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Improving Complaint Service Effectiveness with Web Mobile-Based Complaint Service Information System

Indhitya R. Padiku^{*1}, Rahman Takdir², Amirrudin Paneo³

^{1, 2, 3} Information Systems, Universitas Negeri Gorontalo, Bone Bolango, Indonesia, 96583

Email: Indypadiku@ung.ac.id

ABSTRACT

UPT TIK's complaint service relies on manual methods such as physical mail and WhatsApp, resulting in challenges related to prioritization and limited technical personnel availability. To tackle these obstacles, the study advocates for the utilization of the Multi-Attribute Utility Theory as a decision-making approach. This method facilitates a thorough evaluation of various pertinent factors crucial in decision-making processes about complaint resolution. The development process of the complaint service information system adheres to the Prototype method. Initial phases entail extensive stakeholder engagement to gain profound insights into their needs and expectations regarding the new system. Subsequent meticulous planning aims to formulate effective implementation strategies. Following this, detailed system structure design is conducted to provide a comprehensive depiction of the system's architecture and functionality. Subsequently, prototype construction ensues, aimed at developing software aligned with the agreed-upon design. The final stage involves system delivery and feedback, where the developed system is disseminated for widespread implementation among end-users. User feedback serves as a valuable tool for making necessary improvements and adjustments. The implementation of this complaint service information system is anticipated to streamline the complaint resolution process, prioritize urgent complaints, and optimize the utilization of technical resources. This endeavor is poised to enhance the quality of information technology and communication services within the university setting, consequently yielding substantial benefits for the academic and administrative community as a whole. Additionally, the study also discusses practical implications and outlines directions for future research.

Keywords: Services, Complaints, Information System

Introduction

Complaint refers to the expression of dissatisfaction, either orally or in writing, related to the service or lack of actions taken by the service provider institution. This dissatisfaction can impact and be felt by service users, prompting them to provide feedback or complaints about their experiences [1]. Improving the effectiveness of reporting or complaints can be achieved through the utilization of information system technology [2]. The complaint information system refers to a platform designed to facilitate the complaint process from the public or specific entities to an institution or organization [3]. Thus, this technology aims to simplify, expedite, and enhance efficiency in handling and reporting complaints [4]. UPT TIK (Unit Pelaksana Teknis Teknologi Informasi dan Komunikasi) at Gorontalo State University operates a complaint service to enhance the quality of its complaint services [5]. However, in the current implementation of the complaint service, UPT TIK still relies on manual methods, utilizing physical letters that need to be personally delivered to the office and WhatsApp for submitting complaints. The existing system is deemed less effective and efficient because the complaint history is not well-documented, and individuals still need to visit the building and endure long waiting times for the complaints to be processed again after disposition [6].

In the resolution of complaints, issues often arise, such as delays in complaint resolution due to the necessity of prioritizing which reports to address first. Compounding this challenge is the

limitation of human resources in the technician department. The determination of which complaints to handle first is typically based on investigating the source of the complaint and assessing the deadline or requested completion time. Priority is given to complaints originating from higher-ranking sources and those with the closest deadlines. Undoubtedly, this impedes the complaint resolution process.

Based on the description of the problem above, an information system for complaint services is required at UPT TIK, Gorontalo State University. With the availability of this information system, the complaint reporting facility becomes more easily accessible to users, enabling them to report their complaints quickly and flexibly from various locations and at any time [7]. This advantage is attributed to the web-mobile-based nature of the system, allowing access through devices such as laptops or smartphones [8]. Thus, this information system provides greater accessibility for users to engage in efficient complaint reporting [9].

In determining which complaints to address first, the researcher utilizes one of the Decision Support System (DSS) methods, namely the Multi-Attribute Utility Theory (MAUT). Multi-Attribute Utility Theory is a final evaluation scheme where $v(x)$, of an object x , serves as a weight that will be added to a value relevant to its dimensional value [10]. Each criterion has several solution alternatives. Identifying alternatives that align with user preferences is done by multiplying the established priority scale. The best solution, which closely approximates user preferences, is chosen based on the results of this multiplication. This approach ensures that decision-making is based on careful evaluation and prioritizes aspects that have a high priority level according to user preferences [11].

The Information Complaint Service System of UPT TIK is developed using the prototype method. A prototype is a technique for developing systems that is consistently used, and this technique can assist developers and users in providing feedback during the development process, allowing developers to smoothly outline the software model that will be created [12]. This is based on designing a prototype as quickly as possible and obtaining feedback from users so that the prototype can be quickly improved. The main objective in designing is to serve as an instrument to provide a comprehensive view of the system, including materials and menus that need to be included in the conceptualized prototype. This method consists of five stages, namely Communication, Quick Plan, Modeling Quick Design, Construction of Prototype, and Deployment Delivery and Feedback.

Based on the issues mentioned above, the researcher will design a study titled "Improving Complaint Service Effectiveness with Web Mobile-Based Complaint Service Information System". This research is expected to address the challenges in the complaint service at UPT TIK, Gorontalo State University. With the existence of this system, it can serve as a platform to swiftly report complaints from any location. Furthermore, through the implementation of Multi-Attribute Utility Theory, it can provide recommendations on which complaints should be addressed first [13].

Method

The method applied in the development of the Complaint Service Information System at UPT TIK adopts the Prototype approach. The Prototype approach is a commonly used technique in system development, with the capability to facilitate interaction between developers and users throughout the development process [14]. This approach enables developers to easily outline the software model to be produced. The technique emphasizes the creation of prototypes in a relatively short time, which is then provided to users for feedback. With this feedback, the prototype is promptly adjusted and improved as needed.

The implementation of the Prototype method also serves an essential purpose in formulating the initial design. This design functions as a tool that provides a comprehensive overview of the system. The Prototype method consists of five stages: Communication, Quick Plan, Modeling

Quick Design, Construction of Prototype, and Deployment Delivery and Feedback. Explanations regarding these five stages are outlined in Figure 1 below. With this approach, the development of the Complaint Service Information System at UPT TIK can generate a structured and adaptive solution, aligning with the needs and feedback from the involved users.

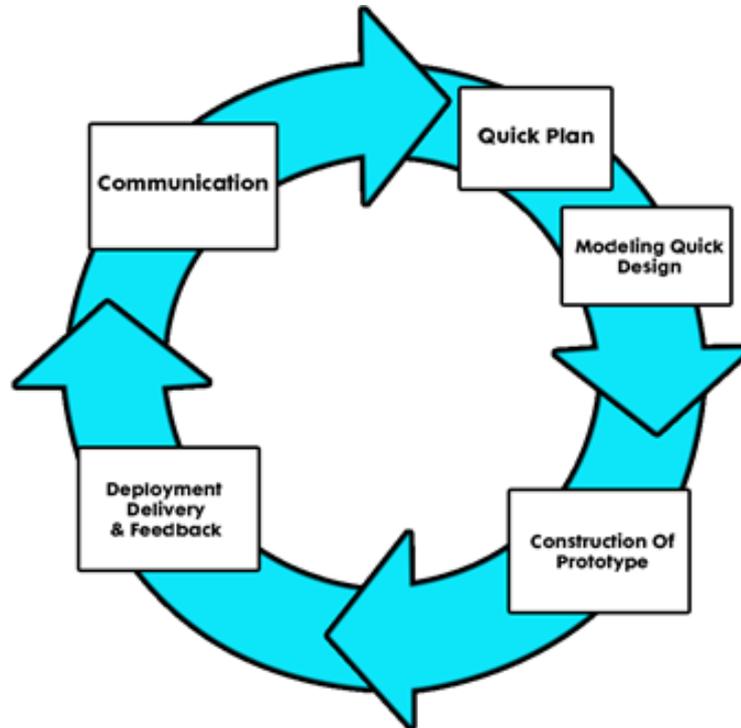


Figure 1. Prototype research method Kurniati, K. (2021)

a. Communication

In this stage, the researcher gathers all the necessary data. For the initial data collection, the researcher employs an interview approach, conducting interviews with UPT TIK at Gorontalo State University and service users, as well as directly observing or witnessing the ongoing processes there.

b. Quick Plan

After completing the communication phase, the process continues with the Quick Plan stage. In this stage, the functional system requirements are planned. Functional requirements involve an analysis of the features to be implemented in the system. The table of functional requirements for the application can provide a detailed depiction of the features and the parties involved. There are four actors involved in this application: the Director of UPT TIK, Head of Department, Technician, and User.

c. Modeling Quick Design

This phase encompasses the initial steps in designing and visually representing the system to be developed. Design and visualization involve creating the system's architecture, Use Case Diagram, Activity Diagram, Sequence Diagram, as well as designing the database and system interface.

d. Construction of Prototype

In this stage, the entire design that has been prepared is implemented into a prototype using a programming language. Once the coding process is completed, the system undergoes testing to identify any errors or issues that need correction. The testing method employed in this research is the Blackbox method [15].

e. Deployment Delivery & Feedback

In this stage, the application is presented as a finalized product that has undergone the necessary adjustments based on user needs and has also undergone testing to ensure freedom from logical errors. The built system is ready to be handed over to UPT TIK at Gorontalo State University. The system delivered to users will require further maintenance based on user needs. During the system maintenance process, it can be developed further based on user feedback.

Result and Discussion

The results of the research on the Complaint Service Information System at UPT TIK are divided into five stages: Communication, Quick Plan, Modeling Quick Design, Construction of Prototype, and Deployment Delivery and Feedback.

1. Communication

The research results in the communication stage include observations and interview findings. From direct observations, the researcher identified the complaint process flow as follows:

- 1) The complainant must visit the building of UPT TIK at Gorontalo State University.
- 2) Submit the complaint letter to the front office staff.
- 3) The front office staff dispatches the letter to the Director of UPT TIK at Gorontalo State University.
- 4) After the Director receives the complaint, a disposition letter is then created to follow up on the complaint with the relevant Department Head.
- 5) The Department Head will receive the disposition letter and proceed to address the complaint, assigning a technician to handle the follow-up.

After conducting observations, the researcher proceeded to interview the Department Head to obtain more information. Here are the results of the interview:

- 1) There are two complaint submission schemes, the first involves submitting a letter as described by the researcher in the previous observation results. The second scheme involves using WhatsApp to report complaints.
- 2) The process of submitting complaints and requests via letters takes a relatively long time due to the lengthy submission process and the need to wait for a long disposition.
- 3) In some instances, complaint letters have gone missing. This is attributed to the prolonged time the letters spent on desks and inadequate storage during the disposition process.
- 4) Lack of documentation for the history of complaints and requests is a result of the complaints being submitted only via WhatsApp, leading to the loss of letters.
- 5) There is no format for documenting the history of complaints and requests.
- 6) UPT TIK encounters difficulty in direct inspection processes by relevant departments due to the absence of a documented history of complaints.
- 7) UPT TIK faces challenges in prioritizing which complaints or requests to address first.
- 8) In monitoring complaints or user requests, users have to visit the UPT TIK building directly.
- 9) The user data list is incomplete.

2. Quick Plan

After completing the communication phase, the process continues with the Quick Plan stage. In this stage, functional requirements planning is generated. Functional requirements involve observations about the features present in this system. The table of application functionality requirements can illustrate the features and actors within the system. The actors in this application include four roles: UPT TIK Director, Head of the Department, Technician, and User. The following is the table of application functionalities:

Table 1. Application Functional Requirements

No	Application Functional Requirements	Actor
1	Registering User Accounts	User
2	User Account Login	User
3	Reporting (Complaints, Requests, Suggestions)	User
4	Monitoring Reports (Complaints, Requests, Suggestions)	User
5	Director UPT TIK Account Login	Director UPT TIK
6	Managing Complaint, Request, and Suggestion Data for all Departments (Viewing, modifying status of report data, and responding)	Director UPT TIK
7	Managing Head of Department Data (Adding, modifying status, Head of Department)	Director UPT TIK
8	Viewing Complaint, Request, and Suggestion Reports for all Departments (Viewing, printing, and downloading)	Director UPT TIK
9	Head of Department Account Login	Head of Division
10	Managing Complaint, Request, and Suggestion Data for the specified department (Viewing, modifying status of report data, and responding)	Head of Division
11	Managing Technician Data (Adding, modifying technician account status)	Head of Division
12	Viewing Complaint, Request, and Suggestion Reports for the specified department (Viewing, printing, and downloading)	Head of Division
13	Technician Account Login	Technician
14	Managing Complaint and Request Data for the specified department (Viewing, modifying status of report data)	Technician

3. Modeling Quick Design

The Quick Plan phase produces the design and visualization in the form of a Use Case Diagram, Activity Diagram. In the use case, there are four actors: User, Director, Head of Department, and Technician. Below is the Use Case Diagram for the System.

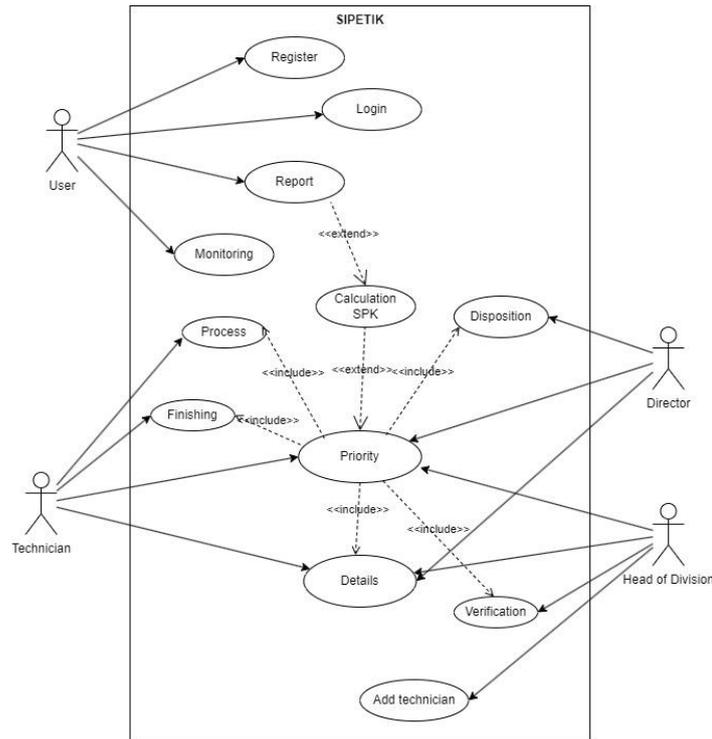


Figure 2. System use cases

4. Construction of Prototype

The next stage is the Construction of Prototype. In this stage, the entire design that has been prepared is translated into a prototype using a programming language. Below is the interface of the Information System for Complaint Services at UPT TIK Universitas Negeri Gorontalo, specifically focusing on the Reporting feature.

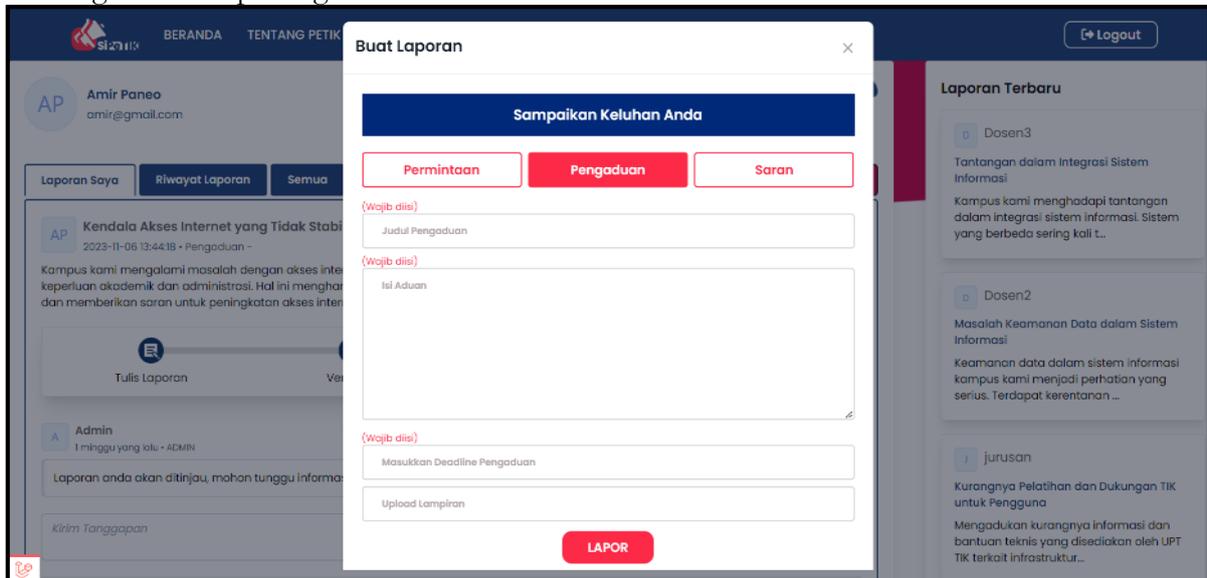


Figure 3. Reporting Page View

On the designated page for reporting, users have the ability to convey their complaints or grievances. However, to initiate the complaint reporting process, users are required to have a registered account within the system. After completing the registration process, users can proceed

with the complaint reporting process by providing various required pieces of information. This information includes the title of the complaint to be submitted, a detailed description of the complaint, the deadline for the complaint report, and the possibility of relevant attachments for the complaint. By providing these details, users can submit their complaints completely and in accordance with the existing regulations. It is essential to note that this reporting page is not limited to complaints alone. Users also have the ability to submit requests based on their needs or expectations and provide constructive suggestions to improve the services provided. All these elements come together to create a holistic and complementary information-sharing ecosystem, allowing users to interact with services more extensively and effectively.

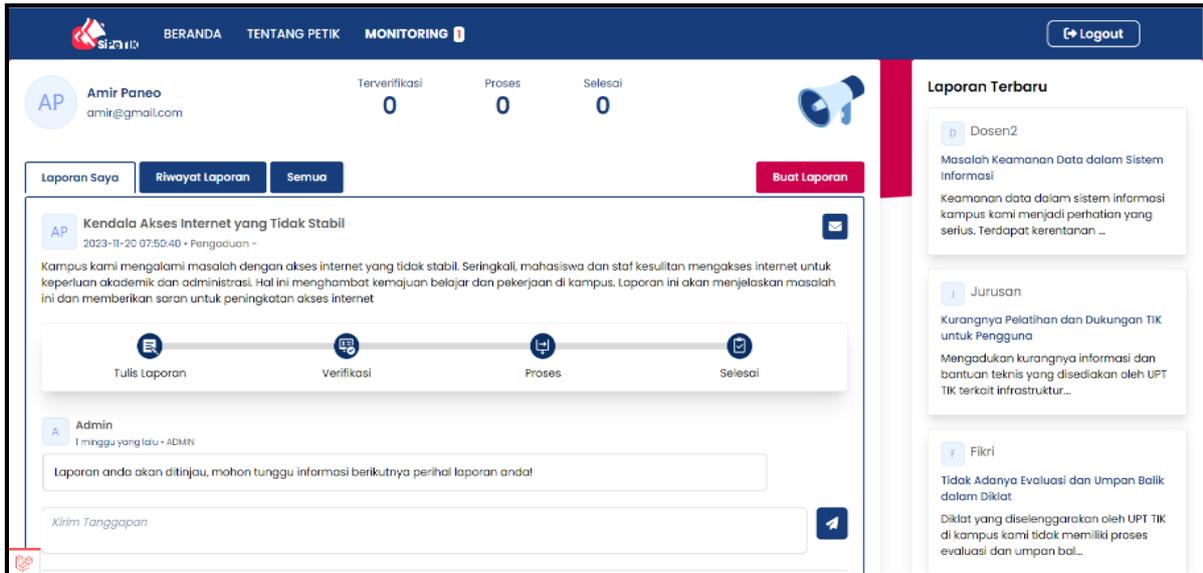


Figure 4. Monitoring page display

On this page, users are given the opportunity to view or monitor the progress of previously submitted complaints. Additionally, on this page, users also have the ability to interact with the UPT TIK through the available chat column. Through this feature, the UPT TIK can provide responses related to the submitted reports, and conversely, users also have the opportunity to provide feedback in the form of interactive responses.

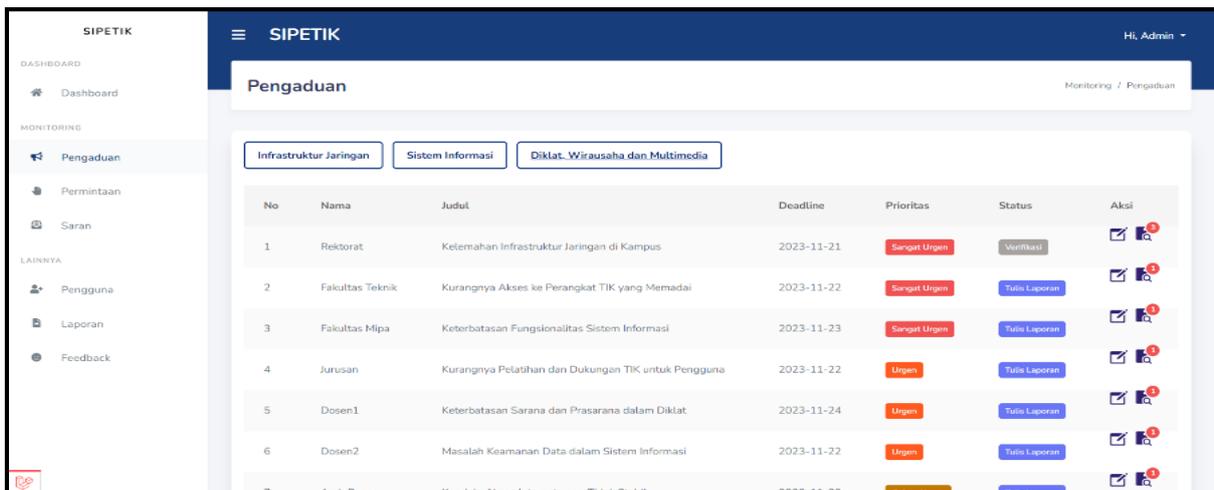


Figure 5. Complaint Priority Page Display

On this page, there is a table detailing recommendations regarding complaints that will be prioritized for immediate attention. On this page as well, the execution of the disposition, verification, process, and resolution stages is carried out by the Director, Head of Department, and Technician. These steps are executed through the available edit action buttons. Furthermore, on this page, there is also a detailed action button that functions to allow users, be it the Director, Head of Department, or Technician, to inspect the report in more detail. In addition to serving as a means of more comprehensive information, the detailed action button also provides an opportunity for users to provide feedback on the report.



Figure 6. Display of the Director's user Complaint Disposition Page

On this page, users with the role of Director are expected to carry out the disposition action on the complaint report by directing it to the Head of Department (Kabid). This process requires interaction with the user interface where the Director is required to press the disposition button, resulting in the appearance of a modal form. Subsequently, the Director will be prompted to choose the most appropriate departmental destination for the content of the complaint report to be directed.

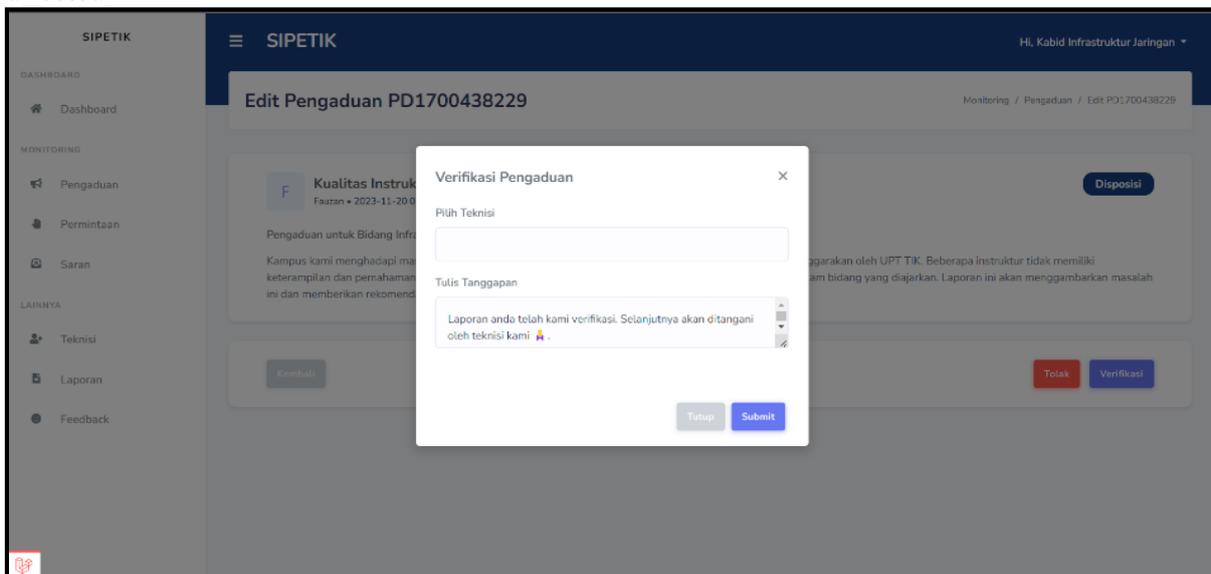


Figure 7. Display of the Kabid user's Complaint Verification Page

After successfully being dispositioned to the Head of Department (Kabid), the complaint report faces the verification stage conducted by the Kabid. The Kabid initiates the verification process by pressing the verification button, triggering the appearance of an input modal form. In this stage, the Kabid has the responsibility to select the technician deemed most suitable for handling and resolving the complaint report. The selection of the technician is based on considerations of skills, knowledge, and technical expertise relevant to the nature and content of the complaint report. The verification process by the Kabid is not only a critical step in managing the complaint report but also determines the next workflow to respond to and resolve the issues disclosed in the report. The Kabid plays a central role in ensuring that the complaint report is carefully verified before being assigned to the right technician, maintaining the integrity and efficiency in handling the complaint.

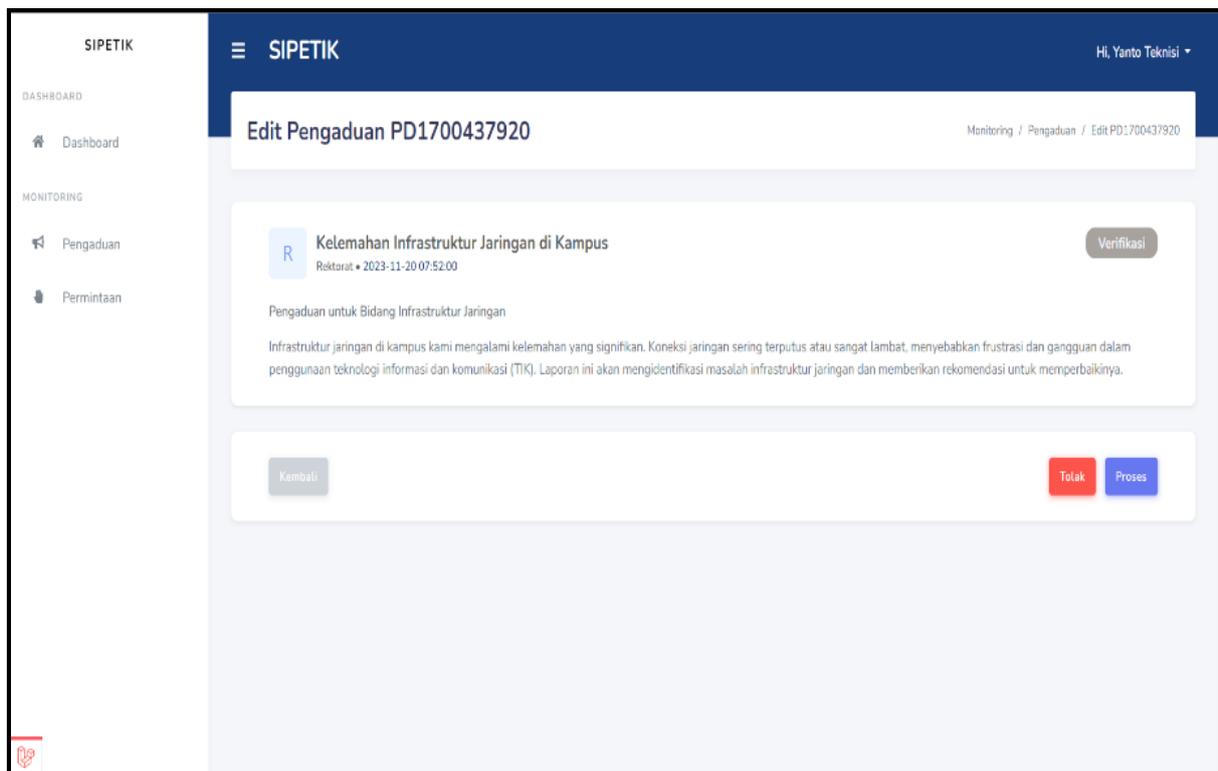


Figure 8. Display of the Technician user process page

On this page, the primary role of technicians is to process complaint reports that have been confirmed by the Head of Department (HoD). The process begins by pressing the "process" button on the page interface, which changes the status of the report to "in progress." This not only provides a visual cue to users but also allows them to monitor progress through the previously provided monitoring page. The "process" button is key to facilitating a smooth transition from the verification stage to concrete steps for resolving the complaint, providing transparency on the progress of work related to the reported issue. By emphasizing the importance of the technicians' role, the "process" button serves not only as the main control for concrete actions but also helps bridge the gap between verification and active resolution. Thus, this page not only enhances the effectiveness of the complaint service but also provides clarity to users about the steps taken to respond to and resolve the issues they have reported.

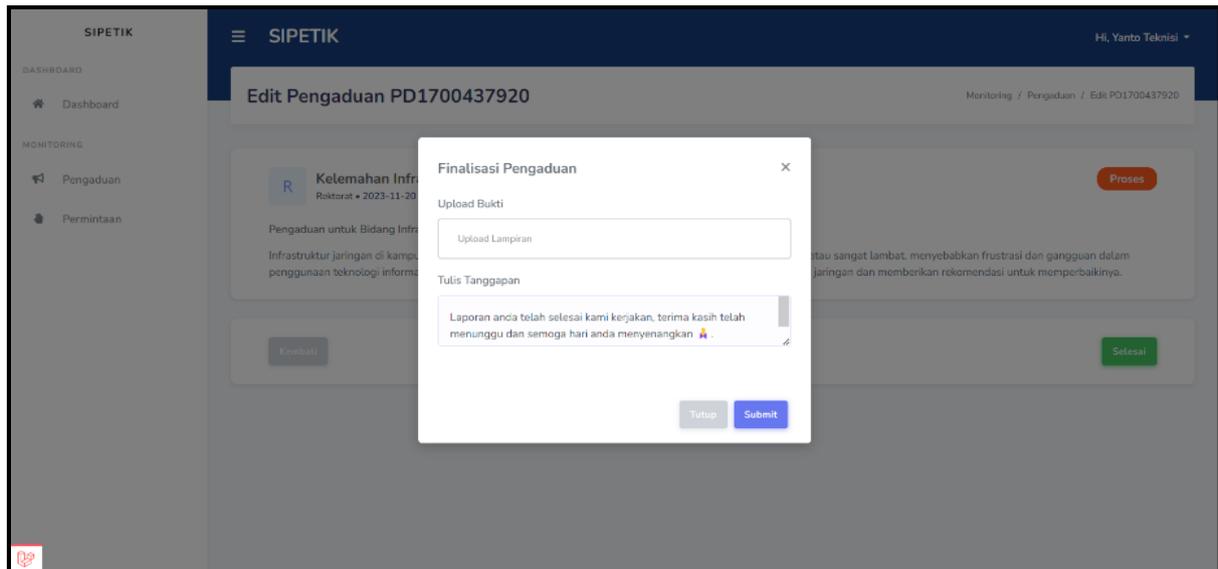


Figure 9. Display of the Technician User Complaint Finishing Page

This page functions as a platform to change the status of the complaint report to "completed." The process begins when a technician takes action by pressing the "complete" button, which provides access to an additional input form. In this stage, technicians are given the opportunity to include concrete and adequate evidence to validate the completion of the complaint report. This evidence can take the form of documents, photos, or videos that clearly demonstrate that the task has been successfully completed. After completing the finishing stage, users can see that the status of their report has been updated to "completed." Furthermore, users have the ability to access and review the evidence uploaded by the technician as visual confirmation regarding the resolution of the complaint report. This process creates transparency and ensures that users have a clear view of the handling and resolution of each complaint they report.

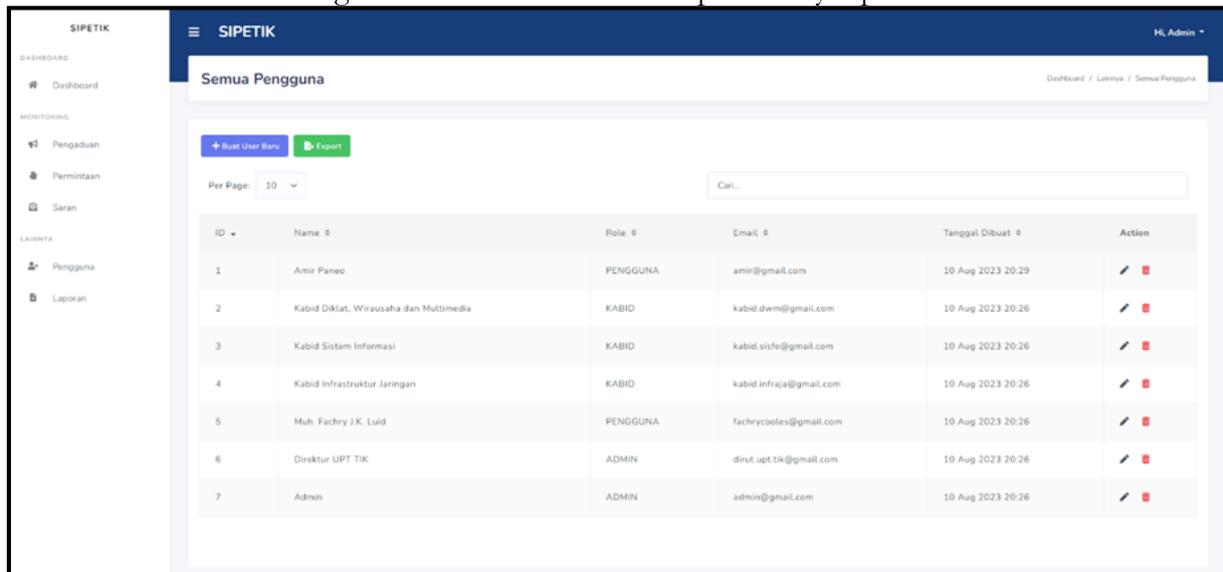


Figure 10. User page view

The User Page is a part of the system designed to manage registered accounts within it. Additionally, this page provides options for adding technician accounts to the system. There is also a function that allows users to update information related to their accounts. Furthermore, this page

provides action buttons for deleting accounts, giving users the option to remove accounts that are no longer needed in the system.

Table 2. Blackbox Testing Reporting Page

Input	The resulting output	Results observation	Conclusion
Select the request button	Displays the request form	Displays the request form	in accordance
Enter the request title, request category, request content, request deadline, and request attachments	Displays a successful reporting message	Displays a successful reporting message	in accordance
Enter only one input	Displays form content messages correctly	Displays form content messages correctly	in accordance
Select the complaint button	Displays the complaint form	Displays the complaint form	in accordance
Enter the complaint title, complaint category, complaint content, complaint deadline, and complaint attachments	Displays a successful reporting message	Displays a successful reporting message	in accordance
Enter only one input	Displays form content messages correctly	Displays form content messages correctly	in accordance
Select the suggestion button	Displays the suggestion form	Displays the suggestion form	in accordance
Enter the suggestion title, suggestion category, suggestion content, and suggestion attachments	Displays a successful reporting message	Displays a successful reporting message	in accordance
Enter only one input	Displays form content messages correctly	Displays form content messages correctly	in accordance

Table 3. Blackbox Testing Monitoring Page

Input	The resulting output	Results	Conclusion
Select the monitoring menu	The monitoring page appears	observation	in accordance
Pressed my report button	My report page appears	The monitoring page appears	in accordance
Press the report history button	displays the report history page	My report page appears	in accordance

Input	The resulting output	Results	Conclusion
Press the all button	Displays a page of all reports	displays the report history page	in accordance
Input	The resulting output	Displays a page of all reports	Conclusion
Select the monitoring menu	The monitoring page appears	Results	in accordance
Pressed my report button	My report page appears	observation	in accordance

Table 4. Blackbox Testing User Page

Input	The resulting output	Results	Conclusion
Select the technician menu	Displays the technician page	Displays the technician page	in accordance
Press the create new user button	Displays the add user form	Displays the add user form	in accordance
Pressing the submit button	Displays a success message	Displays a success message	in accordance
Select the technician menu	Displays the technician page	Displays the technician page	in accordance
Press the create new user button	Displays the add user form	Displays the add user form	in accordance

Table 5. Blackbox Testing Disposition Page

Input	The resulting output	Results	Conclusion
Press the Disposition button	Displays the input capital page	Displays the input capital page	in accordance
Choose the field you want to target	Displays the field to go to	Displays the field to go to	in accordance
Pressing the submit button	Displays a success message	Displays a success message	in accordance
Press the reject button	Displays a success message	Displays a success message	in accordance
Pressing the back button	Redirect to the complaints page	Redirect to the complaints page	in accordance

Table 6. Blackbox Testing Verification Page

Input	The resulting output	Observation result	Conclusion
Press the Verify button	Displays the input capital page	Displays the input capital page	in accordance

Input	The resulting output	Observation result	Conclusion
Selecting a technician	Displays the selected technician	Displays the selected technician	in accordance
Pressing the submit button	Displays a success message	Displays a success message	in accordance
Press the reject button	Displays a success message	Displays a success message	in accordance
Pressing the back button	Redirect to the complaints page	Redirect to the complaints page	in accordance

Table 7. Blackbox Testing Process Page

Input	The resulting output	Results	Conclusion
Press the Process button	Displays the input capital page	Displays the input capital page	in accordance
Pressing the submit button	Displays a success message	Displays a success message	in accordance
Press the reject button	Displays a success message	Displays a success message	in accordance
Pressing the back button	Redirect to the complaints page	Redirect to the complaints page	in accordance

Table 8. Blackbox Testing Finishing Page

Input	The resulting output	Results	Conclusion
Pressing the Finish button	Displays the input capital page	Displays the input capital page	in accordance
Entering evidence	Show evidence	Show evidence	in accordance
Pressing the submit button	Displays a success message	Displays a success message	in accordance
Pressing the back button	Redirect to the complaints page	Redirect to the complaints page	in accordance

5. Deployment Delivery & Feedback

In this stage, the steps taken are part of the completion process and the introduction to the handover of the developed application. The application undergoes a series of refinements to ensure that it meets user needs and has undergone thorough testing to minimize the possibility of logic errors. Thus, the successfully built application is the result of coordinated efforts to provide a reliable solution in accordance with the specified specifications.

After the development and testing processes are completed, the system will be handed over to UPT TIK Universitas Negeri Gorontalo. At this stage, responsibility for system maintenance and usage is transferred to end users. This process requires collaboration between developers and users to ensure a smooth transition and provide necessary guidance.

Once the system is implemented, the maintenance process becomes crucial. System maintenance involves not only addressing potential technical issues but also updates based on user feedback. This approach provides a dynamic framework, allowing the system to evolve in line with user needs and potential environmental changes. Thus, the system handover and maintenance process are not just the end but the beginning of an ongoing journey to support sustainability and flexibility in the built application.

Conclusion

Based on the findings revealed in this research, it can be concluded that the development of the complaint service system by UPT TIK has been successfully implemented through the Prototype method, involving five main stages: Communication, Quick Plan, Modeling Quick Design, Construction of Prototype, and Deployment Delivery and Feedback. This development process allows the management of complaint reports to be well-organized, resulting in more efficient complaint handling. It is essential to note that not only the success of prototype development but also the application of the Multi-Attribute Utility Theory (MAUT) has proven to contribute positively. MAUT is used as a tool to provide prioritized recommendations for complaints that need to be addressed first. This approach assists in selecting reports that have a significant and urgent impact, optimizing the overall efficiency of the complaint handling process. Thus, the results of this research indicate that the approach taken in the development of the complaint service information system has successfully created a structured, efficient system that meets the needs. The integration of information technology and the application of decision-support methods through MAUT prove that this system can make a positive contribution to improving service quality and optimizing complaint management in the UPT TIK environment at Universitas Negeri Gorontalo. The importance of integrating information technology and decision-making methods in complaint management creates an adaptive and responsive system to environmental demands. Therefore, the implementation of this system is expected to have a positive and sustainable impact on the efficiency and quality of services provided by UPT TIK. Ultimately, the results of this research provide a solid foundation for the development and improvement of complaint service systems in higher education institutions and similar environments. Suggestions for future researchers include the hope for further development in more diverse versions, such as mobile versions for Android and iOS, as well as desktop versions. Additionally, it is expected that the system can be enhanced by adding more criteria for use in the decision-making process of the decision support system (DSS), ensuring even more accurate prioritization of complaints.

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