IMPLEMENTATION OF POPULATION ADMINISTRATION INFORMATION SYSTEM (SIAK) IN TOLOTIO VILLAGE BONEPANTAI SUB-DISTRICT, BONE BOLANGO DISTRICT

Novalia Mohi[1)], Djamila Podungge[2)], Maman Musa[3)]
[1,2,3]University of Bina Mandiri Gorontalo
E-mail: mohinovalia@gmail.com, milapodungge@ubmg.ac.id, mamanmusa03@gmail.com

ABSTRACT

This study aims to evaluate the implementation of the Population Administration Information System (SIAK) in Tolotio Village, Bonepantai Sub-district, Bone Bolango District. Specifically, it analyzes the operational workflow managed by the Village Registration Officer (PRC), assesses the impact of decentralized online innovations on community accessibility, and identifies the core infrastructure and data-mismatch constraints affecting daily efficiency. This study employs a descriptive qualitative research design with a case study approach. Data were collected through in-depth interviews with key informants including the village operator and village head complemented by field observations and documentation reviews. The results indicate that the integration of SIAK at the village level has successfully shifted the public service paradigm from bureaucratic centralization to grassroots digital integration, utilizing a hybrid workflow that combines smartphone scanning with informal WhatsApp coordination. However, the daily efficiency of the system is heavily bottlenecked by twin operational barriers: external technological failures in the form of centralized network disruptions and deeply rooted internal human errors involving data mismatches between legacy family records and authentic school diplomas. Despite these technical vulnerabilities, the localized system has drastically minimized socio-spatial isolation and transaction costs, providing unprecedented administrative ease for crucial document updates and cross-regional migration processing for the rural coastal community.

Keywords : SIAK, Street-Level Bureaucrats, Digital Divide, Public Administration, Rural E-Government.

INTRODUCTION

Digitalization in public administration has become a global priority to enhance efficiency, accessibility, and transparency in service delivery. This digital transformation focuses on e-government implementation aimed at streamlining bureaucratic processes, reducing administrative burdens, and increasing citizen satisfaction [1][2]. In this modern era, public administrators are required to possess strong management skills and ethical standards to deliver professional and highly responsive public goods. Leveraging information and communication technology serves as a crucial instrument for government agencies to foster transparent, accountable, and citizen-centric governance.

In rural areas, digitalization offers significant opportunities to bridge service gaps caused by geographic isolation and limited resources through data centralization and process automation [3][4]. In Indonesia, this commitment is realized through a unified national population administration system. Based on Presidential Decree No. 88/2004, the government launched the Population Administration Information System (SIAK), a software designed to facilitate population data management across all government levels. In Bone Bolango Regency, this is integrated with progressive innovations like the "6-in-1" and "DeMantap 3-in-1" services, electronic signatures (TTE), and online processing to ensure legal certainty and easy community access.

Despite these advanced regional innovations, the empirical reality in Tolotio Village, Bonepantai Sub-district, initially

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showed a severe lag in data updates. Historically, due to the long distance to the central Civil Registration Office (Disdukcapil) in Suwawa and a widespread lack of procedural knowledge, residents relied heavily on village officials to manually transport and manage their files. To address this, in 2021, Disdukcapil dispatched a specialized Village Registration Officer (PRC) from Tolotio Village to attend technical guidance. This breakthrough allowed the village to implement SIAK locally, enabling the PRC to scan applicant files via smartphones and process them digitally via direct networks and WhatsApp coordination.

Despite the operationalization of SIAK by the PRC, field observations reveal persistent bottlenecks that hinder seamless administration. First, historical manual reliance has left a legacy of extensive data mismatches, where residents' names and birthdates on Family Cards (KK) and Identity Cards (KTP) do not match their authentic school diplomas. Second, the system faces severe technological vulnerabilities. While residents visit the village office daily for data updates such as updating educational statuses or processing inter-regional migration they are frequently disrupted by centralized network failures. Consequently, applicant files regularly stack up at the PRC desk, forcing officials to wait for network recovery and delay transmissions.

The challenges observed in Tolotio Village resonate with academic literature concerning digital transitions in rural governance. Public service improvement in developing rural ecosystems is heavily dependent on a blend of infrastructure stability and human resource adaptation [5]. Infrastructure limitations, particularly unstable internet connectivity, frequently paralyze well-designed digital platforms (Gómez-Carmona et al., 2023). While grassroots digital literacy can be partially mitigated through targeted technical training for operators, the broader community's administrative orderliness remains constrained by socio-economic factors and structural gaps [6].

The research gap lies in the discrepancy between the perceived success of SIAK innovations (such as smartphone-based PRC scanning and online migration processing) and the daily operational vulnerabilities at the lowest administrative tier. While existing e-government studies widely evaluate macro-level platform efficiency or citizen satisfaction index parameters [7], there is a shortage of empirical research analyzing how local village operators (PRC) navigate concurrent issues of historical document mismatches and centralized network disruptions. This study bridges that gap by providing an on-the-ground evaluation of SIAK implementation within a remote coastal village framework.

Driven by the identified gap, this study aims to analyze and describe the implementation of the Population Administration Information System (SIAK) in Tolotio Village, Bonepantai Sub-district, Bone Bolango District. Specifically, the study aims to evaluate the operational workflow managed by the Village Registration Officer (PRC), assess the impact of online services on resolving community migration and document renewal issues, and identify the specific infrastructure and data-mismatch constraints that limit the system's day-to-day efficiency.

To achieve these objectives, the specific research questions addressed in this study are formulated as follows:

1. How is the Population Administration Information System (SIAK) implemented by the Village Registration Officer (PRC) to deliver online civil registration services in Tolotio Village, Bonepantai Sub-district, Bone Bolango District?
2. What operational constraints, such as centralized network disruptions and citizen data mismatches, affect the daily efficiency of SIAK implementation in Tolotio Village?
3. How do the online SIAK innovations affect the village community's accessibility in managing public documents like family cards and migration letters?

RESEARCH METHODS

Research Design

This study employs a descriptive qualitative research design with a case study approach. A qualitative approach is selected because it allows the researcher to gain a deep, holistic, and contextual understanding of the implementation process of the Population Administration Information System (SIAK) within a specific rural setting [8] (. By focusing on Tolotio Village as a single case, this study thoroughly examines how digital transformation policies interact with grassroots operational workflows, local capacity, and rural infrastructure.

Research Site and Informants

The research was conducted at the Tolotio Village Office, located in Bonepantai Sub-district, Bone Bolango District. This site was selected because it represents a remote coastal village that has actively adopted the decentralized SIAK program through a dedicated operator since 2021, despite facing geographic and infrastructure constraints.

The informants for this study were selected using a purposive sampling technique to ensure they possessed direct, relevant knowledge of the phenomenon. Mr. Alfin Adam, the Village Registration Officer (PRC), is designated as the Key Informant due to his direct technical authority over the system's daily operations. The full matrix of informants interviewed in this study is detailed in Table 1 below:

Table 1. Research Informants Matrix

No	Informant Name	Professional/Social Role	Informant Classification	Core Contribution to Data
1	Mr. Alfin Adam	Village Registration Officer (PRC) / Operator	Key Informant	Details technical SIAK workflows, smartphone scanning processes, network disruptions, and document data mismatches.
2	Mrs. Marien Hamdata, S.Ap.	Head of Tolotio Village (Kepala Desa)	Main Informant	Provides insights on village governance, regional socialization, and the 2021 operator appointment policy.
3	Mrs. Wirna Suaiba	Tolotio Village Resident	Supporting Informant / Beneficiary	Delivers community feedback regarding online Family Card (KK) updates and service accessibility.
4	Mr. Yusrin Lasimpala	Tolotio Village Resident	Supporting Informant / Beneficiary	Provides a citizen's perspective on processing cross-regional migration documents online into Tolotio Village.

Data Collection Techniques

To ensure the validity and richness of the data, three interconnected data collection techniques were utilized:

1. In-Depth Interviews: Semi-structured interviews were conducted face-to-face with the informants listed in Table 1. The questions focused on the implementation process, service innovations (such as the 6-in-1 and online migration systems), and perceived administrative efficiency.
2. Field Observations: The researcher conducted direct observations at the Tolotio Village Office to monitor the actual workflow of civil registration services. This included observing how the PRC handles applicant files, coordinates via WhatsApp with the central Capil officer, and manages the operational bottlenecks caused by centralized network disruptions.
3. Document Review: Administrative artifacts were analyzed to supplement primary data. These documents included the Tolotio Village demographic profiles, registration logs, relevant regional regulations of Bone Bolango Regency, and structural data regarding community identity files.

Data Analysis Procedure

The collected qualitative data were analyzed iteratively following the thematic analysis model proposed by Miles, Huberman, and Saldaña, which consists of three concurrent flows of activity [9]:

1. Data Condensation: The raw data obtained from interview transcripts, observation field notes, and village documents were selected, focused, simplified, and transformed. Irrelevant information was filtered out, while key narratives regarding SIAK implementation, smartphone scanning workflows, network failures, and data mismatches were highlighted.
2. Data Display: The condensed data were organized and assembled into structured matrices, narrative texts, and flowcharts. This display maps out the relationship between the regional e-government innovations and the practical barriers faced by the village operator.
3. Conclusion Drawing and Verification: The researcher identified patterns, configurations, and causal explanations from the displayed data. These initial conclusions were continuously verified against field notes and peer debriefings to ensure trustworthiness before finalizing the research results.

RESEARCH RESULTS

Web-based population administration services represent a critical breakthrough in maximizing information and communication technology to boost public satisfaction and optimize rural village governance. In Tolotio Village, the implementation of the Population Administration Information System (SIAK) allows civil registration products to be handled locally and digitally, minimizing geographic isolation. The empirical findings of this study are structured below based on the three guiding research questions.

Implementation of SIAK by the Village Registration Officer

The first research question examines how SIAK is structurally implemented at the grassroots level through the newly appointed Village Registration Officer (*Petugas*

Registrasi Desa or PRC). Prior to 2021, the administration system was entirely centralized at the Disdukcapil office in Suwawa, forcing residents to rely on inefficient manual processing due to massive geographic distances. To overcome this, a decentralized training initiative was launched. As explained by the Head of Tolotio Village, Mrs. Marien Hamdata, S.Ap.:

> *"For the population documents of the Tolotio Village community, there are still many that have not been updated. In previous years, the community only authorized the village apparatus to take care of population documents at the Population and Civil Registration Office of Bone Bolango Regency, due to the long-distance factor and also the lack of knowledge for all forms of processing requests. In 2021, the Bone Bolango Population and Civil Registration Office directed each village in Bone Bolango District to send a Village Registration Officer (PRC) to attend technical guidance on the application of the Population Administration Information System (SIAK). And I appointed one village operator to attend the technical guidance. Through the PRC, the administration of civil registration can be done in the village online." (Personal Interview, 2023).*

Following this technical training, the practical workflow of SIAK shifted to a mobile-synchronized system within the village office. The PRC acts as a bridge, utilizing smartphone technology to scan, digitize, and transmit physical applications directly to regional officers via verified channels. The Key Informant and Village Registration Officer, Mr. Alfin Adam, detailed this daily operational framework:

> *"I have attended technical guidance on the implementation of the Population Administration System (SIAK) at Hotel Maqna, Gorontalo City. This system is very helpful for the Village Government to send files of people who take care of Family Cards, Birth Certificates, Transfer Letters, etc. Each village has been assigned a Capil officer to process the document. For the Bone Pesisir area, you can send the file directly to Mr. Yudin (Bone Bolango Capil Officer). The file is scanned using the PRC cellphone, then sent to Mr. Yudin's WhatsApp contact, and we wait for the file to be processed. On April 21, 2021, I performed the Adminduk process in Tolotio Village and on that day it worked well; there were 4 files, namely Family Card applications... and all four files were processed that day." (Personal Interview, 2023).*

Operational Constraints: Network Disruptions and Data Mismatches

The second research question explores the structural and technological constraints that limit the daily efficiency of the decentralized SIAK platform. Despite the administrative convenience of smartphone scanning, the system faces severe infrastructure vulnerabilities—primarily centralized server and network failures—alongside deeply rooted human errors in historical records. Field observations and interviews with the PRC highlighted that while community members visit the village office daily, data backlogs are common. Mr.

Alfin Adam elaborated on these twin operational barriers:

> *"...It's just that there are still many community population documents that have not been updated and do not match the data that should be, such as the names on the KK and KTP do not match the authentic school diplomas. Then, almost every day there are people coming to the Village Office to take care of population documents, but they are affected by centralized network disruptions so that the community application files that I have made are still stacked on the PRC waiting for the network system to recover and the files are sent back the next day." (Personal Interview, 2023).*

These findings indicate that while decentralized digital apps optimize access, their absolute efficiency is heavily bottlenecked by wider regional telecommunication infrastructure and historical data inconsistencies that require structural cleanups.

Impact of Online SIAK Innovations on Community Accessibility

The third research question assesses how regional e-government innovations—such as integrated 6-in-1 services, electronic signatures (TTE), and digitized migration systems—affect community accessibility. Empirically, the local execution of SIAK has eliminated expensive logistical travels and provided unprecedented administrative ease for crucial lifestyle updates, such as child marriages, educational level shifts, and inter-regional migration.

A community member, Mrs. Wirna Suaiba, expressed the relief experienced by residents needing document renewals:

> *"I want to renew my family card because the family card still lists my first child... who got married in 2021, so I have to make a new family card, and also change the education of other family members. I asked to make a family card through the village because it is far away to arrange population administration at the Bone Bolango Capil which is located in the sub-district of Suwawa. With the online population administration service, it can help our community to make it easier to take care of population documents, without having to go far... because it can be taken care of directly at the village office through the officer." (Personal Interview, 2023).*

Similarly, the online system has drastically simplified demographic mutations, including inbound migration. Another resident, Mr. Yusrin Lasimpala, who migrated into the village, verified the efficiency of the digitized process:

> *"I was already a resident of Gorontalo City then wanted to apply to move to Tolotio Village... Now taking care of moving is very easy, just by bringing a KTP and a letter of transfer from the original area, you can already be moved to the destination. Exactly on March 17, 2022, we came to the Tolotio Village office to take care of moving online. All the documents requested were prepared and then submitted to the officer. Then, in approximately one or two days, the officer said that our moving data had been processed by*

officers at the Civil Registration Office of Bone Bolango Regency. We are very grateful that at least we don't have to go here and there... after this, we will come back again to take care of our child's birth certificate here." (Personal Interview, 2023).

In conclusion, the system successfully meets its primary objectives: building a connected, synchronized database while significantly lowering the social and financial transaction costs of public administration for marginalized rural populations.

DISCUSSION

Implementation of SIAK by the Village Registration Officer

The implementation of SIAK in Tolotio Village presents a successful operational shift from bureaucratic centralization to grassroots digital integration. The data reveals that the transition from a manual system located far away in Suwawa to an online network inside the village office was achieved by introducing a dedicated intermediary: the Village Registration Officer (PRC). Structurally, the workflow relies on a hybrid mechanism where physical community documents are digitized on-site using smartphone cameras and immediately coordinated through direct WhatsApp channels with the regional Capil officer, Mr. Yudin. This setup demonstrates that implementing a web-based e-government platform in a rural area does not mean completely eliminating manual interactions; rather, it requires creating a localized "human bridge." The 2023 interviews prove that the presence of a technically trained operator like Mr. Alfin Adam, who received direct guidance at Hotel Maqna, is the core factor that makes the system work, allowing the village to process multiple administrative applications in a single day.

This operational dynamic closely mirrors contemporary public administration literature regarding the role of "street-level bureaucrats" (SLBs) in digital governance. According to Wihlborg and Iacobaeus and González-Martínez and Peeters, SLBs in developing countries play a critical role in bridging the gap between citizens and formal state bureaucracies, particularly in contexts where grassroots digital access and technical skills are limited [10][11]. In Tolotio Village, Mr. Alfin Adam acts as this vital human intermediary. Without his presence, the digital platform would remain inaccessible to the rural population. His role confirms the trend noted by Melin et al., where digitalization shifts a village official's role from a simple administrator into a generalized facilitator focusing heavily on digital inclusion and citizen education [12].

Furthermore, while formal e-government software is typically designed for rigid, desktop-based environments, the PRC's reliance on informal mechanisms specifically scanning documents via cellphones and texting a dedicated regional officer aligns with the insights of González-Martínez and Peeters [11]. They emphasize that informal and relational practices are often necessary in the Global South to bypass formal bureaucratic rigidity, thereby making digital public services functional at the village level. This hybrid approach allows the village government to maintain a highly responsive service interface. It shows that the adaptation of informal communication channels like WhatsApp by a street-level bureaucrat can successfully

mitigate the limitations of rigid government technology.

However, the literature also notes that relying heavily on the informal mechanisms of street-level bureaucrats can bring risks, such as clientelism or systemic errors, if not managed properly [11]. In Tolotio's case, because the files are processed directly on a 1-on-1 basis through the PRC's personal contact with the central Capil officer, strong managerial support and community oversight are required to maintain data security. Wihlborg and Iacobaeus argue that for these entrepreneurial SLB approaches to remain sustainable, local governance must ensure clear standard operating procedures [10]. This step is necessary so that the informal hybrid workflow does not depend solely on the personal relationships of one individual operator.

Operational Constraints: Network Disruptions and Data Mismatches

The operational constraints identified in Tolotio Village show that the daily efficiency of SIAK is split by two distinct types of barriers: external technological failures and internal historical data errors. The field data illustrates a frustrating loop where the convenience of local smartphone scanning is frequently halted by centralized network and server disruptions. This infrastructure failure directly causes a physical backlog of applications, forcing the PRC to stack up files and delay transmissions until the system recovers the next day. However, an even deeper operational problem is the widespread human error in historical documents, where residents' names and birthdates on legacy Family Cards (KK) and Identity Cards (KTP) contradict their authentic school diplomas. Consequently, the PRC cannot simply upload files; he must first deal with these deep-seated data inconsistencies, proving that technical infrastructure upgrades alone cannot achieve full administrative efficiency without a systematic cleanup of historical community records.

This operational strain reflects the dark side of digital transformation frequently discussed in academic literature, where the introduction of digital tools increases task complexity for frontline workers. Literature underscores that the transition to digital tools often causes alienation, increased complexity, and a loss of workplace autonomy for street-level bureaucrats when they are not backed by stable infrastructure [13][14]. In Tolotio, Mr. Alfin Adam's experience of facing daily network disruptions that cause applicant files to stack up physically on his desk serves as a concrete example of this "technostress." Instead of reducing his workload, the digital system forces him to manage constant technical backlogs, turning the automated system into a more complex manual holding process.

Giest and Raaphorst observe that such structural and environmental barriers severely hinder the efficiency of digital public service delivery at the street level [13]. When centralized systems experience disruptions, the frontline worker bears the brunt of citizen dissatisfaction, despite having no control over the core network infrastructure. In Tolotio Village, this infrastructure gap traps the PRC between progressive regional software demands and harsh local telecommunication realities. This situation proves that e-government models cannot achieve absolute efficiency if the underlying rural network

infrastructure remains unstable, as it directly paralyzes the automated service delivery flow.

Moreover, the constraint regarding citizen data mismatches (such as name discrepancies against school diplomas) illustrates what literature defines as a second-level digital divide, where the issue is no longer just access to technology, but the quality of data input [14]. Pors and Melin et al. explain that digitized bureaucracies often struggle to handle historical human record liabilities because digital systems demand absolute standardized data [15][12]. In Tolotio Village, decades of manual record-keeping have left a legacy of inconsistent data that slows down the digital validation process, forcing the village operator to act as a data corrector rather than just a system transmitter.

Impact of Online SIAK Innovations on Community Accessibility

The impact of online SIAK innovations on Tolotio Village marks a radical change in how rural populations interact with public administration, shifting from socio-spatial isolation to immediate local access. The field findings demonstrate that decentralized features such as online migration tracking and immediate family document updates directly resolve long-standing demographic issues caused by milestones like child marriages or changes in education levels. The narratives of Mrs. Wirna Suaiba and Mr. Yusrin Lasimpala provide concrete evidence that processing documents locally eliminates the major financial and logistical burdens of traveling all the way to the distant Suwawa sub-district. Whether updating an active Family Card (KK) or handling inbound migration from Gorontalo City within a couple of days, the current SIAK setup successfully minimizes the transactional friction of public services, ensuring that marginalized rural populations can secure legal recognition and civil documents right from their village office.

The ultimate success of these online SIAK innovations in improving community accessibility highlights the vital role that local institutional support plays in rural digital programs. The text provided by Dema et al. indicates that the outcomes of rural e-government initiatives depend heavily on managerial support, citizen involvement, and the immediate socio-political environment [16]. In Tolotio Village, this contextual backing was triggered by the Head of the Village, Mrs. Marien Hamdata, S.Ap., who structurally responded to regional regulations by sending the operator to technical guidance at Hotel Maqna in 2021. This proactive local leadership created a supportive environment that allowed the digital service to be integrated smoothly into the village's daily administrative culture.

From the citizen's perspective, this local institutional support directly aligns with the goal of digital public administration, which is to achieve digital inclusion and equitable access for vulnerable groups [10]. By placing the SIAK platform at the village level, the government effectively democratizes access for residents like Mrs. Wirna Suaiba, who previously lacked the procedural knowledge or financial means to travel to the central regency office. The literature confirms that when digital inclusion is executed through local community nodes, it builds trust between citizens and the state, transforming the government interface from an intimidating bureaucracy into an accessible, supportive public service [11].

In conclusion, the current SIAK setup in Tolotio Village successfully achieves the core objectives of e-government by utilizing technology to meet community demands. However, as noted by Dema et al., sustaining these digital benefits requires continuous citizen involvement and regular feedback mechanisms to monitor service satisfaction [16]. The positive testimonies from residents regarding fast cross-regional migration processing and smooth document adjustments prove that the hybrid system has lowered transaction costs. For long-term sustainability, the village must continue to leverage its street-level bureaucracy to ensure that the benefits of digital transformation reach all segments of the rural population equally.

CONCLUSION

Based on the qualitative analysis, field observations, and discussion regarding the implementation of the Population Administration Information System (SIAK) in Tolotio Village, the following primary conclusions are drawn:

1. Successful Grassroots Decentralization and Hybrid Workflows: The transition of SIAK from a highly centralized framework at the Disdukcapil office in Suwawa to a localized operation at the Tolotio Village Office has been successfully executed. This achievement relies heavily on the introduction of a Village Registration Officer (PRC) acting as a digital street-level bureaucrat. The operational workflow utilizes a functional hybrid mechanism where physical civil registration documents are digitized via smartphone scanning and coordinated dynamically through informal WhatsApp channels to maintain a responsive service interface.
2. Dual Operational Bottlenecks: The daily operational efficiency of the decentralized SIAK platform is fundamentally restricted by two concurrent barriers. Structurally, external technological vulnerabilities—specifically centralized server and regional network disruptions—frequently paralyze the system, causing physical file backlogs at the village office. On a human-resource level, deep-seated historical data mismatches between legacy Family Cards (KK) or Identity Cards (KTP) and authentic school diplomas significantly complicate the validation process, forcing the village operator to serve as an active data corrector.
3. Radical Enhancement of Socio-Spatial Equity: Despite structural and infrastructural limitations, the online SIAK innovations have successfully democratized public document management for the rural coastal community. Local execution of features like online migration processing and integrated document updates has effectively eradicated the long-standing financial, logistical, and temporal burdens of traveling long distances to the regency capital.
4. Critical Role of Local Institutional Support: The overall performance and digital inclusion achieved by the platform are highly dependent on proactive village leadership and local socio-political backing. The timely structural appointment and professional training of the village operator in 2021 created an institutional foundation that successfully

minimized procedural ignorance among vulnerable residents, fostering a more inclusive and trustworthy relationship between the rural citizenry and the state.

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