



Design of a Web-Based Digital Archive Information System for Incoming and Outgoing Mail Case Study of the Rambang Kapak Tengah District Office

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Abstract

Well-organized archives are an important element in supporting smooth operations and public services in government agencies. The Rambang Kapak Tengah Subdistrict Office still uses manual methods in managing records. This is often inefficient and susceptible to damage and data loss. This research aims to design a web-based digital archive information system that is able to increase efficiency and reliability in managing archives in the office. The method used is the RAD development model which includes requirements analysis, design, implementation and testing stages. The resulting system makes it easy to store, search and manage archives digitally. This helps minimize the risk of data loss and improves ease of access and security of information. It is hoped that the implementation of this system can support more effective and efficient archive management at the Tanjung Rambang village sub-district office.

Keywords: Digital Archives Information System, Case Study of District Head Office Government, Web Based System.

1. Introduction

Current technological developments significantly facilitate work in various fields, including government offices. One frequently used technology is information systems, which can help make work processes faster, neater, and more organized. An information system is a system within an organization that reconciles the needs of daily transaction processing, supporting the organization's managerial operational functions, with the organization's strategic activities, to provide reports required by certain external parties[1]. At the Rambang Kapak Tengah Sub-district Office, the Personnel and General Affairs department still records incoming and outgoing mail manually, by writing in books and storing letters in folders. This method often makes it difficult for employees to find letters, especially when there are a lot of them. Furthermore, letters can be damaged, lost, or simply piled up. Yet, archives are crucial for administrative and public service purposes. An archive is a collection of messages generated by work, actions, and document transactions that are stored to prepare for further action as needed. Archives also record, store, and process all letters[2]. Therefore, a web-based digital filing system is needed to help employees manage incoming and outgoing mail more easily and quickly. This system allows letters to be stored as files on a computer, making them more secure, less susceptible to damage, and easier to find at any time. Furthermore, this system can be accessed by employees according to their respective duties. This allows for more efficient work, faster service to the public, and a more organized document management system.

2. Theoretical Basis

2.1. Definition of Design

Designing is the process of planning everything in advance. Design is a visual manifestation resulting from creative forms that have been planned[3]. Designs are usually in the form of drawings which will later be realized in actual form[4].

2.2. Definition of Web

A website is a collection of pages that display various types of information, including text, data, images, videos, or a combination of these, both static and dynamic. Before discussing this further, it's important to first understand the web[5]. The web is a media consisting of

several pages that are interconnected with each other, and functions as a media for displaying information, whether in the form of images, videos, text, sound, or a combination of all of them[6].

2.3. Definition of Information Systems

Information Systems are a combination of information technology and the activities of people who use that technology to support operations and management. In a very broad sense, the term information system is often used to refer to the interaction between people, algorithmic processes, data, and technology[7]. An information system is an organized combination of people, hardware, software, communication networks, and data resources that collect, transform, and disseminate information within an organization. An information system is a system within an organization that meets the needs of daily transaction processing that supports the organization's managerial operational functions with the strategic activities of an organization to be able to provide certain external parties with the necessary reports[8].

2.4. Definition of Digital archive

Digital archives are archives created and used in electronic form. Digital archives can originate from printed archives converted to digital form or archives that were "born" in digital form[9]. Digital archives are archives stored electronically and can be easily accessed. The emergence of information in digital or electronic form is unavoidable in today's technological era[10].

2.5. Definition of the RAD Method

Rapid Application Development (RAD) is a software development method that emphasizes the software development cycle in a short time[11]. According to additional definitions, RAD is a software development method that uses an object-oriented systems development approach, which includes software development and software development.

3. Research Methods

3.1. Data Sources

In this study, the data sources used consist of two types, namely primary data and secondary data :

1. Primary Data
Primary data were obtained directly from the Sub-district Head, the Head of the Public Services Section, and administrative staff at the Personnel and General Affairs Section of the Rambang Kapak Tengah Sub-district Office through interviews and field observations.
2. Secondary Data
Secondary data comes from archival documents, Standard Operating Procedures (SOPs) for archive management, office organizational structures, regulations/policies related to digital archives, and literature in the form of books, journals, articles, and online sources relevant to the research topic.

3.2. Data Collection Techniques

In this study, data collection techniques were used to obtain accurate and relevant information according to research needs. The data collection techniques used are as follows:

1. Interviews
Conducted with the Sub-district Head, Head of the General Services Section, and administrative staff of the Personnel and General Affairs section to obtain information related to the manual archive management process, problems encountered, and the need for a digital archive system.
2. Observation
Direct observation was conducted in the Rambang Kapak Tengah Sub-district Office environment to observe the archiving workflow, infrastructure conditions, and user interaction with the existing system.
3. Documentation
Collect and study related documents, such as incoming and outgoing mail archives, archive management SOPs, and office organizational structures.
4. Literature Study
Review references from books, journals, scientific articles, and relevant online sources to strengthen the theoretical basis and support system design.

4. Systems Analysis And Design

4.1. Proposed Class Diagram

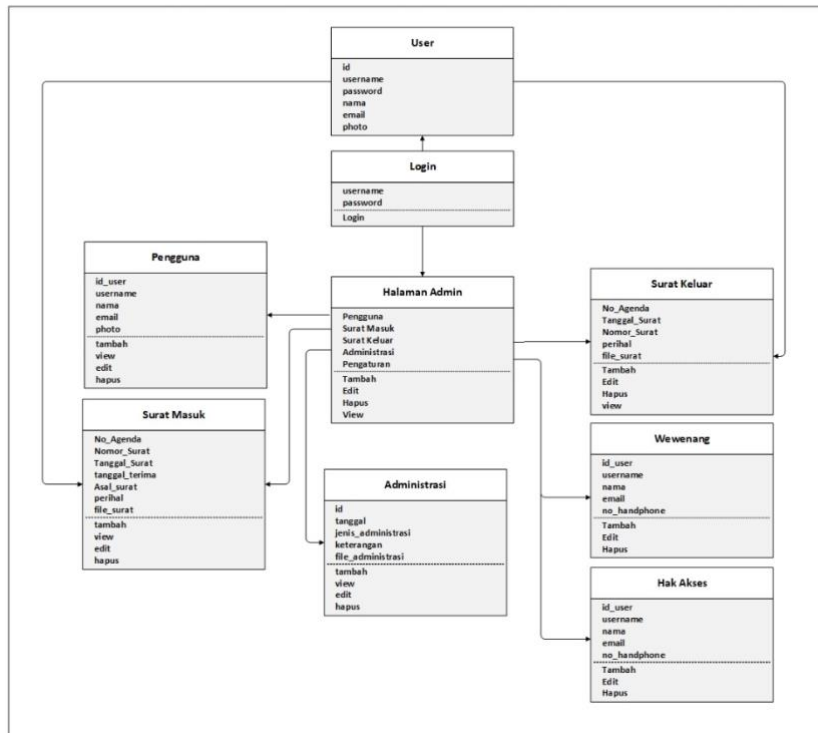


Fig. 1 : Class diagram

This class diagram shows the relationship between the main components in a digital archive information system, including user management, incoming mail, outgoing mail, administration, and the arrangement of authority and access rights which are interconnected through the admin page to support the archiving process in a structured manner.

5. Implementation and Testing

5.1. Interface Implementation

The interface display is the finished display of the software system that has been designed, the following is the interface display for designing a digital archive information system for incoming and outgoing letters, a case study of the Rambang Kapak Tengah sub-district office based on the web :

a. Main page

This page serves as the initial gateway to the system. It features two buttons, each with two options: admin and user, to make it easier for users to distinguish between login locations. The page's layout is simple and focused so users can immediately understand its primary function.

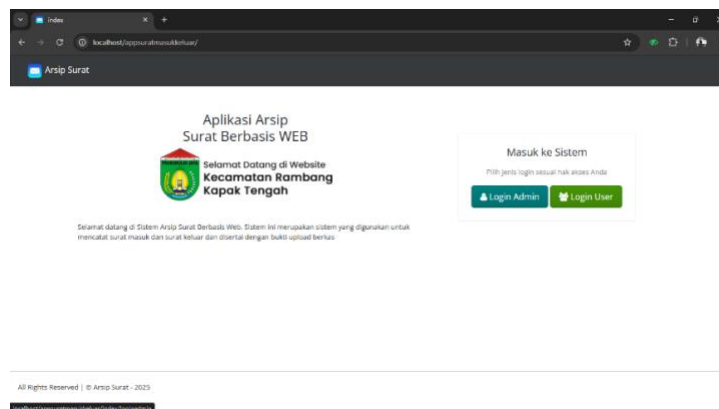


Fig. 2 : Home page

b. Admin login page

This page is used by admins to log in to the admin area. There are two input fields: username and password, and a login button. For admin convenience, a "Remember Me" option is available to automatically save login information in the browser.

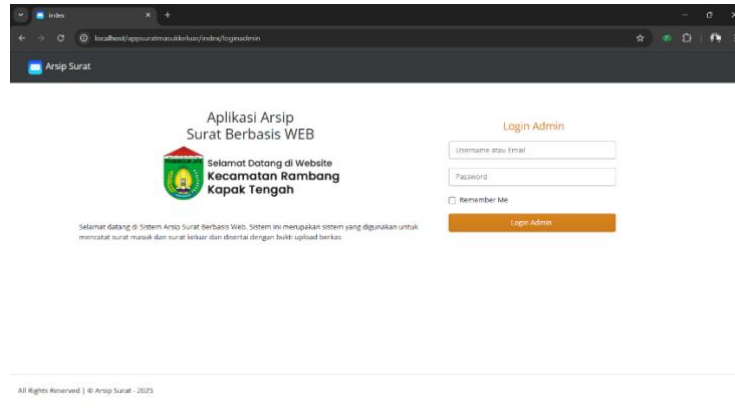


Fig. 3 : Admin login page

c. User login page

This page serves as a login page for users. Three input fields are available: username, password, roles, and a login button. For user convenience, a "Remember Me" option is available to automatically save login information in the browser. The page's layout is simple and focused so users can immediately understand its primary function.

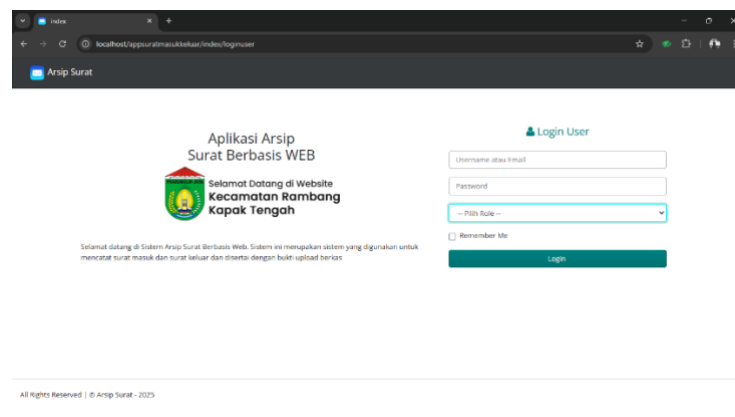


Fig. 4 : User login page

d. Admin home page

This is the initial page that appears after the admin successfully logs into the system. The homepage displays a summary of important system data, such as the total number of existing users, the number of admins, and the number of users. This page allows the admin to quickly and comprehensively monitor the system's condition.

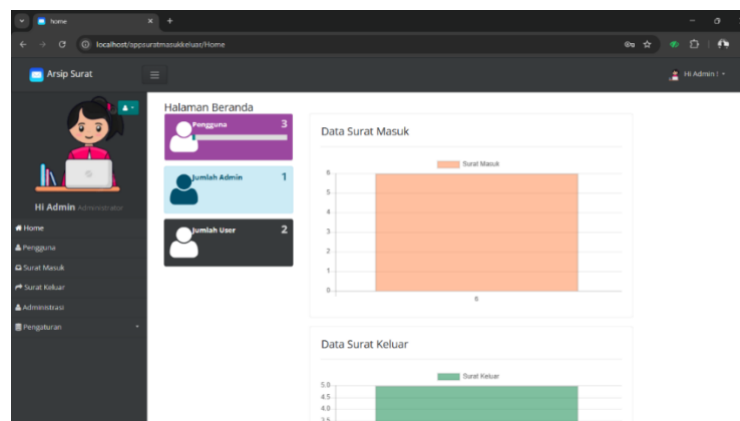


Fig. 5 : Admin home page

e. User page

This page displays a table listing active users in the system. Admins have full control over adding, editing, and deleting users. A search feature also makes it easy to find specific accounts. The displayed data includes the user's ID, username, name, role (access level), and email address. This page's design prioritizes information organization and ease of user management.

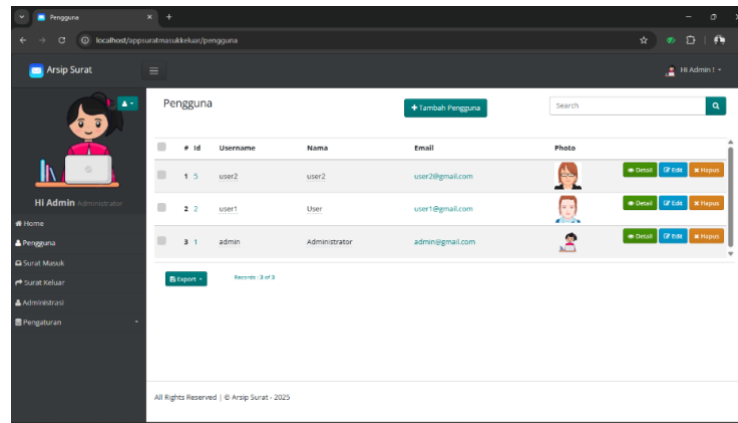


Fig. 6 : User page

f. Admin inbox page

This page is used to record and manage all letters received by the sub-district office. Admins can enter information such as the letter number, date, origin, and content/subject. Additionally, letter files can be uploaded for digital storage. Letters can then be reviewed, edited for errors, or deleted if unnecessary. All data is displayed in a neat table that can be sorted and searched. This page makes it very easy to find old letters without having to dig through physical archives.

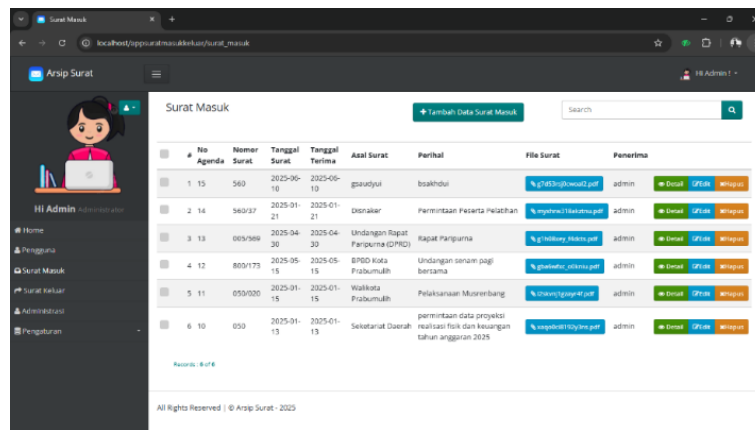


Fig. 7 : Admin inbox page

g. Admin outgoing mail page

Its function is similar to the incoming mail page, but specifically for letters sent out of the office. Admins can add new letters, fill in details such as the recipient, number, date, and upload the document. These outgoing mail files can be opened at any time and downloaded if needed. This page helps keep outgoing mail well-documented and accessible at any time.

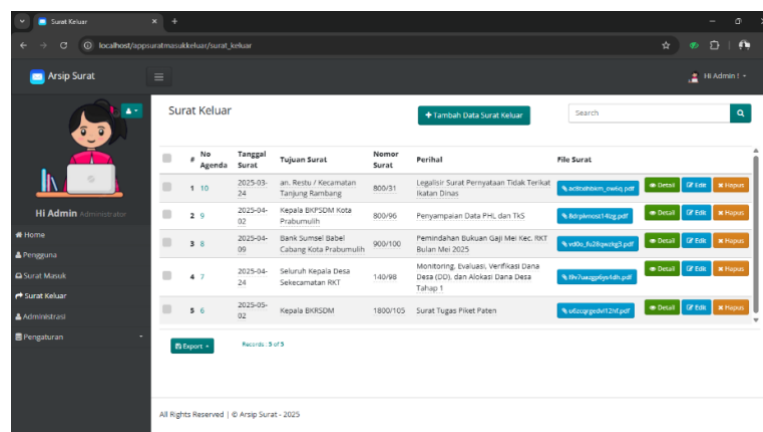


Fig. 8 : Admin outgoing mail page

h. Admin administration page

This page is used to manage administrative information. Admins can add new administrative data, edit existing ones, and delete unused ones. Adding data allows admins to add administrative types, fill in descriptions, dates, and upload relevant files. All this data is securely stored and can be retrieved if needed. This page ensures administrative documents are kept separate and can be managed digitally.

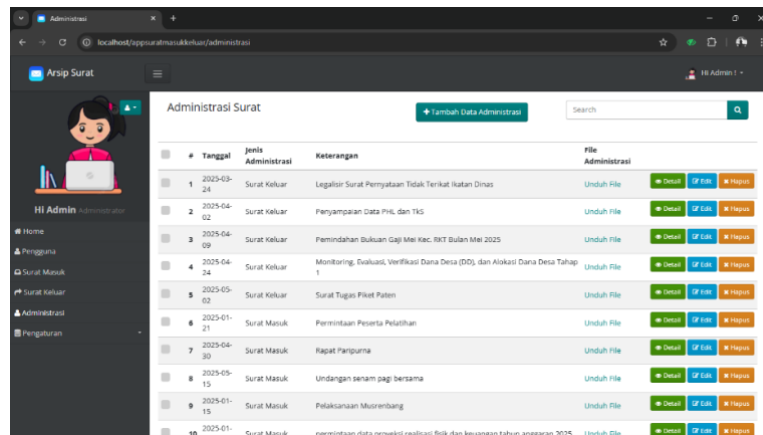


Fig. 9 : Admin administration page

i. Access rights settings page

On this page, admins can control who can perform certain actions within the system. For example, admins can set regular users to only view data, but not delete or edit it. This access rights setting ensures document security and confidentiality, as each user can only access features relevant to their specific role. This page is crucial to prevent all users from having full control over the system.

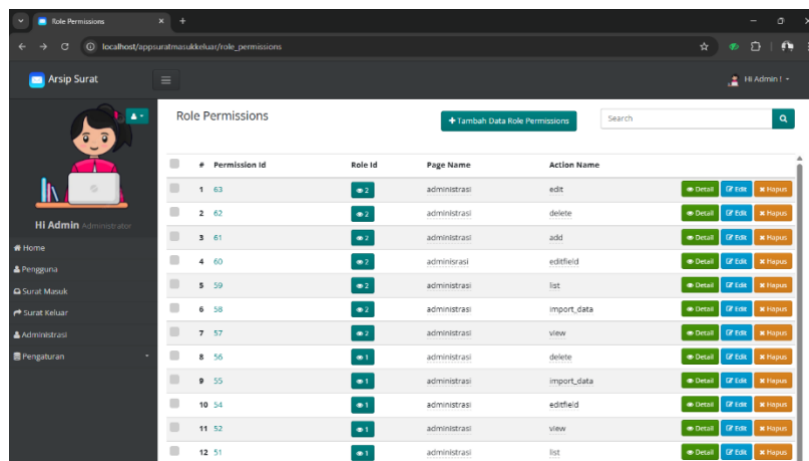


Fig. 10 : Access rights settings page

j. User home page

This page displays the main home page for users with the user role. After successfully logging in, users will be directed to this page, which serves as the initial homepage. This page provides general information about the system, such as application names, system functions, and basic usage instructions. The purpose of this page is to provide easy initial access and an overview of the digital archive system to users, depending on their access rights.

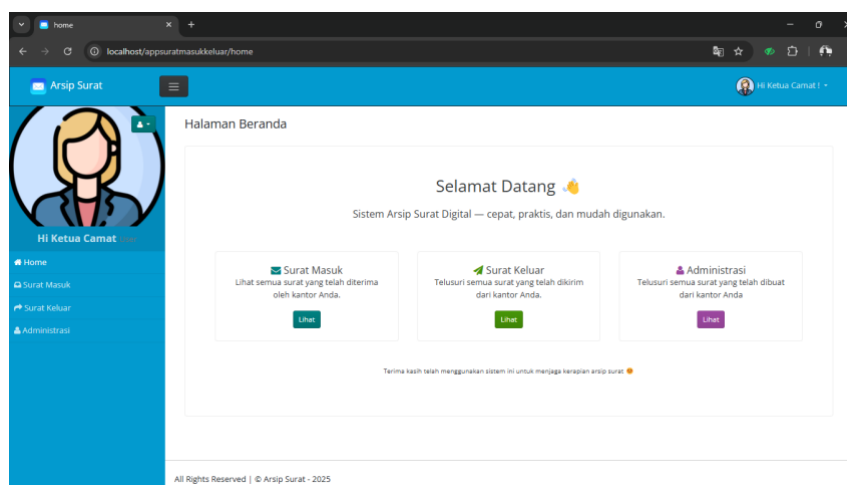


Fig. 11 : User home page

k. User inbox page

This page displays a list of incoming mail that users can view. Available information includes the date, number, origin, subject, and downloadable file. On this page, users only have access to view and download documents, but they cannot add, edit, or delete data. This aligns with the concept of role-based access restrictions to maintain data security.

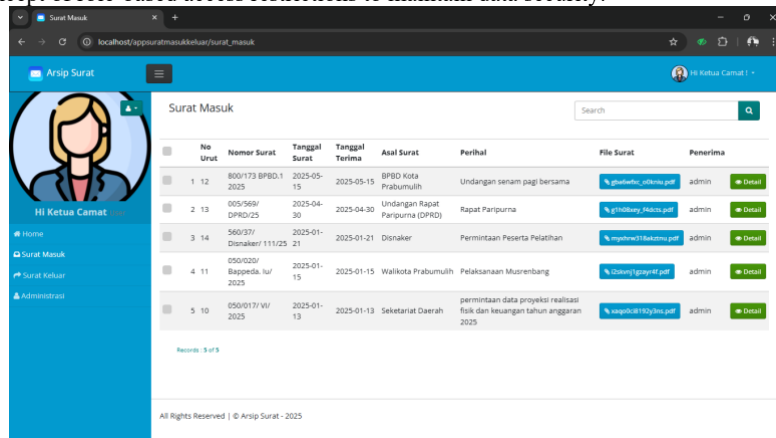


Fig. 12 : User inbox page

l. User outgoing mail page

This page displays a list of outgoing mail that users can access. As with incoming mail, users can only view the displayed information, including the date, destination, number, subject, and available file types. This page is designed to provide users with easy access to information relevant to their tasks, without granting them the right to modify or delete existing data.

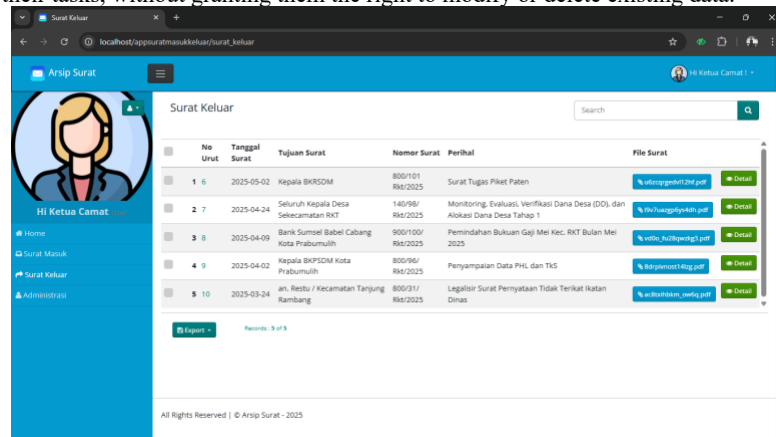


Fig. 13 : User outgoing inbox mail page

m. User administration page

This page displays the administrative data page for users. On this page, users can only view a list of administrative archives uploaded by the administrator, including information such as the date, administration type, description, and administration file. This feature is useful for ensuring users still have access to important administrative information, but with limited access rights, meaning they can only view and download data without being able to modify its contents.

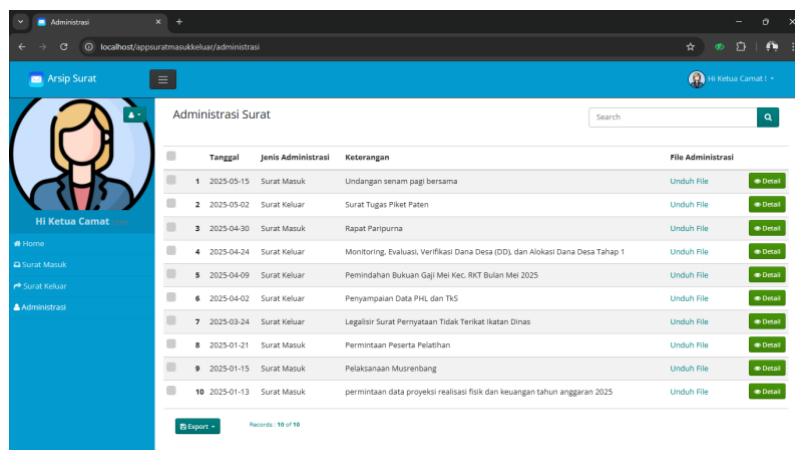


Fig. 14 : User administration page

5.2. System Testing

System testing is the final stage in the Rapid Application Development (RAD) methodology, ensuring the software performs according to specifications. This study used a black-box method, checking for menu errors, program imperfections, and errors that could lead to execution failure. The results are shown in the table below.

Table 1 : Black Box Testing

No	Test Item	Test Details	Test Type	Conclusion
1	Login	Verifikasi Data Login	Black-Box	Succeed
2	User Data Management	View, Add, Edit, and Delete Data	Black-Box	Succeed
3	Incoming Mail Management	View, Add, Edit, and Delete Data	Black-Box	Succeed
4	Outgoing Mail Management	View, Add, Edit, and Delete Data	Black-Box	Succeed
5	Administrative Management	View, Add, Edit, and Delete Data	Black-Box	Succeed
6	Access Rights Management	View, Add, Edit, and Delete Data	Black-Box	Succeed

6. Conclusion

Based on the results of research and design of a web-based digital archive information system at the Rambang Kapak Tengah Sub-district Office, it can be concluded that the manual archiving system currently used in the Personnel and General Affairs section has many obstacles, such as slow document searches, the risk of loss or damage to archives, and limited storage space. The designed digital archive information system has successfully replaced the manual method with a web-based system that allows for faster, more organized, and more efficient management of incoming and outgoing mail and administrative documents. The Rapid Application Development (RAD) development method applied is able to accelerate the system design and development process because it involves users directly in the design and testing stages. The results of system testing using the *black-box* method show that all system functions run well and are valid according to user needs.

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