

The Development of Report Features on Android-Based Mobile Applications (TIAS)

Pengembangan Fitur Laporan pada Aplikasi Mobile (TIAS) Berbasis Android

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ABSTRACT

The rapid development of technology has driven significant changes in various sectors, including education, with technology increasingly being used as a means of information and communication in learning. One of the media that is often used in education is the website, which allows the dissemination of information quickly, safely, and easily. Currently, the student reporting system in the Informatics Engineering study program of UIKA Bogor is still carried out manually using paper, especially for reporting damage to facilities and infrastructure that has an impact on the learning process. This manual process presents a number of issues, such as long wait times, slow report handling, and wasted resources. In addition, administrative staff have to manually check documents, which slows down the data collection process. As a solution, this study proposes the development of a report feature in the TIAS (Academic Informatics Engineering System) information system that allows online reporting of student complaints. The implementation of this feature not only simplifies administration, but also reduces the risk of file corruption or loss, as well as increases efficiency in report management. In addition, this feature makes it easier for students to access information related to their complaint reports. This research will focus on the development of report features on the Android-based TIAS mobile application, which is expected to be an effective solution in handling student complaint reporting problems more efficiently than the manual method that is still used today.

Keywords: Android; TIAS (Academic Informatics Engineering System); Online Reporting

ABSTRAK

Perkembangan teknologi yang pesat telah mendorong perubahan signifikan di berbagai sektor, termasuk pendidikan, dengan teknologi yang semakin dimanfaatkan sebagai sarana informasi dan komunikasi dalam pembelajaran. Salah satu media yang sering digunakan dalam pendidikan adalah website, yang memungkinkan penyebaran informasi secara cepat, aman, dan mudah diakses. Saat ini, sistem pelaporan kemahasiswaan di program studi Teknik Informatika UIKA Bogor masih dilakukan



secara manual menggunakan kertas, khususnya untuk pelaporan kerusakan sarana dan prasarana yang berdampak pada proses pembelajaran. Proses manual ini menghadirkan sejumlah masalah, seperti waktu tunggu yang lama, penanganan laporan yang lambat, serta pemborosan sumber daya. Selain itu, staf tata usaha harus memeriksa dokumen secara manual, yang memperlambat proses pengumpulan data. Sebagai solusi, penelitian ini mengusulkan pengembangan fitur laporan dalam sistem informasi TIAS (Teknik Informatika Akademik Sistem) yang memungkinkan pelaporan aduan mahasiswa secara online. Implementasi fitur ini tidak hanya mempermudah administrasi, tetapi juga mengurangi risiko kerusakan atau kehilangan berkas, serta meningkatkan efisiensi dalam pengelolaan laporan. Selain itu, fitur ini mempermudah mahasiswa dalam mengakses informasi terkait laporan aduan mereka. Penelitian ini akan berfokus pada pengembangan fitur laporan dalam aplikasi mobile TIAS berbasis Android, yang diharapkan dapat menjadi solusi efektif dalam menangani masalah pelaporan aduan mahasiswa secara lebih efisien dibandingkan metode manual yang masih digunakan saat ini.

Kata kunci: Android; TIAS (Teknik Informatika Akademik Sistem); Pelaporan online

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 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).

Currently, the student reporting system in the Informatics Engineering study program of UIKA Bogor is still carried out manually using paper, starting from reporting facilities and infrastructure that have been damaged so that they interfere with the learning process (Alda et al., 2024). This can cause various problems, such as the length of time waiting for complaints that have been reported, complaints that are slow and not acted upon, and wasteful use of ink and paper. In addition, the informatics engineering administration staff must also check each document submitted by students one by one, which makes the data collection process slow.

Therefore, there needs to be a more efficient solution to overcome the above problems, By applying the report feature to the TIAS (Academic Informatics Engineering System) information system, student complaint reports can be made online. This not only makes administration easier, but also reduces the risk of file corruption or loss. Thus, the application of report features can increase administrative efficiency (Dewi et al., 2023).

In addition to administrative benefits, the report feature on the TIAS (Academic Informatics Engineering System) information system, allows students to get complaint report information, this makes it easier to access information for students.

Based on the background that has been described, this research will concentrate on "Development of Android-Based Mobile Application Report Features (TIAS)". With the creation of this feature, it is hoped that it will be an efficient solution in reporting student complaints and can overcome problems related to reporting student complaints manually.

PROBLEM STATEMENT

Based on the problems that have been explained in the description above, the formulation of the problem was obtained, namely how to implement the android-based TIAS (Academic Informatics Engineering System) information system in the process of reporting student complaints in the Informatics Engineering Study Program of UIKA Bogor?

LITERATURE REVIEWS

Website

A website or web is a page displayed on the internet that usually contains certain information according to its individual 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 website rendering process that is done on the server side so that the web page can be displayed faster in the web browser, making the website performance better and implementing projects easier to do, which allows developers to develop website applications by applying 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 activity diagram.

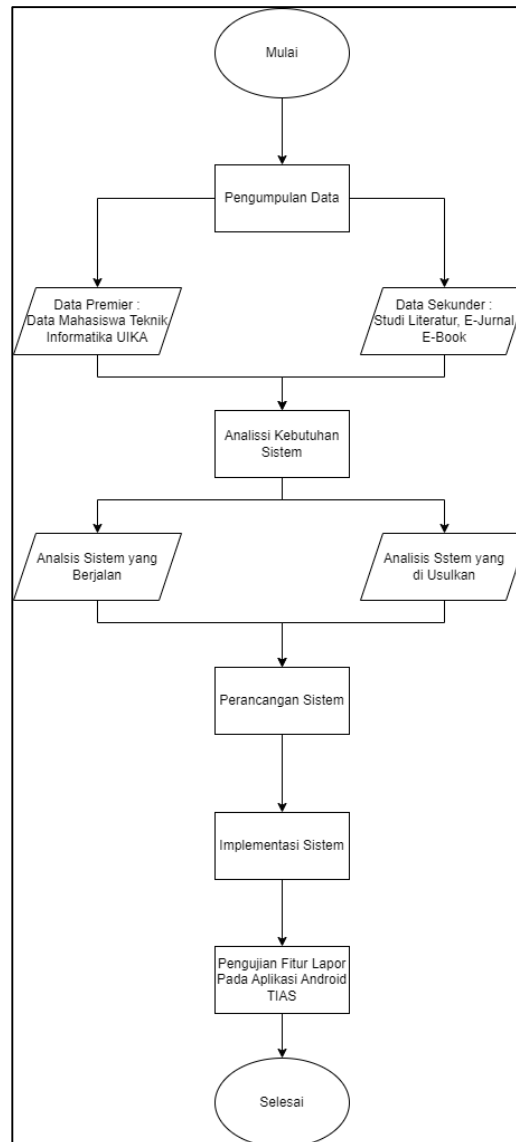
Java Script Object Notation (JSON)

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

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: Research Flow Diagram



The data collection process is a stage carried out to obtain data related to the needs of this research. This stage is divided into primary and secondary data. Primary data is information obtained through data collection from all students of the Informatics Engineering Study Program who are active at Ibnu Khaldun University Bogor. Secondary data is data obtained in addition to research objects from various sources through literature studies and documentation studies related to the creation of reporting features on Android-based TIAS applications from various sources such as journals, books, e-books, reports and others. The analysis stage is the process of analyzing the needs of the system to be created, including the analysis of the system architecture, process analysis, and analysis of the system data to be made. The next stage is system design, which is the design process by applying the concept of OOD (Object Oriented Design) through UML which is used, among others, Use case Diagram, Activity diagram, Class Diagram.

At this stage, the process of implementing the program (coding) from system design to program code that can be understood by the system. This website-based TIAS uses the JavaScript programming

language with ReactJS and Next.js as the library and framework used in its development. Once the program is created, a testing stage is carried out to test the overall functionality of the system to ensure that all functions have worked properly. The test was carried out using the blackbox method.

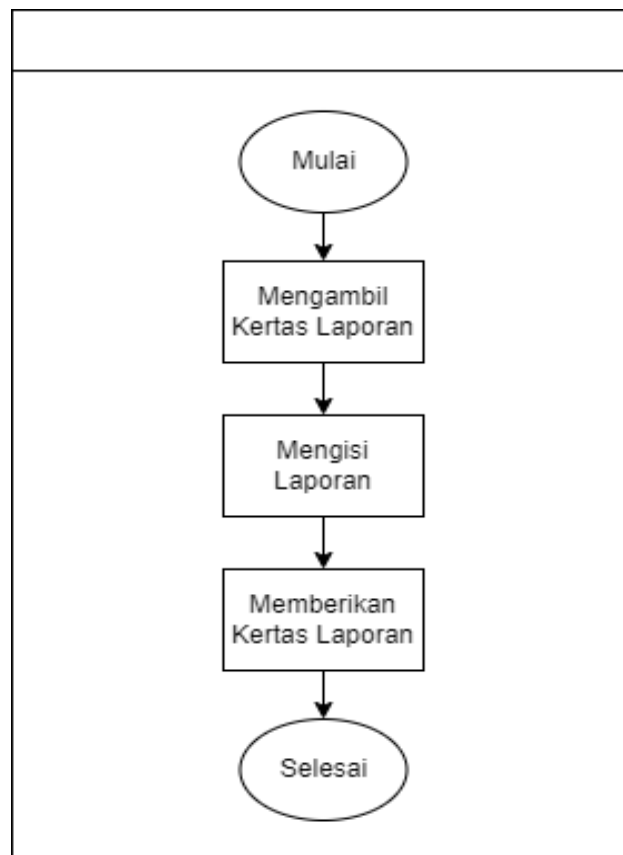
FINDINGS AND DISCUSSION

Analysis

Problem Analysis

Based on the problems that occurred at Ibnu Khaldun University Bogor, when carrying out the administrative report process to the administrative staff, it was still done manually, so the time needed was inefficient and the process was quite long. The following system is currently running which is shown in Figure 2.

Figure 2: Running System



Data Collection

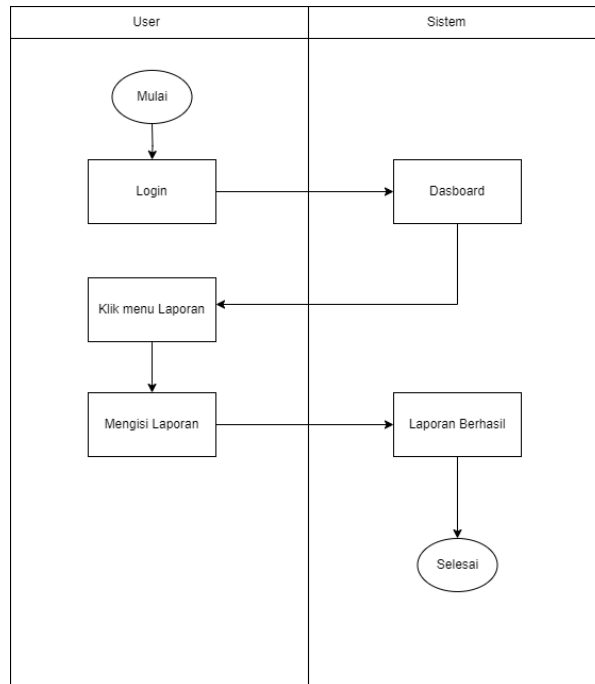
Data collection is carried out by collecting data, in the form of Secondary Data obtained from available sources and related to research through literature, related journals.

Troubleshooting

Designing and building a report system within the Informatics Engineering Study Program and Laboratory to assist users, namely Students, Lecturers in the process of reporting information on facilities and infrastructure problems, academic reports and student reports, and various other administrative reports.

The following is a flowchart of the proposed system for the solution of the problem shown in Figure 3.

Figure 3: Proposed system

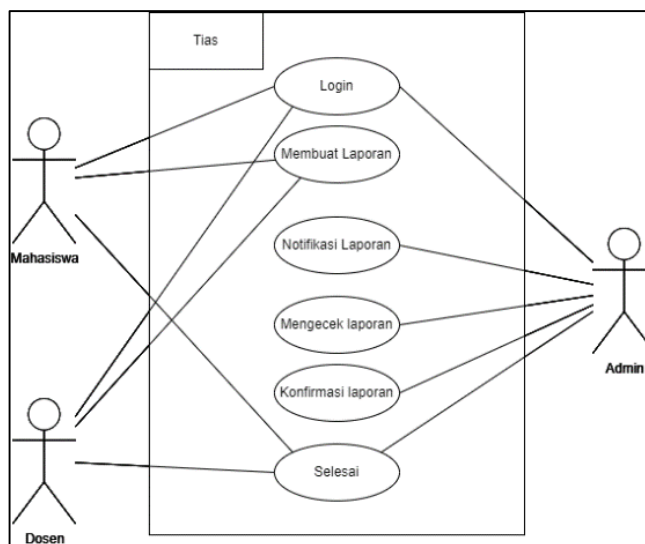


Planning

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

Use Case Diagram

Figure 4: Use case diagram



The Use Case Diagram shows the interaction between having full access to manage links and users, whereas Users can only view and edit profiles, their own actors (Admins and Students and Lecturers) with the system. Can be seen in Figure 4.

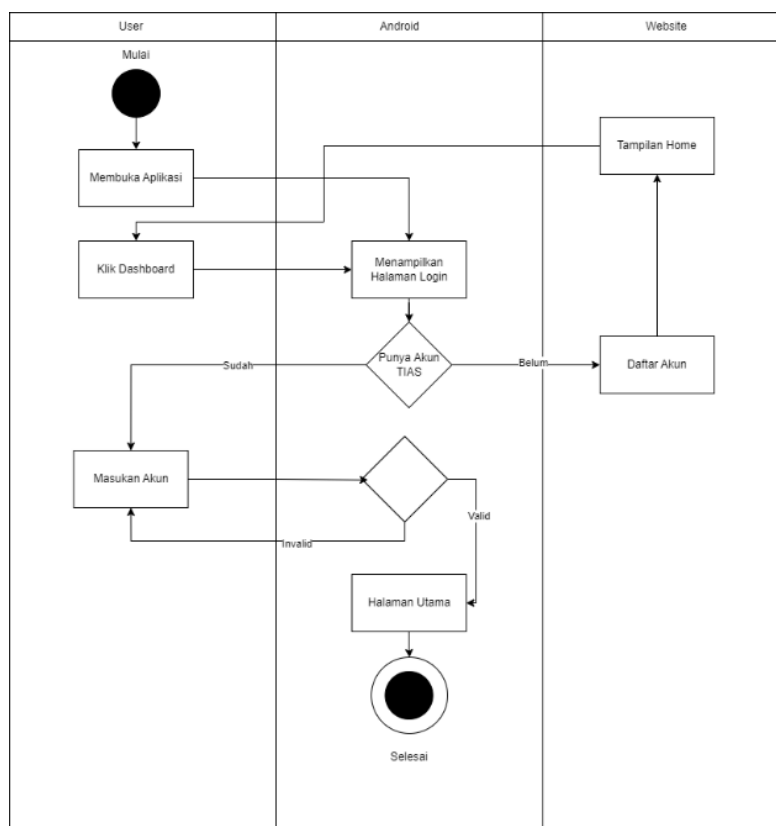
Activity Diagram

An activity diagram is a visual representation that describes the sequence of activities that occur in a process or system. This includes the start of the activity, the course of the activity process, and the termination of the activity. 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.

1. Activity Diagram Login

The login activity diagram visualizes the steps required when a user wants to access the system. To log in to the system, users must first have a TIAS account if not, they must register through the TIAS website. After having an account, users are then asked to enter the username and password that has been registered. Details of these steps can be seen in Figure 5.

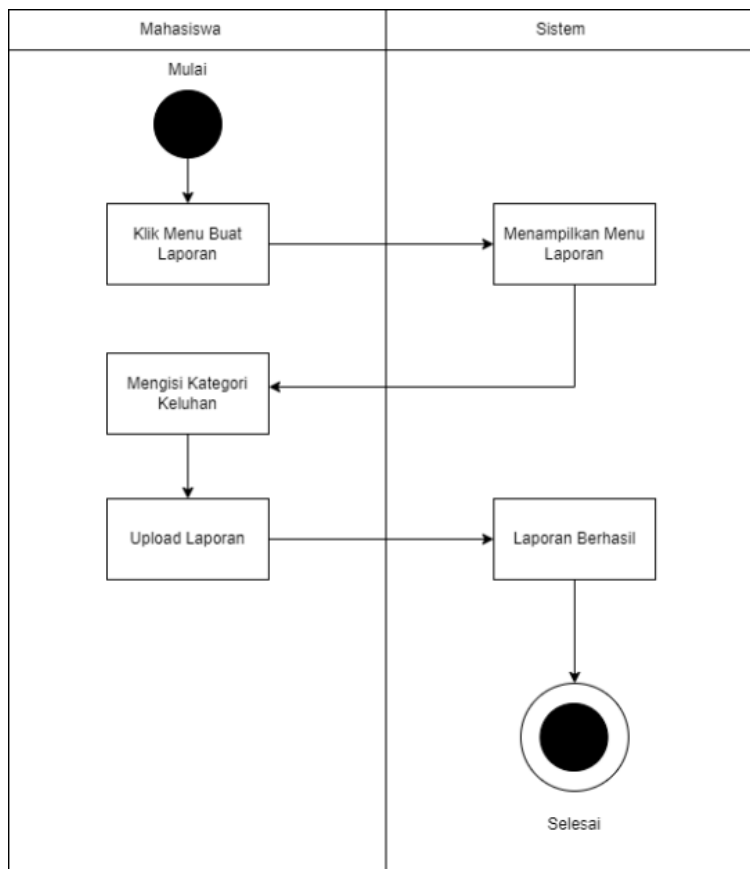
Figure 5: Activity Diagram Login



2. Activity Chart User Report Features

The activity chart files a report from the user process that submitted the report. Details of these steps can be seen in the following activity diagram Activity Chart Report Features in Figure 6.

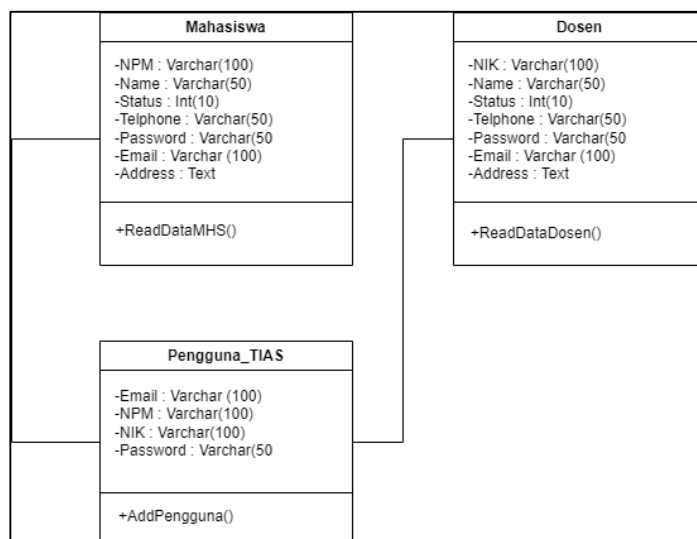
Figure 6: Activity Diagram Report Features



Class Diagram

Based on the analysis and design that has been carried out, an Android-based TIAS report feature was built to make it easier for students to report problems in the TIAS system.

Figure 7: Class diagram

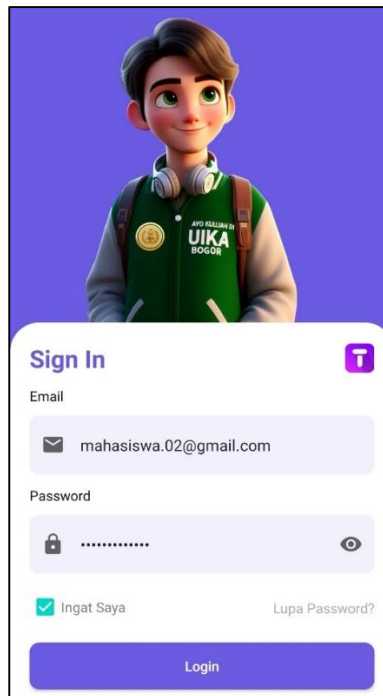


Login Page

The login page is a page that students, lecturers and admins access before logging in to the dashboard page and this page will display a login form. Users will be required to log in to the account

using an email and password to be able to log in to the main page of the website. The login page can be seen in Figure 8 below.

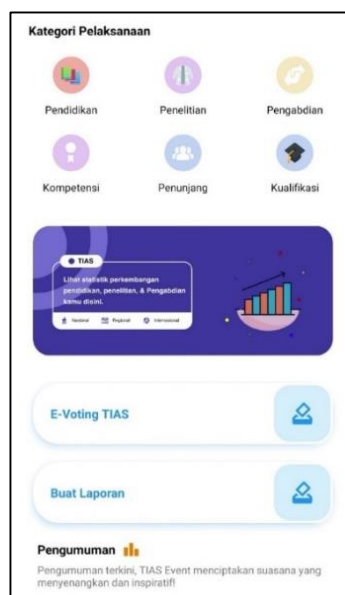
Figure 8: Login page



Dashboard Page (User)

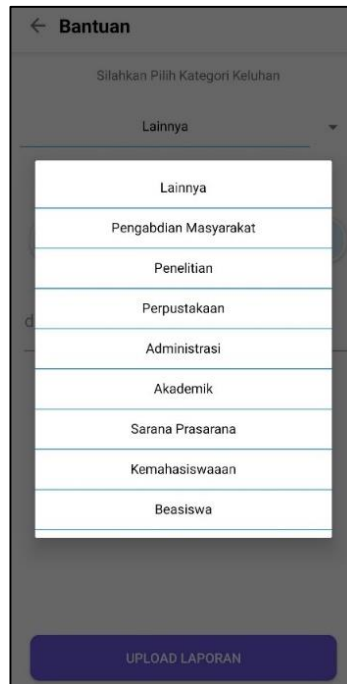
The Dashboard page is a page that students and lecturers access after logging in to the login page and this page will display the dashboard menu and report menu. The dashboard page can be seen in Figure 9.

Figure 9: User dashboard



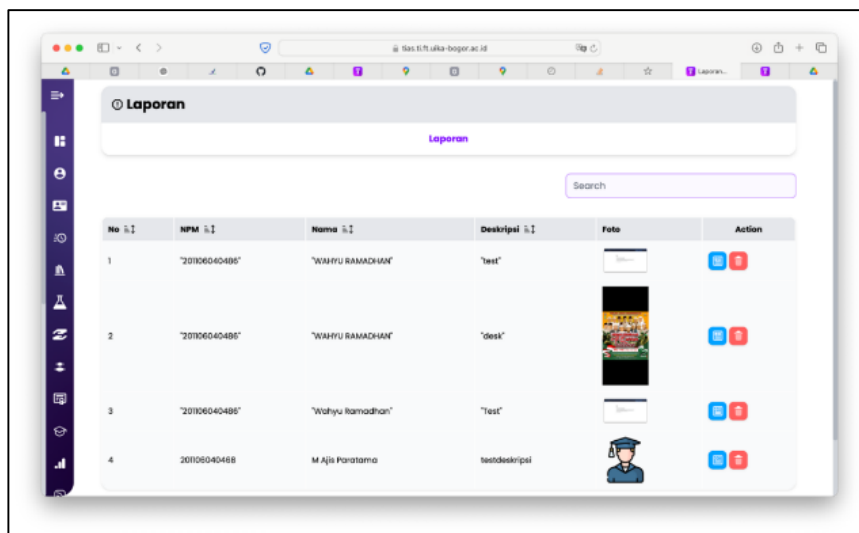
Report Category Page (Users)

The report page is a page that students and lecturers access after entering the dashboard page and this page will display the report menu. Users will be prompted to enter the issue they want to report. The report page can be seen in Figure 10.

Figure 10: Report categories

Report Feature Page (Admin)

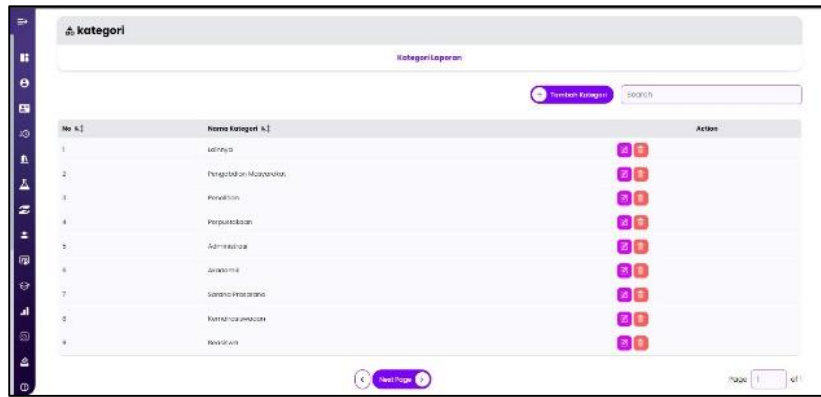
The report admin page is the page that the admin accesses after logging in to the dashboard page and this page will display all submitted reports. Admins will be asked to confirm the reported issue. The admin report page can be seen in the following image in Figure 11.

Figure 11: Report features page (admin)

Report Category Page (Admin)

The admin report category page is the page that the admin accesses after logging in to the dashboard page and this page will display all the submitted report categories. Admins can also add report category types can be seen in Figure 12.

Figure 12: Report category page (admin)



Functional Testing (Black-Box Testing)

Black-box testing was performed on all core functions of the reporting feature, including login, report submission, report listing, report status updates, and category management. The results are shown in Table 1.

Table 1: Summary of Black-Box Testing Results

Feature Tested	Expected Result	Actual Result	Status
Login	User can log in with valid credentials	Works as expected	Pass
Submit report	Report successfully submitted and saved	Works as expected	Pass
View report list	All user reports displayed accurately	Works as expected	Pass
Admin confirms report	Status changes and notification sent	Works as expected	Pass
Add report category	Category saved to database	Works as expected	Pass

All functionalities tested successfully with a 100% pass rate, indicating that the developed features are functionally stable.

Usability Testing (System Usability Scale / SUS)

Usability testing involved **25 respondents**, consisting of Informatics Engineering students and administrative staff.

- Average SUS Score = 82.4 (Excellent / Grade A) According to SUS interpretation, scores above 80 indicate:
- High usability
- Low learning difficulty
- Users strongly prefer the new system over manual reporting

Participants highlighted that reporting through TIAS is faster, easier, and more transparent.

Performance Testing (API and Load Time)

Performance evaluations included measuring the API response time and the page load time of the report feature.

Performance Results:

Parameter	Result	Interpretation
API response time (avg)	289 ms	Very Good (below 500 ms)
Mobile page load time	1.8 seconds	Good (under 3 seconds)
Report submission process	< 2.5 seconds	Optimal

These findings indicate that the TIAS mobile reporting feature performs well and responds quickly on standard mobile devices.

Comparison with Manual System

A comparison study was conducted to measure efficiency improvement after using TIAS.

Table 2: Manual vs TIAS System Comparison

Indicator	Manual System	TIAS System	Improvement
Report processing time	15–20 minutes	3–5 minutes	≈ 75% faster
Error rate in report recording	10–15%	1–3%	≈ 85% fewer errors
Document loss risk	High	None	Eliminated
User satisfaction	58%	91%	+33%

Key Findings:

- The TIAS reporting feature reduces processing time by approximately 75%.
- Human error decreases by 85%.
- Overall user satisfaction increased significantly.

CONCLUSION

Based on the discussion and implementation carried out in the research, the conclusion obtained is that the student reporting system in the Informatics Engineering study program of UIKA Bogor is still carried out manually using paper, especially for reporting damage to facilities and infrastructure that has an impact on the learning process. This manual process presents a number of issues, such as long wait times, slow report handling, and wasted resources. In addition, administrative staff have to manually check documents, which slows down the data collection process. As a solution, this study proposes the development of a report feature in the TIAS (Academic Informatics Engineering System) information system that allows online reporting of student complaints. The implementation of this feature not only simplifies administration, but also reduces the risk of file corruption or loss, as well as increases efficiency in report management.

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helped and encouraged the author in completing this report. The author realizes that this scientific work is still far from perfect, considering the limitations of knowledge and ability, so what the author conveys is not without shortcomings.

REFERENCES

- Alda, M., Nasution, F. H., Fitria, N., & Ardhana, M. R. (2024). *Design of a final project management application for students of the Android-based information systems study program*. Journal of Tambusai Education, 8(1), 5118–5131.
- Alda, M., Nasution, F. H., Fitria, N., & Ardhana, M.R. (2024). Final Project Management Application Design for Android-Based Information Systems Study Program Students. Journal of Tambusai Education, 8(1), 5118-5131.
- Brooke, J. (1996). *SUS: A “quick and dirty” usability scale*. In P. W. Jordan et al. (Eds.), Usability Evaluation in Industry (pp. 189–194). Taylor & Francis.
- Dewi, A. N., Supriyono, S., & Muzid, S. (2023). DIGITIZATION OF FINAL PROJECT MANAGEMENT IN THE MECHANICAL ENGINEERING STUDY PROGRAM WITH A WEB-BASED INFORMATION SYSTEM. IT Only: Journal of Information Systems, Information Technology and Computers, 14(1).
- Dewi, A. N., Supriyono, S., & Muzid, S. (2023). *Digitization of final project management in the mechanical engineering study program with a web-based information system*. Just IT: Journal of Information Systems, Information Technology and Computers, 14(1), 1–8.
- F. Widoyutomo and H. Ajie, "Development of Web Service Student Modules in the Academic Information System of the State University of Jakarta."
- Giovan, I. (2021). Implementation of the application for the assessment management of final assignment courses for the 2020/2021 academic year. Journal of STRATEGY-Journal of Maranatha, 3(1), 17-29.
- Haviluddin, H. (2016). Understand the use of uml (unified modeling language). Informatics Mulawarman: Scientific Journal of Computer Science, 6(1), 1-15.
- Haviluddin. (2016). *Understand the use of UML (Unified Modelling Language)*. Informatics Mulawarman: Scientific Journal of Computer Science, 6(1), 1–15.
- Herlambang, F., & Santoso, N. (2021). Design and build a web-based event management information system. Journal of Information Technology and Computer Science Development, 5(2), 644-650.
- Iskandar, D., Kusumah, F. S. F., & Fajri, H. (2024). CREATION OF A WEB SERVICE UNIVERSITY JOB SEARCH SYSTEM USING THE REST METHOD. JATI (Informatics Engineering Student Journal), 8(3), 2968-2975.
- Lewis, J. R. (2018). *The system usability scale: Past, present, and future*. International Journal of Human–Computer Interaction, 34(7), 577–590.
- M. R. Zahir, "Journal of Technorama Academic Information System (Informatics and Technology El Rahma) SMP Bina Insan Mandiri Bogor Using PHP Native ARTICLE HISTORY," 2023.
- Novianto, M.A., & Munir, S. (2022). Analysis and implementation of Restful API for the development of academic information systems in universities. Journal of Integrated Informatics, 8(1), 47-61.
- P. W. Saputra, I. Gede, and D. Gunawan, Putu Wisnu Saputra & I Gede Dharman Gunawan The Utilization of Educational Technology as a Communication Media in Learning. [Online]. Available: <https://prosiding.iahntp.ac.id>

Pressman, R.S. (2005). *Software engineering: a practitioner's approach*. Palgrave Macmillan.

Safira, Y. B., & Purtiningrum, S. W. (2023). Decision Support System for Student Indiscipline Assessment Using Web-Based SAW Method (Case Study: MA Al-Muddatsiriyah). *Informatics IKRA-ITH: Journal of Computer and Informatics*, 7(1).