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Outgoing Letter Approval System at Class I Climatology Stations in North Sumatra Using the Prototype Method

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ABSTRACT

The mechanism for outgoing correspondence at the North Sumatra Class I Climatology Station is through the approval of the Verifier and Kasklim. The system runs in approving outgoing letters, still going through the traditional process where the Verifier and Kasklim must go through directly in the room. This research aims to develop the intended outgoing letter approval application, to increase the effectiveness and efficiency of outgoing letter approval. This research is development research using the System Development Life Cycle (SDLC) approach and the prototype method which refers to data obtained from interviews with several letter operators at the North Sumatra Class I Climatology Station. Based on testing the system using a black box and evaluating the application by the staff concerned, it was concluded that the application was relevant to needs and could be implemented. This study also provides a basis for further research in optimizing similar systems in the context of climatology stations or other fields that require effective management of outgoing mail approvals.

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1. INTRODUCTION

Letters are a form of communication between one party who conveys information in writing to another party, both individuals and organizations [1]. One of the operational activities carried out at the Meteorology, Climatology and Geophysics Agency (BMKG), precisely at the Technical Implementation Unit (UPT) of the North Sumatra Class I Climatology Station (Staklim Sumut) is making outgoing letters such as issuing official travel letters (SPT), financial report letters, leave letters, etc., as well as responding to incoming letters from other agencies. At the stage of making the outgoing letter, it must go through conventional approval from the Verifier and the Head of the North Sumatra Class I Climatology Station (Kasklim).

By paying attention to existing problems, the author wishes to replace the letter approval process with a digital one by developing a Letter Draft Concept System Application (Sikodrat) using a prototype method which aims to create effective and efficient letter approvals.

The application of the prototype method is very commonly used in the design and development of an application, for example in research conducted by [2] with the title "Implementation of Prototyping Models in Village Information System Design", the aim of the research is to integrate village information data that is owned by accurate, automatic and integrated with applications, so that people can enjoy village information digitally following developments in the technological era that has developed.

In subsequent research conducted by Masan Abdi [3] with the title "Design of a Letter Archive Information System Using the Prototype Method", the aim of the research was to produce updates and improvements to the application at UPTD SPNF SKB Salatiga".

As well as research conducted by Ibnu [4] with the title "Web-based Design of an E-Archive Information System for the Original Satia Persada CV using the Prototype Method" which aims to develop an electronic archival information system.

The rapid development of technology in the current era has had an impact on several fields that were previously carried out conventionally to become digitalized, according to [5] who stated that the use of computers as the main support in technology is quite necessary in several circles such as agencies or institutions because their use is quite good in supporting ongoing operational activities.

Apart from that, according to Gunawan in [1] he explained that information technology can help companies, organizations, schools and governments in facing competition and can also increase productivity, the use of technology that is developing in an agency or company institution can increase efficiency, effectiveness, transparency and accountability. administration of government public services.

2. RESEARCH METHOD

The method used in this research is qualitative, qualitative instruments include several things such as interviews, observations, documentation studies, case studies, and focus groups, these instruments help in collecting data and ensure consistency in collecting information [6].

2.1 Data Collection Techniques

a. Observation

Observation activities involve direct observation of research subjects [6]. The author made direct observations related to the conventional process of letter approval carried out by employees. The author also paid attention to existing procedures. This was done in order to get an overview of the problems that were occurring to follow up on solutions.

b. Interview

Interviews are a technique for collecting data that involves direct interaction between researchers and research participants [6]. The author interacted directly with several employees who were directly involved in the process of initialing the approval letter by conducting questions and answers aimed at finding out the problems that occurred and getting solutions. of expected desires.

2.2 System Development Methods

In the development stage, the application being developed will adopt the System Development Life Cycle (SDLC) method, namely Prototype. According to Sigit and Setiawan, a prototype is a method for developing a system or designing a system by approaching or introducing the system to potential users who will use or enjoy the desired system [7], in general, a prototype focuses on the desires of the customer from a problem. happens and a solution is provided in the form of designing an application prototype in accordance with the needs provided by the customer (client). The stages of the prototype method can be seen in Figure 1.

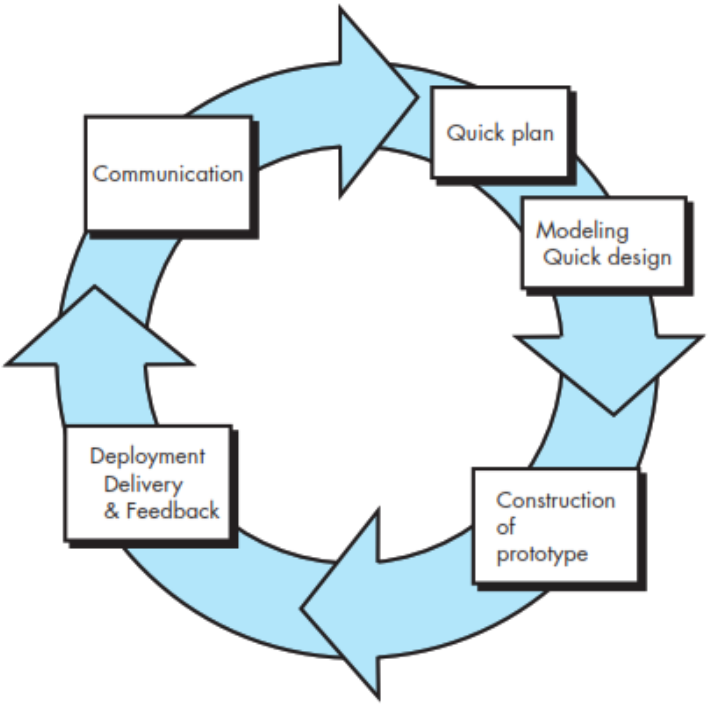

Figure 1. Stages of the Prototype Method

The following describes each stage of the Prototype method in Figure 1 as follows:

1. Communication

Requirements collection aims to find out the components and data that will be used during the creation or development of applications such as hardware and software [8]. The process of collecting requirements in the communication stage of the system to be developed is carried out using observation and interview techniques.

2. Quick Plan, Modeling, Quick Design

a. Quick Plan

At this stage the author will carry out quick planning based on the needs at the communication stage

b. Modeling and Quick Design

At this stage the author will create an application design model that is needed to describe the needs of the customer (client).

3. Construction of Prototype

At this stage the author will create a design or mockup of the application. The design consists of a display design that will be developed to provide an overview of the application prototype that the customer (client) wants.

4. Development, Delivery and Feedback

At this stage the author will construct a prototype that has been approved by the customer (client) and will be implemented or translated into an application using the PHP programming language and MySQL database.

3. RESULTS AND DISCUSSION

Based on the prototype method used in application development, the results obtained are as follows:

3.1. Communications

a. Functional Requirements

Functional requirements are a type of requirement that contains what processes will be carried out by the system [9], functional requirements come from interviews with customers (clients) regarding the desires and processes that will be developed in the application, the functional requirements required are as follows:

1. Users consist of 3 access rights, namely Operator, Verifier and Kasklim.
2. There is a feature that can enter letters that have been created into the application for processing.
3. There is a feature for Approving and Rejecting processed letters, as well as error records available after a letter is rejected
4. There is a feature to delete a letter when the letter has been rejected and will be revised.
5. There is a feature to view the author of the letter, this can be seen based on the IP address of the employee's computer and the IP address of the employee's computer when creating the letter.
6. There is a feature to download the letter format that will be used.

b. Non-Functional Requirements

Non-functional requirements analysis is the analysis needed to determine system requirements specifications [9], Non-Functional requirements include hardware and software applications, Non-Functional requirements required are as follows:

1. Laptop or computer, used for application use.
2. Browser (Google, Opera, Chrome, Mozilla and others), used as application media.
3. Internet, used to open applications that are connected to the hosting server.
4. Mysql Databases, used as application data storage
5. PHP programming language, used as program code for developing applications.
6. Visual Studio Code, used as a text editor for writing program codes.

3.2. Quick Plan, Modeling, and, Quick Design

a. Running System Analysis

The running system is a diagram or picture that depicts the work flow [10]. Based on the results of observations and interviews conducted by the author at Staklim North Sumatra regarding the Conventional Letter Approval Initial Process, it can be seen that the parties involved are divided into 3 people, namely the Operator, Verifier and Kasklim, the system running on approval of outgoing letters can be seen in Figure 2.

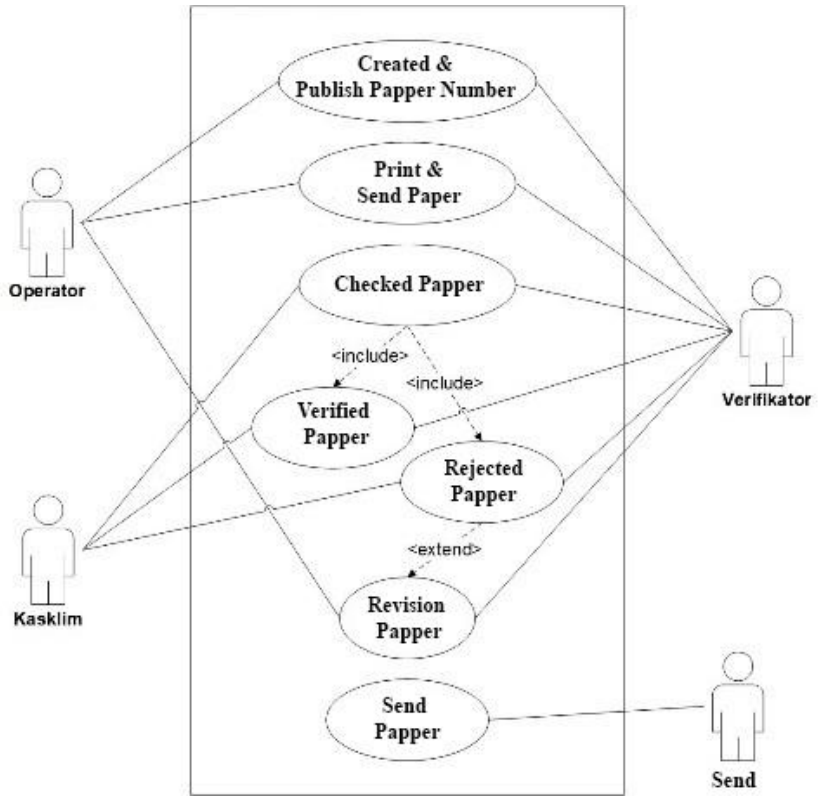

Figure 2. Running System

b. Proposed System Analysis

Paying attention to Figure 2 regarding the current system for approval of outgoing letters, a system can be created which is proposed as a solution to the problems that occur. The proposed system is a visual representation that describes the activities of the proposed system [11], the proposed system can be seen in Figure 3.

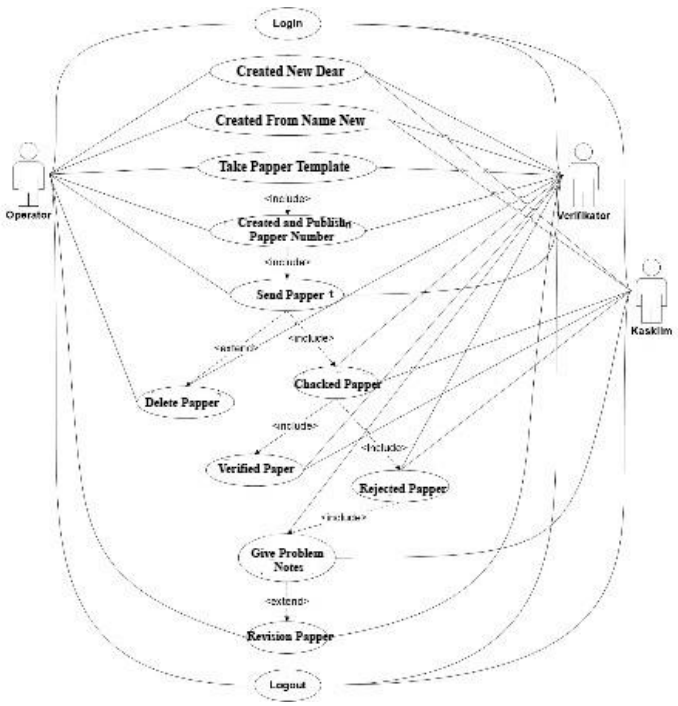

Figure 3. System Continuation

c. Entity Relationship Diagram (ERD)

Entity Relational Diagram is a model for explaining relationships between data [12], ERD in this research is used to visualize the relationship between table relationships in the database (database) which is used in system development and is interrelated. The relationship between table relationships can be seen in Figure 4.

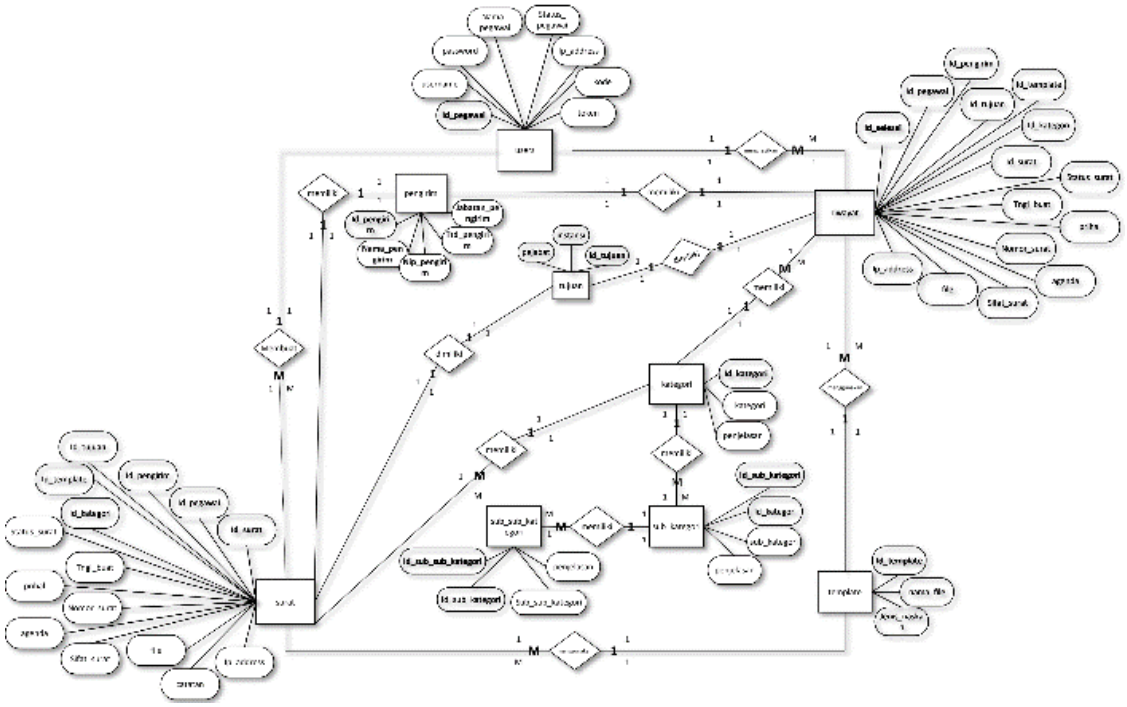

Figure 4. Table Relations in the Database

d. Class Diagrams

A class diagram is a description of the system structure seen in terms of defining the data classes that will be created to build a system [13], the class diagram in this research will visualize the data classes used in the database, the classes These are previously related and interrelated between one class and another class. The class diagram of the database referred to in the system to be developed.

3.3. Construction of Prototype

At this stage the author has created a simple design of the appearance of the application system to be developed, while the design includes a general description of customer (client) needs for the system being created.

3.4. Development, Delivery and Feedback

a. Login View

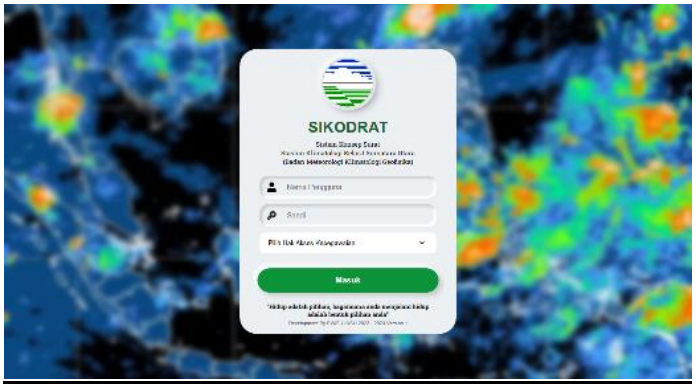

Figure 6. Login page

b. Operator View

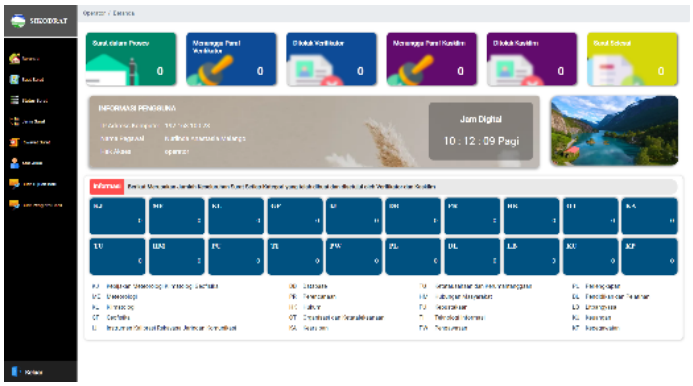

Figure 7. Operator Homepage

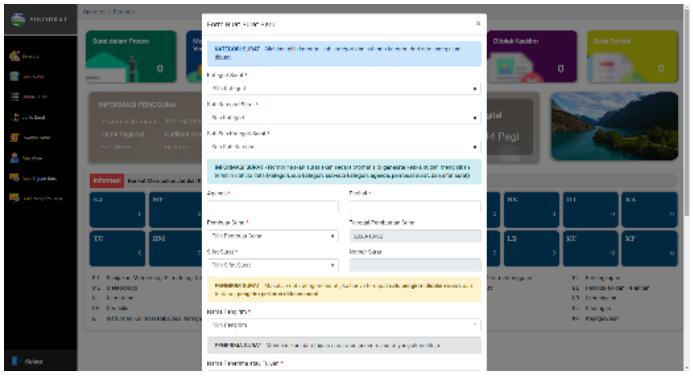

Figure 8. Create a Letter by Operator

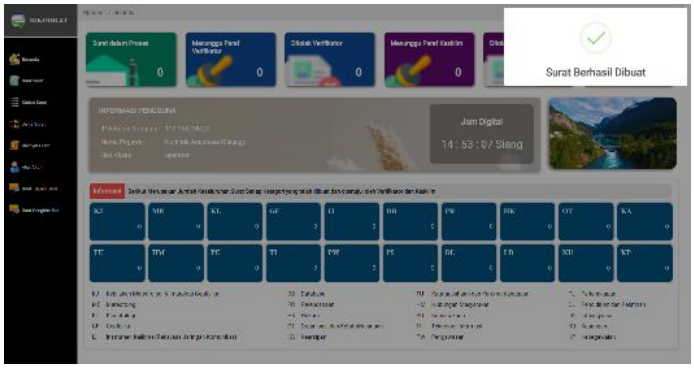

Figure 9. Successfully Created Operator Letter

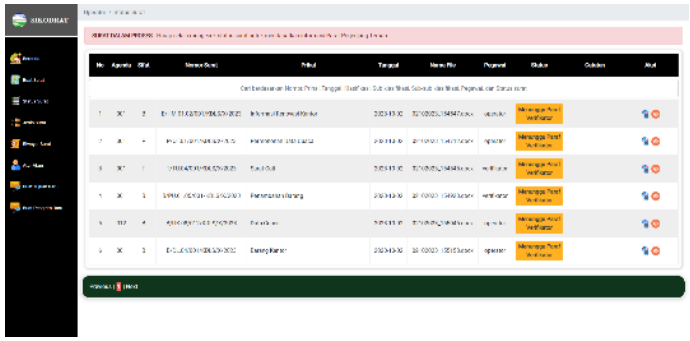

Figure 10. Operator Mail Status

c. Verifier View

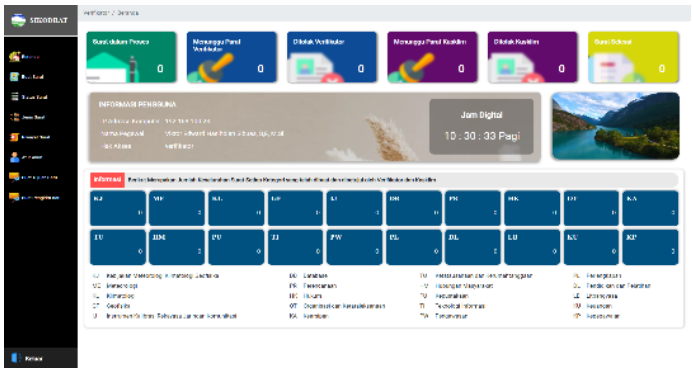

Figure 11. Status of Verifier Letter

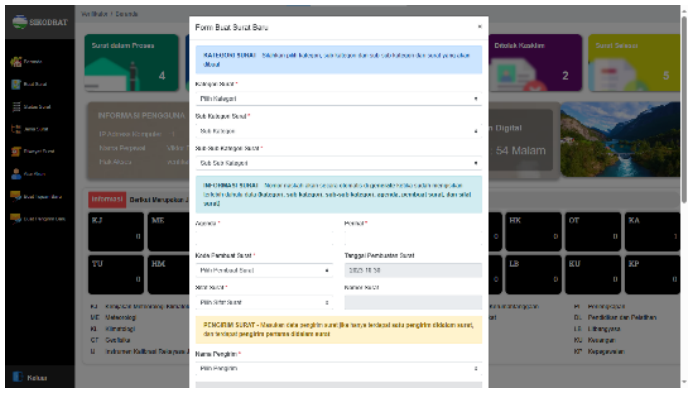

Figure 12. Create a Verification Letter

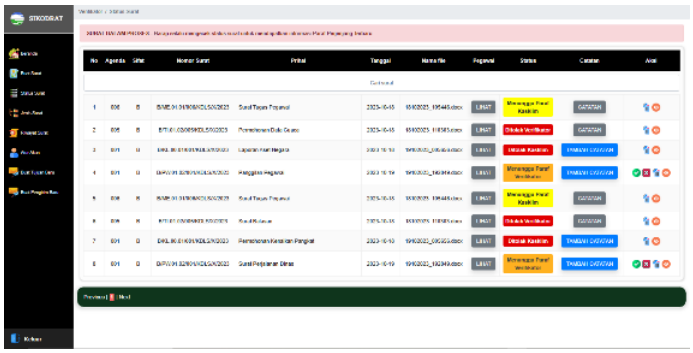

Figure 13. Approval of Letter by Verifier

d. Kasklim View

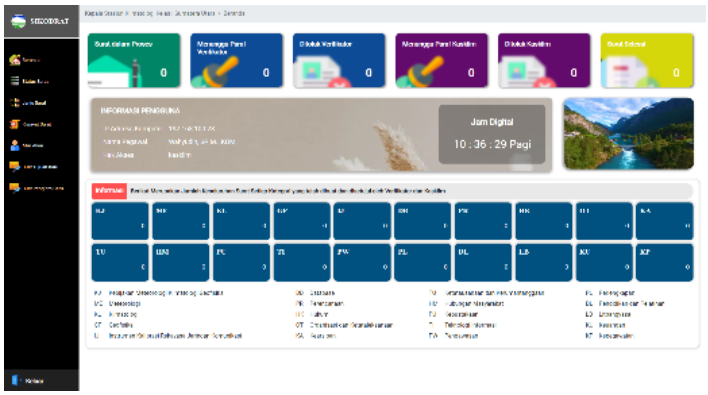

Figure 14. Kasklim Homepage

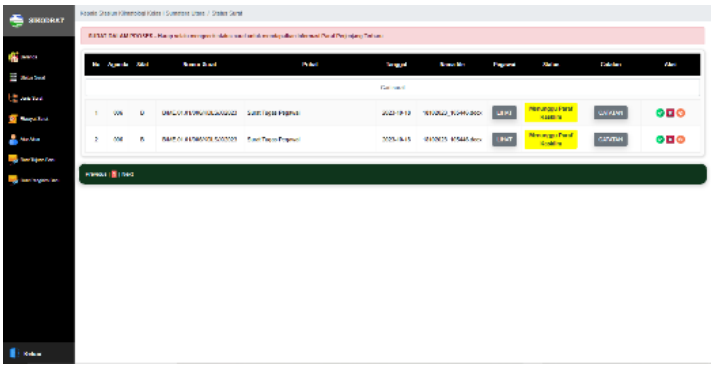

Figure 15. Approval of Letter by Kasklim

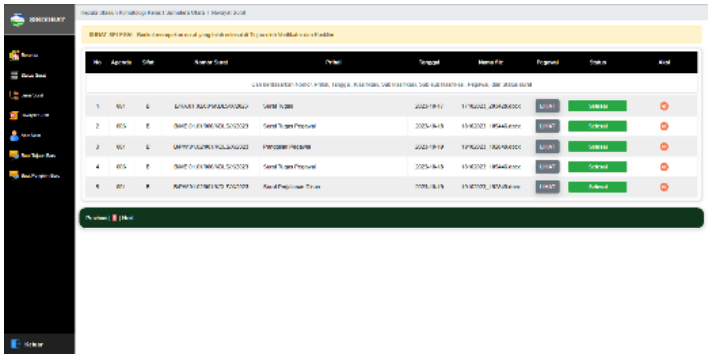

Figure 16. Completed Letter History

Next, testing will be carried out by the customer, the system that has been developed will be tested directly by the Head of North Sumatra Staklim Administration, namely Mr. Viktor Erward Hasiholan Sibuea, SE, M.Si, with an indicator assessment of whether it is suitable as a solution or not. The results of system testing carried out by the Head of North Sumatra Staklim Administration can be seen in Table 1.

Table 1. System Evaluation Results

Customer expectations (*client*)	Generate by developer (*programmer*)	Conclusing
The system can provide a good letter script format, not messy like in conventional methods	There is a feature available to download the letter script format that will be used	Enough
The system can enter letters that have been created by the Operator to be submitted to the Verifier and Kasklim	There is a create letter feature that can be used to enter letters that have been created. Apart from that, there is an automatic issuance of a letter number when a letter is submitted	Appropriate
The system can be used by three parties, namely the Verifier, Operator, and Kasklim	There are three accounts available that can be used with access rights status, namely Operator, Verifier, and Kasklim	Approviate
The system can carry out a letter checking process in the form of approval and rejection carried out by the Verifier and Kasklim	There is a feature for approving and rejecting the letter status on each page of the Verifier and Kasklim	Appropriate
The system can display the letter maked based on the employee's computer IP Address	There is a view employee button in the letter status which will display the letter maker based on IP Address	Enough

The system can save letters that have been created and display them if needed	There is a mail history feature that will save letters that have been completed or approved	Appropriate

In an effort to improve the quality of feasibility of the system that has been developed, testing using the Black Box method is required. The black box method is a test that looks at the results of execution through test data and ensures the function of the software [14], whereas according to Wahidin, black box testing is needed to find out the program is running according to what is required by the company [15], the results of black box testing can be seen in Table 2.

Table 2. Black Box Testing

Testing Description	Expected results	Conclusing
Operator, Verifikator and Kasklim fill in the username, password and access rights when they want to log in	The system accepts input of username, password, and access rights when you want to login	Valid
The operator fills in the necessary data when writing a letter	The system receives data when it wants to compose a letter	Valid
Verifier and Kasklim can provide error notes when letters are rejected	The system receives input error records provided by the Verifier and Kasklim	Valid
The Verifier and Kasklim can press the checklist (approved) and cross (rejected) buttons when checking the letter	The system receives a response when the Verifier and Kasklim want to check the letter	Valid
All accounts can enter new sender data	The system accepts the input of new sender data entered	Valid
All accounts can include new recipient destinations	The system receives input as the new recipient destinations is entered	Valid
All accounts can search for letter in the search column on the mail status and history pages	The system receives search input when it wants to search for letters	Valid
All accounts can enter new goals on the create goal page	The system receives new destination data input	Valid
All account can enter new sender on the sender page	The system receives new sender data input	Valid

4. CONCLUSION

Based on the existing problems, the author can conclude that the application that has been developed using the prototype method is the right solution to digitize outgoing letter approval activities at the Class I Climatology Station in North Sumatra. In the application there is an approval and rejection feature for outgoing letters which also aims to replace the method of Conventional becomes digitalized, from black box testing and employee evaluation it can be concluded that the application is suitable for use because it suits the employee's desires and needs. Some of the suggestions given by the author to future researchers are that the appearance of the system being developed can be improved to increase user comfort (user experience), as well as adding features such as the availability of PDF when downloading letters.

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