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An Integrated Approach to Supervising and Managing Students Final Year Projects in Higher Institutions

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ABSTRACT

Final Year Projects (FYP) are essential for students to acquire during their final year to solve projects similar to real-world problems. However, situations such as poor communication, trouble monitoring progress, and a lack of consolidated documentation and evaluations are common problems between students and supervisors. Therefore, this study proposes to design and deploy an integrated platform for UniKL MIIT to manage the student's final year project. The system would streamline the coordination between supervisors and FYP coordinators in supervising, monitoring, and evaluating the student's progress tracking through Web technologies. Therefore, the proposed approach demonstrates a better process flow experience that could benefit all the stakeholders, such as supervisors, FYP coordinators and students.

1. Introduction

The Final Year Project (FYP) is one of the course offered in Universiti Kuala Lumpur, Malaysian Institute of Information Technology (UniKL MIIT). UniKL MIIT is the campus that focus on the fields of multimedia and information technology only. FYP is a course that give a chance for students to apply the technical abilities and theoretical information they have learned during their academic studies to a practical project. FYP task pushes the students to tackle intricate issues, suggest innovative solutions, and provide results by taking the real issues and apply the theoretical knowledge gained to practical situations. Usually, students take FYP during their final year of study at many Malaysian universities as an integral part of the undergraduate curriculum. Students can integrate their theoretical knowledge with real-world applications, better preparing them for workplace demands or further education through FYP [3,4]. FYP can significantly enhance a student's portfolio or resume by highlighting their communication skills and talents, which are critical for success in any area. Students who participate in FYPs receive experience and skills that provide them a competitive edge in the job market and increase their employability [5]. As a result, FYP gives

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students the chance to show potential employers or academic institutions their abilities, creativity, and talent [6].

Students gain skills such as project management, research techniques, and effective communication through the FYP that prepare them for careers or business endeavours. Students are monitored throughout their FYP by knowledgeable supervisors. Additionally, FYP at UniKL MIIT focuses on aligning with industry demands, allowing students to work on projects that address practical issues related to current Malaysian technology. However, there are a few challenges or gaps for UniKL MIIT to manage FYP as follows:

i. Administrative Challenges
   a. Manual Process —The FYP monitoring and tracking for supervisors rely on spreadsheets or paper records. The students also rely on email and shared drives which pose difficulties in organizing submissions effectively.
   b. Ineffective supervision allocation —Students struggle to match the supervisors' expertise with their FYP project.
ii. Communication Barriers
   a. Feedback Mechanisms — FYP supervisors struggle to monitor student FYP progress status efficiently.
iii. Monitoring Evaluation Issues
   a. Progress Tracking: The FYP coordinators also have difficulties keeping track of students' FYP component submissions. The usage of spreadsheets slows the collecting process from the supervisors' and assessors' assessment evaluation.
   b. Evaluation Submission —Supervisors must evaluate student FYP component submissions across multiple platforms. There is no centralised platform for students to submit their FYP materials to be assessed.

The FYP management system is suggested as a way to foster the integration of students of academic learning into practical applications [1,2]. Thus, many universities have implemented digital platforms to make the FYP flow procedures more efficient. FYP management system will act as a consolidated platform for project-related information and materials accessible to administrators, supervisors, assessors, and students. This lowers the possibility of human error and ensures that everyone is promptly notified of updates and alerts

This study also reviews the current implementation of FYP Management systems at Universiti Teknologi Petronas (UTP) [14], Universiti Tuanku Abdul Rahman (UTAR) [15], Universiti Poly-Tech Malaysia [19] and Universiti Kebangsaan Malaysia [20]. These FYP management systems oversee, track, and assess student projects. However, the FYP component functionalities that was not included in the FYP management system are assessor allocation assignment, proposal feedback approval and supervisor allocation assignment.

A summary of pertinent research on the creation, application, and advantages of FYP management systems are discussed as follows:

i. Centralized Assessments — A centralized digital platform could easily evaluate student submissions [8]. The system could track student submission, supervisor-student interaction, and outcome assessments [9,7]. Automated assessment rubrics and digital submissions can improve the FYP process efficiency and accuracy [10]. At the same time, the FYP learning outcomes would ensure that evaluations reflect students' competencies [11]. Thus, FYP assessments should be more transparent for accreditation purposes [9]

ii. Loss documents —The Final Year Project Online System (FYPOS) emphasized online registration, report submissions, and progress tracking [12]. Therefore, FYP system management could resolve document loss and submission delay [13].
iii. Communication issues —A centralized FYP platform should allow students to make independent decisions while receiving constructive feedback from supervisors [13]. Thus, students' progress can be tracked in real time, communication between students and supervisors can be improved, and common issues such as forgotten or misplaced logbooks can be eliminated [14].

With the growing number of students in the UniKL MIIT, manual procedures managing the FYP students have become a major issue. Therefore, the component features proposed in the FYP management system for UniKL MIIT are as follows:

i. Student
   (a) Project Registration: Students can propose or choose from pre-defined projects.
   (b) Progress Tracking: A dashboard to track milestones, such as proposal submission, proposal evaluation feedback, and final report submissions.
   (c) Document Management: Allow uploading of FYP-related documents, including proposals, reports, and presentations.
   (d) Supervisor Feedback: Displays supervisor comments.
ii. Supervisor
   (a) Project Monitoring: supervisors can view assigned projects and track student submissions.
   (b) Feedback Mechanism: The supervisor provides comments, approves submissions, and assigns grades.
   (c) Meeting Scheduling: schedule and record progress updates with students.
iii. Coordinator
   (a) Task assignment: Automatically assigns supervisors or assessors based on expertise and
   (b) workload.
   (c) Performance Monitoring: Tracks the progress of all projects under the supervisors.
   (d) Evaluation Management: Manages the evaluation workflow, including rubric customization and grade submission.
   (e) Analytics and Reporting: Generates reports on project completion, student performance, and student grades.

This study aims to analyze and address the challenges in UniKL MIIT in managing students' FYP, including decentralized tracking, manual evaluations, and fragmented submissions. Therefore, this study plans to develop a web-based management system with features such as proposal management, FYP submission tracking, and assessment evaluation. At the same time, the supervisors could monitor their FYP students effectively through the system.

2. Methodology

The Rapid Application Development (RAD) methodology was adopted in the FYP management system (FYPHub) for UniKL MIIT. RAD consists of four phases: Requirement Planning, User Design, Construction, and Cutover [17,18]. Each phase is discussed in detail as follows:

i. Requirement planning —the study focuses on understanding the FYP process flow challenges faced by students, supervisors, and assessors in UniKL MIIT. This involves examining the current manual procedures, communication gaps, and inefficiencies. All the stakeholders such as students and lecturers who act as supervisors and assessors were interviewed to identify the inconsistencies in communication, difficulty tracking progress, and inconsistent assessments.
ii. User Design —the user design phase involves the general idea of the proposed system design architecture tailored to users' requirements. The use case diagram for lecturers who also act as supervisors and assessors is shown in Figure 1 and the use case diagram for the FYP coordinator is shown in Figure 2. The UniKL MIIT has two coordinators who oversee the FYP operation every semester. One coordinator will monitor students in the first semester and the other will monitor students who take FYP in the second semester. The coordinator in Figure 2 shows the component task required for managing students who take FYP.

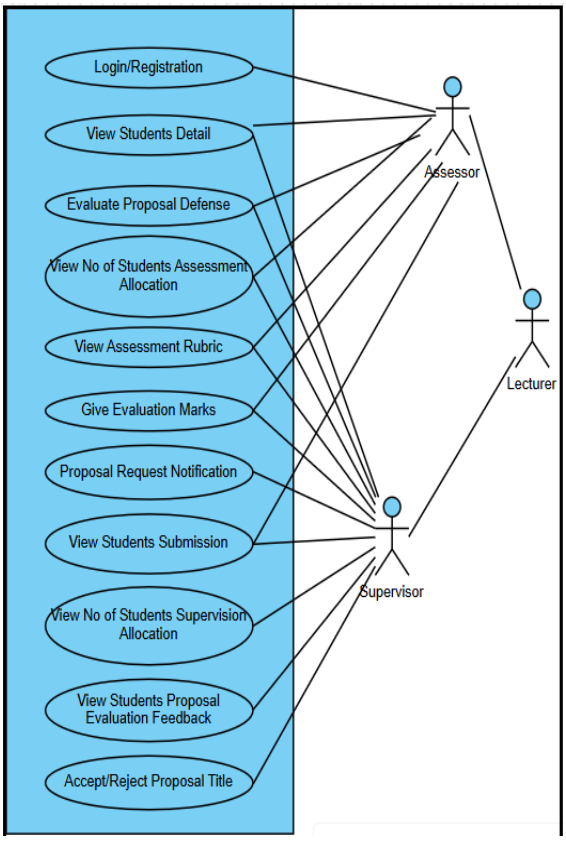

Fig. 1. Use case diagram for Lecturers

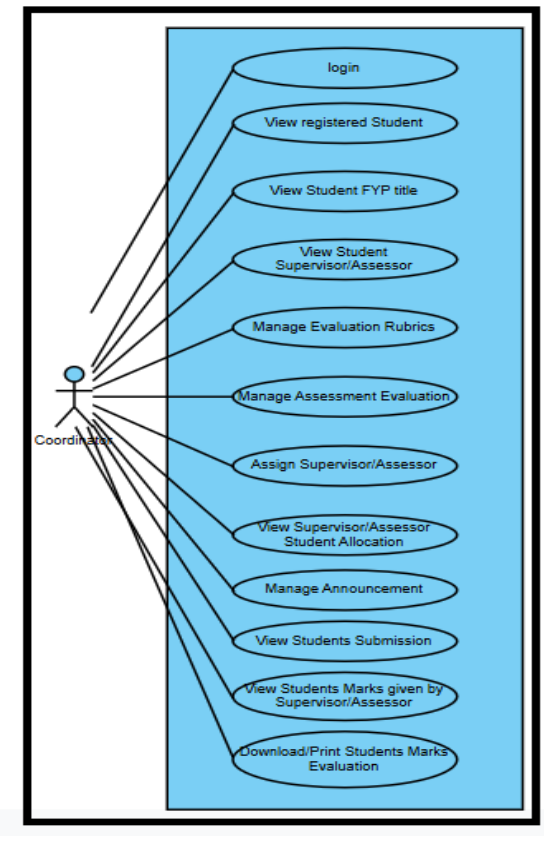

Fig. 2. Use case diagram for Coordinator

iii. The stakeholder of the FYP Management System consists of five main users: administrator, coordinator, student and lecturer who will also act as supervisors or assessors as shown in the Figure 3. The FYP management system in the UniKL MIIT is known as FYPHub.

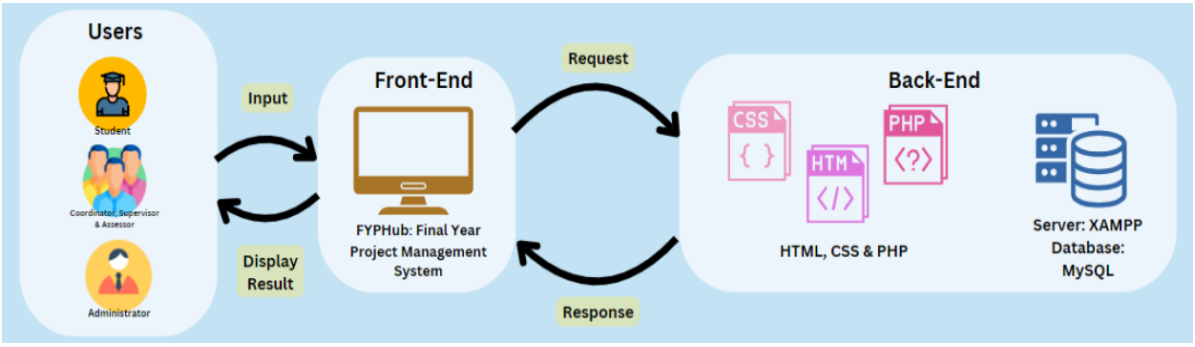

Fig. 3. System Architecture of the FYP Management System(FYPHub)

iv. Construction phase — The FYPHub is developed based on requirements gathered in UniKL MIIT manual procedures and user stakeholder feedback. The flow of the FYPHub system is shown in Figure 3 which reflects the interaction between students, lecturers, coordinators and administrators.
v. Cutover phase —The FYPHub prototype is prepared for deployment, ensuring all the features meet requirements and quality standards. As illustrated in Figure 3, instructors and students must first register in order to use the FYPHub management system.

3. Results

This section discusses the FYPHub prototype in detail. The system was developed using CSS, HTML, PHP, JavaScript, Bootstrap and MySQL database. All users must log in to the system shown in Figure 4. However, only students and lecturers are required to register for the first time before logging in as shown in Figure 5. Once registered, users can update their profiles. This system is for bachelor courses only and requires students to complete their FYP in two semesters.

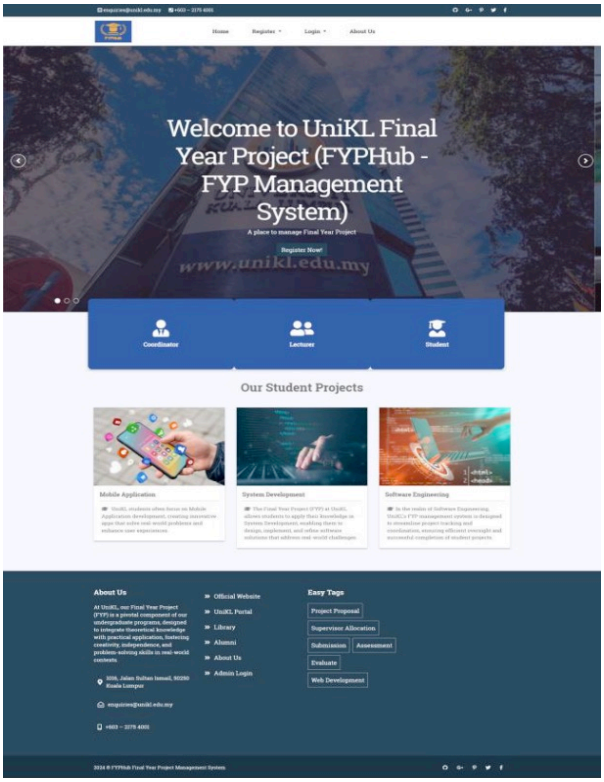

Fig. 4. The main page of the FYPHub

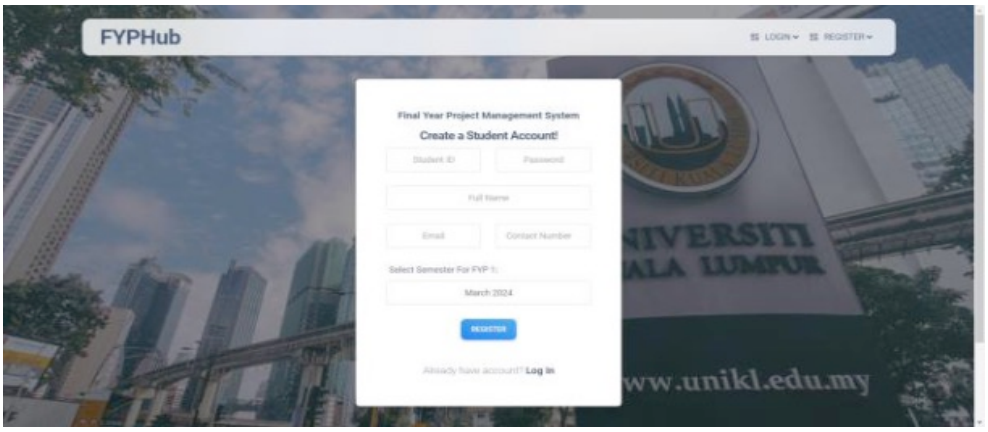

Fig. 5. Registration page

Figure 6 depicts the lecturer's dashboard, which allows lecturers to monitor students under supervision and become assessors for students from other supervisors. This system enables lecturers to approve project titles, review and accept proposals, and assess students.

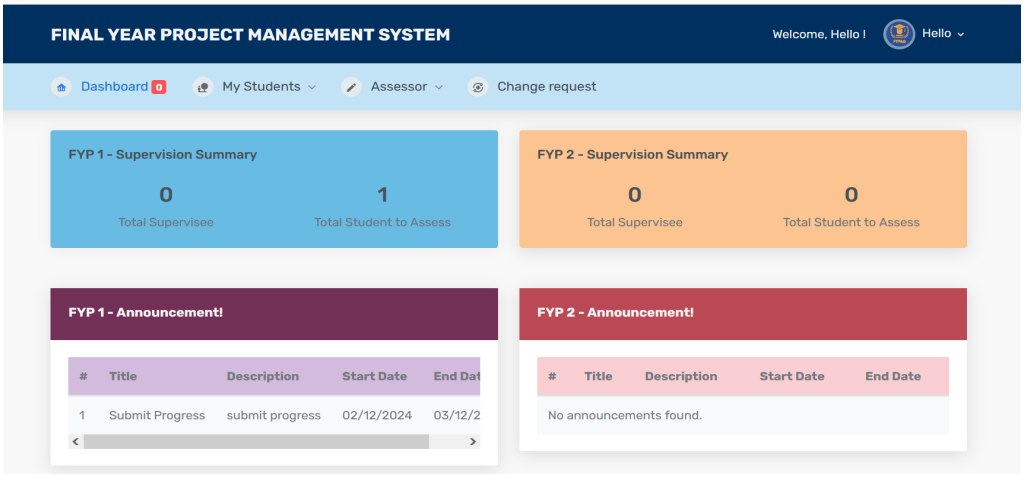

Fig. 6. Lecturer dashboard

Lecturers also could monitor their students' submissions and evaluate the students' component submissions using the features of My Students as shown in Figure 7.

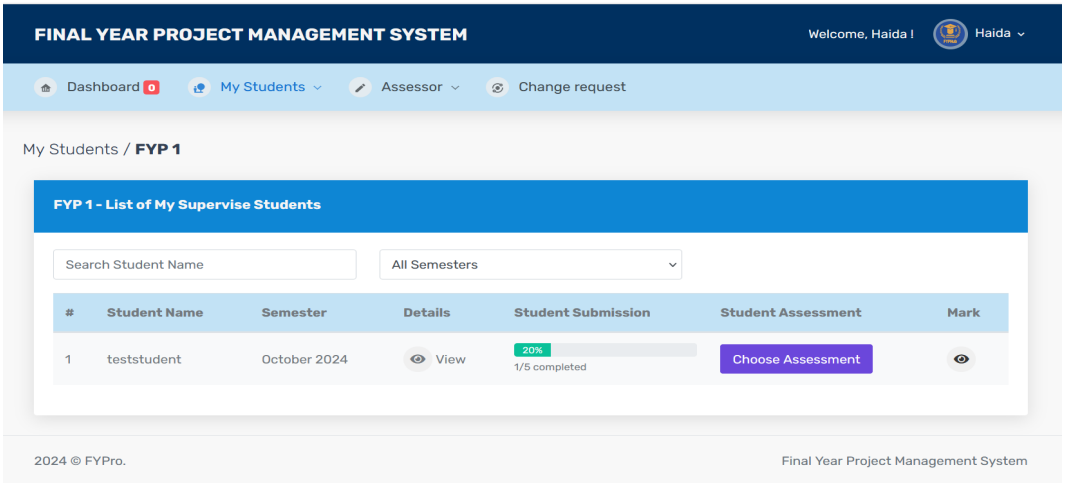

Fig. 7. Lecturer dashboard

Students can submit their FYP component tasks, submit their proposals, download learning materials, view lecturers who are suitable to become supervisors and request a change of title using the student dashboard shown in Figure 8.

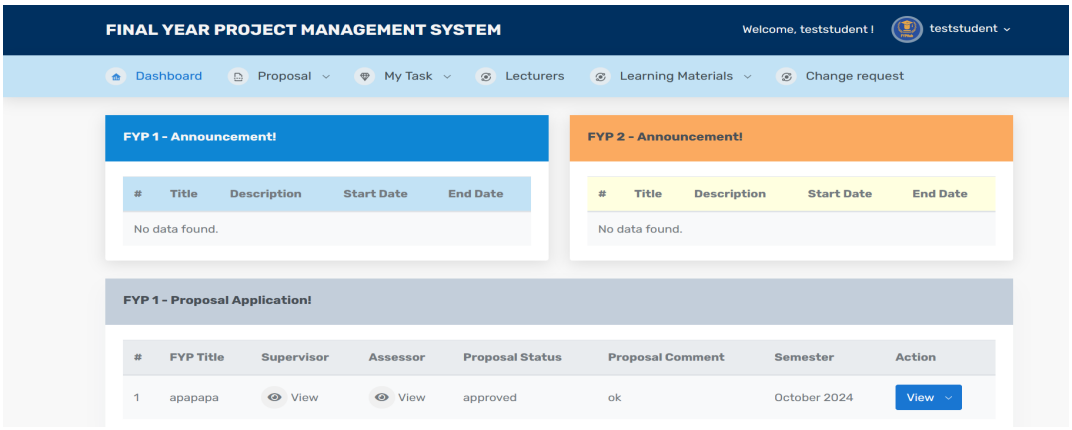

Fig. 8. Students dashboard

Figure 9 and Figure 10 show the coordinator's dashboard responsible for monitoring the overall process of the FYP by managing the students, and supervisors and managing evaluation marks submitted by supervisors and assessors.

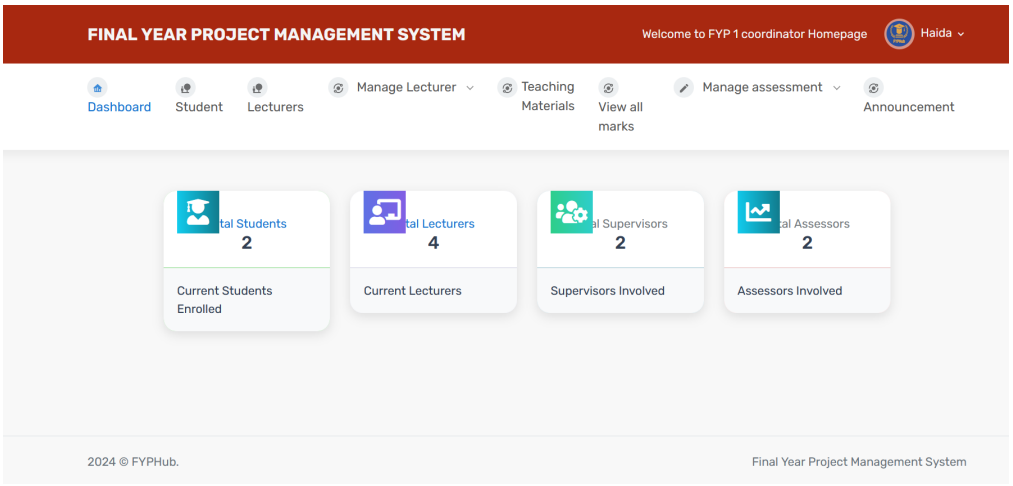

Fig. 9. Coordinator dashboard

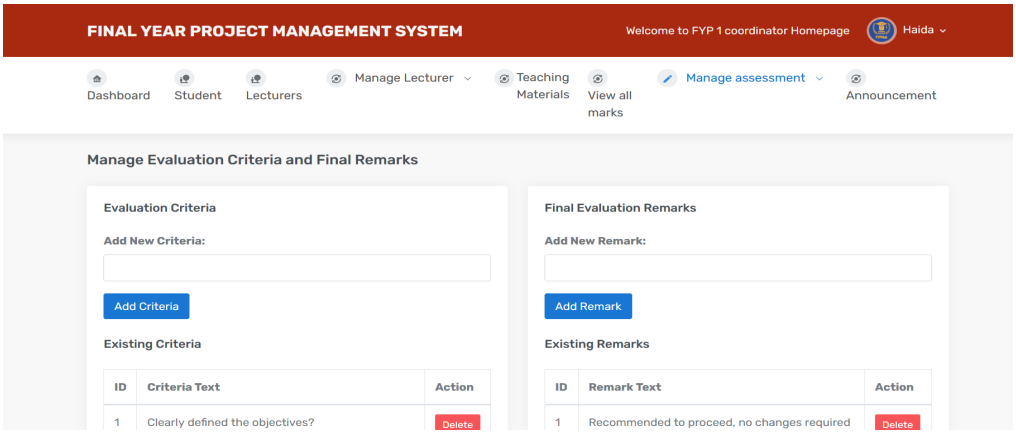

Fig. 10. Coordinator manages evaluation marks

The FYPHub management system shows a simplified improvement of the procedures for stakeholders, such as coordinators, supervisors, students, and assessors. Supervisors have access to a dashboard interface to monitor student progress and give feedbacks. Students can manage their FYP components submission, due dates, and deliverables through a centralized platform. In order to ensure accuracy and consistency in grading the students, supervisors and assessors have access to appropriate evaluation methods. Lastly, the coordinators are equipped with effective supervision tools that enable them to monitoring all the stakeholders involved.

4. Conclusions

FYPHub was introduced at MIIT UniKL to improve user interaction by providing step-by-step instructions and real-time support. These features improve communication effectiveness between the FYPHub platform stakeholders. These improvements are intended to make final-year project management easier and more effective for coordinators, supervisors, and students. Thus, the FYP management system will benefit the following stakeholders as follows:

i. Students would have clear visibility of project milestones and deadlines, convenient document submission, feedback retrieval and improved communication with supervisors.
ii. Supervisors would reduce administrative burdens with automated processes, easily organize student progress tracking and improve time management with streamlined scheduling.
iii. FYP Coordinators could comprehensively oversee the FYP monitoring process between supervisors, assessors and students and organise monitoring of student submissions.

Overall, the FYPHub provides a comprehensive solution to the challenges of managing final-year projects in UniKL MIIT, contributing to academic administrative efficiency.

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