Design and Build an Information System for Management of Incoming and Outgoing Mail Archives Based on a Website at the Bandung Subdivre Logistics Affairs Agency (BULOG)

Muhamad Fahmi Nugraha[1*], Yunita Sulistiani[2], Ajeng Rahayu[3]

[1,2,3] *Information Systems, Ma'soem University, Indonesia*

Corresponding author email: fahmino22@gmail.com

Abstract

The design of information for managing incoming and outgoing mail archives is made to solve problems that occur in the Agency for Logistics Affairs (BULOG) Subdivre Bandung in terms of managing mail archives, namely manual mail archives management, causing data loss. This research was made based on a method approach in collecting the information data needed in order to make a description of the situation, event. While the system development method used is the RUP (Rational Unified Process) model with OOAD (Object Oriented Analysis and Design) where the development tool is in the form of UML (Unified Modeling Language). The purpose of the research and from the interviews that have been carried out, the solution to overcome the above problems is to create a website-based mail archive system that can be accessed anytime and anywhere.

Keywords: Design, information systems, mail archive management.

1. Introduction

The development of information technology in the era of globalization is now experiencing a lot of progress and has an important role in life. Therefore, many companies are applying information technology to assist in many work activities. Due to the existence of information technology, the process that is done becomes easier and faster. One part of information technology is the internet. The internet can help us find information quickly and easily (Watanabe, 2023). Internet world cannot be separated from website technology. Websites are often used by many parties because of the website's ability as an information provider and information processor.

At BULOG Subdivre Bandung, the management of incoming and outgoing mail archives is still done manually. Where in the process of managing this archive is done by recording incoming and outgoing mail data in the agenda book by the administrative and financial assistant manager. When there is an incoming letter, the administrative and financial assistant manager will record the incoming letter in the agenda book and disposition sheet to be submitted to the leadership, after obtaining approval and instructions from the leader, the letter is delivered to the relevant section employees. After that, the letter is archived by year in the filing cabinet using Ordner.

Then the management of outgoing mail is also still manual, namely the administrative and financial assistant manager first makes an outgoing letter, if the outgoing letter has been signed, the letter is recorded by the administrative and financial assistant manager in the agenda book. Then the letter is archived by year in the filing cabinet using Ordner.

From the incoming and outgoing mail procedures described above, the applicable information system has several weaknesses, namely:
1. Difficulty in searching mail archive data.
2. Allows for the loss and damage of mail archive data because it uses paper media that is recorded in the agenda book and storage media that uses a lot of space.
3. It takes a long time to create a mail archive report.
4. Management of mail archives is limited, because it can only be done in the office, so access to mail archives is limited.

The role of the filing system is very important in managing incoming and outgoing mail, This problem is a concern for creating a website-based system in managing mail archives.

2. Literature Review

Table 1: Literature Riview

No	Writer's name	Title	Results	Difference
1.	Putri Imelda Sari (2018) Thesis for College of Informatics and Computer Management (STMIK) Gici Batam	Information System for Archiving Incoming and Outgoing Letters at Notary Debora Ekawati Lukman Dadali, SH	Designing a desktop-based information system for archiving incoming and outgoing mail using Microsoft Access 2007 and Visual Basic.net 2010 databases. The system was created to facilitate employees in archiving letters.	1. The location in the research is different, namely located at the Notary 2. The system used is different, Putri Imelda made a 2010 desktop-based system.
2.	Rita Lestari (2016) Thesis of UIN Alauddin Makassar	Design of Archives Management Information System at the Integrated Licensing and Investment Agency for the City of Makassar	Designing and building a website-based archive management information system that can streamline time in searching, data collection, and reporting incoming and outgoing mail.	1. Locations in different studies 2. Using the Waterfall method
3.	Rosalina Citra (2020) Ma'soem University Final Project	Design and Development of a Website-Based Archiving Information System for Incoming and Outgoing Letters at SMA Bina Muda Cicalengka	Designing a mail archive information system in the process of recording archives using the website programming language and Sublime as the programming software and MySql as the database.	1. The location of the research is different, namely at SMA Bina Muda Cicalengka 2. The system created by Rosalina cannot make dispositions through the website.
4.	Tri Yuli Nugrahanto (2019) Final Project at the University of Semarang	Letter Archiving Management Information System at the Fishing Center	Designing a website-based information system using the PHP programming language and Atom Text Editor as the software specifically for the fishing village hall office.	1 Research Locations are different 1. Using the waterfall method

3. Methods

3.1 System Development Method

This information system was built using the PHP (Hypertext Preprocessor) web programming language. PHP is widely used in the development of web-based information systems and can be used for other uses as well (Hunaifi, 2020). OOAD method with RUP (Rational Unified Process) model. The RUP stages are Inception (beginning), Elaboration (expansion/planning), Construction (construction), and Transition (transition). RUP uses an object

oriented concept, with activities that focus on model development using UML (Unified Model Language), namely Use Case Diagrams, Activity Diagrams, Class Diagrams, Sequence Diagrams.

*Rational Unified Process*or abbreviated as RUP is a method with the concept used, namely Object Oriented. Inception (beginning), in this stage focuses on modeling business modeling and explains the needs of the system to be designed. The following are the stages of the RUP (Chan, 2021):

1. *Inception*(beginning), in this stage the focus is on business modeling.
2. *Elaboration*(expansion/planning), at this stage perform system analysis and design along with system implementation (prototype).
3. *Construction*(construction), focus on developing system components and features. There is also a program code implementation.
4. *Transition*(transition), at this stage focuses on the installation of the system that aims to be understood by the user. Activities in this stage are user training, maintenance and system testing whether the system is in accordance with what the user expects.

3.2 System Analysis and Design

3.2.1 Business process

In the business use case model can describe the relationship between the actor's business and the system, an actor is an entity that interacts with the system to perform certain jobs (Maesaroh,2018). The following is the Business Object Model on the Incoming and Outgoing Mail Archive Management Information System at the Bandung Subdivre Logistics Affairs Agency (BULOG):
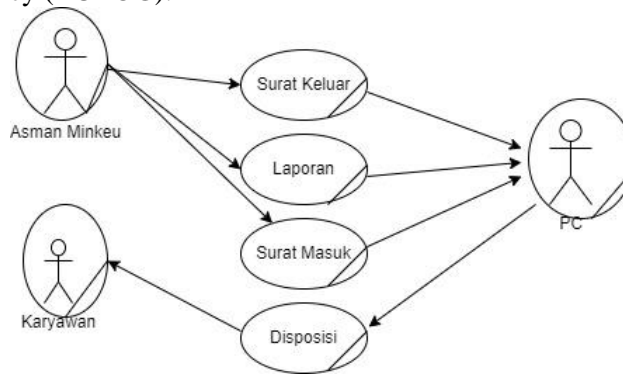

Figure 1: Business process

3.2.2 Identification of User Needs

From the results of the information system that is designed to be able to help and facilitate the company and users according to their needs, the identification of user needs is as follows:

1. The system created can assist administrative and financial assistant managers in managing mail archives such as mail file data input and mail data searches and can make transactions at any time.
2. The system created can assist branch leaders in making dispositions.
3. The system created can keep archive data more secure.
4. The system created can make reports of incoming and outgoing letters easier.

3.2.3 Information Needs

Information needs must be able to produce accurate and precise information so that it can meet good qualifications. The information needs for the information system for managing incoming and outgoing mail records needed can be seen in the table:

Table 2: Information Needs

No	Information needed	Destination
1.	Incoming mail	All Actors
2.	Outgoing mail	Branch Manager, Assistant Manager of Administration and Finance
3.	Disposition	Branch Manager, Assistant Manager of Administration and Finance

3.2.4   Application Needs

The following are the required application requirements:

Table 3: Application Needs

No	Required application	Destination
1.	Incoming Mail Application	All Actors
2.	Outgoing Mail App	Branch Manager, Assistant Manager of Administration and Finance
3.	Disposition	Branch Manager, Assistant Manager of Administration and Finance

3.2.5   Use Case Diagrams

Use case diagrams can describe the activities and interactions between actors and interrelated system (Yani, 2019). There are several symbols in describing use case diagrams, namely use cases, actors and relationships (Sugiarti, 2012). The following is a Use Case for Designing an Information System for Management of Incoming and Outgoing Mail Archives Based on a Website at the Logistics Affairs Agency (BULOG) Subdivre Bandung:
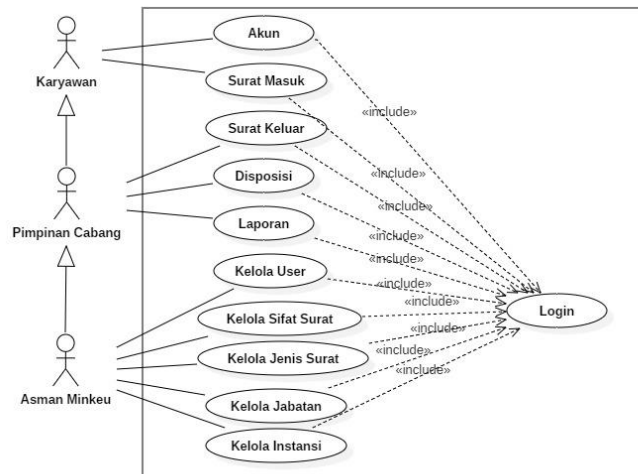
Figure 2: Use Case Diagrams

3.2.6   Activity Diagrams

With the Activity Diagram, you can find out the work flow or work activities of a system (Yani, 2019). The following is an Activity Diagram of Designing an Information System for Management of Incoming and Outgoing Mail Archives Based on a Website at the Logistics Affairs Agency (BULOG) Subdivre Bandung:
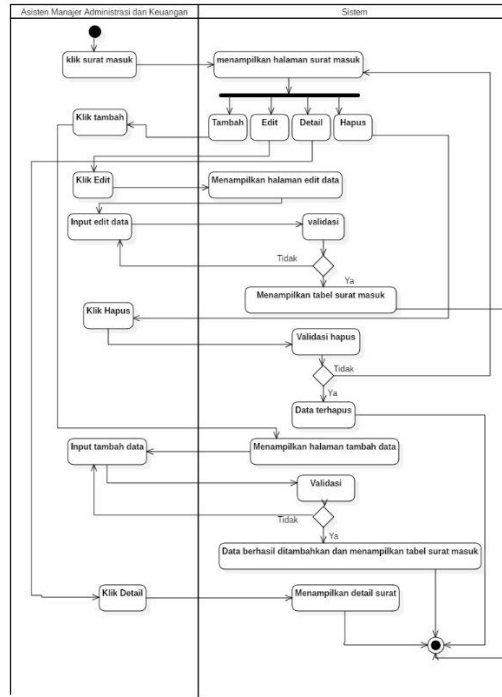Activity Diagram of Administration and Finance Manager Assistant Incoming Letter

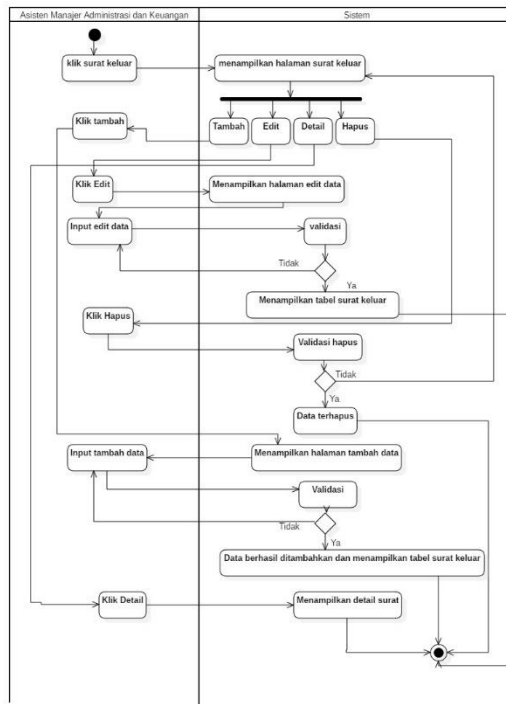**Figure 3:** Activity Diagram Manage Inbox Assistant Manager of Administration and Finance

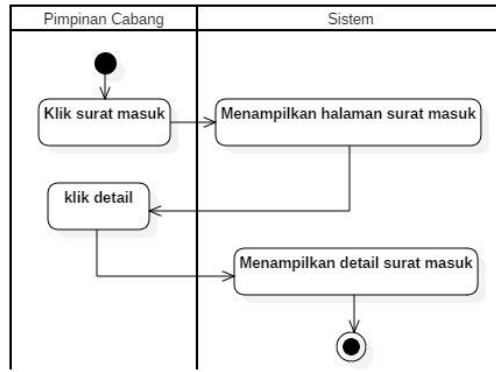**Figure 4:** Activity Diagram of Administration and Finance Assistant Manager Exit Letter

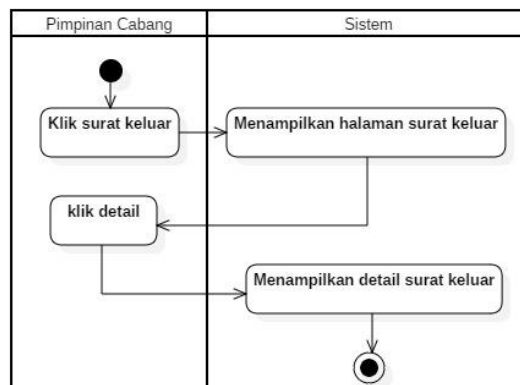**Figure 5:** Activity Diagram View Branch Manager Incoming Letter

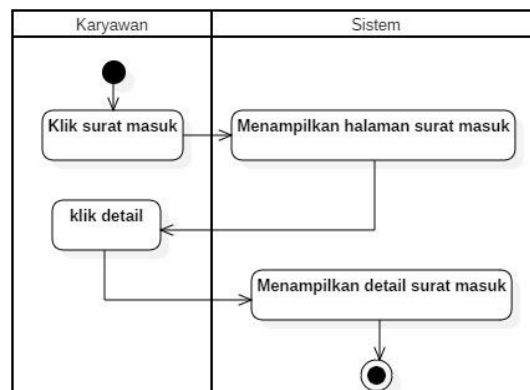**Figure 6:** Activity Diagram View Branch Manager Exit Letter

Figure 7: View Employee Login

3.2.7 Sequence Diagrams

*Sequence Diagrams*describes interactions that show the behavior of a system that has interactions between objects arranged in sequence based on time (Hermanto, 2020).
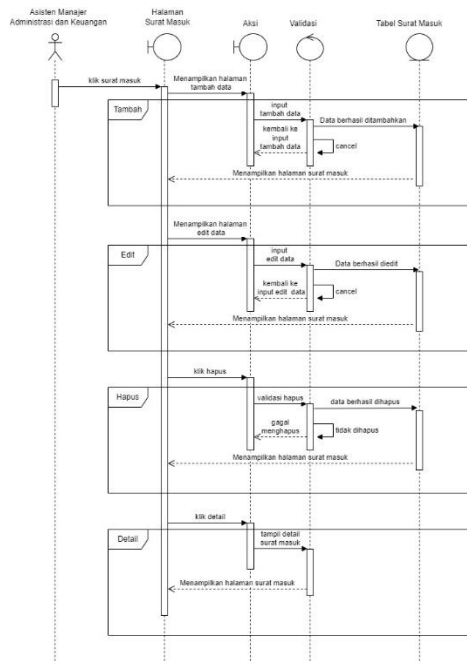
Figure 8: Sequence Diagram of Administration and Finance Assistant Manager Entry Letter
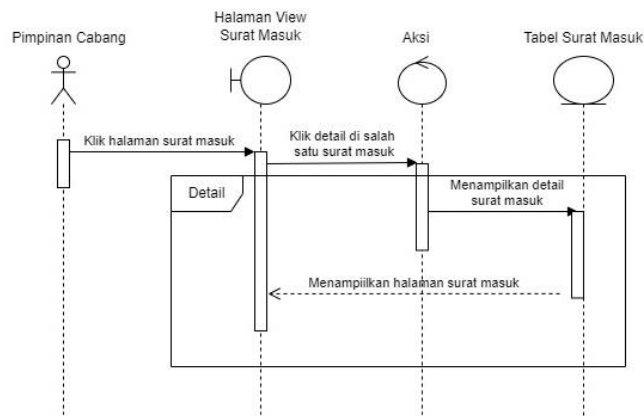

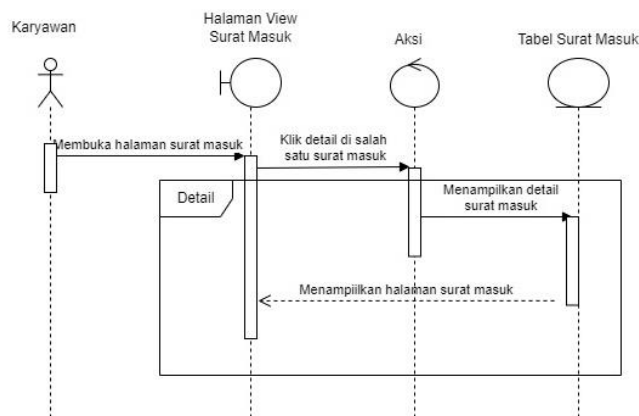**Figure 9:** Sequence Diagram View Branch Manager Incoming Letter

Figure 10: Sequence Diagram View Employee Incoming Mail

3.2.8 Class Diagram

*Class diagrams*describes the structure of the system in terms of defining the classes that will be made to build a system (Sugiarti, 2013). The following is a Class Diagram of Design and Build Information Systems for Archive Management of Incoming and Outgoing Letters Based on the Website at the Logistics Affairs Agency (BULOG) Bandung Subdivre:
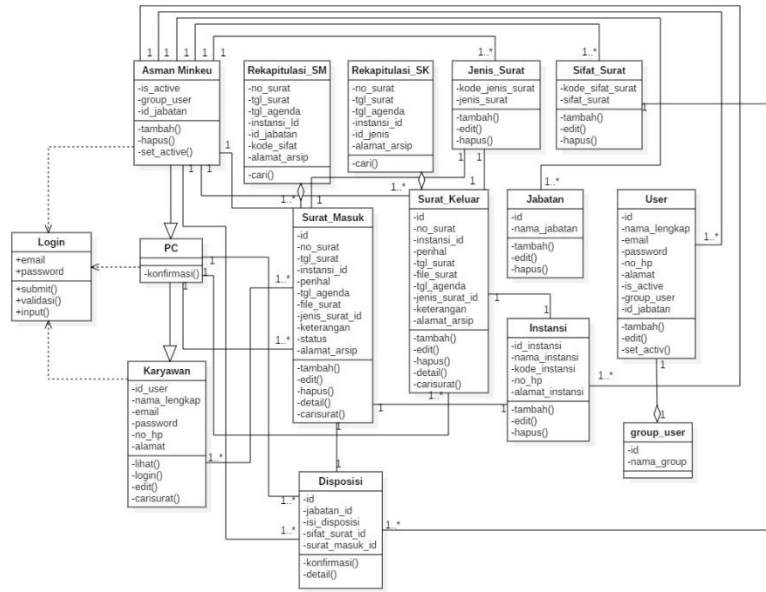
Figure 11: Class Diagram

3.2.9   Hardware Configuration

Hardware configuration which is a description of the structure and relationships between the overall physical system components. Because if you want to access the system, you need an internet network.
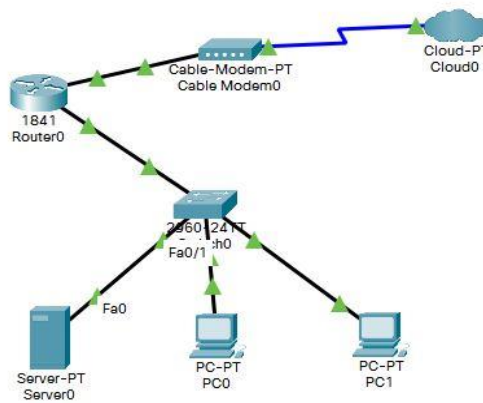

Figure 12: Hardware Configuration

4   Results and Discussion

4.1 Testing and Implementation

4.1.1 System Implementation

System implementation is the final stage in application development (Setiawan, 2021). This website-based mail archive application is designed to be implemented for employees at the Bandung Subdivre Logistics Affairs Agency (BULOG). The targeted users to use the application are:
1.   Assistant manager of administration and finance as the division that manages mail archives.
2.   Branch leaders to view mail archives and to be able to make dispositions to employees through the website.
3.   Employees of the Bandung Subdivre Logistics Affairs Agency (BULOG) to see the letter that was disposed of to them.

1.   Login View
      On this page, the user must enter his email and password in order to enter the dashboard page.
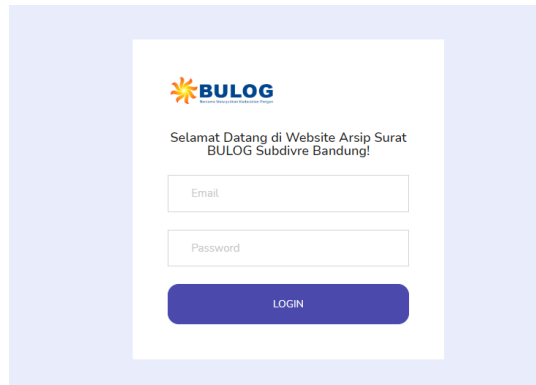
Figure 13: Login View

2. Incoming Mail Display

    On this page displays incoming mail data and there are functions that can be run such as add data, edit, detail, delete, and search for incoming mail that can be accessed by the assistant administrative and financial manager. Branch managers can only see details of incoming mail, while employees can only see details of incoming mail that has been disposed of to the employee.
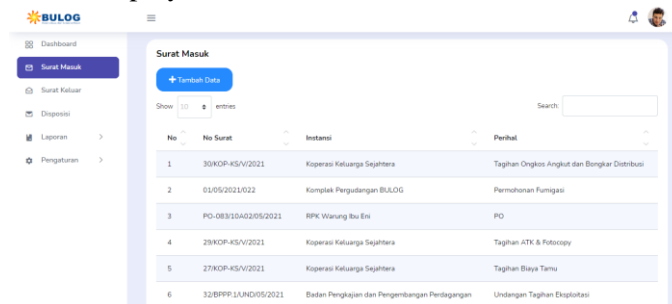

Figure 14: Administration and Finance Manager Assistant Incoming Letter Display

3. Outgoing Mail Display

    On this page displays outgoing mail data and there are functions that can be run such as add data, edit, detail, delete, and search for incoming mail that can be accessed by the assistant administrative and financial manager. Meanwhile, branch leaders can only see details of outgoing letters.

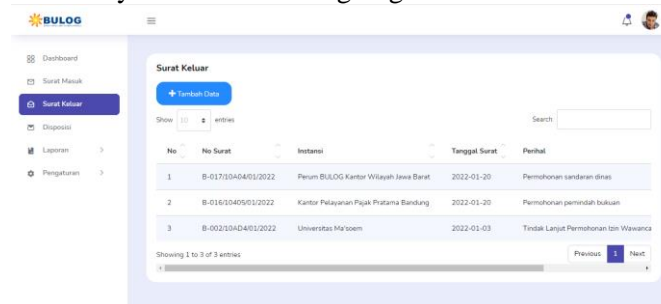**Figure15:** Administrative and Finance Manager Assistant Exit Letter Display

4. Disposition Display

    On the administrative and financial manager assistant page, you can view the data to see the disposition and can perform a disposition search. Meanwhile, branch leaders can confirm the disposition of incoming letters to employees in accordance with their positions.
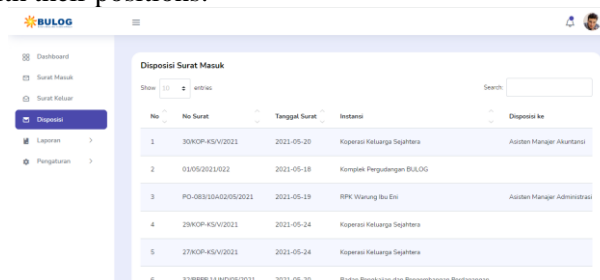

Figure 16: Branch Manager Disposition Display

5. View Manage User
    The user management page is located in the settings menu. On the manage user page, display user data in a table. On this page you can add data, edit data, and can search user data.
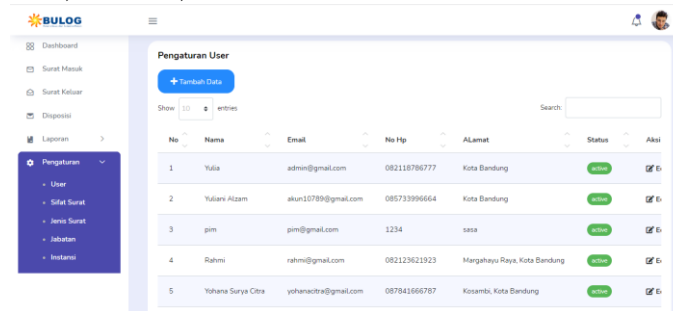

Figure 17: View Manage User Assistant Manager Administration and Finance

4.2 Testing

*Black box testing*is a test that focuses on the functional specifications of the system that has been made. Testing with blackbox testing is done by identifying the input so that it can be seen where the error lies (Mustaqbal, 2015). Black box testing is a system test that is carried out by entering input such as data into a form, so that it can fulfill the functional requirements of a program (Wahyudi, 2016). The following are the results of testing using black box testing:

Table 4: Administration and Finance Manager Assistant Function Test

Input	Function	Expected results	Conclusion
Login(enter email and password)	For validation of users who are entitled to use the system	Display the main page/dashboard	Succeed
Manage Inbox (add, edit, detail and delete)	Add incoming mail data, edit, view details, and delete incoming mail data	Incoming mail data has been successfully added and entered into the database system, can be edited, can view mail details, and can delete incoming mail data	Succeed
Manage Outgoing Mail (add, edit, detail and delete)	Add outgoing mail data, edit, view details, and delete outgoing mail data	Outgoing mail data has been successfully added and entered into the database system, can be edited, can view mail details, and can delete outgoing mail data	Succeed
Click Disposition	View disposition data	Displays a data table of the disposition of incoming mail	Succeed
Incoming and outgoing mail reports	Filter report data based on the date the user wants	Display incoming mail report data or outgoing mail reports by date filter	Succeed
Manage Users (Add and edit)	Add user data, and edit data. In editing data, you can disable the user	User data has been successfully added and entered into the database system, and can be edited. In edit data can disable user	Succeed
Manage Mail Properties (Add, edit and delete)	Add letter character data, editable data, and delete letter character data	The letter nature data has been successfully added and entered into the database system, can be edited, and can delete the letter character data	Succeed
Manage Mail Types (Add, edit and delete)	Add letter type data, editable data, and delete letter type data	Letter type data has been successfully added and entered into the database	Succeed

Input	Function	Expected results	Conclusion
		system, can be edited, and can delete letter type data	
Manage Jobs (Add, edit and delete)	Add job nature data, editable data, and delete job data	Position data has been successfully added and entered into the database system, can be edited, and can delete job data	Succeed
Manage Instances (Add, edit and delete)	Adding agency data, editable data, and deleting agency data	Agency data has been successfully added and entered into the database system, can be edited, and can delete agency data	Succeed

Table 5: Branch Manager Function Test

Input	Function	Expected results	Conclusion
Login (enter email and password)	For validation of users who are entitled to use the system	Display the main page/dashboard	Succeed
Click Incoming Mail	View incoming mail data	Displays a data table from incoming mail and can view incoming mail details	Succeed
Click Outgoing Mail	View outgoing mail data	Displays a data table of outgoing mail and can see the details of outgoing mail	Succeed
Disposition	Sending dispositions to the targeted section/division employees	Confirming disposition and successfully sending disposition of incoming letters to employees based on the intended division/position	Succeed
Incoming and outgoing mail reports	Filter report data based on the date the user wants	Display incoming mail report data or outgoing mail reports by date filter	Succeed
Account	To edit your own account data	Account data edited successfully	Succeed

Table 6: Employee Function Test

Input	Function	Expected results	Conclusion
Login (enter email and password)	For validation of users who are entitled to use the system	Display the main page/dashboard	Succeed
Click Incoming Mail	View incoming mail data that has been disposed of	Displays data from incoming mail that has been disposed of by the leadership	Succeed
Account	To edit your own account data	Account data edited successfully	Succeed

5. Conclusion

By using the Information System for managing incoming and outgoing mail archives based on the website at the Bandung Subdivre Logistics Affairs Agency (BULOG), the following conclusions can be drawn:
1. Can make it easier to search archive data for incoming and outgoing mail.
2. Can minimize the occurrence of data loss and damage.
3. Can make it easier to view reports if at any time the leadership needs it.

4. Can make it easier to access the system, because by using an information system archive incoming and outgoing mail can be done anywhere and anytime.

References

Chan, T. K., & Chin, C. S. (2021). Review of autonomous intelligent vehicles for urban driving and parking. *Electronics, 10*(9), 1021.

Hermanto and S. Khalimah. (2020). Design and Build a Website-Based Warehousing Information System. *J. Computer Science. and Communal Design. vis.*, *5*, p. 13.

Hikmah, A., & Ary, M. (2020, July). Online Information System for Archiving Documents And Letters Requests at The Sub-District Level. *In Proceedings of the 7th Mathematics, Science, and Computer Science Education International Seminar, MSCEIS 2019,* 12 October 2019, Bandung, West Java, Indonesia.

Maesaroh, A and T. Trianto. (2018). Designing a Website-Based Outpatient Registration and Payment Information System at Amc Hospital Bandung, *AIMS J. Accounts. inf. syst.*, *1*(1), 1–15, , doi:10.32627/aims.v1i1.26.

Mustaqbal, MS., Firdaus, RF and Rahmadi, H. (2015). Testing Applications Using Black Box Testing Boundary Value Analysis (Case Study: Application for SNMPTN Graduation Prediction), *I*(3), 31–36.

Setiawan, T. (2021). Electronic Voting System Design for the Election of OSIS Chairperson at SMAN 25 Garut, *J. Accounts. inf. syst.*, *4*, p. 12, doi:10.32627.

Sugiarti, Y. (2013). *Analysis & Design UML (Unified Modeling Language) Generated VB.6*, Pert Edition. Yogyakarta: Graha Ilmu.

Syauki, A. and Marlin, S. (2019). Design of a Web-Based Academic Information System at Madrasah Aliyah Attaqwa Tangerang, *J. Inform, 6*(7).

Wahyudi, R., Utami, E., and Arief, MR. (2016). Expert System Of E-Tourism At Diy Tourism Department Using Forward Chaining Method, *J. Ilm.*, *1*, 1411–3201, 2016.

Watanabe, O., Delmo, C., & Ridho, T. (2023). Analysis Analysis of Mobile-Based Archive Management Information System Design. *Journal of Information Systems and Technology Research, 2*(2), 91-101.