

Development of Complaint Report Dashboard Module for TIAS Admin

Pengembangan Modul Dashboard Laporan Pengaduan Untuk Admin TIAS

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ABSTRACT

The Academic Informatics Engineering System (TIAS) is the application of information technology to support the management of academic operations and administration in the university environment. This system is designed to optimize the educational process, including student data management, curriculum administration, academic performance evaluation, administrative staff management, and handling complaints related to facilities and infrastructure. This research aims to design and evaluate the implementation of TIAS as a solution to improve the efficiency and effectiveness of academic services in the digital era which is characterized by the increasing complexity of academic needs. The research methodology used includes the development of a waterfall-based system, system functional testing, and user evaluation through a five-level Likert scale based survey. The number of respondents in this study was 35 users consisting of students and administrative staff. The results of the evaluation showed that TIAS obtained an average score of 4.42 for the aspect of ease of use, 4.38 for the speed of access to information, and 4.46 for overall user satisfaction. Quantitatively, the implementation of TIAS was able to reduce non-follow-up reports by up to 32% and accelerate the provision of academic reports by 40% compared to the previous manual system. Thus, TIAS has been proven to be able to improve operational efficiency, provide accurate academic data for decision-making, and support the personalization of academic services through access to real-time information for users.

Keywords: TIAS; Complaint Reports; Efficient; Information Systems and Data Management

ABSTRAK

Sistem Teknik Informatika Akademik (TIAS) merupakan penerapan teknologi informasi untuk mendukung pengelolaan operasional dan administrasi akademik di lingkungan perguruan tinggi. Sistem ini dirancang untuk mengoptimalkan proses pendidikan, meliputi pengelolaan data mahasiswa, administrasi kurikulum, evaluasi kinerja akademik, pengelolaan staf administrasi, serta penanganan pengaduan terkait sarana dan prasarana. Penelitian ini bertujuan untuk merancang dan mengevaluasi implementasi TIAS sebagai solusi peningkatan efisiensi dan efektivitas layanan akademik di era digital yang ditandai oleh meningkatnya kompleksitas kebutuhan akademik. Metodologi penelitian yang



digunakan meliputi pengembangan sistem berbasis waterfall, pengujian fungsional sistem, serta evaluasi pengguna melalui survei berbasis skala Likert lima tingkat. Jumlah responden dalam penelitian ini sebanyak 35 pengguna yang terdiri dari mahasiswa dan staf administrasi. Hasil evaluasi menunjukkan bahwa TIAS memperoleh nilai rata-rata 4,42 untuk aspek kemudahan penggunaan, 4,38 untuk kecepatan akses informasi, dan 4,46 untuk kepuasan pengguna secara keseluruhan. Secara kuantitatif, penerapan TIAS mampu menurunkan laporan non-tindak lanjut hingga 32% dan mempercepat penyediaan laporan akademik sebesar 40% dibandingkan sistem manual sebelumnya. Dengan demikian, TIAS terbukti mampu meningkatkan efisiensi operasional, menyediakan data akademik yang akurat untuk pengambilan keputusan, serta mendukung personalisasi layanan akademik melalui akses informasi real-time bagi pengguna.

Kata kunci: TIAS; Laporan Pengaduan; Efisien; Sistem Informasi dan Pengelolaan Data

INTRODUCTION

The rapid development of technology has prompted many changes, including in the world of education. This leads to the use of technology as a means of information and communication in learning (Saputra et al., 2024). One of the media that is widely used in the world of education today is the website. The website functions to provide information quickly, safely, and easily accessible (Zahir, 2023).

Managing complaint reports is often challenging, especially when it comes to monitoring, analyzing, and resolving them. TIAS admins need dashboards to view report trends, determine resolution priorities, and evaluate the performance of handling complaint reports. Therefore, a dashboard module is needed that is able to present complaint report data in real-time and interactively, so that it can make it easier for TIAS admins to manage and follow up on complaints effectively and efficiently (Alda et al., 2024).

This research aims to develop a complaint report dashboard module that can be used by TIAS admins to monitor and analyze reports in real-time. This development is carried out through several stages that begin with an analysis of user needs. At this stage, data collection is carried out through interviews, questionnaires, and literature studies to identify the specific needs of TIAS admins in managing complaint reports, including the desired features in the dashboard module. Next, the system design stage is carried out, where the dashboard module architecture is designed based on the findings of the needs analysis. This design includes the development of an intuitive and user-friendly user interface (UI), as well as an efficient workflow design to support the process of monitoring and analyzing reports (Dewi et al., 2023).

The next stage is the implementation of the dashboard module, where the design that has been made is applied using the appropriate web-based technology. This implementation process involves software development, integration with existing TIAS systems, as well as initial testing to ensure basic functionality runs smoothly. After the dashboard module is successfully implemented, a testing and evaluation stage is carried out which includes functionality tests to ensure all features work according to specifications, as well as performance tests to assess the speed and stability of the system in handling complaint report data in real-time. Evaluation is also carried out through feedback from TIAS admins who use this module in their work environment, to measure its impact on the effectiveness and efficiency of complaint report management. The hypothesis proposed in this study is that the use of the developed dashboard module will increase the effectiveness and efficiency of complaint report management by TIAS admins. In addition, this module is expected to help admins analyze report trends, prioritize handling, and improve responses to complaints received

PROBLEM STATEMENT

The formulation of this research problem is how to implement the TIAS (Academic Informatics Engineering System) information system based on statistical dashboards and maps in the management of student complaint reports at the Informatics Engineering Study Program of Ibn Khaldun University (UIKA) Bogor to overcome the delay in resolving complaints that exceed the Service Level Agreement (SLA), data inconsistencies due to manual logging, and the absence of a previous integrated monitoring

system, as shown by empirical findings that academic dashboards are able to improve service speed and data consistency.

LITERATURE REVIEWS

Information Systems

Information systems are systems that work together to collect data, process and process it, and display the processed data into useful information for making decisions. Information systems are very important in a university environment because they can make time more efficient in data processing and the necessary information can be easily known.

Website

A website or web is a page displayed on the internet that usually contains certain information according to each one's needs. The web is compiled by the World Wide Web technology standards body, this standard is intended to make the web itself more compatible in its increasingly varied uses.

Waterfall Method

Waterfall is a traditional software engineering process model that suggests a systematic and sequential approach to software development. The model starts with the specification of the requirements by the customer and continues through phases such as planning, modelling, construction, and deployment, ultimately leading to the continued support of the finished software.

React.js

React.js is an open source JavaScript library developed by Facebook to facilitate the development of interactive, stateful, and reusable user interface components. React is used to handle the display layer in an application that implements a single-page concept.

Next.js

Next.js is one of the JavaScript frameworks used to create website applications. In its implementation, Next.js consider several things such as the process of rendering websites being done on the server side so that web pages can be displayed faster in web browsers, making website performance better, and implementing projects is easy to do, which allows developers to develop website applications by implementing server-side rendering.

Application Programming Interface (API)

An API is a software interface that consists of a set of instructions that are stored in the form of a library and explain how the software can interact with other software.

Unified Modelling Language (UML)

Unified Modelling Language (UML) is a tool for visualizing and documenting results and designs that contain syntax in a visual modelling system. It is also a collection of modelling conventions used to define or draw a software system associated with an object. Definable UML is used to define requirements, perform analysis, design and describe architectures in object-oriented programming. The UML design that is created consists of several things, namely: a list of actors, a list of use cases, a context diagram, a use case diagram, a sequence diagram, and an active diagram.

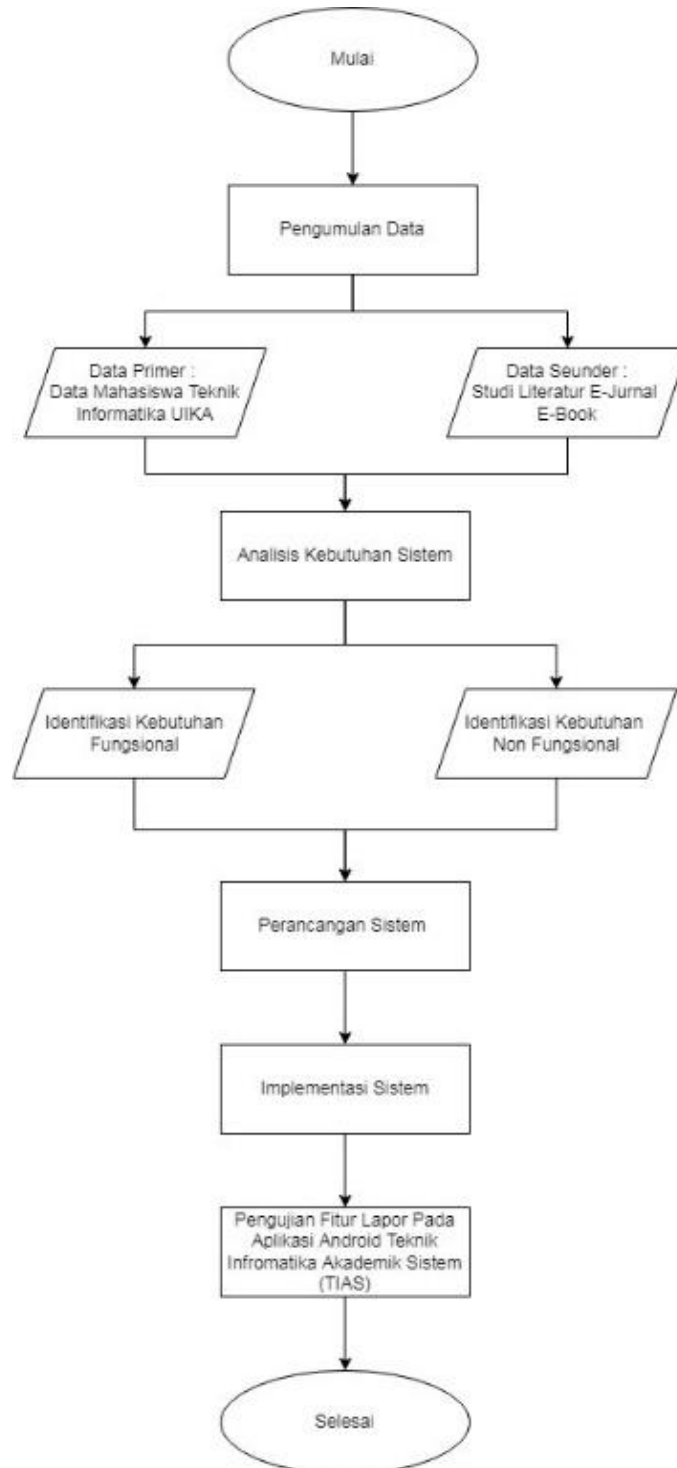
Java Script Object Notation (JSON)

JavaScript Object Notation (JSON) is a data exchange format that is lightweight, easy to read and write by humans, and easy to translate and generate by computers.

METHODOLOGY

The model starts with the specification of the requirements by the customer and continues through phases such as planning, modelling, construction, and deployment, ultimately leading to the continued support of the finished software. Below are the steps taken to support the research process so that the research carried out can run more structured and systematic. As shown in Figure 1.

Figure 1: Stages of Research Method



Data Collection

The data collection process is carried out to obtain information relevant to the research needs of the development of the Academic Informatics Engineering System (TIAS). The data used is divided into two types, namely primary data and secondary data. Primary data was obtained through data collection and distribution of questionnaires to active students of the Informatics Engineering Study Program, Ibn Khaldun University Bogor as well as interviews with TIAS admins. The sample in this study consisted of 120 students as system users and 5 admins as complaint report managers. Secondary data was

obtained through literature studies and documentation studies sourced from scientific journals, books, e-books, research reports, as well as documents related to the development of the academic complaint report dashboard system.

System Analysis Stage

The analysis stage is the process of identifying and formulating the needs of the system to be built. Analysis was carried out on the functional and non-functional needs of the system, the flow of the complaint report process, the data structure, and the architecture of the TIAS system. In addition, an analysis of previous system problems was carried out, such as delays in handling complaints, data inconsistencies, and the absence of an integrated monitoring dashboard.

System Design Stage

The system design stage is carried out by applying the concept of Object Oriented Design (OOD). The system modelling uses a Unified Modelling Language (UML) which includes a Use Case Diagram to describe the user's interaction with the system, an Activity Diagram to explain the flow of the complaint reporting process, and a Class Diagram to represent the class structure and relationships between objects in the system.

System Implementation Stage

The implementation stage is the process of making programs based on the design of the system that has been designed. TIAS is developed on a website-based basis using the JavaScript programming language, ReactJS as a user interface library, and Next.js as a framework for managing application routing and rendering. Implementation is carried out until the system can be run and used by students and admins.

Data Analysis Techniques

The data analysis techniques used in this study include quantitative descriptive analysis. The questionnaire data was analyzed by calculating the average score and percentage of respondents' answers using a five-level Likert scale to assess ease of use, system speed, clarity of information, and user satisfaction. The results of the analysis were used to evaluate the acceptance and effectiveness of the TIAS system.

System Testing Stage

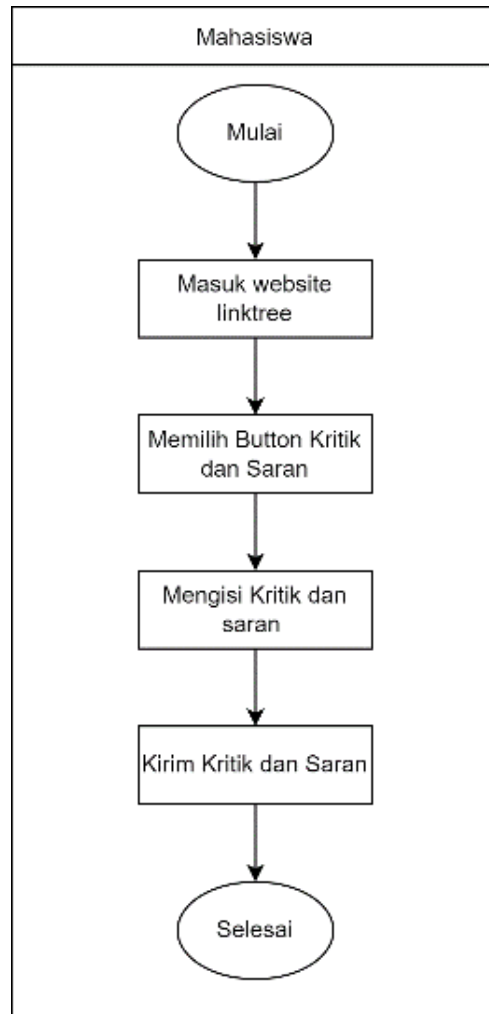
The system testing stage is carried out to ensure that all system functions run according to the predetermined needs. The test method used is blackbox testing, which is a test that focuses on the functionality of the system without paying attention to the structure of the program's code.

FINDINGS AND DISCUSSION

Analysis

1. Problem Analysis

Based on the problems that occurred in the Informatics Engineering Study Program, Ibnu Khaldun University Bogor, when making criticisms or complaint reports related to problems with facilities or infrastructure within the Faculty of Engineering & Science, precisely in the Informatics Engineering Study Program it is still not efficient, so the time needed and the process is quite long. The following system is currently running which is shown in Figure 2.

Figure 2: Running system

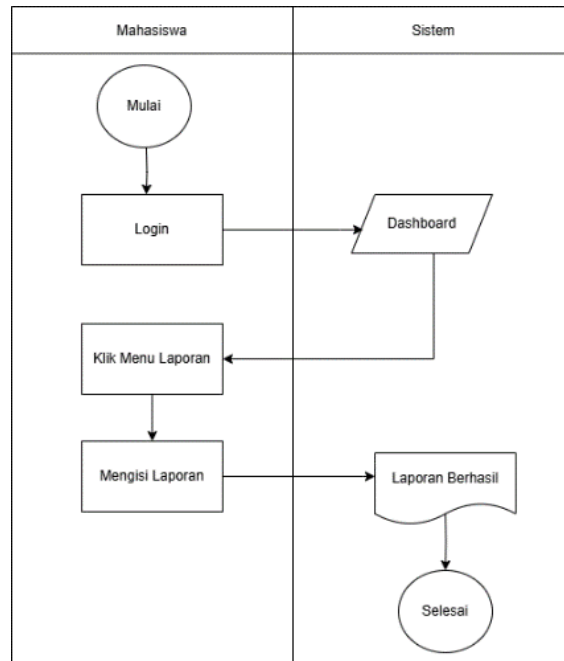
2. Data Collection

Data collection is carried out by collecting data, in the form of secondary data obtained from available sources and related to research through literature, related journals.

3. Troubleshooting

Designing and building an Academic Informatics Engineering information system at the Informatics Engineering Study Program of Ibnu Khaldun University Bogor to help users, namely students, lecturers and also Administrative Staff in the process of accessing academic information related to complaint reports related to facilities and infrastructure, academics, scholarships, student affairs and also community service. The following is a flowchart of the proposed system for the solution of the problem shown in Figure 3.

Figure 3: Proposed system



4. Modelling

Modelling consists of context diagrams, use case diagrams, activity diagrams, class diagrams, sequence diagrams and database design and user interface design.

Admin Diagram Use Cases

The Admin Use Case Diagram describes how the admin interacts with the system. It can be seen in Figure 4.

Figure 4: Use the case diagram admin

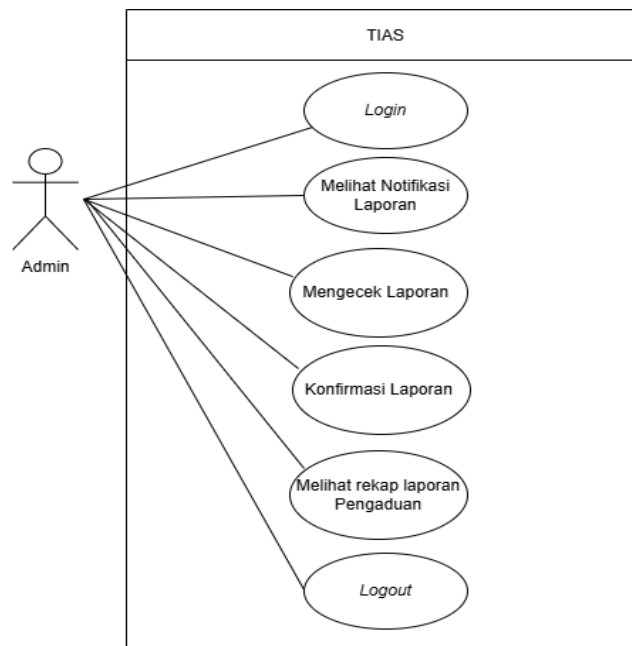


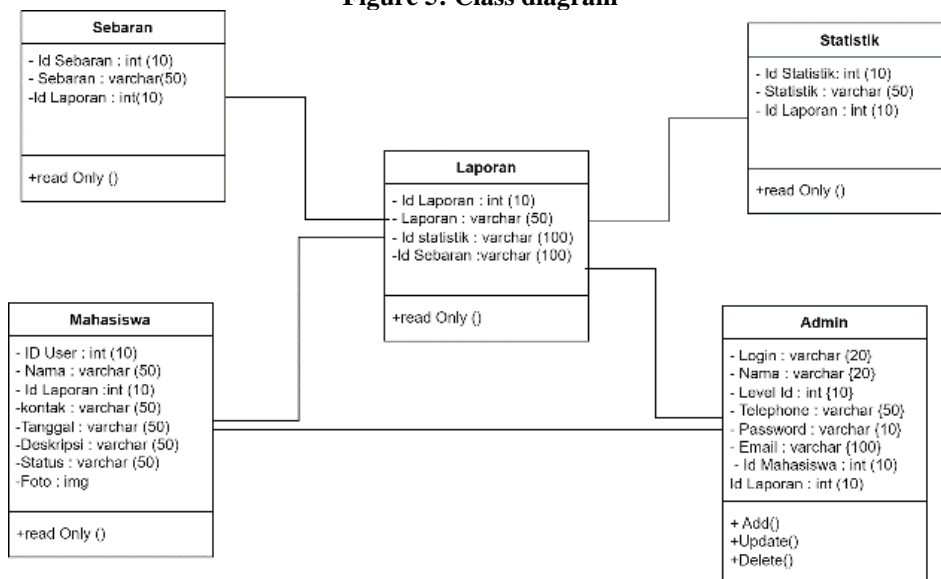
Table 1: Use the case diagram admin

Use Cases Name	Actors	Description
Log in	Admin	This use case serves to authenticate so that actors can log into the system.
View Complaint Report	Admin	This use case allows admins to view all complaint reports
View Recap of Complaints	Admin	This use case serves to allow admins to view a summary of the data of the complained report.
Making a Complaint Report	Admin	This use case serves as an admin to create a report from the results of complaints.

Class Diagram

This Diagram class displays the execution code of the software application, as well as visualizes the various system elements, database structures, and system pages that have been designed. This class of diagrams can be found in Figure 5.

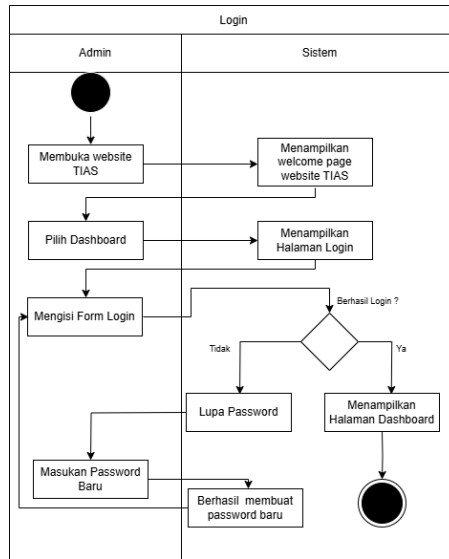
Figure 5: Class diagram



Activity Diagram Login

The activity diagram described in this study is an extension or further explanation of the use case diagram, which outlines the concrete steps that occur in the system usage scenario. The Login Activity chart visualizes the steps required when an admin wants to access the system. To log in to the system, the admin must first have a TIAS account if you do not need to register through the TIAS website account. After having an account, the admin is then asked to enter the username and password that has been registered. Details of these steps can be seen in the activity diagram in Figure 6.

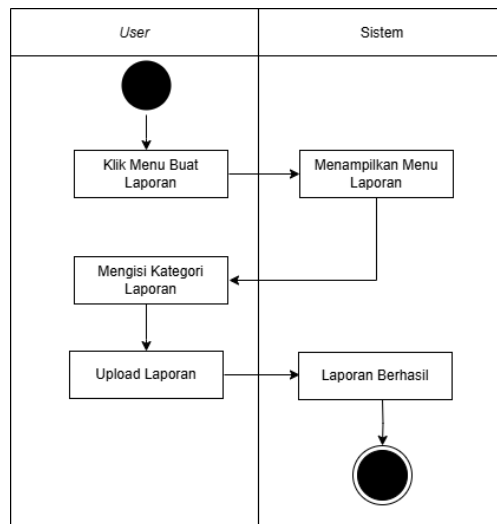
Figure 6: Login Activity Diagram



Report User Activity Chart

The user report activity chart is the process of submitting a user report. Details of these steps can be found in the activity chart. The following is a diagram of the student's profile activity in Figure 7.

Figure 7: Activity Chart Report Features



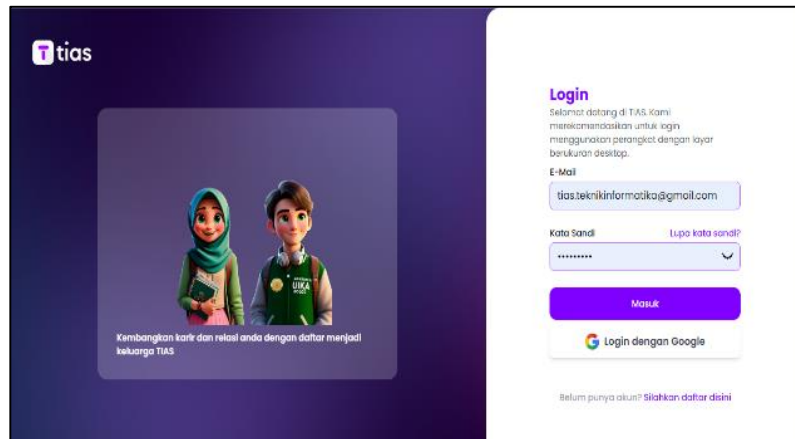
Modelling

In the application of the system, the main focus is to apply the concept of statistical graphs and also maps to find out student complaint reports. This aims to make it easier for admins to record student complaint report data and also find out in real time related to complaints reported by students, as well as reduce reports that are not followed up due to inefficient data collection and immediately find out the point where problems occur.

Login Page

The Login page is the starting page when a user opens a website or app. There is a requirement to log in, which is to use the email address and password that the student has created. There is also a "forgot password" feature so that students who forget their passwords can use this feature, if the wrong email or password is eaten, a failure message will appear in the input process as shown in Figure 8.

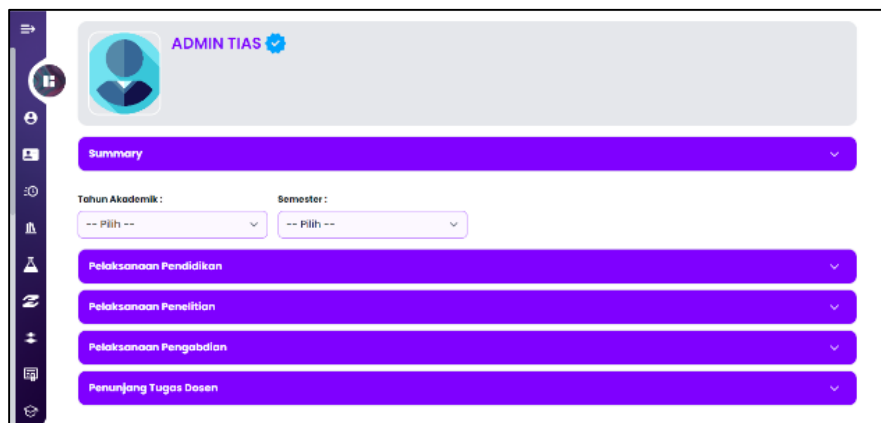
Figure 8: Login View



Dashboard Page

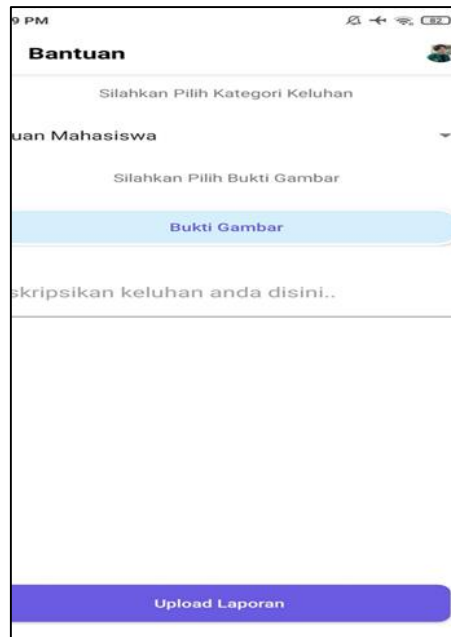
The Dashboard page is the main page that appears after the user successfully logs in. On this page, users can see the bound implementation categories, namely education, research, competencies, support and qualifications and on the dashboard page there is a feature where students can file complaints about TIAS reports and e-voting. As shown in Figure 9.

Figure 9: Dashboard View



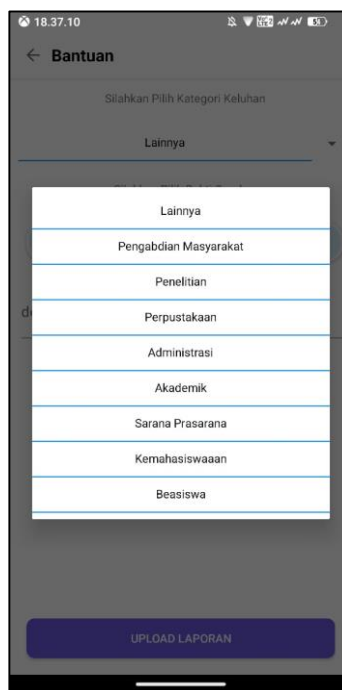
Report Features Page

This report feature page is a feature where students will complain about reports related to facilities or infrastructure problems. As shown in Figure 10.

Figure 10: Feature view of the report

Report Category Page

This report category page is a page where the reporting feature that will be complained by students is related to several attached things such as student complaints, application damage reports, facilities and infrastructure, scholarships, community service and other types of complaints, as shown in Figure 11.

Figure 11: Report Category View

Report Page

The Report page contains a list of the results of complaints from students and a recap of this page contains each report complained through the application. And on this page it is also explained in detail from the time of the complaint, the type of complaint the student's name and npm as well as the contact of the student who filed the complaint, as shown in Figure 12.

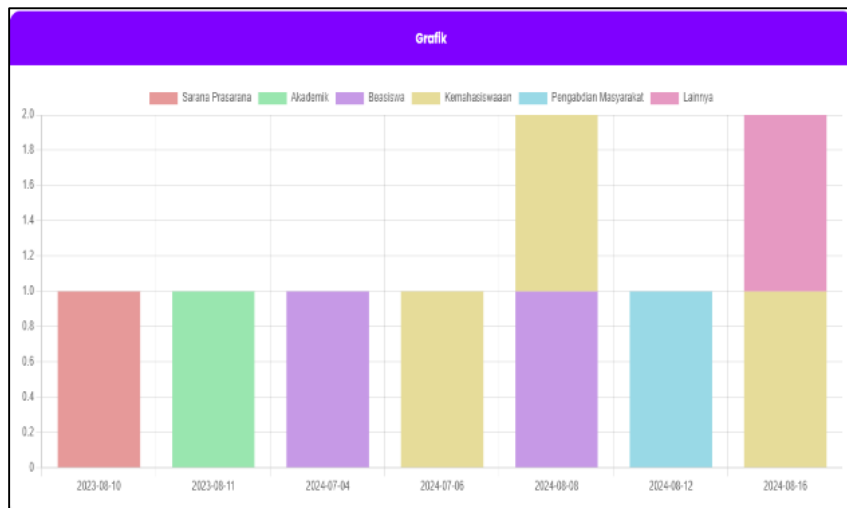
Figure 12: Display of Report Results

No	NPM	Kontak	Tanggal	Deskripsi	Status	Foto	Action
1	MOCHAMMAD TAMAM MUIYA 201106040472	tamammulya21@gmail.com 089538187480	17 Agustus 2024 pukul 13.28	berhasil melakukan voting kaprodi	MULAI		
2	MOCHAMMAD TAMAM MUIYA 201106040472	tios.teknikinformatika@gmail.com 0895349139240	17 Agustus 2024 pukul 13.27	berhasil voting	MULAI		
3	Fitrah Satriya Fajar Kusumah, M.Kom.	tios.teknikinformatika@gmail.com 0895349139240	12 Agustus 2024 pukul 23.57	test	MULAI		

Statistical Data Report Page

The Statistical Data Report page displays a diagram of student complaint reports and also the results of frequently complained reports. As shown in Figure 13.

Figure 13: Statistical Data Display



Data Map Report Page

This Data Map Report page displays the points where students complain about reports related to problems, whether it's facilities or infrastructure. As shown in Figure 14.

Figure 14: Map Data Report View



System Testing Stage

The system testing stage is carried out to ensure that all system functions run according to the predetermined needs. The test method used is blackbox testing, which is a test that focuses on the functionality of the system without paying attention to the structure of the program's code.

Blackbox Test Results

Table 2: Black box testing

No.	Tested Features	Testing Scenarios	Expected Results	Test Results	Verdict
1	User Login	User enters a valid username and password	The system displays the dashboard page	Confirm	Accepted
2	Complaint Report Input	Students fill out and submit a complaint form	Complaint data is stored and displayed	Confirm	Accepted
3	Dashboard Statistics	Admin opens the dashboard page	Complaint graphs and maps appear	Confirm	Accepted
4	Complaint Status Management	Admin changes the status of the complaint	Complaint status successfully updated	Confirm	Accepted
5	System Logout	User logs out of the system	System returns to the login page	Confirm	Accepted

Based on the results of the blackbox test, all the main features of TIAS function according to the needs of the system, so that the application is declared suitable for use in the management of academic complaint reports at the Informatics Engineering Study Program, Ibn Khaldun University Bogor.

CONCLUSION

Based on the results of the research, it can be concluded that the development of a complaint report dashboard module for TIAS admin that utilizes statistical graphs and maps has been successfully implemented and is functioning well. The results of the blackbox test showed that all the main features

of the system were running according to the set functional requirements. The application of data visualization in the form of graphs and maps has proven effective in simplifying the recapitulation process and monitoring student complaint reports, especially complaints that have not been resolved or have not been followed up. This dashboard module increases admin productivity by accelerating the identification of the most frequently occurring types of complaints, clarifying the distribution of the location of facilities and infrastructure problems, and reducing manual processes in data processing. In addition, the integration of complaint reports through the TIAS system allows students to submit complaints in a structured and well-documented manner, thus facilitating the verification and follow-up process by admins. With a real-time monitoring dashboard, this system is able to increase compliance with *Service Level Agreements* (SLAs) and reduce complaint resolution times, as admins can prioritize complaints based on status, category, and location distribution. Overall, this module contributes to improving the efficiency of academic services and the quality of complaint management within the Informatics Engineering Study Program, Ibn Khaldun University Bogor. As a recommendation, the TIAS system needs to be further developed into an integrated academic information system, including student data management, scheduling, assessment, academic communication, as well as complaints about facilities and infrastructure, and is designed to be responsive so that it can be optimally accessed through desktop and mobile devices. The development of this system also has the potential to be implemented on a wider scale, such as at the faculty level and Ibn Khaldun University Bogor as a whole, in order to improve the quality of information technology-based academic services.

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