Development of a Campus Project Management System to Enhance Collaboration Using the Agile Method

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Abstract

The advancement of information technology encourages educational institutions to improve the effectiveness of internal project management, such as research activities, student organization programs, and system development. However, collaboration among project team members is often suboptimal due to the lack of integrated project management tools. This study aims to develop a webbased project management system specifically designed for campus environments to enhance collaboration among users, including lecturers, students, and administrative staff. The system was developed using the Agile methodology, particularly the Scrum framework, which allows for incremental development and adaptability to changing user requirements. The system provides key features such as task planning, progress tracking, team management, and integrated team communication. Testing results indicate that the developed system significantly improves team coordination, project progress transparency, and task accountability. With the implementation of this system, campus project management is expected to become more efficient, adaptive, and productive.

Keywords: *Project Management, Information System, Collaboration, Agile, Scrum, Campus*

1. Introduction

In today's digital era, project management has become a crucial aspect in various institutions, including educational institutions such as universities. In this context, universities often face challenges in managing various projects effectively and efficiently. These projects may include research, academic activities, infrastructure development, and collaborative programs with external parties.

A well-structured project management system is essential to address the complexity and dynamics of these projects. However, many universities still rely on traditional methods that tend to lack flexibility in responding to rapid and frequent changes in project requirements. This can lead to delays, increased costs, and project outcomes that fall short of expectations. Studies have shown that the use of Agile Project Management can overcome the limitations of traditional methods by offering a more adaptive and collaborative approach.

2. Literature Review

2.1. Project Management

This study aims to develop a web-based project management application, with the main focus on supporting the management process so that projects can be completed according to plan. This application is expected to help improve order and efficiency in project completion, provide clearer guidance for team members, and facilitate coordination and time management for each stage of work [5].

2.2. Agile Methodology

Software engineering is a continuously evolving field, driven by technological advancements and the increasing demands of the business world. This development has led to the emergence of various new approaches to produce effective software. One widely adopted approach is Agile. The Agile method in software development is known as a lightweight and adaptive approach designed to address the shortcomings of traditional methods. Agile helps reduce unnecessary costs and workload, while offering high flexibility to adapt to changing requirements at each stage of development. This flexibility is achieved by applying a set of values and principles that form the foundation for coordination and task management within the development team [7].

2.3. Website

The field of website quality evaluation attracts interest from various academic disciplines, each bringing its own perspective. This study aims to identify the key characteristics—methods, techniques, and tools—of evaluation instruments described in the literature, with special

attention to the factors being analyzed. Based on this, a versatile model is proposed for the development of a new comprehensive evaluation instrument [13].

Website quality evaluation tends to focus on three main aspects: strategic, functional, or user experience. Expert analysis techniques are more dominant compared to user studies, and most of the examined instruments classify the evaluated characteristics—such as usability and content—into factors that operate at different levels, although there is little agreement on the terminology used to refer to them [13].

3. Analysis

The analysis shows that campus project management is still manual, resulting in miscommunication, delays, and difficulties in accessing data. To address this issue, an Agile-based project management system was developed to support active collaboration and adaptability to changing requirements. Key features include registration, login, task dashboard, document upload, revision comments, progress tracking, and real-time collaboration. This system is expected to enhance efficiency, communication, transparency, and accountability in the execution of academic projects.
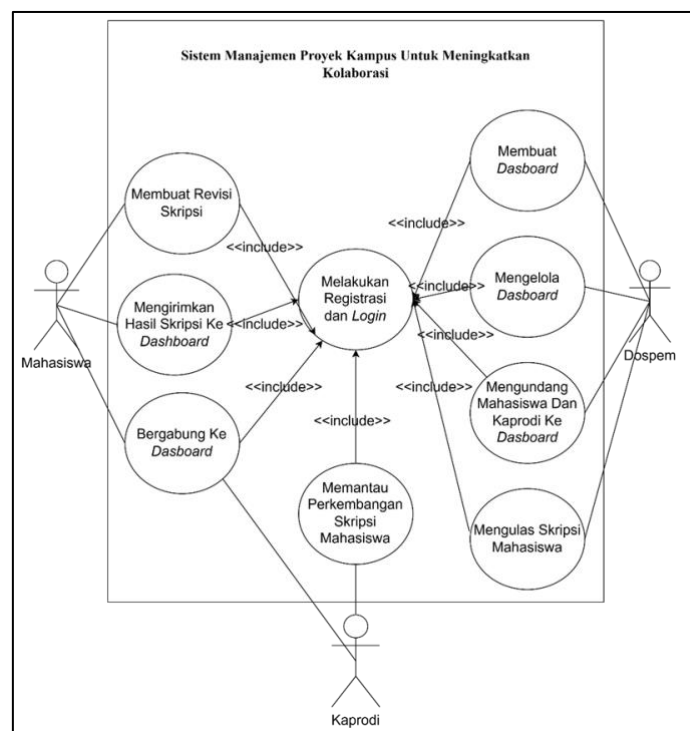
The flowchart illustrates the process flow within the project management system. Below is an explanation of each stage in the flowchart:
1. Registration and Login:
The user fills out the registration form → clicks the register button → the system processes the data → if incorrect, an error message appears and the user returns to the form → if correct, proceeds to login → user fills out the login form → clicks the login button → system processes the data → if incorrect, an error message appears → if correct, the dashboard page is displayed.
2. Joining the Dashboard:
The system displays the dashboard page created by the academic supervisor.
3. Submitting the Thesis to the Dashboard:
The student clicks on a board → views the assigned tasks → clicks the add button under Upload File → the system checks the file extension → if incorrect, an error message appears → if correct, a successful upload notification is shown.
4. Making Thesis Revisions:
The student clicks the comment notification → the system displays the activity page → the student uploads the revised file → the system checks the file extension → if incorrect, an error message appears → if correct, a successful upload notification is shown.
5. Monitoring Thesis Progress:
The Head of Program opens the dashboard → monitors the progress of students' theses and the performance of supervising lecturers in real time.
6. Creating a Dashboard:
The supervisor clicks the create board button → the system displays the create dashboard menu → the lecturer enters the name and sets privacy settings → the system displays the new dashboard.
7. Managing the Dashboard:
The lecturer clicks on a dashboard → the system displays its contents → the lecturer adds a task → the system shows the task form → the lecturer fills in the task details → the system processes the data → if incorrect, an error message appears → if correct, the task appears on the dashboard.
8. Inviting Students to the Dashboard:
The lecturer opens a dashboard → opens a task card → opens the member menu → clicks the add member button → enters the student's name → the system processes the data → if incorrect, an error message appears → if correct, the invitation is sent.

9. Reviewing Students Theses:
The lecturer opens a dashboard → opens a task card → downloads the thesis file → the file is successfully downloaded → the lecturer writes a comment in the comment section → the system processes the submitted comment.

4. Results

Detailed submission guidelines can be found on the journal web pages. All authors are responsible for understanding these guidelines before submitting their manuscript.
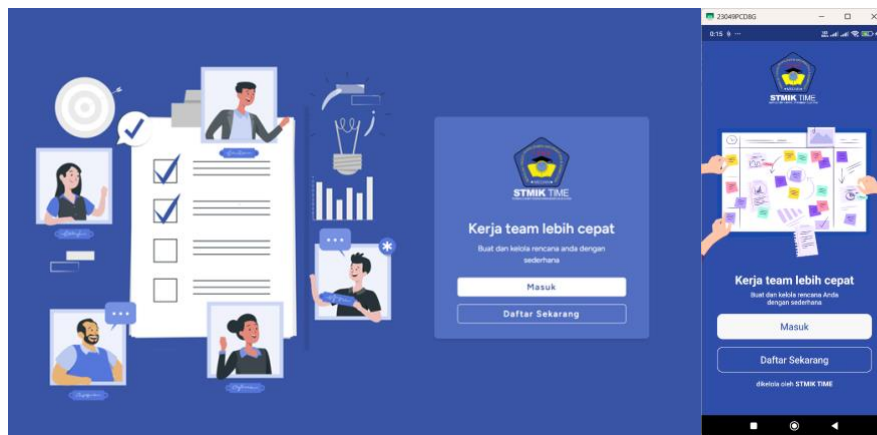
1. Homepage View

Figure 1: Website and Android View

This website offers a variety of features designed to make it easier for users to manage projects through boards and cards.

2. Login View

The login page is used by users to access the system by entering previously registered credentials. On this page, users are provided with two input fields: email and password. After filling in the data correctly, users can click the "Login" button to proceed into the system. Additionally, for users who do not yet have an account, a link is provided to navigate to the registration page.
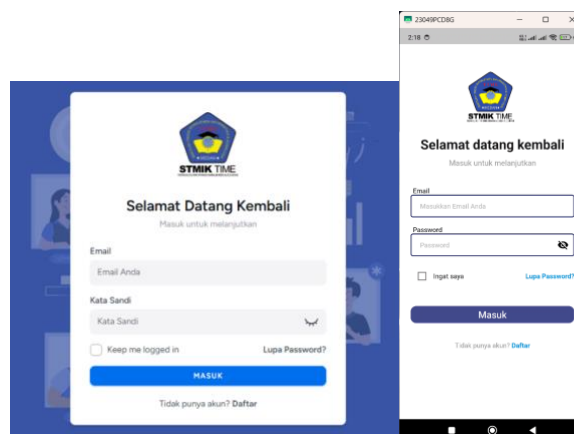
Figure 2: Login

3. Register View

The registration page is used by users to register before they can access the system. On this page, users are required to fill in several necessary fields, including full name, email, password, and choose a role as either Student or Lecturer. After selecting a role, users must enter their Student ID (for Students) or Lecturer ID (for Lecturers) according to the selected role. Once all data is correctly filled in, users can click the "Register" button to save the data to the system.

Figure 3: Register

4. Forgot Password View

The forgot password page is used when users forget their password and need to recover access to the system. Users can enter their registered email, and the system will send a link or code to reset the password.

Figure 4: Forgot Password

5. Reset Password View

This view is used when users forget their password to access the system. Users can enter their registered email, and the system will send a link or code to reset their password.

Figure 5: Reset Password

6. Dashboard View

The dashboard is the main page after login, displaying a summary of the user's activity in the form of a list of boards. Each board represents a project with a list of tasks and members. Information such as the number of tasks, members, board creator, and access status (public/private) is shown here. Search, data update, and new board creation features are also available. User access rights are limited based on their role to ensure system security and proper usage.
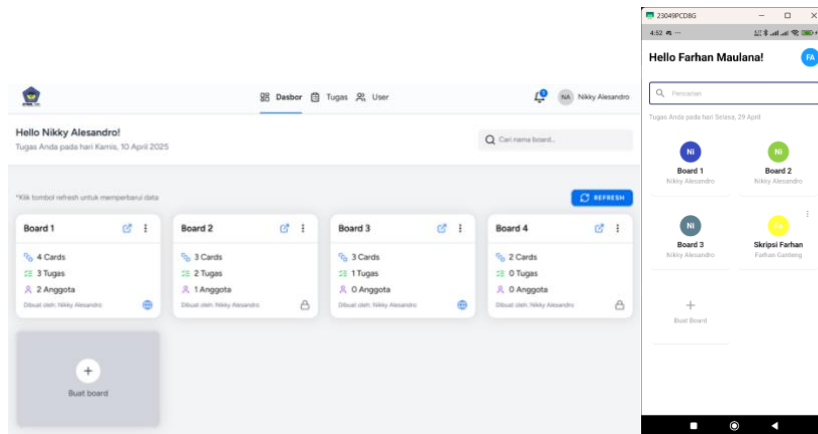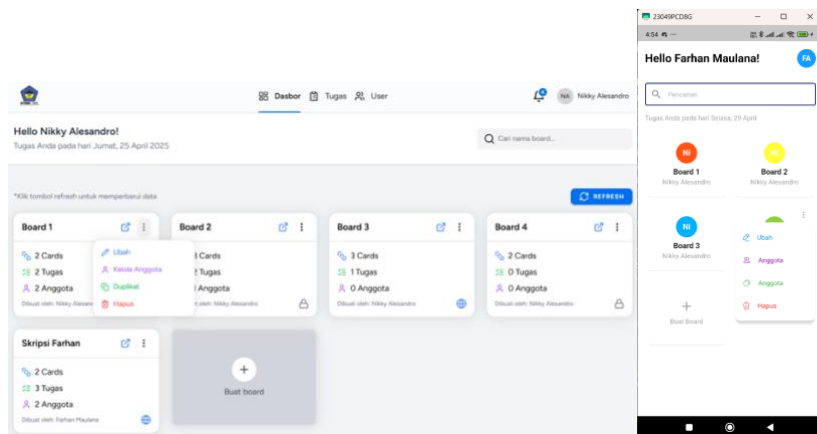
Figure 6: Dashboard
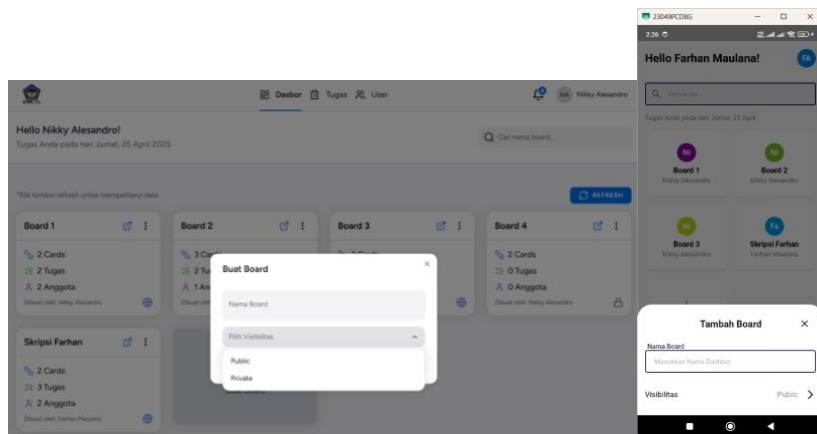
Figure 7: New Board
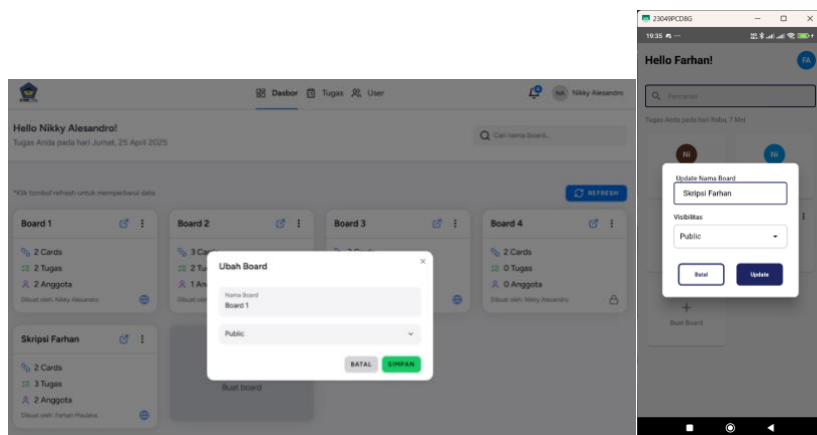

Figure 8: Dashboard Action Menu
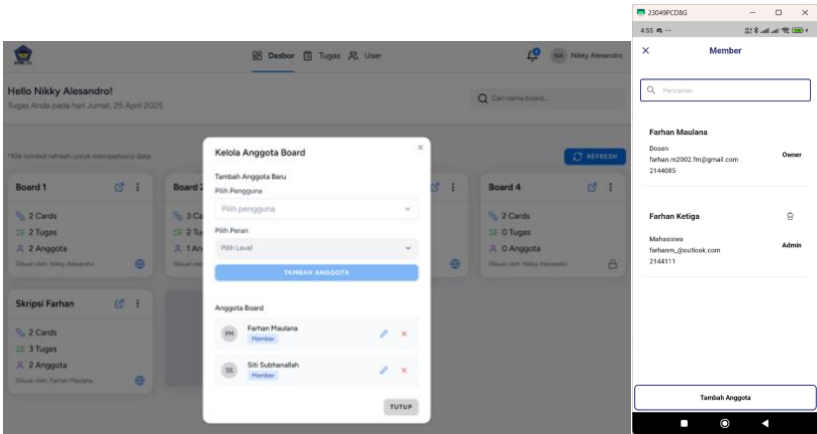

Figure 9: Update Board

Figure 10: Manage Board Member

7. Card View

This task page view features active boards containing a list of cards, where each card may contain tasks. Boards can be easily accessed via tabs at the top of the page, and users can search for specific cards using the "Search card name..." field for easier navigation.
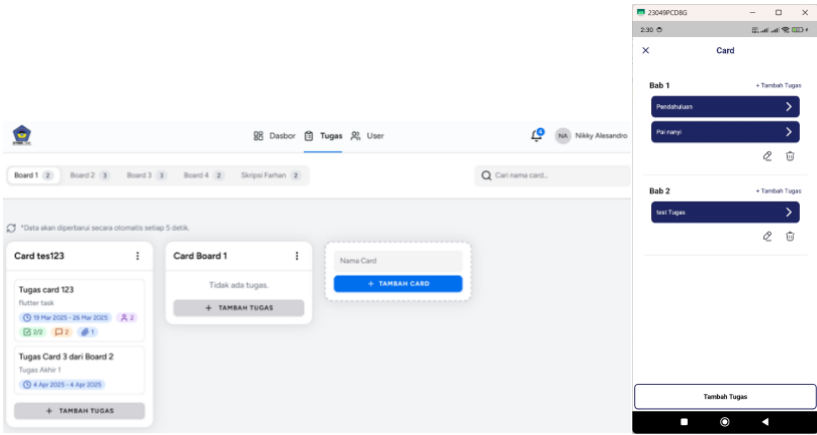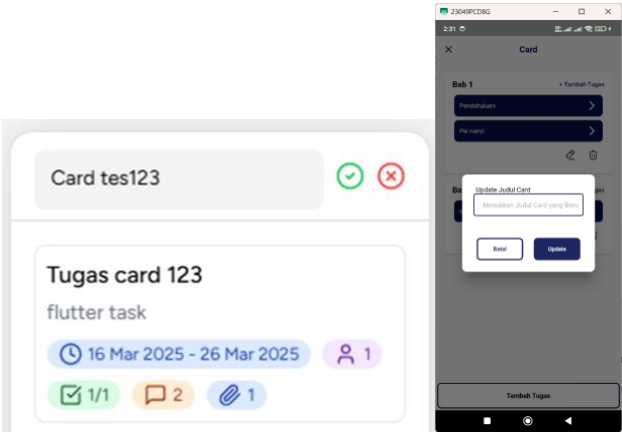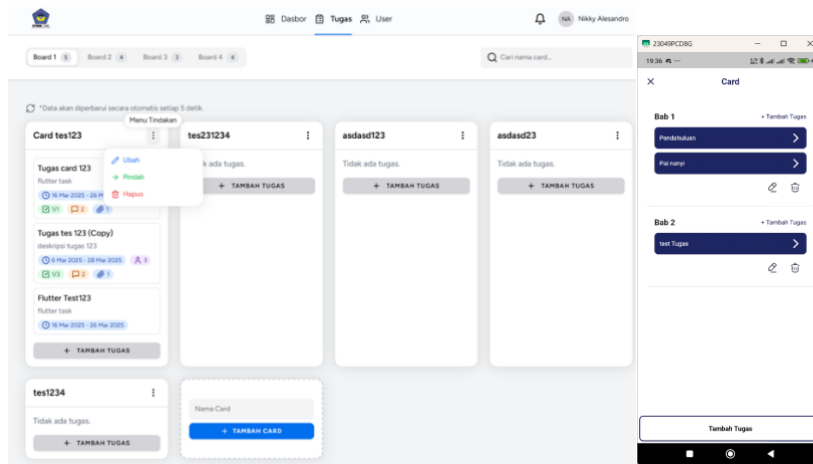

Figure 11: Card

Figure 12: Update Card
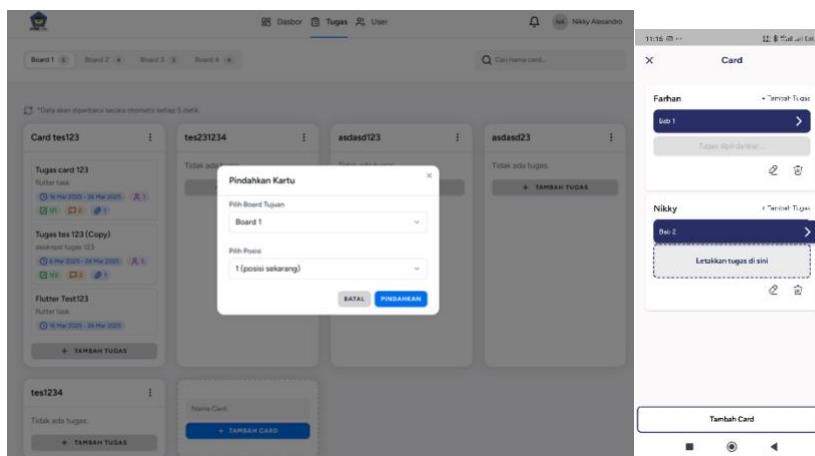
Figure 13: Card Action Menu
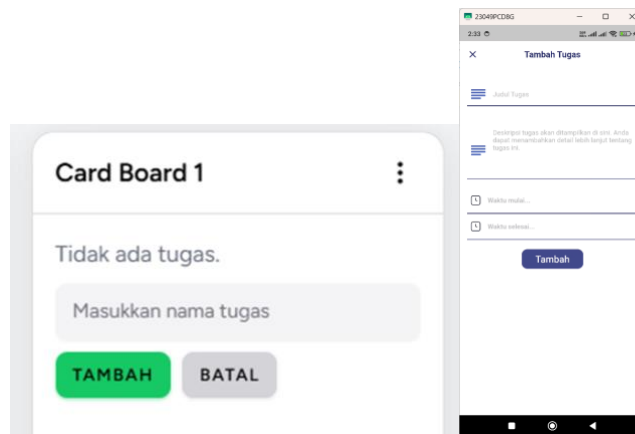

Figure 14: Move Card

Figure 15: New Task

8. Task View

This view provides detailed information about a selected task within a card on a project board.
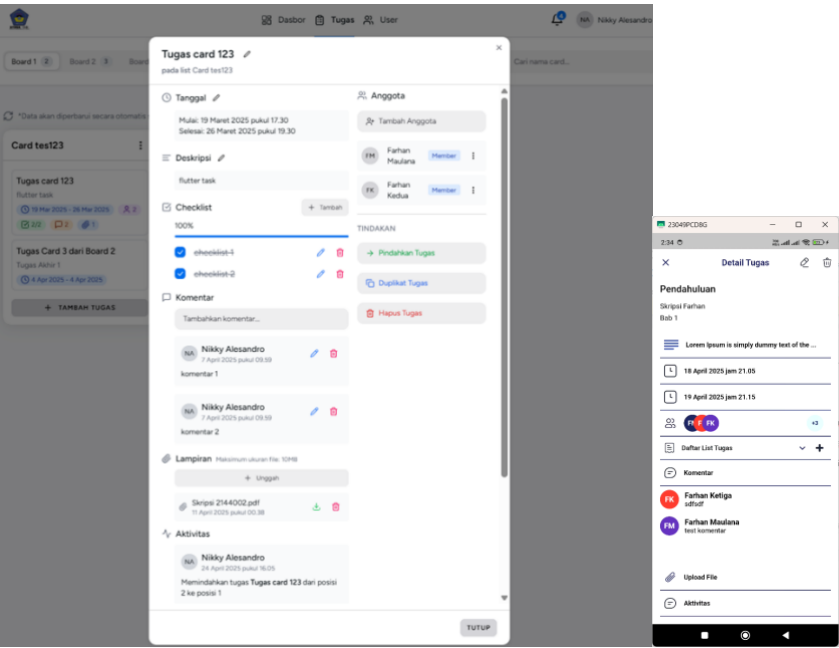
Figure 16: Task Details

9. Profile View

This page displays user profile information including full name, email, and Student ID (for students) or Lecturer ID (for lecturers), according to their role in the system. Additionally, this page provides a form to change the user's password.
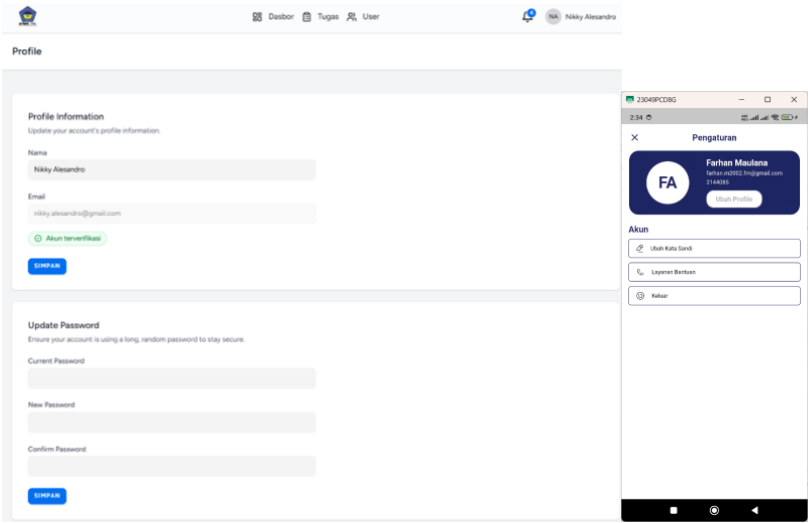

Figure 17: Profile

10. Notification View

The notification view allows users to receive updates regarding activities in the system, such as file deletions, document uploads, or comments. Notifications are displayed in a dropdown that appears when the bell icon in the top-right corner is clicked. Each notification shows the name of the user who performed the action, the type of activity, and the name of the affected task. This view also includes a feature to mark all notifications as read.
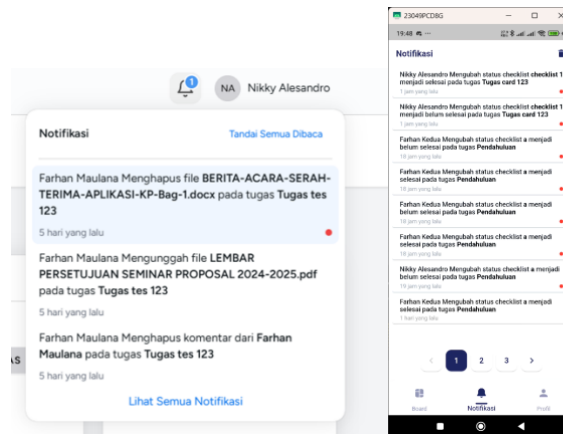
Figure 18: Notification

11. User Management View

The user management view is a special page accessible only by the Super Admin to manage all types of users within the system. This page includes features to add, view details, modify information and roles, and delete users.
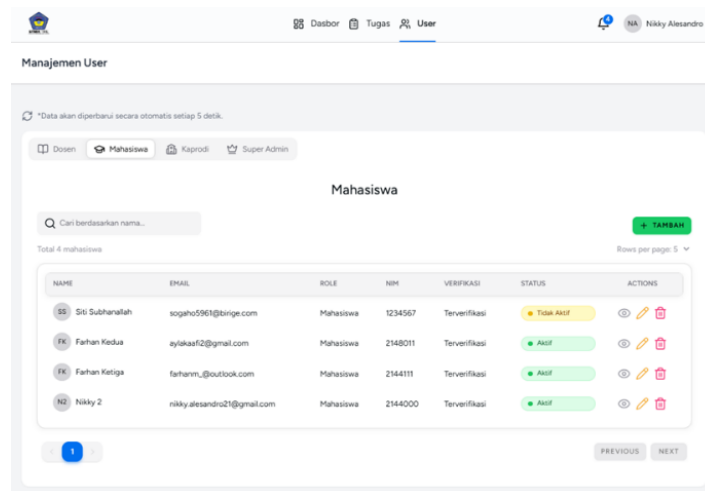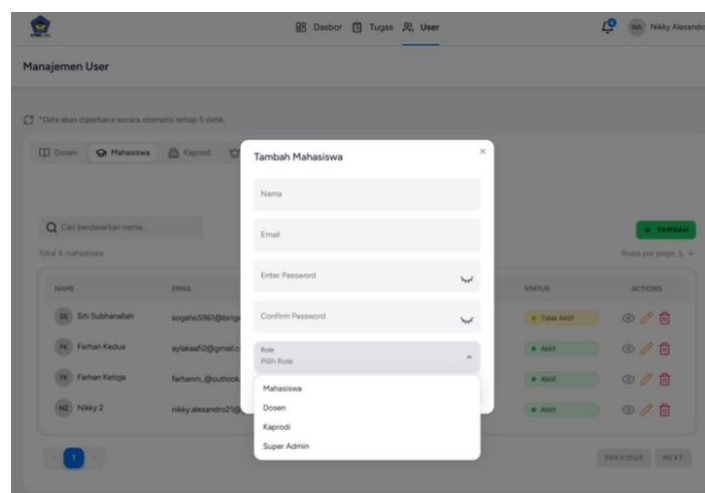

Figure 19: User Management

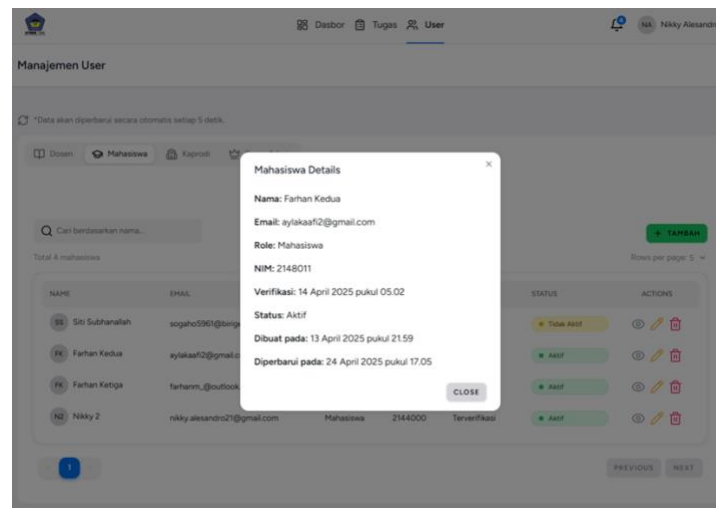**Figure 20:** New User
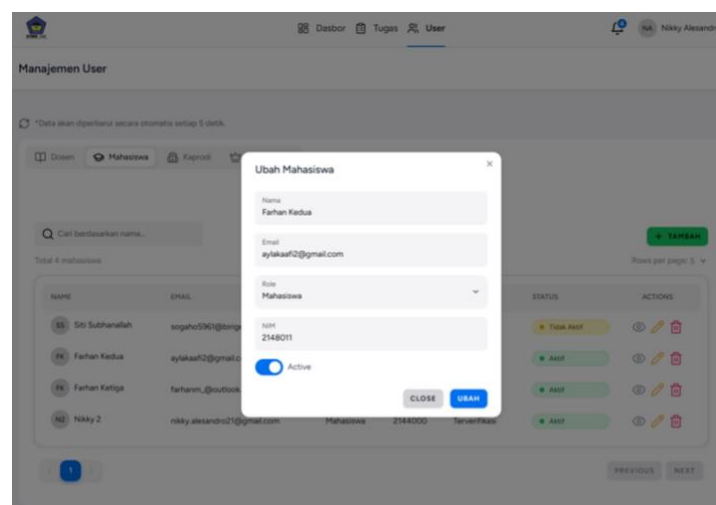
Figure 21: User Details

Figure 22: Update User

5. Conclusion

The conclusions drawn by the author from the design of this thesis are as follows:

1. The campus project management system developed is capable of facilitating collaboration between students and lecturers in project work by providing task management and internal communication features.
2. The implementation of the Agile method in the system development process allows the development team to perform iterative development in stages and respond to user needs, making the system more flexible and adaptive.

3. This system helps improve transparency and effectiveness in campus project management, particularly in task delegation, progress tracking, as well as document and comment management among team members.

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