

Web-Based Digital Administration Service System for Nossa Senhora Do Rosario Parish, Oé-Cusse

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<i>Keywords</i>	<i>Abstract</i>
<i>Digital Administration, Church Management System, PHP, Mysql, RAD, Oecusse, Catholic Community, Pante Macassar.</i>	The Parish Church of <i>Nossa Senhora do Rosário</i> , located in the Special Administrative Region of Oecusse-Ambeno, Timor-Leste, plays a vital role in providing spiritual and administrative services to the local Catholic community. Traditionally, church administration—including the recording of sacramental and administrative documents such as Baptism, First Communion, Confirmation, Marriage, recommendation letters, and ordination certificates—has been conducted manually. These conventional methods often result in operational inefficiencies, service delays, data inaccuracies, and limited transparency. This study was conducted in the Pante Macassar subdistrict, specifically in Costa Village, the central hub of the local Catholic community. The primary objective is to develop a web-based church administration system using PHP and MySQL, employing the Rapid Application Development (RAD) methodology to ensure an iterative and user-responsive process. The implementation demonstrates significant improvements in administrative efficiency, data consistency, and the ease of managing sacramental records while enhancing the parish's internal operational transparency. This study contributes both practically and academically to the digital transformation of religious institutions, particularly for the Parish of <i>Nossa Senhora do Rosário</i> .



INTRODUCTION

Digital transformation in the era of information technology is a strategic necessity in modernizing administrative management in public and private organizations (Buani & Abineno, 2022; Marentek et al., 2017). Web-based information systems have been proven to improve workflow efficiency, enhance data accuracy, and facilitate quick and transparent access to information (Buani & Abineno, 2022; Marentek et al., 2017; Ongeteua et al., 2024; Sakaria et al., 2022). In the context of social and religious institutions, digital information systems play an important role in supporting administrative services and preserving vital documents (Ongeteua et al., 2024; Simanjuntak et al., 2025).

Religious institutions, including churches and parishes, have a significant responsibility in managing congregational data and sacramental archives that hold spiritual, social, and legal value (Bamashmoos, 2025; Camilleri, 2024; Chando, 2025; Drummond III, 2024). Previous studies have shown that the implementation of a web-based church administration system can improve operational efficiency, reduce manual errors, and enhance service transparency (Arundaa et al., 2025; Krisna et al., 2025; Patterson, 2025; Simanjuntak & Malau, 2026; Vega-Quintana et al., 2024).

However, most religious institutions at the local level still rely on manual methods, which are prone to process delays, risks of data errors, and limited information control (Marentek et al., 2017; Ongeteua et al., 2024; Simanjuntak et al., 2025). This condition becomes increasingly complex as the volume of congregational data grows and the capacity of manual archives remains limited (Ongeteua et al., 2024; Megatama et al., 2025).

The parish of Nossa Senhora do Rosário in Pante Macassar, Costa Village, Timor-Leste, has a predominantly Catholic congregation (Correia, 2022; Garrido, n.d.; Leach, 2023).

Therefore, an integrated digital administration system is essential to manage sacramental documents and church administration effectively and efficiently (Buani & Abineno, 2022; Marentek et al., 2017; Sakaria et al., 2022). This research develops a web-based system using PHP and MySQL with the Rapid Application Development (RAD) methodology, enabling iterative development, user input integration, and continuous system quality improvement (Buani & Abineno, 2022; Ongeteua et al., 2024).

In addition, data security is a primary focus to ensure the protection of congregational information and the confidentiality of sacramental documents (Simanjuntak et al., 2025; Megatama et al., 2025). With the implementation of this system, it is expected that church administration will become more efficient, data will be more accurate, and congregational services will be more transparent, while also making practical and academic contributions to the digitization of religious institution administration.

The urgency of this study lies in the need to develop a practical and context-appropriate digital solution that can be implemented in religious institutions with limited technological infrastructure. In addition, this study addresses the broader challenge of digital inclusion by providing a model that can be adapted to similar communities. The novelty of this research is reflected in its application of the Rapid Application Development (RAD) methodology to design a web-based church administration system tailored specifically to the needs of the Nossa Senhora do Rosário Parish. Unlike previous studies that focus primarily on system design, this research emphasizes iterative development, user involvement, and adaptability to local conditions.

This study aims to develop and implement a web-based digital administration system using PHP and MySQL to support church administrative services, particularly in managing congregational data and sacramental records. Furthermore, this study seeks to evaluate the effectiveness of the system in improving efficiency, data accuracy, and service transparency. The expected benefits of this research are threefold: theoretically, it contributes to the literature on information systems in religious institutions; practically, it provides a functional system that can be utilized by the parish to improve administrative services; and academically, it offers a reference for future studies on digital transformation in similar socio-cultural contexts.

The implication of this study is that the adoption of web-based administrative systems can significantly enhance the quality of services in religious institutions, even in regions with limited technological resources. By integrating technology into administrative processes, churches can improve efficiency, ensure data integrity, and provide better services to their communities, thereby supporting both organizational development and community engagement.

RESEARCH METHODS

This study adopted a web-based system development approach to digitize the administration of the Nossa Senhora do Rosário Parish in the Special Administrative Region of Oecusse-Ambeno, focusing on Pante Macassar District, particularly Costa Village, as the center of Catholic community activities. The approach aligned with the church's need to optimize administrative efficiency, provide real-time data access, and ensure service transparency through web-based administration, document digitization, and data security. Data were collected using a mixed-methods approach combining qualitative and quantitative techniques, including semi-structured interviews to identify specific administrative needs and challenges in manual processes, field observations to monitor church administrative workflows and congregation interactions, and documentation of sacramental archives and church records such as Baptism, Communion, Confirmation, Marriage, recommendation letters, and other relevant data.

The digital administration system was developed using the Rapid Application Development (RAD) methodology, allowing iterative, rapid, and user-adaptive development.

Development steps included prototype design covering parishioner data management, sacramental documents, and administrative reporting, along with database and user interface (UI) design; prototype testing and evaluation by administrative staff and congregation representatives to gather feedback on usability and functional suitability; iterative improvements to enhance efficiency, accuracy, security, and ease of use; and final module implementation with security integration using PHP and MySQL, including role-based access control, data encryption, backup, and recovery mechanisms. The RAD methodology ensured that the digital administration system was flexible, responsive, and supported service transparency.

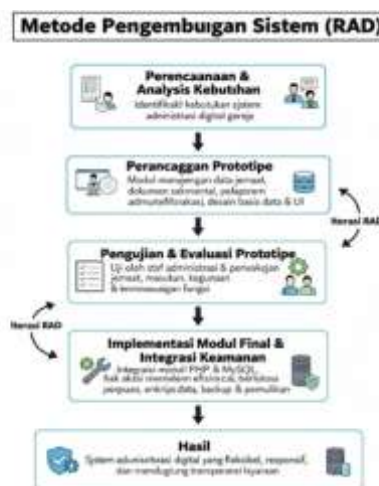


Figure 1. RAD Method

Source: Adapted from Pressman (2014) and modified by the researcher, 2025

The research flow consisted of several systematic steps carried out by the researcher. It began with a literature study and needs analysis, combining a literature review with interviews and observations to document system requirements. Next was system design, which involved creating the database schema, transaction flows, user interface, and role-based access controls. The system was then developed using the Rapid Application Development (RAD) methodology, including prototype creation, testing, and continuous improvement. Implementation and system integration followed, covering modules for parishioner data management, sacramental documents, and administrative reporting, with security protocols applied. Finally, system evaluation and testing were conducted to measure efficiency, accuracy, process speed, and user satisfaction.



Figure 2. Research method flowchart

Source: Developed by the researcher, 2025

System Analysis

The system analysis stage was carried out to identify the functional and non-functional needs of the digital administration system of the Parish Church of Nossa Senhora do Rosário. This analysis is based on the results of interviews, observations, and documentation studies that have been carried out in the previous stage. The results of the analysis are the basis for designing a system model using UML diagrams.

The use case diagram models the interactions between the system and its actors, which include the Administrator, responsible for managing all data and user access rights; the Pastor, who monitors church administrative activities; and the Staff, who input data and manage sacramental information. The main functions accommodated by the system include recording sacraments such as Baptism, Communion, Confirmation, and Marriage, managing parishioner and staff data, generating administrative letters (e.g., parish transfer letters and death certificates), and producing administrative reports, as illustrated in the accompanying diagram.

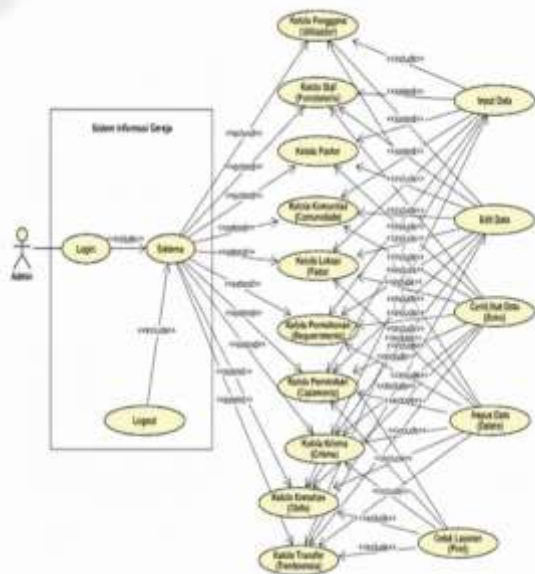


Figure 3. UseCase Admin

Source: Developed by the researcher, 2025

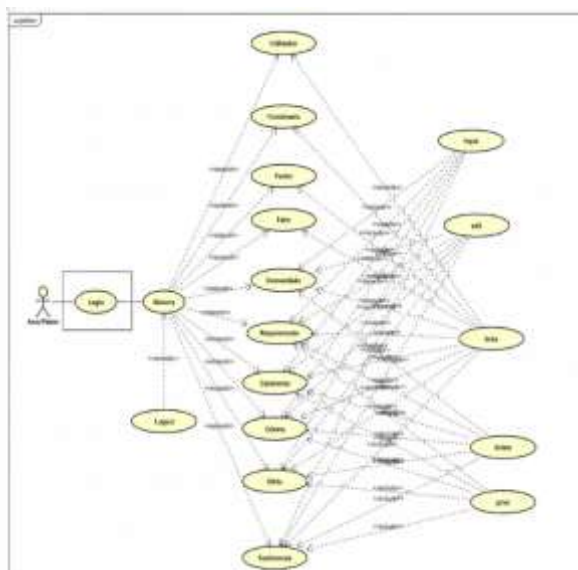


Figure 4. UseCase Pastor

Source: Developed by the researcher, 2025

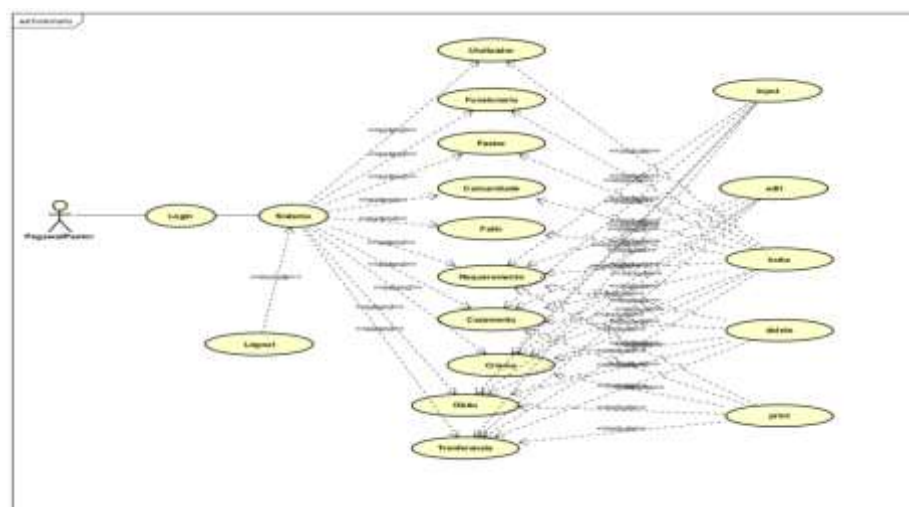


Figure 5. Employee/Employee UseCase

Source: Developed by the researcher, 2025

From the use case diagram, it is evident that the system is designed to support an integrated administrative process, reduce data redundancy, minimize the risk of manual

recording errors, and improve work efficiency. The activity diagram further models the dynamic sequence of system activities, from user login to logout, illustrating the workflow carried out by the Administrator, Pastor, and Staff, as well as how data moves and is processed within the system, as shown in the accompanying diagram.

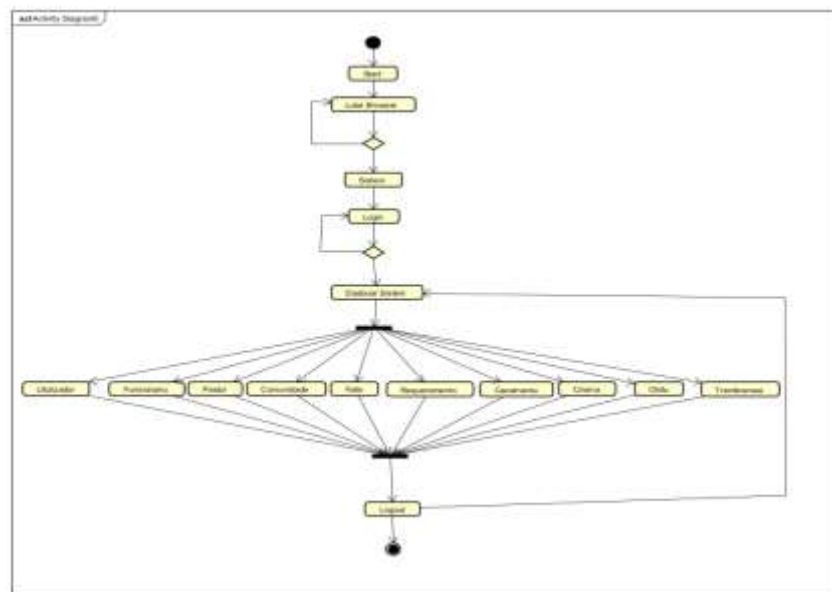


Figure 6. Activity Diagram & Class Diagram

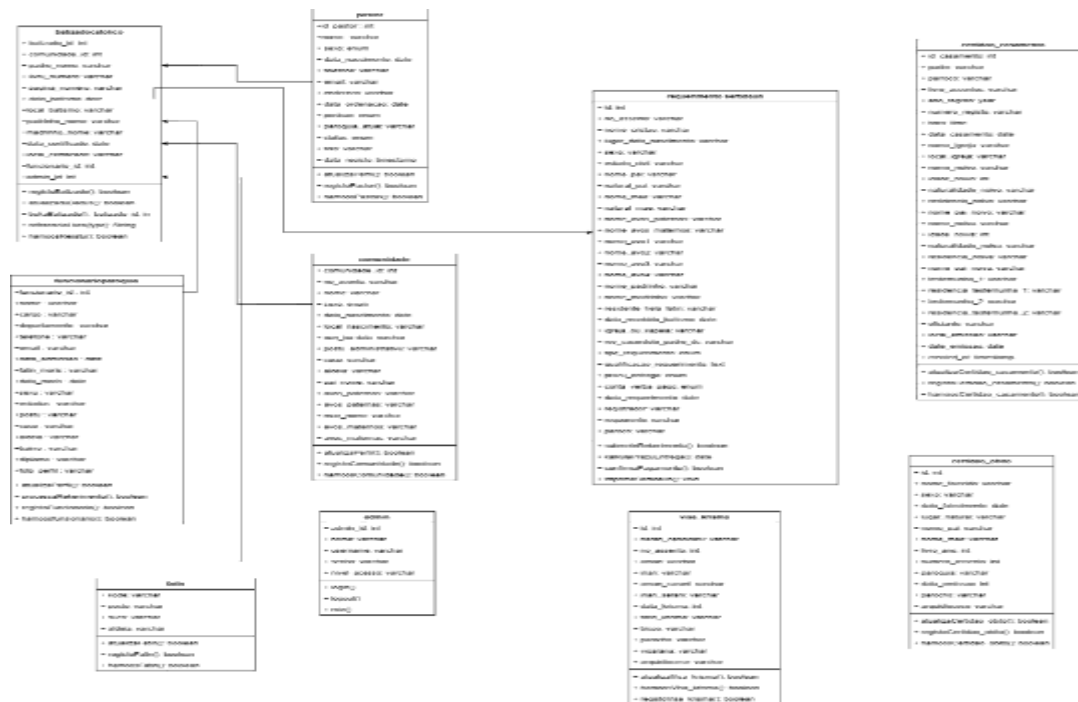
Source: Developed by the researcher, 2025

The activity diagram shows that the system:

- Simplify church administration workflows.
- Speed up the administrative service process.
- Ensure data consistency and accuracy with validation at every input stage.
- Provide a monitoring mechanism for priests to supervise administrative activities.

Class Diagram

The class diagram describes the static structure of the system as well as the relationships between classes and the attributes and controls used in the following classes such as the following



Gambar 7. Activity Diagram

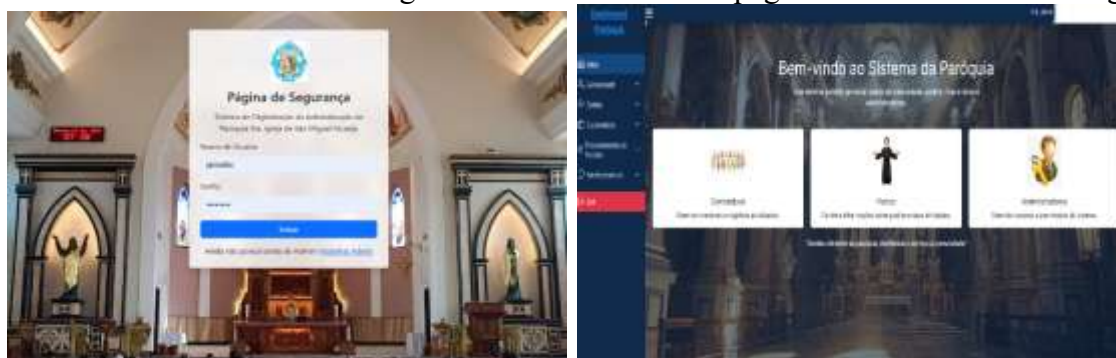
System Design and Implementation

The implementation of the system is an important stage in the digitalization of church administration, which aims to replace manual processes with an integrated digital system. The system has three main user roles:

Administrators have full responsibility for the management of church data, including:

- Management of users, pastors, and employees.
- Input and maintenance of congregation data and regional data.
- Management of sacramental documents (Baptism, Communion, Chrism, Marriage).
- Creation of church administrative letters, such as parish transfer letters and death cover letters.
- Creation of administrative reports and monitoring of the entire system.

Here is an interface designed for the administrator page as shown in the following image



Gambar 8. Interface Administrator

Pastor/Padre

Page Pastor/Padre is used for:

- Monitor sacrament data and administrative documents input by employees.
- Provide approval or validation of certain administrative activities.

- Facilitate the supervision of the congregation service process and data-based decision-making.

Here is the interface designed for the Pastor page as shown in the following image



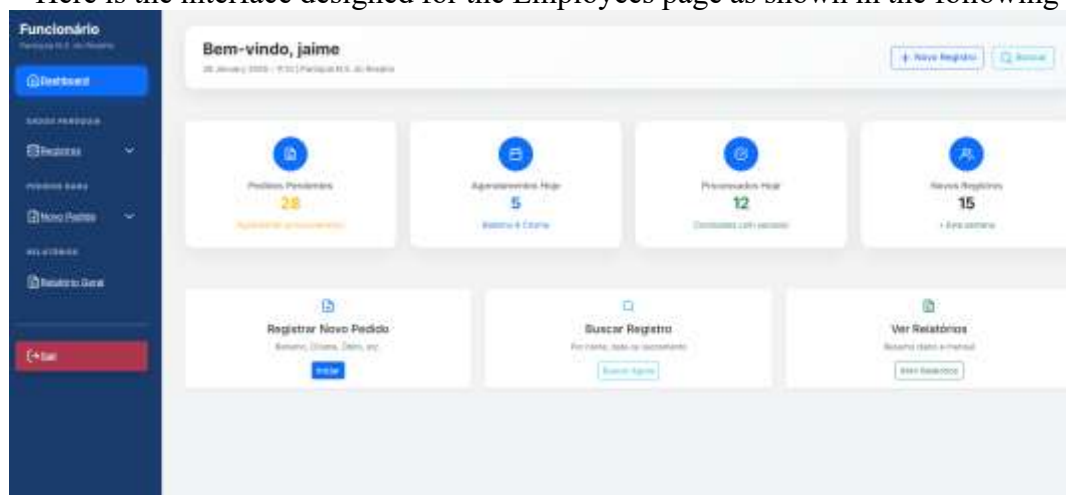
The interface for the Pastor page features a sidebar with navigation options like 'Home', 'Relatório', 'Configurações', 'Usuários', 'Paróquia', 'Batismo', 'Eucaristia', 'Casamento', 'Crisma', 'Ordemação', 'Profissão de Fé', 'Receitas', 'Arquivos', 'Relatório Geral', and 'Sair'. The main content area includes a header with the church name 'Nossa Senhora do Rosário', a logo, and a greeting. Below this are four circular statistics: 'Total de Fregueses' (1588), 'Batizados' (47), 'Eucaristia' (82), and 'Casamentos' (10). The right side displays a table titled 'Dados da Comunidade' with columns for ID, Nome, Sexo, Data Nascimento, Local Nascimento, Data Batismo, Plano, Nome Pai, Nome Mãe, Data Nascimento Pai, Data Nascimento Mãe, Data Casamento, Data Batismo, Data Eucaristia, and Data Casamento. The table contains several rows of data for different individuals.

Gambar 9. Parent Interface

Employee/EmployeeEmployee is responsible for:

- Input of sacramental data (Baptism, Communion, Chrism, Marriage) and other administrative documents.
- Ensure the accuracy of the data entered.
- Creating administrative reports as required by the administrator or Pastor.

Here is the interface designed for the Employees page as shown in the following image



Gambar 10. Interface Pegawai Funsionariu

With this design, the digital administration system of the Parish Church of Nossa Senhora do Rosário is able to improve operational efficiency, reduce recording errors, speed up the congregation ministry process, and provide consistent and easily accessible data for all parties involved.

System Testing

System testing is carried out to ensure that the web-based digital administration service system functions as per both functional and non-functional needs. The testing methods include Black Box Testing, Role-Based Access Control (RBAC), security testing and data validation, and User Acceptance Test (UAT).

Black Box Method

Black Box Testing is used to check the functioning of the system without paying attention to the code structure. This testing includes the login process, church data management, recording of sacrament documents, making administrative letters, and administrative reports.

The test results showed that all the main functions of the system were running well, the user's access rights were applied according to their roles, the security mechanisms were able to prevent unauthorized access, and the system was easy to use and accepted by the user. Based on these results, the system was declared feasible to be implemented in the administrative operations of the Parish of Nossa Senhora do Rosário.

Table 1. System testing

Yes	Modules/Features	Testing Scenarios / Aspects	Test Data / Scale	Expected Results	Test Results	Status
1	Admin	Log in with valid data	Username: admin, admin123	Admin dashboard appears	Conform	Valid
2	Admin	Login with the wrong password	Username: admin, password: false123	Error message appears	Conform	Valid
3	Admin	Login without input	username: kosong, password: kosong	Login declined	Conform	Valid
4	Batizadocatholic	Complete baptism data input	All fields are filled in	Data stored to the database	Conform	Valid
5	Batizadocatholic	Incomplete data input	padre_nome is empty	Validation message appears	Conform	Valid
6	Batizadocatholic	Edit data baptisan	Ubah local_batismo	Data is successfully updated	Conform	Valid
7	Batizadocatholic	Delete baptism data	batizado_id = 10	Data was successfully deleted	Conform	Valid
8	Certidao_Marriage	Marriage data input	All fields are filled in	Stored data	Conform	Valid
9	Certidao_Marriage	Blank date input	data_casamento empty	Input rejected	Conform	Valid
10	Certidao_Obito	Death data input	All fields are filled in	Stored data	Conform	Valid
11	Certidao_Obito	Invalid data input	nome_falecido Empty	Error message appears	Conform	Valid
12	Visa_Krisma	Krisma data input	All fields are filled in	Stored data	Conform	Valid
13	Visa_Krisma	View chrism data	Search by naran kandidat	Data displayed	Conform	Valid
14	Requerimento_Certidao	Make a certificate application	All fields are filled in	Saved applications	Conform	Valid
15	Requerimento_Certidao	Incomplete data	nome_cristao empty	Process rejected	Conform	Valid
16	Funcionario_Parish	Employee data input	All fields are filled in	Stored data	Conform	Valid
17	Pastor	Input data pastor	All fields are filled in	Stored data	Conform	Valid
18	Pastor	Access reports	Login as a Pastor	Can only view data	Conform	Valid
19	System Reports	Generate administrative reports	Period: Jan–2024	Reports are displayed	Conform	Valid
20	System Reports	Export report	Format PDF	The file was downloaded successfully	Conform	Valid
21	Administrator	Full access rights	All modules	Full access to all features	Conform	Valid

22	Pastor/Father	Monitoring & validation	All modules	Only can view & validate	Conform	Valid
23	Pegawai / Funsionario	Sacrament data input & documents	All modules	Input & report only, can't delete/access full report	Conform	Valid
24	System (UAT)	Ease of use	Scale 1–5 / User comments	Easy to use & understand	Conform	Valid
25	System (UAT)	Clarity of the interface	Scale 1–5 / User comments	Clear & intuitive interface	Conform	Valid
26	System (UAT)	Speed of the administrative process	Scale 1–5 / User comments	Faster process than manual	Conform	Valid
27	System (UAT)	Data consistency & accuracy	Scale 1–5 / User comments	Neat & documented data	Conform	Valid
28	System (UAT)	User satisfaction	Scale 1–5 / User comments	High satisfaction rate	Conform	Valid

Test Results

Based on the table above, it can be concluded that:

1. All the main functions of the system run according to the user's specifications and needs.
2. User access rights have been applied appropriately according to the roles: Administrator, Pastor, and Employee.
3. The security and data validation mechanisms successfully prevent input errors and unauthorized access.
4. The user acceptance rate (UAT) indicates that the system is easy to use, the interface is intuitive, and the administration process is faster than manual methods.
5. Thus, this web-based digital administration system is feasible to implement in the Parish of Nossa Senhora do Rosário.

CONCLUSION

The web-based digital administration system at Nossa Senhora do Rosário Parish in the Special Administrative Region of Oecusse-Ambeno demonstrated significant improvements in church administrative processes by replacing manual methods with a PHP- and MySQL-based system, resulting in greater operational efficiency, reduced processing time, and decreased reliance on physical archives. The use of the Rapid Application Development (RAD) methodology proved effective in enabling iterative development and accommodating user feedback from administrators, pastors, and church staff. The system also enhanced data accuracy, consistency, and integrity, particularly in managing sacramental records such as Baptism, Communion, Confirmation, and Marriage, through data validation and role-based access control mechanisms. Additionally, it improved transparency and internal supervision by providing real-time monitoring features that support better accountability and data-driven decision-making. Overall, the system offered both practical benefits for Nossa Senhora do Rosário Parish and academic contributions to the digitalization of religious institution administration in resource-limited settings; future research is recommended to explore system scalability, integration with mobile platforms, and the incorporation of advanced security features such as encryption and cloud-based data management.

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