



# Digital Transformation of the Village Correspondence Information System (SIPDES) in Supporting Good Village Governance: A Case Study of La'bo' Village

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## Abstract

This research focuses on the implementation of the web-based Village Correspondence Information System (SIPDES) in La'bo' Village, North Toraja Regency, as a digital solution to address the limitations of conventional public service delivery. SIPDES was designed to transform the village correspondence process by enabling community members to submit letter requests and monitor their application status independently through mobile devices, thereby reducing the need for repeated physical visits to the village office. The system was developed using the structured Waterfall methodology and underwent comprehensive functional testing. Black Box Testing confirmed that all system features functioned as intended and complied with the specified requirements. Furthermore, the User Acceptance Test (UAT) demonstrated a high level of user approval, indicating that SIPDES is perceived as practical, user-friendly, and suitable for real-world implementation. The implementation of SIPDES has proven effective in improving administrative efficiency, enhancing service transparency, and simplifying access to village administrative services. These outcomes indicate that SIPDES contributes meaningfully to the improvement of public service quality and supports the broader objectives of digital governance and Good Village Governance at the village level.

**Keywords:** E-Government; SIPDES; UAT (User Acceptance Test); Waterfall

## 1. Introduction

The rapid development of information technology has driven digital transformation across various sectors, including government administration. The concept of e-government has emerged as a new paradigm in governance that promotes more efficient, transparent, and responsive public services (Ichsan, 2025). The implementation of e-government plays a crucial role in improving public service quality and realizing good governance, particularly at the regional and village government levels (Hamim *et al.*, 2024; Aw, 2024).

However, although the adoption of e-government has progressed at the national and regional levels, its implementation at the village government level in Indonesia remains relatively limited and underexplored in academic research. Many villages still rely on conventional administrative processes due to limited digital infrastructure, the absence of integrated information systems, and the low utilization of information technology in village administrative governance. As a result, empirical studies that specifically examine digital transformation in village administrative services particularly in correspondence management and population data administration are still scarce. La'bo' Village, located in North Toraja Regency, South Sulawesi Province, exemplifies this

condition, where public services are still managed through conventional procedures. Community members are required to visit the village office directly to handle administrative matters, while population data and correspondence documents are manually processed using word-processing software. Such practices are prone to service delays, data entry errors, and inefficiencies in document archiving. Ineffective data management directly affects service quality and community satisfaction with village administrative services.

To address these challenges, digital transformation in village administration has become an urgent necessity. Administrative services need to be supported by information systems integrated with structured databases to prevent repetitive data entry and to improve service efficiency and accuracy (Ningtyas & Angin, 2023). This study seeks to fill the identified research gap through the development of the Village Correspondence Information System (SIPDES), which is tailored to the operational context of village governance. SIPDES enables community members to submit letter requests, independently monitor application status via mobile devices, and reduce reliance on physical visits to the village office. The system is also integrated with village population data, thereby supporting more efficient and accurate data management.

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Several previous studies have demonstrated that the implementation of web-based village service information systems can enhance administrative efficiency and service transparency. However, most of these studies primarily focus on the technical and functional aspects of system development and provide limited discussion on digital transformation as a strategic instrument for strengthening village governance. Therefore, this research contributes to the existing literature by positioning SIPDES not merely as a technical solution, but as a digital transformation model that supports the implementation of e-government and the realization of good village governance.

## 2. Theoretical Framework

### 2.1 Smart E-Government

The development of smart e-government requires an understanding of the system as a network of interconnected components to solve problems in an integrated manner. The information generated from the data processing process plays an important role in supporting decision-making, especially in producing faster, more precise, and data-driven public services (Sidiq & Junarto, 2025). Information systems are the main foundation in the implementation of smart e-government because they are capable of processing, storing, and manipulating data to produce information that is useful for the government, businesses, and the community (Miswar, 2021)

### 2.2 Waterfall Method

The Waterfall method is a software development approach that emphasizes a sequential and systematic process, in which each development phase must be completed before proceeding to the next. The phases typically include requirements analysis, system design, implementation, testing, deployment, and maintenance. This structured approach is particularly suitable for public sector information systems, where system requirements are relatively stable and well-defined, and where formal documentation and regulatory compliance are essential (Alzayed, 2024).

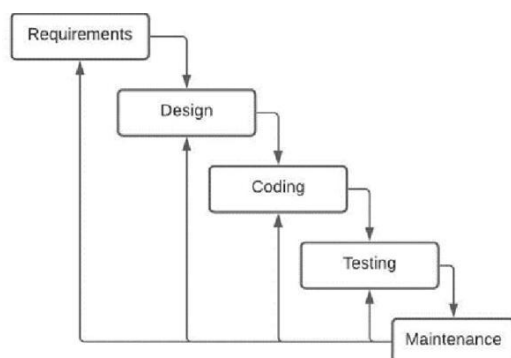


Figure 1. Waterfall Method

### 2.3 The requirements analysis

The requirements analysis phase plays a critical role in SIPDES development, as it focuses on identifying and documenting functional and non-functional requirements based on village administrative procedures, user roles, and regulatory standards. This phase involves close collaboration with village officials to ensure that the system accurately reflects correspondence workflows, document validation processes, and reporting needs. Effective requirements analysis reduces the risk of system mismatch and enhances alignment between system functionality and real operational needs in public administration environments (Akbar & Siregar, 2024).

### 2.4 The system design

The system design phase translates the documented requirements into a comprehensive technical blueprint. This phase utilizes modeling tools such as Unified Modeling Language (UML) to represent system behavior and business processes, and Entity Relationship Diagrams (ERD) to define database structures and relationships. In the context of SIPDES, system design ensures that correspondence data, user access control, and archival mechanisms are logically structured and scalable. A well-defined design phase minimizes implementation errors and supports long-term system maintainability (Wijaya *et al.*, 2024).

### 2.5 The implementation

The implementation phase involves converting the system design into executable code using appropriate programming languages and database management systems. During this phase, SIPDES modules such as letter submission, verification, approval, and document generation are developed according to predefined specifications. The sequential nature of the Waterfall model ensures that development activities remain aligned with approved designs, which is crucial in government systems that require consistency and compliance (Rahayu *et al.*, 2024).

### 2.6 The Testing

Once implementation is completed, testing is conducted to verify that the system functions correctly and meets user requirements. Black box testing is commonly applied to evaluate system functionality without examining internal code structures, ensuring that all SIPDES features operate as expected. Subsequently, User Acceptance Testing (UAT) is performed to measure user satisfaction, usability, and system acceptance using instruments such as the Likert scale. UAT results provide empirical evidence of implementation success and system readiness for operational deployment in village administrative environments (Handira, 2024).

Table 1. Likert scale

Weight	Likert scale
5	Strongly agree
4	Agree
3	Netral
2	Disagree
1	Strongly disagree

### 3. Methods

To construct the Village Correspondence Information System (SIPDES), this research will employ the Waterfall methodology. This method was selected for its systematic and sequential nature, which ensures that each development phase is thoroughly completed and validated before transitioning to the next stage .

- A. Requirement Analysis: This initial phase involves identifying the needs of the correspondence system in La'bo' Village. This includes mapping the letter processing workflow, defining the necessary data elements, and specifying the desired features by both the village staff and the community.
- B. System Design: The results from the Requirement Analysis are translated into a comprehensive system design. This includes the User Interface (UI) design for the smartphone application and the database schema design which will facilitate the integration of village resident data.
- C. The implementation phase focuses on building the SIPDES application using the Laravel framework as the main development platform. Key implementation aspects include:
  - 1) Back-end Development using Laravel to manage business logic, authentication, authorization, and correspondence workflows.
  - 2) Database Interaction through Eloquent ORM, which simplifies data manipulation and improves code readability and maintainability.
  - 3) Form Validation and Security, implemented using Laravel's built-in validation, middleware, and CSRF protection to ensure data integrity and system security.
  - 4) User Authentication and Role Management, utilizing Laravel authentication features to differentiate access rights between administrators, village staff, and users.
  - 5) Front-end Integration, where Blade templates are combined with HTML, CSS, and JavaScript to produce responsive interfaces accessible via smartphones and desktop devices.

- D. System Testing: The developed system will be rigorously tested to ensure all functionalities operate correctly, that it is bug-free, and that it integrates with the database without errors. This phase also includes User Acceptance Testing (UAT) to verify that the application meets the requirements and expectations of the end-users (Laila *et al.*, 2025).
- E. Maintenance: Following the system's deployment (launch), this ongoing phase will ensure the system remains running optimally. Activities include performing necessary bug fixes, addressing any discovered issues, and providing future updates in response to policy changes or evolving operational requirements.

### 4. Results And Discussion

#### 4.1. Analysis of the Current System

The correspondence administration process at the La'bo' Village Office (Lembang La'bo') is currently conducted using conventional, non-integrated procedures. These conditions limit service efficiency, data management effectiveness, and accessibility for the community. Administrative processes that rely on physical interactions and manual data handling reduce service flexibility and responsiveness. These limitations indicate the need for a more systematic and technology-based approach to correspondence management. The absence of an integrated information system highlights the importance of developing a digital solution capable of improving administrative performance and supporting modern public service delivery at the village level.

#### 4.2. Proposed System Analysis

To address the limitations of the existing system, the Village Correspondence Information System (Sistem Informasi Persuratan Desa – SIPDES) is proposed as a digital solution to enhance the quality of village administrative services. The system is designed to improve service accessibility, operational efficiency, transparency, and collaboration among village staff.

SIPDES enables citizens to submit correspondence requests electronically without requiring physical visits to the village office. The system is integrated with the village resident database, allowing automated data retrieval to ensure accuracy and reduce processing time. In addition, SIPDES provides real-time tracking of correspondence status, which enhances transparency and accountability. The system also supports multi-user access, facilitating task distribution and collaborative workflows to ensure faster and more reliable service delivery.

4.3. System Requirements Analysis

1. Admin Functional Requirements

Table 2. Admin Functional Requirements

No	Requirement	Brief Description
1	Admin Login	Provides secure access for authorized village staff.
2	Manage Resident Data	Maintains accurate and consistent resident data in the system.
3	SKCK Letter Management	Processes SKCK introduction letters digitally.
4	Domicile Certificate Management	Generates general domicile certificates using integrated data.
5	Business Certificate Management	Supports the issuance of business permit certificates (SK Usaha).
6	Moving Certificate Management	Handles resident moving certificates (SK Pindah).
7	Indigency Certificate Management	Issues indigency/poor certificates (SKTM).
8	Death Certificate Management	Records and issues death certificates for official use.

2. User Functional Requirements

Table 3. User Functional Requirements

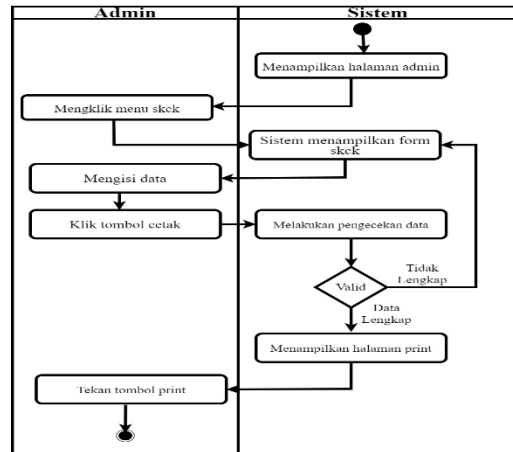
No	Requirement	Brief Description
1	User Login	Enables users to securely access the system.
2	Letter Application	Allows users to submit correspondence requests online.
3	Application Tracking	Provides real-time monitoring of application status.
4	Application Receipt	Generates proof of submission for user reference.

A. Use Case Diagram



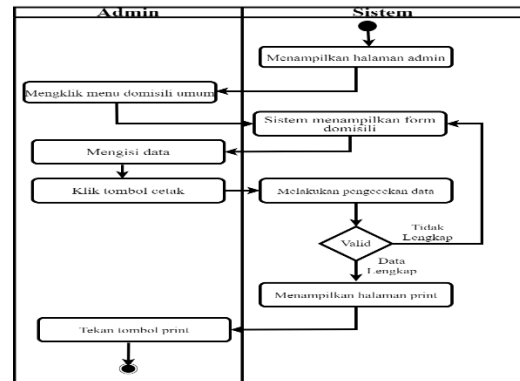
Figure 2. Use Case Diagram

B. Activity Diagram



4. 1 Activity Diagram SKCK

Figure 3. Activity Diagram Form SKCK



Figur 4. Domicile Activity Diagram Interface Implementation

A. User Interface

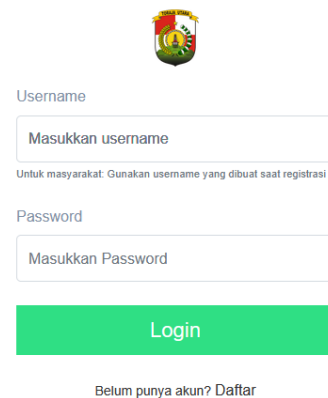


Figure 5. Login Page

The login page serves as the initial access point of the SIPDES application. This interface requires users

to enter a registered username and password to ensure secure system access. The presence of authentication mechanisms on this page supports data protection and access control based on user roles. The implementation of a simple and responsive login interface facilitates ease of use for both village staff and community members. In practice, this feature contributes to system security while ensuring that only authorized users can access correspondence services and administrative functions within SIPDES.

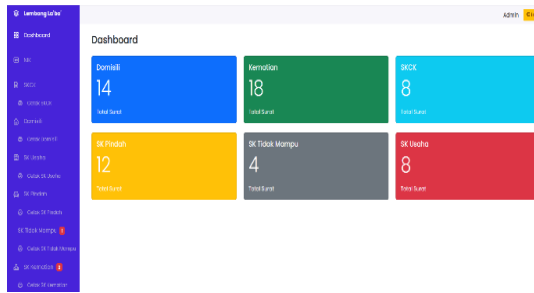


Figure 6. Dashboard Admin.

The dashboard page functions as the main interface after user authentication. It presents a summary of correspondence activities, including submitted applications and their current status. This centralized view helps users and administrators quickly understand ongoing processes, thereby improving efficiency and decision-making in correspondence management.

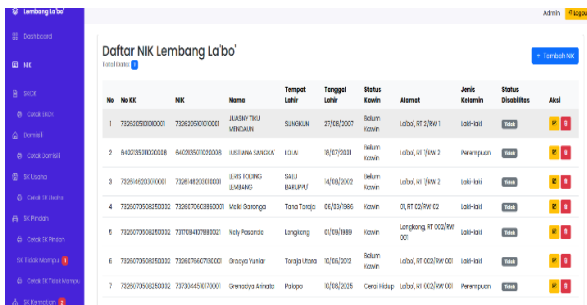


Figure 7. Dashboard SKCK Dashboard Implementation

The SKCK dashboard provides an overview of SKCK (Police Clearance Certificate) introduction letter requests submitted through the SIPDES system. This page displays application data and processing status, enabling administrators to efficiently monitor, verify, and manage SKCK correspondence. The implementation of this dashboard improves administrative control and workflow efficiency by presenting structured and up-to-date information. It also supports faster decision-making and ensures that SKCK services are processed in an organized and accountable manner.

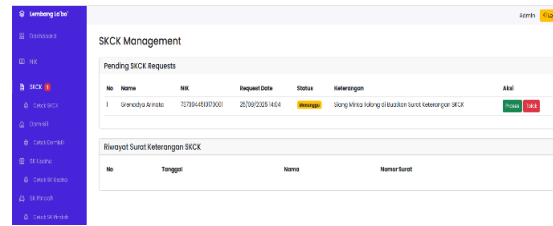


Figure 8. domicile certificate dashboard

The domicile certificate dashboard presents a structured overview of domicile certificate applications submitted through the SIPDES system. This dashboard enables administrators to monitor application status, validate resident data, and manage the issuance process efficiently. The implementation of this dashboard enhances administrative effectiveness by streamlining correspondence workflows and ensuring accurate, timely processing of domicile certificates within the village administration system.

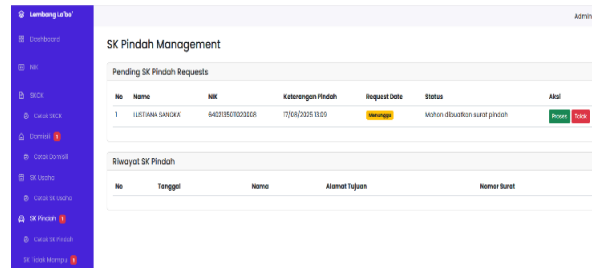


Figure 9. Dashboard displays resident moving certificate

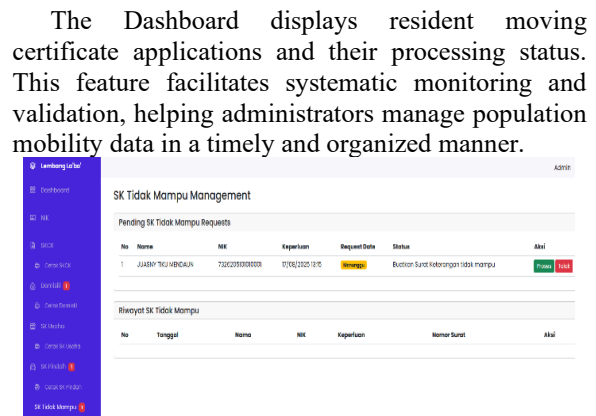


Figure 10. Dashboard indigency certificate (SKTM)

The indigency certificate (SKTM) dashboard presents a structured overview of applications submitted through the SIPDES system. This dashboard enables administrators to verify applicant data and monitor the processing status in a systematic manner.

The implementation of this feature improves transparency and administrative efficiency by supporting accurate documentation and timely

issuance of indigency certificates required for social assistance purposes.

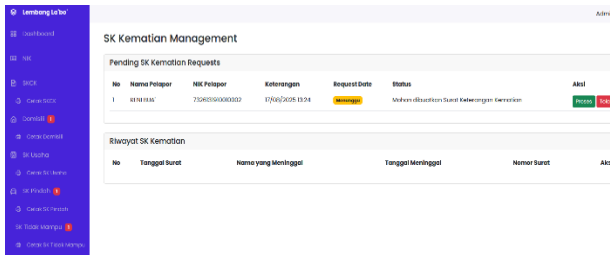


Figure 11. Death Certificate (SK Kematian) Dashboard Implementation

The SK Kematian dashboard provides a structured view of death certificate applications submitted through SIPDES. The implementation supports accurate documentation and efficient processing, contributing to reliable population administration and archival management.

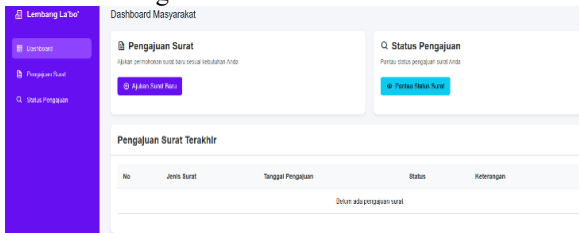


Figure 12. Dashboard User

The user dashboard serves as the primary interface for community members after successful authentication. This page provides an overview of submitted correspondence applications and their current processing status. The implementation of the user dashboard enhances usability and transparency by allowing users to monitor their requests efficiently, thereby improving user experience and trust in the SIPDES service.

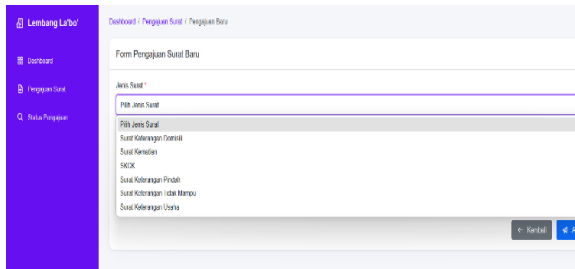


Figure 13. User Letter Submission Dashboard Implementation

The user letter submission dashboard allows community members to initiate correspondence requests through the SIPDES system. This interface provides access to available letter types and submission features in a structured manner. The implementation of this dashboard simplifies the application process and improves service accessibility by enabling users to submit letter requests

electronically without the need for in-person visits to the village office.

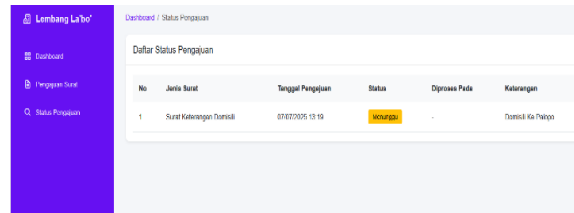
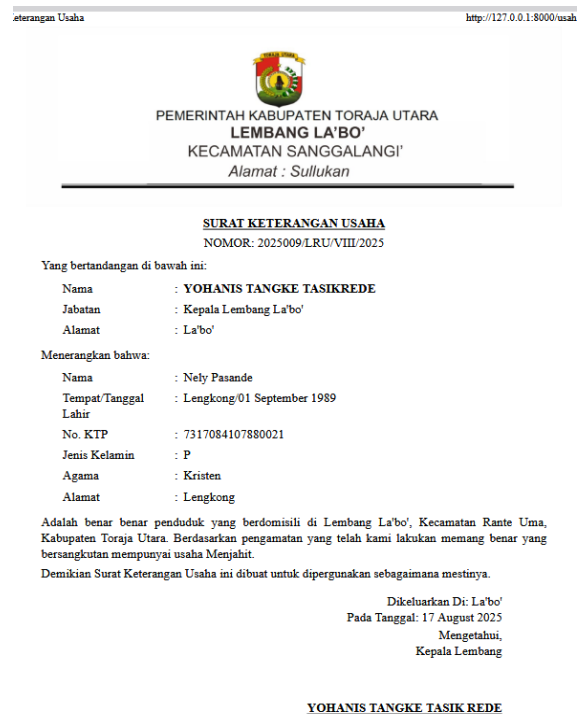


Figure 14. Letter Application Status Dashboard Implementation

The letter application status dashboard provides users with real-time information on the progress of their submitted correspondence requests. This interface displays the current processing stage of each application in a clear and structured manner.

The implementation of this dashboard enhances transparency and user trust by enabling applicants to monitor service progress efficiently, while also supporting administrative accountability within the SIPDES system.




Gambar 15. The output of the Business Certificate (Surat Keterangan Usaha)

The output of the Business Certificate (Surat Keterangan Usaha) is generated automatically by the SIPDES system based on verified application data. The document follows a standardized format and contains accurate resident and business information retrieved from the integrated database.

The implementation of this output feature improves document accuracy and processing efficiency, while ensuring consistency and reliability in issuing official business certificates at the village level.

eterangan Pindah http://127.0.0.1:80



PEMERINTAH KABUPATEN TORAJA UTARA  
**LEMBANG LA'BO'**  
KECAMATAN SANGGALANGI'  
Alamat : Sullukan

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**SURAT KETERANGAN PINDAH PENDUDUK**  
NOMOR: 5/LRU-SKPP/VIII/2025

Yang bertanda tangan dibawah ini:

Nama	: YOHANIS TANGKE TASIK REDE
Jabatan	: Kepala Lembang La'bo'
Alamat	: La'bo'

Menerangkan bahwa:

Nama	: JUASNY TIKU MENDAUN
Tempat/Tanggal Lahir	: SUNGKUN, 27 August 2007
Jenis Kelamin	: Laki-laki
Agama	: Kristen Protestan
Status Perkawinan	: Belum Kawin
Pekerjaan	: Petani
Alamat Asal	: La'bo'
Lembang/Desa Asal	: La'bo'
Kecamatan Asal	: Sanggalangi'
Kabupaten/Kota Asal	: Toraja Utara
Provinsi Asal	: Sulawesi Selatan

**Pindah Ke:**

Alamat Tujuan	: Kumu
Lembang/Kelurahan	: Maroangin
Kecamatan	: Tulluwana
Kabupaten/Kota	: Palopo
Provinsi	: Sulawesi Selatan
Klasifikasi Pindah	: Antar Kabupaten/Kota
Alasan Pindah	: Ikut Keluarga
Tanggal Pindah	: 17 August 2025

Demikian surat keterangan ini dibuat untuk dipergunakan sebagaimana mestinya.

Dikeluarkan Di: La'bo'  
Pada Tanggal: 17 August 2025  
Mengetahui,  
Kepala Lembang

**YOHANIS TANGKE TASIK REDE**

Gambar 16. Output Moving Certificate (Surat Keterangan Pindah)

The output of the Moving Certificate (Surat Keterangan Pindah) is automatically generated by the SIPDES system using validated resident data. The document is produced in a standardized format to ensure consistency and administrative compliance.

This implementation enhances efficiency and accuracy in managing population mobility documentation, while supporting reliable record-keeping within the village administrative system.

## 5. Conclusions

The findings of this study indicate that the implementation of the web-based Village Correspondence Information System (SIPDES) in La'bo' Village has effectively addressed key challenges in village correspondence administration. The use of the Waterfall methodology ensured a structured development process, which contributed to system stability and functional completeness. The results of Black Box testing demonstrate that all

system features operate in accordance with the defined functional requirements. In addition, the User Acceptance Test (UAT), which yielded an average score of 85.6%, reflects a strong level of user acceptance. This result suggests that the system not only functions technically as intended but is also aligned with user expectations and operational practices at the village level. From an implementation perspective, these outcomes imply that SIPDES can significantly improve administrative efficiency, transparency, and service accessibility in rural governance contexts. The web-based and modular nature of the system indicates that it is technically feasible to adapt and deploy SIPDES in other villages experiencing similar administrative constraints, with limited customization required for local regulations and service types. Therefore, SIPDES may be considered a viable model for broader adoption in village-level digital administration. Future research and development should focus on enhancing system interoperability and scalability to support wider implementation.

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