

## Analysis and Visualization of Incoming and Outgoing Mail Information System Based on Responsive Design

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### Abstract

The proliferation of information technology has made all aspects of human existence dependent on technical advancements. This includes the Jakabaring Subdistrict of Palembang, the place where we conduct our study. The incompetent management of the archive storage facility for incoming and outgoing mail is the issue facing the Palembang City Jakabaring Sub-district Office. After doing a thorough analysis, we conclude that there's no mechanism in place to handle the incoming and outgoing mail archives. Therefore, to help officers in the Jakabaring Subdistrict of Palembang generate reports more successfully, we offer a solution in the form of an application that visualizes incoming and outgoing mail data. The traditional Waterfall approach is the foundation of our solution. Requirement analysis, system design, WAR server, and system testing are the techniques used to implement the solutions. The study's findings suggest that officers may find it simpler to handle incoming and outgoing mail archives if they use a web-based application system.

### Keywords

Analysis, Visualization, Waterfall, Bootstrap, Responsive Design

### Introduction

Archives of letters in an organization are essential to maintain and manage. Poor management of records in an institution or office will harm the performance of the office. Problems often arise in local government offices, including finding the required letter archives.

The Jakabaring Sub-district Office is one of the government agencies in Palembang City engaged in the service sector and is inseparable from one of the activities, namely recording incoming and outgoing mail. Recording incoming and outgoing mail data at the Jakabaring Sub-District Office is still done manually using dispositions and agenda books (Nikmah et al., 2023). Recording incoming and outgoing mail data that is only recorded in the agenda book may result in data problems with the letter recording system, requiring quite a long time to search for letter files storing hardcopy documents. It can allow damage and loss of mail files (Tining, 2018).

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Therefore, we need a digitalized letter recording system solution in the form of a Web-Based Information System for Incoming and Outgoing mail at the Jakabaring District Office using the Waterfall method to be able to help the process of recording and searching mail files quickly, storing mail data more safely and avoiding damage and loss of mail files, and provide convenience in making letter data reports at the Jakabaring Sub-district Office, Palembang City (Indramayu & Mira, 2023). This test also uses black box design elements, namely testing based on checking the design details using the control structure of the program design (Verma et al., 2017).

For the problem to be more focused and to achieve the goal, the research that was carried out was limited to making applications for incoming and outgoing mail to the Jabaring Palembang sub-district office. This research aims to make it easier to manage incoming and outgoing mail filings, avoid damage and loss of incoming and outgoing mail files, make mail report applications according to the date or time needed, and display mail data following the filing of mail that has been entered.

The expected benefits are taking advantage of information system technology by using a web-based incoming and outgoing mail application, which can help employee performance in the Jakabaring Sub-district Office, Palembang City. The results of this research can be used as a consideration and input for the sub-district head, sub-district secretary, and head of personnel subdivision to make information technology a tool that plays an essential role for an agency (Millard, 2017). The expected benefits are taking advantage of information system technology by using a web-based incoming and outgoing mail application, which can help employee performance in the Jakabaring Sub-district Office, Palembang City. The results of this research can be used as a consideration and input for the sub-district head, sub-district secretary, and head of personnel subdivision to make information technology a tool that plays an essential role for an agency.

## **Methodology**

The quantitative descriptive method is a method in which data from a sample of the research population is analyzed according to the statistical method used and then interpreted (Prof Dr. Sugiyono, 2010).

### **Data Collection Methods**

This thesis data collection method consists of three kinds of data collection techniques:

#### *Interview*

It is a two-way communication to get data from respondents. Interviews can be in the form of personal interviews, intercept interviews, and telephone interviews.

#### *Observation*

It is a technique or approach to obtain primary data by directly observing the data object. Observational approaches can be classified into behavioural observation (behavioral observation) and non-behavioral observation (non-behavioral observation).

### *Documentation*

Data collection is done by searching for data from written sources and images that can be obtained to provide information about research to complement the data obtained in the field.

### **Development Method**

This research is without a framework, namely, using PHP Native. PHP Native means creating a website with PHP starting from scratch, while PHP Framework means creating a website that doesn't start from scratch, and you must download the framework first. The waterfall method is a systematic and sequential software development method that begins at the level and progress of the system to analysis, design, code, test, and maintenance. The following are the stages of the waterfall method (Suherman et al., 2017):

#### *Requirements Analysis and Definition*

Requirement Analysis and Definition is the stage of determining features, constraints, and system objectives through consultation with system users. All these things will be defined in detail and serve as a system specification.

#### *System and Software Design*

System and Software Design is a stage that will form a system architecture based on predetermined requirements and identify and describe the fundamental abstractions of software systems and their relationships (Kaisler, 2005).

#### *Implementation and Unit Testing*

Implementation and Unit Testing are the stages that result from software design and will be realized as a set of programs or program units. Each unit will be tested to see if it meets its specifications.

#### *Integration and System Testing*

Integration and System Testing is a stage where each program unit will be integrated and tested as a complete system to ensure the system meets the existing requirements (Honest, 2019). If the system meets the requirements, the black box method testing phase will be carried out. After that, if the system passes the feasibility test, it can be used; if not, it will be repaired.

#### *Operation and Maintenance*

Operation and maintenance are the stages of installing and starting the system. In addition, it also fixes errors that were not found at the build stage (Hapira et al., 2020). In this stage, system development, such as adding new features and functions, is also carried out.

## **Results and Discussion**

Based on the research results that have been carried out at the Jakabaring Palembang Sub-district Office, all the final results of the research activities and the stages that have been carried out are the implementation of the designs in the previous chapter so that the results obtained are in the form of a web-based incoming and outgoing mail information system at the Jakabaring Palembang Sub-District Office, which will run on a localhost server and later produce a system that can be

used as an aid in the process of incoming and outgoing mail at the Jakabaring Palembang Sub-District Office.

### *Login Form display*

The login page for the incoming and outgoing mail information system at the Jakabaring sub-district office consists of a username and password that has been created. This login page is the main page displayed when the application is opened, and the process of accessing the application by entering the identity of the user account and password to get access rights to use the application's resources. This application is divided into four (4) users for user access rights: the first operator, the second operator, the sub-district secretary, and the sub-district head.



Figure 1. Display of the Login Form

### *Home page*

This home page is the second page after logging in to the incoming and outgoing mail application for the Jakabaring District office. The home page displays five (5) menus, namely: the incoming mail menu that shows the results of incoming mail, the mail disposition menu that displays the destination or follow-up of incoming mail, the outgoing mail menu that displays the results of outgoing mail reports, the user menu that displays user data and the mail properties menu reveals a character of a letter in the form of ordinary or essential.



Figure 2. View of the Home Page

### *Incoming Mail Page*

This incoming mail page is mail to the Jakabaring sub-district office from other agencies, individuals, companies, or organizations. On the incoming mail page is a search item, a shortcut to find a letter. On a page, incoming mail cannot load all incoming mail. You can manually search for incoming mail from the next or previous items.

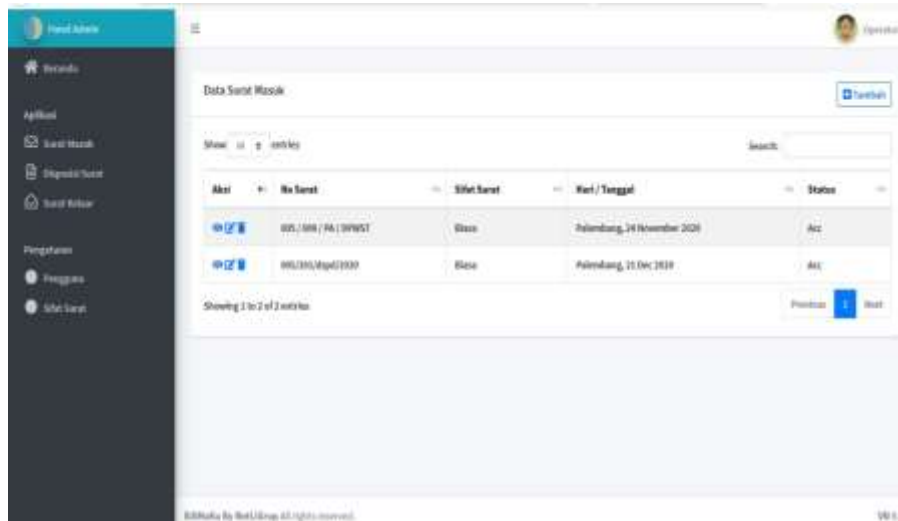


Figure 3. Incoming Mail Page Display

### *Display Letter Disposition Page*

The disposition page of this mail indicates the follow-up of incoming mail, which is generally immediate or must be carried out or followed up immediately. This page contains instructions that must be carried out by employees or officials of the Jabaring sub-district office regarding certain activities or events. The mail disposition page can only be operated by the secretary of the Jabaring sub-district head.

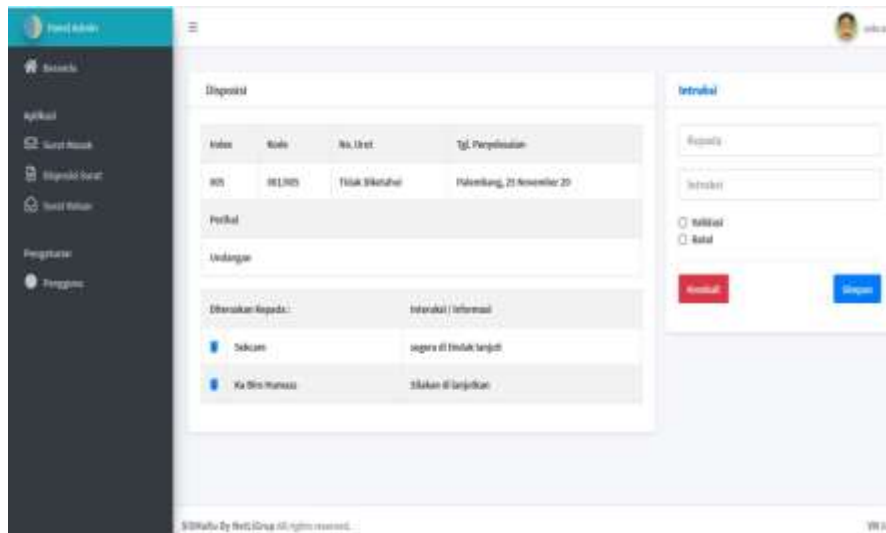


Figure 4. Display of Letter Disposition Pages

### *Outgoing Mail Page Display*

These outgoing mail pages are letters issued or created by the Jakabaring sub-district office to be sent to other parties, individuals and groups, or other organizations as a reply or notification to agencies or individuals regarding some issues. The outgoing mail page can only be operated by operators of 2 Jabaring sub-districts.

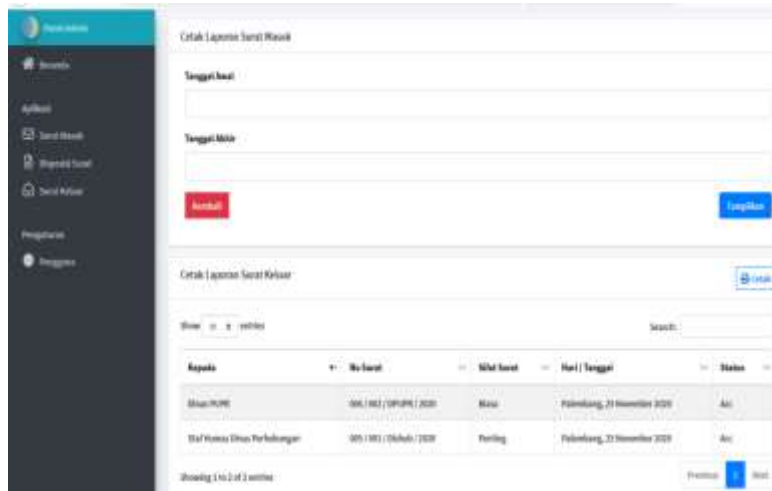


Figure 5. Outgoing Mail Page Display

### *Display User Page*

The user page is a page that functions to manage all users on the website list for the Jakabaring sub-district office. For logged-in users, data can be seen in the upper right corner of the page. In the web-based incoming and outgoing mail information system at the Jakabaring sub-district office, there are four (4) users: operator 1, the sub-district secretary, the sub-district head, and operator 2.

Operator 1 oversees inputting incoming and outgoing mail data into the system. The sub-district secretary is to validate the accuracy of incoming mail data. The sub-district head handles approving outgoing mail, validating incoming mail data, and receiving reports of incoming and outgoing mail. At the same time, operator 2 prints incoming and outgoing letters and gives them to the person addressed by the mail, archives incoming and outgoing mail and then makes a report, which will later be given to the sub-district head.

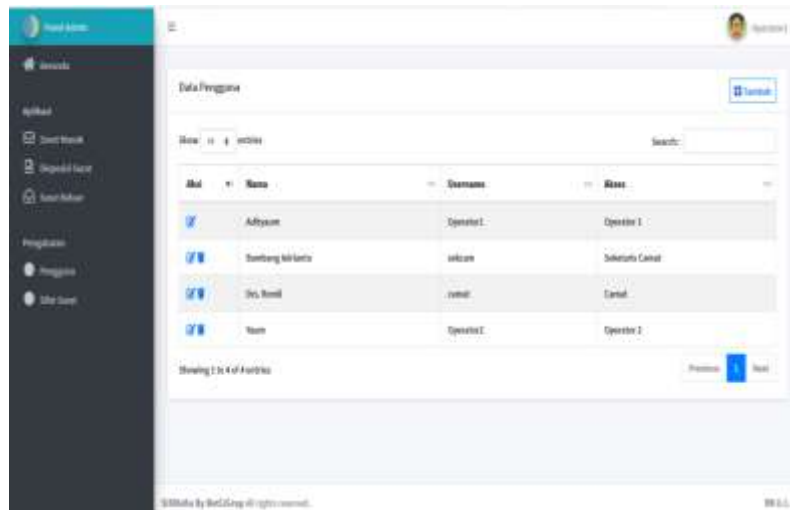


Figure 6. Display of User Pages

### *Collection of Mail Properties Page*

The nature of the mail page is a page that distinguishes the heart of the mail based on the letter received or the mail issued. The nature of the letter itself is usually divided into 3, namely: ordinary, essential, and unknown.

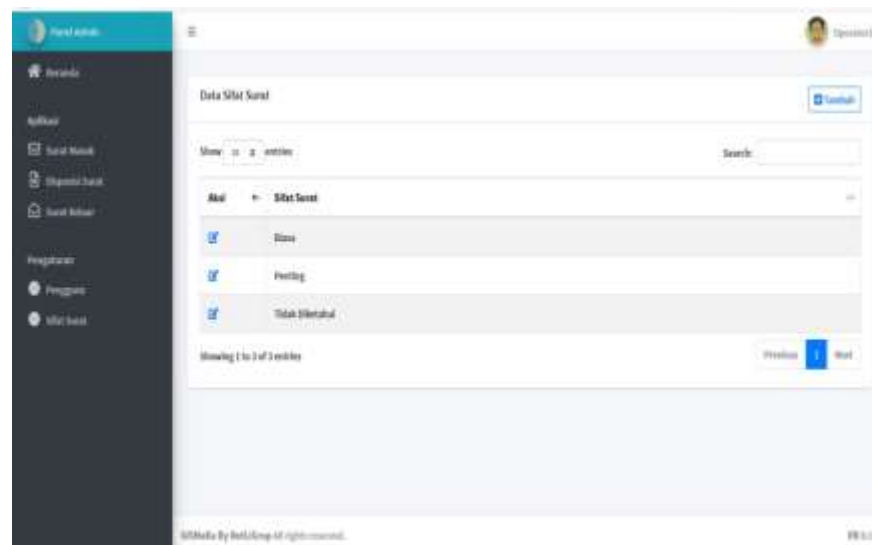


Figure 7. Display of Letter Properties Page

## Conclusion

With the help of this research, the Jakabaring Palembang sub-district office now has a web-based information system for outgoing and arriving mail that also uses the waterfall approach. The flexibility provided by this web-based information system for managing incoming and outgoing mail will be advantageous to employees. Mailing system information systems can improve organizational efficiency by reducing duplicate records.

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