?
User satisfaction	Users' assessment of process and outcome	Ease; certainty; perceived security; transparency; alignment with expectations	How do civil servants assess the service experience, and what shapes that assessment?
Net benefits	Tangible changes in service performance	Time and cost; fewer errors; access; decision	What benefits are created, for whom, and are they

		speed	distributed equitably across locations?
Archipelagic conditions	Cross-cutting context	Distance; transportation; network quality; literacy; local support	How does geography enable or constrain digital-service effectiveness?

Table 1 explains that the analysis begins with three quality attributes—system, information, and service—and then traces how they shape patterns of use and satisfaction before identifying resulting benefits. The archipelagic setting is not treated as a single causal factor, but as a context that alters user experience. Effectiveness is considered strong when services enable consistent administrative completion without making location, network quality, or personal proximity to an operator decisive. Conversely, reliance on physical documents, repeated data entry, unclear status, and the need to contact personnel through informal channels are interpreted as gaps between formal design and service practice.

METHOD

This study adopted a qualitative approach using a single evaluative case-study strategy at BKPSDM Meranti Islands Regency. The case was bounded to the delivery of digital personnel administration services, particularly the processes used to receive, verify, monitor, and complete civil servants' requests. The temporal boundary covered service experiences during the preceding twelve months so that informants could provide current accounts. A case-study strategy was selected because effectiveness cannot be separated from organizational procedures, staff capacity, infrastructure, and the geographical characteristics of the setting in which services operate. The unit of analysis was the digital service process; individual experiences were treated as sources of evidence for explaining that process rather than as independent units.

Informants were selected purposively according to the principle of maximum variation in order to capture differences in role, experience, service type, and location. Purposive selection enables cases to be prioritized according to their relevance to the research questions (Campbell et al., 2020). The sample comprised: (1) four BKPSDM officials or policy decision-makers; (2) five service administrators, verifiers, or operators; and (3) eleven civil-service users from different local-government agencies and islands. Saturation was not invoked as a mechanical claim; recruitment ceased when additional informants no longer extended the substantive explanation of the patterns being developed (Braun & Clarke, 2021b).

User eligibility required experience submitting or monitoring a digital service during the preceding twelve months and willingness to explain the complete service journey. Variation was sought by service type, work location, intensity of use, procedural stage experienced, and

request outcome. Officials and operators were selected on the basis of their responsibilities for policy design, system management, verification, and case resolution. Individuals without direct involvement in the process under study were excluded.

Data were collected through semi-structured interviews. The interview guide was derived from the analytical framework, used open-ended questions, and followed the sequence of each informant's experience: the service need, initial access, document preparation, interaction with the system and personnel, status monitoring, completion, and perceived benefits or disadvantages. Interviews with managers explored system objectives, allocation of authority, standards, operator capacity, data governance, and mechanisms for handling disruptions.

Non-participant observation was conducted along service workflows and at points of user-staff interaction. Documentary analysis covered standard operating procedures, service standards, user guides, forms, sample notifications, anonymized request summaries, incident reports, and relevant policies. The three sources were used complementarily: interviews explained meanings and experiences, observation revealed actual practices, and documents indicated formal design and administrative traces.

The researcher served as the principal instrument, supported by an interview guide, observation sheet, document-review matrix, audio recorder, and reflexive journal. The guide was piloted through one or two initial interviews to assess question clarity and sequencing, not to produce statistical testing. Data collection proceeded in stages: obtaining permission, mapping processes and actors, interviewing managers, tracing operator and user experiences, conducting observations, and returning to informants when contradictions or explanatory gaps arose. Each file was anonymized and stored separately from the identity register.

Data were analyzed iteratively using thematic framework analysis. The first stage involved familiarization through repeated reading of transcripts, field notes, and documents while preparing analytical memos. The second produced a hybrid set of initial codes: deductive codes were derived from the six framework dimensions, while inductive codes captured unanticipated experiences, mechanisms, and contradictions. The third stage grouped codes into categories, compared sources and informant groups, and developed themes that answered the research questions. The fourth mapped themes onto a case-by-dimension matrix to identify patterns by role, service type, and location. The fifth used pattern matching to compare formal design, actual practice, user experience, and benefits. The final stage developed an explanation of the conditions that enabled or constrained effectiveness.

Thematic analysis was selected because it can identify patterns of meaning systematically without detaching data from context (Kiger & Varpio, 2020). Themes were developed not simply because they were frequently mentioned, but because they had explanatory power in relation to service effectiveness. Analytical quality was maintained by aligning the questions, theoretical assumptions, coding procedures, and forms of claim (Braun & Clarke, 2021a). All code revisions, theme mergers, negative cases, and interpretive

decisions were documented to preserve an auditable analytical pathway. NVivo was used to organize the data, while interpretation and theme development remained the responsibility of the researcher.

Credibility was strengthened through triangulation across sources, methods, and informant positions; negative-case analysis; and member reflection on interpretive summaries, rather than by requesting informants to endorse every conclusion. Dependability was supported by an audit trail recording sampling decisions, instrument revisions, coding development, and theme construction. Transparent reporting was used to make the coherence and trustworthiness of the thematic findings assessable (Nowell et al., 2017).

Finally, informants received information about the study's purpose, participation, recording, confidentiality, use of quotations, right to decline questions, and right to withdraw without consequence. Individual names, overly specific job titles, identity numbers, and file contents were anonymized. Operational documents were analyzed only after authorization, and personal data were not reproduced in the manuscript. Quotations were attributed using informant codes that distinguished perspectives without disclosing identities.

FINDING

The study involved 20 informants representing key positions within the service ecosystem: managerial officials, operators or verifiers, and civil-service users. Users were selected to reflect variation in work location and service experience; five were stationed in the regency center and six in subdistricts or islands outside the administrative center. The evidence bases also included 168 anonymized request records, two standard operating procedures, service guidelines, sample notifications, and observations of service workflows. This composition brought together the perspectives of policy design, operational implementation, and service-user experience (see Tables 2 and 3).

Table 2. Composition of Informants

Informant group	Number	Information focus
Officials/managers	4	Policy, governance, evaluation, and resources
Operators/verifiers	5	Receipt, verification, communication, and problem resolution
Civil-service users—regency center	5	Access experience with relatively limited geographical barriers
Civil-service users—outside the center/other islands	6	Access, connectivity, and travel-cost experience
Total informants	20	In-depth interviews

Table 3. Summary of Descriptive Indicators

Indicator	Value	Initial meaning
Requests completed without an initial office visit	124/168 (73.8%)	Digital channels reduced the need for initial physical submission
Requests requiring informal clarification	69/168 (41.1%)	Users/operators switched to telephone or WhatsApp
Requests still requiring physical documents	39/168 (23.2%)	Digitalization was not yet fully end-to-end
Median completion time for complete files	3 working days	Faster than the seven-day estimate for predominantly manual processing
Returns due to non-compliant documents	28/168 (16.7%)	Requirements information was not consistently clear
Recorded access/connectivity disruptions	31/168 (18.5%)	The impact was greater on users outside the regency center

Table 4. Matrix of Resulting Themes

Theme	Dimension	Pattern and evidence	Interpretation
Improved spatial access, but unstable digital access	System quality; archipelagic conditions	Initial visits declined, but connectivity and file size impeded uploads	Benefits were greater outside the center, but exclusion risks remained
Information did not consistently enable action	Information quality	Requirements in guidelines, forms, and operator explanations were not always identical	Informal clarification and document returns remained high
Operators bridged the system and case resolution	Service quality	Operators resolved exceptions not accommodated by the system	Service was enabled but depended on individuals
High use did not equate to an end-to-end process	Use	Digital submission was followed by physical verification or archiving in some cases	Partial efficiency and hybrid bureaucracy
Satisfaction was conditional	User satisfaction	Positive when personnel were responsive; negative when files were returned without explanation	Certainty mattered more than sophistication
Benefits were tangible but	Net benefits	Travel time and costs declined, while connectivity	Effectiveness should be assessed by location

unevenly distributed		differentiated outcomes	and user group
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The matrix in Table 4 shows that system, information, and service quality did not operate independently. Together, they shaped how users engaged with digital channels and evaluated service certainty, ultimately affecting perceived benefits. To clarify these relationships without converting the qualitative study into a statistical test, the cross-theme synthesis is visualized in Figure 1.

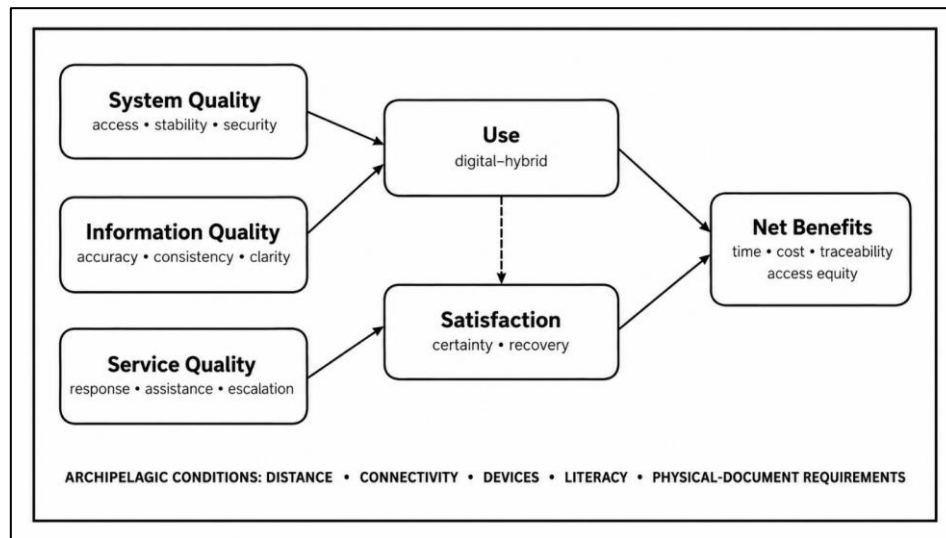


Figure 1. Configuration of Findings on Digital Service Effectiveness

Figure 1 presents the explanatory sequence: system quality and information quality shape use, while service quality sustains satisfaction through assistance and recovery. Use and satisfaction contribute to net benefits. All relationships operate within the archipelagic context, meaning that distance, connectivity, devices, literacy, and physical-document requirements may strengthen or weaken outcomes at each stage.

Table 5. Matrix of Evidence Convergence across Sources

Theme	Interviews	Documents	Observation	Interpretive status
Spatial access and digital stability	Strong	Moderate	Strong	Convergent; disruptions should be compared by location
Information fragmentation	Strong	Strong	Moderate	Convergent; evident in requirements and file corrections
Operators as a bridge	Strong	Weak	Strong	Partially convergent; practices were insufficiently documented
Digital-hybrid process	Strong	Strong	Strong	Convergent; physical stages were traceable across

				sources
Conditional satisfaction	Strong	Weak	Moderate	Predominantly user experience; member reflection required
Uneven benefits	Strong	Moderate	Moderate	Emergent pattern; verification required by location and service type

Table 5 functions as an interpretive audit. The labels strong, moderate, and weak do not represent numerical scores; rather, they indicate the degree of evidentiary support from each source. The digital-hybrid process received the most consistent support, whereas user satisfaction and equitable distribution of benefits required confirmation through location-based comparison and negative-case examination.

The first theme indicates that digital channels became meaningful when they replaced inter-island travel for initial submission and status monitoring. Of the 168 requests, 73.8% were initiated without an office visit. Users outside the administrative center obtained relatively greater benefits because avoided travel translated into savings in time and transportation costs and reduced the risk of weather-related delays. Accessibility nevertheless remained uneven: 18.5% of records documented connectivity problems or failed uploads of large files. Some cases were completed only after resubmission through alternative channels, indicating that actual success resulted from the combined effects of the application, connectivity, and operator intervention.

The findings distinguish system availability from effective reach. Services were formally available to all civil servants, but connection costs, device quality, and network stability affected users' capacity to complete the process. The system did not consistently provide temporary storage, automatic compression, or failure notifications. Users with weak connections therefore often repeated uploads or sought assistance from colleagues. From an effectiveness perspective, reduced travel constituted an achievement, while resilience under low-connectivity conditions remained a gap in system quality.

The second theme concerns information fragmentation. Comparison of standard operating procedures, guidelines, forms, and operator communications revealed differences in terminology and detailed requirements. This condition was reflected in the 16.7% of requests returned for non-compliance. Returns were not always caused by user negligence; some arose because additional requirements became known only after verification. Moreover, 41.1% of requests required clarification by telephone or interactive messaging. Informal channels accelerated resolution, but simultaneously demonstrated that official information was not yet sufficiently self-contained to guide action.

Users regarded information as effective when it answered four questions: which documents were required, in what format they should be submitted, who was processing the request, and when a decision could be expected. Ambiguity in any one of these areas

increased repeated contact and operator workload. Notifications that merely stated that corrections were required without identifying the error generated additional communication cycles. Information quality was therefore determined not only by factual accuracy but also by its capacity to direct the next action.

The third theme highlights the central role of operators. They not only verified documents but also interpreted requirements, resolved upload failures, contacted users, and coordinated cases requiring decisions. Operator responsiveness enabled an incompletely integrated system to continue producing service outcomes. At the same time, dependence on personal assistance generated variation in experience. Users who knew an officer's contact number or had access to internal communication networks generally obtained clarification more readily than those relying solely on formal notifications.

Service capacity was thus person-dependent. Solutions to recurring problems had not been fully recorded as organizational knowledge, causing responses to similar issues to vary by operator. The absence of a help center, issue classification, and escalation standards increased this risk. Effectiveness grounded in individual commitment may produce short-term satisfaction, but it remains fragile under staff rotation, increased workloads, or operator unavailability.

Use of digital channels was high at the submission stage but did not consistently extend to archiving and final decisions. Physical documents were still required at some stage in 23.2% of requests. This pattern produced a hybrid bureaucracy: data were entered digitally, after which certain documents were printed, transported, and reverified. Such procedures may be justified for documents requiring special authentication, but they constitute duplication when they lack a clear legal or control rationale.

User satisfaction did not follow a simple satisfied–dissatisfied binary. Users tended to evaluate the service positively when it eliminated travel and allowed status monitoring, even when the interface was basic. Evaluations became negative when documents were returned without explanation, status remained unchanged, or digital channels still required an office visit. Process certainty and the quality of problem recovery were therefore more influential than the number of features. A median completion time of three working days for complete files signaled efficiency, but it did not capture the time users spent correcting files before they were declared complete.

Overall benefits included fewer trips, faster document distribution, stronger traceability, and a lower risk of misplaced files. These benefits were most tangible for users outside the regency center. Yet this group was also the most vulnerable to weak connectivity and limited local assistance. The findings therefore reveal an archipelagic paradox: the greater the need for digital services, the greater the consequences when the system cannot be accessed.

Effectiveness cannot consequently be inferred solely from average completion time or the number of active accounts. Evaluation must examine the distribution of outcomes by location, service type, and request complexity. The empirical model that emerged is one of

conditional effectiveness: system and information quality generate benefits when reinforced by operator support and end-to-end procedures, whereas poor connectivity and physical-document requirements weaken these relationships. Priority improvements include consolidating requirements, issuing specific corrective notifications, documenting incident resolution, adopting low-bandwidth design, and removing physical stages that lack justification.

The strength of these patterns derived not only from their recurrence in interviews but from convergence across evidence sources. Reduced visits, for example, appeared in user accounts and were checked against digital-receipt traces. Information fragmentation was evident in inconsistent formal documents, returned files, and requests for clarification. Operator dependence was reflected in channel switching and the resolution of particular cases. This convergence allowed themes to function as explanations of process rather than compilations of opinion. The evidentiary matrix also identified supporting sources, contradictory evidence, and the boundaries of each interpretation.

Deviant cases were equally important. Some users outside the regency center completed services without difficulty because they possessed adequate devices, stable connections, and prior experience. Conversely, several users in the regency center had documents returned because the information provided was unclear. These cases reject a deterministic explanation in which distance invariably produces failure. Archipelagic conditions operate through combinations of connectivity, competence, file design, support, and service complexity. Variation by service type also matters: simple data updates are more easily completed digitally, while transfers and promotions involve longer cross-document and cross-authority verification. A single technical standard is therefore insufficient for all services.

Table 6. Patterns of Effectiveness by Location and Service Complexity

Use context	Dominant conditions	Outcome pattern	Status
Regency center—simple service	Relatively stable connection; high operator access	More complete digital processing	Effective
Regency center—complex service	Cross-document/authority verification	Fast but still hybrid processing	Partially effective
Outside the center—simple service	High travel savings; variable connectivity	Effective when uploads and notifications are stable	Conditional
Outside the center—complex service	Layered connectivity, physical documents, and escalation	Risk of repetition and outcome inequality	Vulnerable
All locations—exception cases	Dependence on operators and informal channels	Resolution depends on individuals	Person-dependent

Table 6 demonstrates that location is not a single determinant. Service complexity and recovery capacity alter the consequences of geography. The synthesis yields two possible

outcomes—effective and partially effective—which are formulated as the conditional effectiveness model presented in Figure 2.

Figure 2 emphasizes that digital-service capacity produces full effectiveness when organizational and technical enablers support an end-to-end process. When constraints dominate, the service continues to provide benefits, but only partially: procedures become hybrid, outcomes vary across locations, and resolution depends on particular operators. The model redirects evaluation from usage volume toward four outcome indicators: completion without an office visit, fewer returned files, successful disruption recovery, and a narrowing of outcome disparities across locations.

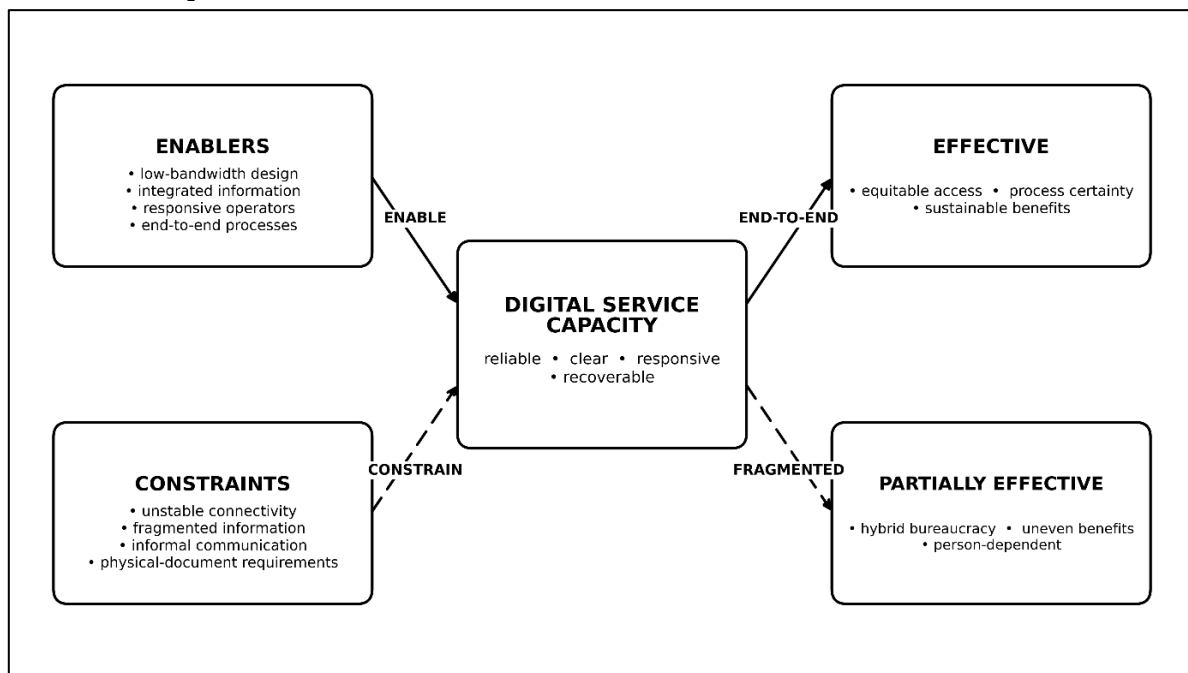


Figure 2. Conditional Effectiveness Model for an Archipelagic Region

Discussion

The findings show that effective digital services in an archipelagic region constitute a socio-technical achievement rather than a temporary application-level output. Fewer office visits demonstrate the creation of public value through efficiency and more equitable access, consistent with MacLean and Titah (2022) and Twizeyimana and Andersson (2019). The benefits, however, were not linear: a universally available system generated different experiences when connectivity, devices, and technical support were unequal. This pattern extends Lythreathis et al.'s (2022) argument that the digital divide must be understood in terms of outcome disparities rather than access alone. In Meranti Islands Regency, service equity means enabling users in different locations to complete administrative matters with relatively comparable burdens.

Information quality proved as important as technical quality. The high incidence of informal clarification and returned documents indicates that information was not yet fully

actionable. In the DeLone & McLead (2003) model, information quality influences use and satisfaction; the present findings explain this mechanism through uncertainty about action. When requirements are inconsistent or notifications are non-diagnostic, users turn to personnel to obtain operational meaning. This finding supports Ariyanto et al (2022), who identify system, information, and service quality as foundations of successful government information systems. The analytical contribution of this study lies in demonstrating that high-quality information must reduce the need for personal interpretation, rather than merely satisfy administrative requirements.

The dominant contribution of operators demonstrates that technology does not replace human service; it changes the nature of the work performed. Operators acted as boundary spanners among regulations, applications, and users' circumstances. Such support increases satisfaction, as also reported by Shuib et al. (2019), but dependence on personal contact creates unequal access and weakens institutionalization. Sustainable effectiveness requires transforming individual knowledge into organizational mechanisms, including a help center, knowledge base, and standardized escalation and resolution procedures. Otherwise, success depends on who happens to be on duty rather than on a replicable level of service quality.

Hybrid procedures explain why high use is not synonymous with transformation. Lindgren et al (2019) emphasize that public-service digitalization occurs at the intersection of technology and public processes. If digital submission is followed by printing, physical delivery, or repeated verification without a clear control rationale, technology merely adds another layer to legacy bureaucracy. This is consistent with the definitions of transformation proposed by Mergel et al (2019) and Vial (2019), both of which require process change and value creation. Success indicators should therefore distinguish digital initiation, digital processing, and digital completion. This distinction prevents organizations from describing a service as end-to-end merely because its initial stage is available online.

Conditional satisfaction extends the application of the information systems success model to mandatory services. In commercial contexts, repeated use may reflect choice; for civil servants, use of a personnel system is often mandatory. Frequency of use consequently has limited explanatory power. Evidence from Indonesian passport services (Varastika et al., 2025) and employee-centered e-government evaluation (Rahmatullah et al., 2025) supports the importance of satisfaction and net benefits, but the present study identifies process certainty and recovery capacity as their principal antecedents. Users may accept a simple interface when status, errors, completion time, and assistance channels are communicated clearly.

The convergence matrix and conditional patterns reinforce the interpretation that no single factor independently explains success. Findings supported by interviews, documents, and observations—particularly the digital-hybrid process—had a stronger interpretive basis than themes derived primarily from perceptions. User satisfaction and equitable benefits, by contrast, require cautious verification because experience varies by location, service

complexity, and digital capability. This position avoids claims of qualitative homogeneity and treats negative cases as resources for refining, rather than disrupting, the principal explanation.

Theoretically, the study proposes a conditional effectiveness model for archipelagic regions. The three antecedent qualities—system, information, and service—shape use and satisfaction; net benefits emerge when processes are completed end-to-end. Connectivity, distance, literacy, and physical-document requirements operate as contextual conditions that modify the strength of these relationships. Three analytical propositions are derived from the empirical findings: system quality produces equitable benefits when it remains functional under prevailing connectivity conditions; information quality reduces user burden when it directs corrective action; and operator support improves effectiveness when resolution knowledge is institutionalized rather than retained as a personal capability.

In practical terms, BKPSDM should prioritize low-bandwidth design, consolidated requirements, corrective notifications, status dashboards, escalation standards, and outcome evaluation. Implementation can begin by mapping every stage that still requires physical documents and assessing its legal basis and control value. Stages without justification should be removed, while mandatory stages should be explained from the outset. Performance should be reported using median end-to-end completion time, return rates, completion without office visits, disruptions by location, and the quality of problem recovery.

CONCLUSION

The study concludes that the effectiveness of digital personnel administration services in an archipelagic region cannot be determined by the existence of an application, the number of users, or processing speed alone. Effectiveness results from the configuration of system quality, information quality, service quality, patterns of use, user satisfaction, and benefits. In the Meranti Islands, this configuration is directly shaped by distance, connectivity stability, user capability, access to assistance, and physical-document requirements. The archipelagic setting is therefore not merely the study location, but an institutional and geographical condition that shapes the distribution of digital-service benefits.

Digital services can reduce initial office visits, accelerate document circulation, strengthen traceability, and lower the travel burden of civil servants stationed outside the regency center. These achievements are nevertheless conditional. Inconsistent requirements, non-diagnostic notifications, upload failures, shifts to informal communication, and the need to resubmit physical documents produce a hybrid bureaucracy. Operators consequently bridge the gap between system limitations and the need for completion. Although this role improves responsiveness, it creates vulnerability through personal dependence.

The study's theoretical contribution is the conditional effectiveness model for archipelagic regions. The model distinguishes two outcome configurations. An enabling configuration—comprising integrated information, responsive operators, and end-to-end

processes—produces more equitable access, process certainty, and sustainable benefits. A constraining configuration—characterized by unstable connections, fragmented information, informal communication, and physical-document requirements—produces partial effectiveness marked by hybrid bureaucracy, uneven benefits, and dependence on individuals. In mandatory services, satisfaction cannot be adequately inferred from usage frequency; status certainty, corrective guidance and the capacity to recover from failure offer stronger explanatory power.

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