(Research Article)

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Mitigating the challenges of final year projects supervision in Nigeria tertiary institutions for improved quality assurance

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Abstract

Final Year Project supervision in Nigeria Tertiary Institutions is one of the challenging tasks confronting both the students and their supervisors at all levels resulting to poor, sub-standard students' projects that add no value to the society. In this work, the challenges are identified with respect to all stakeholders in the business of Project Supervision which include students, supervisors, examiners and administrators. The identified challenges are the basis for a web-based Project Supervision System developed in this work, which is a platform that enables improved communication and synergy between the stakeholders. This system provides a comprehensive solution to the identified challenges and insights for a solid foundation for Nigeria Tertiary Institutions to transform the Final Year Project supervision process into an effective and useful results that add value to the society.

Keywords: Challenges; Final Year Project; Project Supervision; Solution; Society

1. Introduction

Final Year Project (FYP) is usually carried out by both undergraduate and postgraduate students as cumulative intellectual academic exercise with a report aimed to demonstrate the skills and knowledge acquired over the years of study. A successfully completed project is an attestation that a student has gone through the walls of the tertiary institution and completed his/her programme [4]. In order to produce a project that is worthwhile, presentable and beneficial to the society, the student is guided by a lecturer (Supervisor) with required knowledge and experience in the research area. However, with increase in the population of students and the need to meet up with the challenges of technologically driven research work, it has become imperative to effectively apply Information Technology as additional tool in the management and supervision of FYP by students across all tertiary institutions in Nigeria [2].

The management of FYP involves three parties; the student, the supervisor (Lecturer) of the department and the External Supervisor. It is the responsibility of the supervisor to oversee the student through to a successful execution of the project in line with the rules and regulations of his department with regards to report writing and the expected practical outcome, the External Supervisor/Examiner assesses both the report and the practical output within the scope, standard and regulations of the student's discipline and ensuring that the right thing is done with regard to the process and procedure followed by both the student and the supervisor.

The aim of this work is to find solutions to challenges associated with the activities of parties involved through appropriate automation processes that will enable real time communication, correction, follow-up and assessment in a web-based Final Year Project Supervision Management System (FYPSMS) that is developed to achieve the following objectives;

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- Enable students to upload the digitized version of their FYP to the Final Year Project Supervision Management System (FYPSMS)
- Enable students to easily update the progress of their project from time to time
- Provide supervisors with up-to-date information about the progress of their students' project in real time
- Enable supervisors to give immediate/timely feedback to students, especially during holidays and in a situation where and when the students and the supervisor are geographically far apart to meet face-to-face
- Adequately bridge the gap of time and space between supervisors and students.

2. Challenges of project supervision

Over the years, students' final year projects are carried out annually through the traditional method with little modifications from one institution to the other. The process, in most cases involves the following steps;

- Grouping of students among qualified lecturers as supervisors. Some institutions however, do allow students to choose from among the lecturers.
- Students look for researchable topics in the area of specialization of the supervisor upon which a desirable choice is made.
- After the approval of the project topic, the student will need to make arrangement on how and when to meet with the supervisor for him to make necessary inputs, corrections and guidance. This process has to continue until the project write-up effectively pass across the work implemented following the laid down rules and standards.

The major challenges arise here as a result of limited time available for supervisors to attend to many students. In most cases, the write-up will not be adequately read for the necessary inputs of the supervisors. Most students do take advantage of this to present very watery write-ups that lack originality and standard. Most students are found to present already made write-ups with little or no input from them. The fact that the students are many and are limited to the working hours only to get the attention of their supervisors further make the situation worse. The same scenario happens at the table of other stakeholders including the external examiners and administrators.

The objective of student's project work is practically unachievable as a result of these challenges.

3. Analysis of work

The limitations of the traditional project supervision process prompted the development of various computerized systems to automate the process. [5] proposed a framework for a cloud-based Final Year Project (FYP) management system. This system leverages cloud computing to provide a centralized platform for students, supervisors, and external examiners to access project information, communicate, and collaborate. The framework emphasizes features such as online submission of project reports, real-time progress tracking, and online discussions.

In the same vein, [6] explored the use of information and communication technology (ICT) to improve FYP supervision in Nigerian universities. Their research suggests that ICT-based systems can enhance communication, promote transparency, and facilitate efficient resource allocation.

However, problems associated with yearly increase in students' enrollment are not adequately addressed. This of course, will lead to spontaneous increase in the number of final year projects allocated to lecturers to supervise. Also, there is need for a comprehensive web-based system that is not only user-friendly, but one that can be used and operated with little or no expertise knowledge in Computing. These and many other issues are addressed as further improvements brought into this work in mitigating the challenges of Final Year Project (FYP) supervision process in Nigeria tertiary institutions.

Several key technologies are essential for developing an effective FYP management system. The foundation for building the user interface of the web-based system relies on web development technologies like HTML, CSS, and JavaScript [3]. For functionalities like user authentication, data processing, and interaction with the database, server-side scripting languages such as PHP or Python

Selecting a robust database management system is crucial for storing project information, student data, and supervisor feedback. Popular options include MySQL, PostgreSQL, or Microsoft SQL Server. These database systems provide a structured way to organize and manage the vast amount of data generated throughout the FYP process.

4. Methodology

Addressing the challenges of Final Year Project supervision as implemented in this work involves the development of a web-based system with both functional and non-functional requirements. The functional requirements centered around the core functionalities needed by students, supervisors, and external examiners to manage and effectively oversee the process, while the non-functional requirements ensure the system's performance, usability, and reliability:
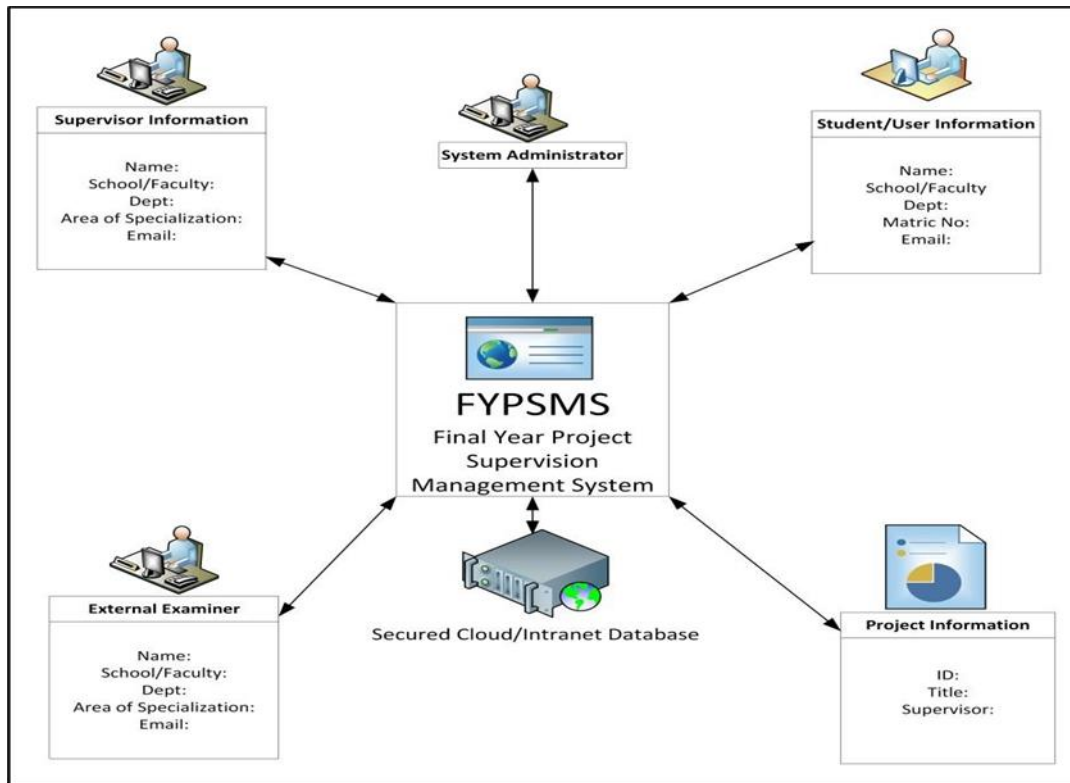
4.1. System Architecture

Figure 1 System Architecture

The system architecture follows a multi-tier design, which separates the system into distinct layers to enhance scalability, maintainability, and manageability [1]. The architecture consists of three main layers, the presentation layer that is responsible for the user interface, is developed using HTML, CSS, and JavaScript to create a front-end. The application layer contains the business logic of the system. It is implemented using PHP, which handles requests from the presentation layer, processes the data, and interacts with the data layer. This layer includes various modules such as user management, project management, communication, and scheduling. The data layer is responsible for data storage, retrieval, and management. It uses MySQL to manage the database, ensuring data integrity and efficient access.

4.2. System Flowchart Breakdown

The system functionalities are visualized through a series of flowcharts, each representing a distinct user role: Student, Supervisor, Administrator, and External Examiner. These flowcharts depict the user journey within the system, highlighting the key interactions and functionalities available to each role.
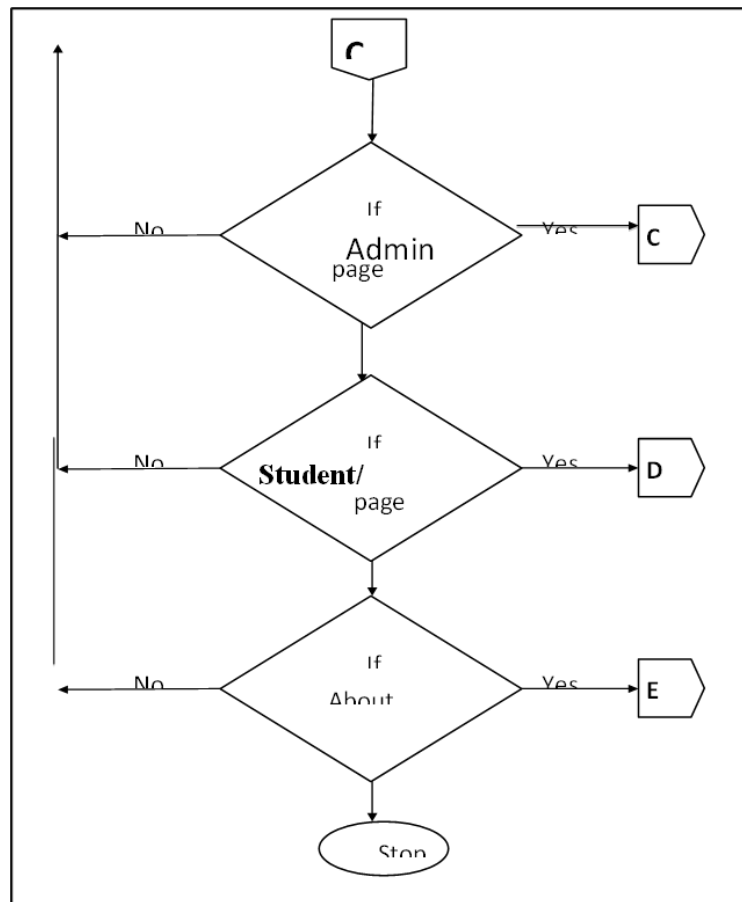
Figure 2 System Flowchart

5. Results and discussion

5.1. User Interface Design

The user interface (UI) is described through wireframes. Wireframes are low-fidelity mockups that focus on the UI's layout and functionalities, excluding visual elements like colors or fonts.

Figure 3 Home Page

5.2. The dynamic login Page

The dynamic login page below is a web application designed to facilitate user authentication for students, external supervisors, and supervisors. Implemented using HTML, CSS, JS and PHP, it provides a secure login mechanism with role-based access control.
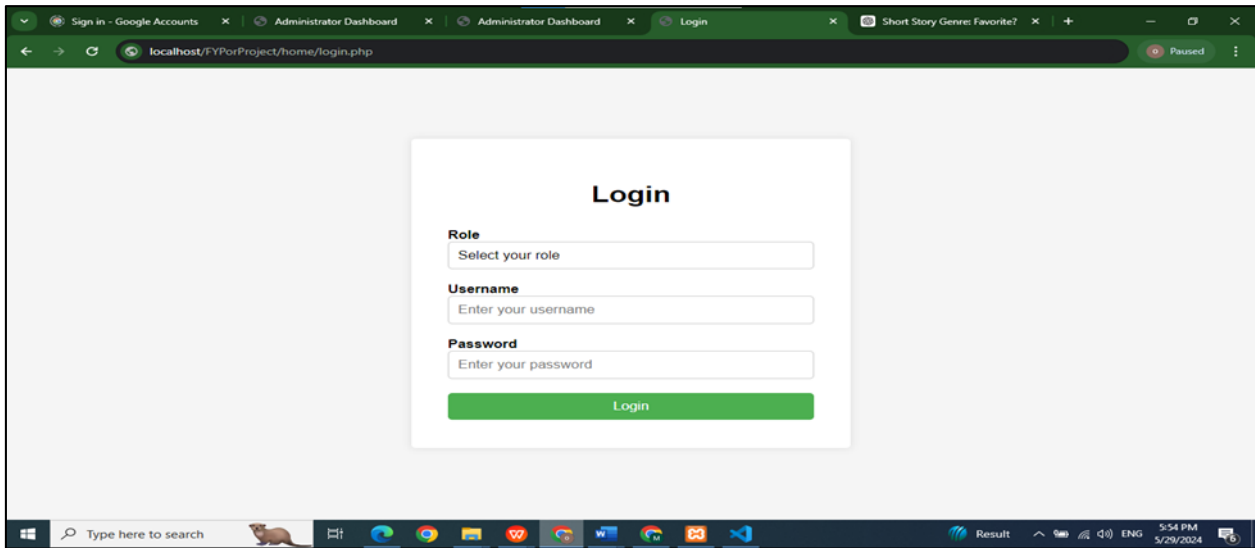
Figure 4 Login Page

5.3. Student Homepage

The student homepage designed with clarity and organization as top priorities. It will feature dedicated sections to keep students informed and on track with their projects. A prominent section displays upcoming deadlines and milestones for assigned projects. This ensures students are aware of important dates and can plan their work accordingly. A visual progress bar will offer a quick and easy status update, providing students with a clear understanding of their project completion status. Readily available action button empowers students to upload project documents, request feedback from supervisors, and schedule meetings for further guidance.
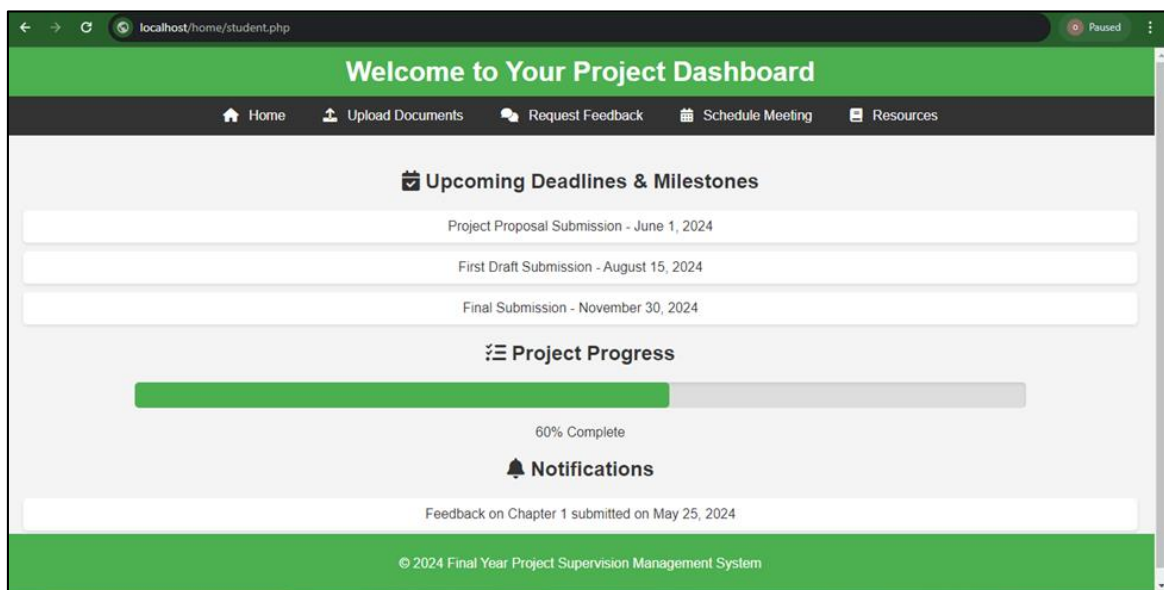

Figure 5 Student dashboard

A notification area will keep students informed by displaying system messages and feedback provided by supervisors on uploaded documents. Also, easily accessible links to relevant resources, such as institution style guides or plagiarism checkers, will be available to promote academic integrity and proper formatting.

5.4. Supervisor Homepage

The supervisor homepage will prioritize efficiency in managing assigned students and their projects. A list will showcase student names, project titles, and progress indicators. This allows supervisors to quickly identify students who may require more attention. Clicking on a student will reveal details such as contact information and uploaded documents. Supervisors will be equipped with functionalities to streamline the supervision process. They can conveniently download student documents for thorough review and evaluation. The platform will allow supervisors to provide written feedback directly on uploaded documents, saving time and effort. Supervisors can also utilize the system to schedule meetings with students for in-depth discussions or clarification of any issues. Upon project completion, supervisors can efficiently assign grades within the system.
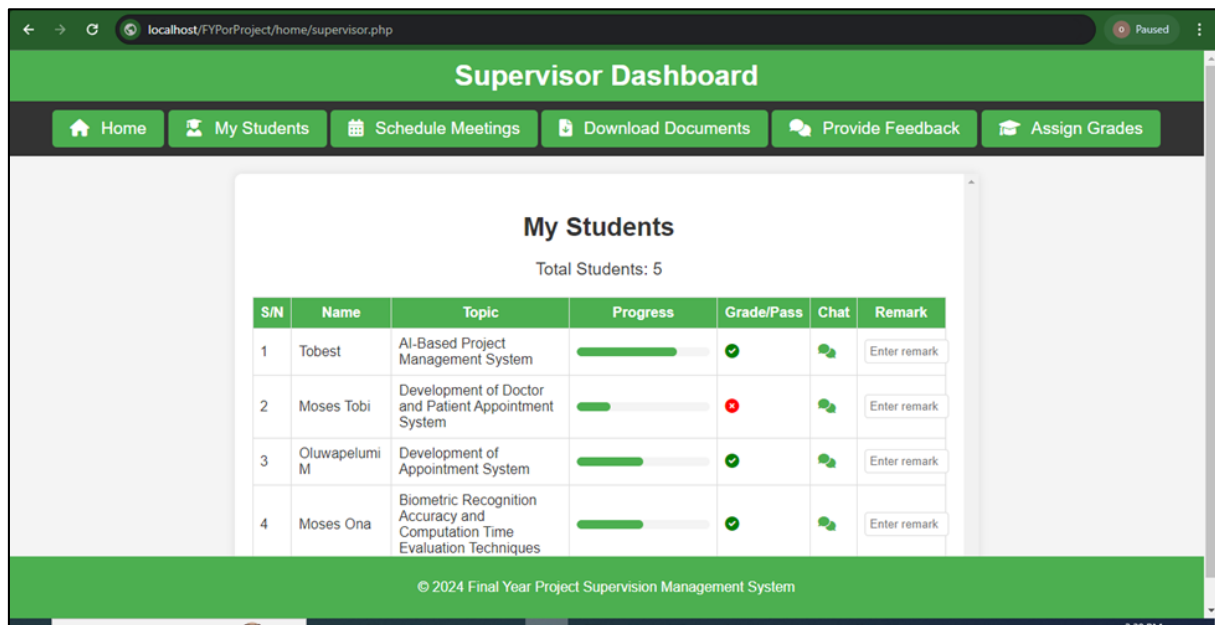

Figure 6 Supervisor Homepage

5.5. Project Inspection Page

The Project Inspection page is designed to facilitate supervisors in managing and reviewing student projects efficiently. It provides functionalities for downloading and viewing student documents, providing written feedback, and scheduling meetings with students. The page is designed to be user-friendly, visually appealing, and functional, utilizing Font Awesome icons for enhanced aesthetics.
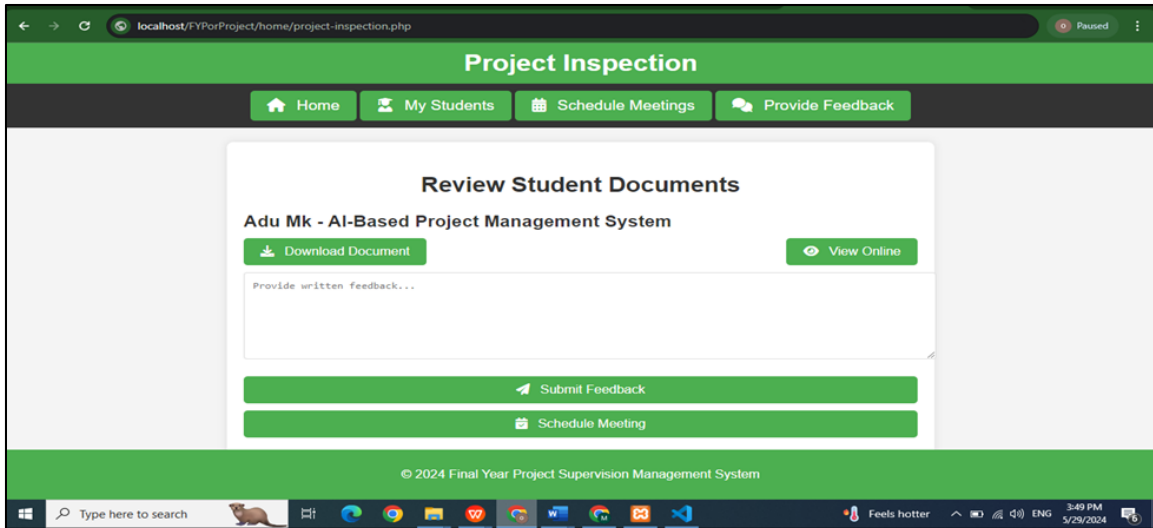
Figure 7 Project Inspection Page

5.6. Administrator Dashboard

The administrator dashboard function as the central hub for system management. This comprehensive dashboard divided into sections, providing administrators with the tools they need to maintain and configure the FYPSMS. The user account management section empowers administrators to create, edit, and deactivate user accounts for students, supervisors, and external examiners. This ensures proper system access control. Within the system configuration section, administrators can define deadlines, access permissions, and notification preferences. This allows them to tailor the system to meet specific departmental requirements. The reporting and analytics section will be a valuable asset. The system will generate reports on student progress, supervisor workload, and overall FYP program performance. These reports, often visualized through charts and graphs, will provide administrators with valuable insights for program improvement, the system maintenance section equips administrators with functionalities for data backups and software updates, ensuring system stability and security.
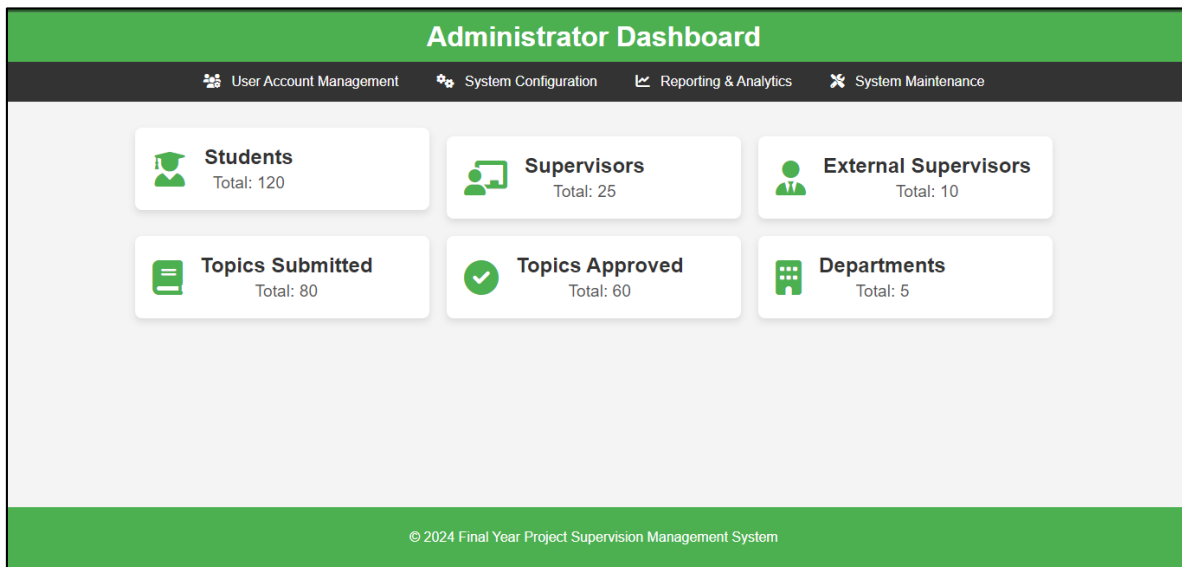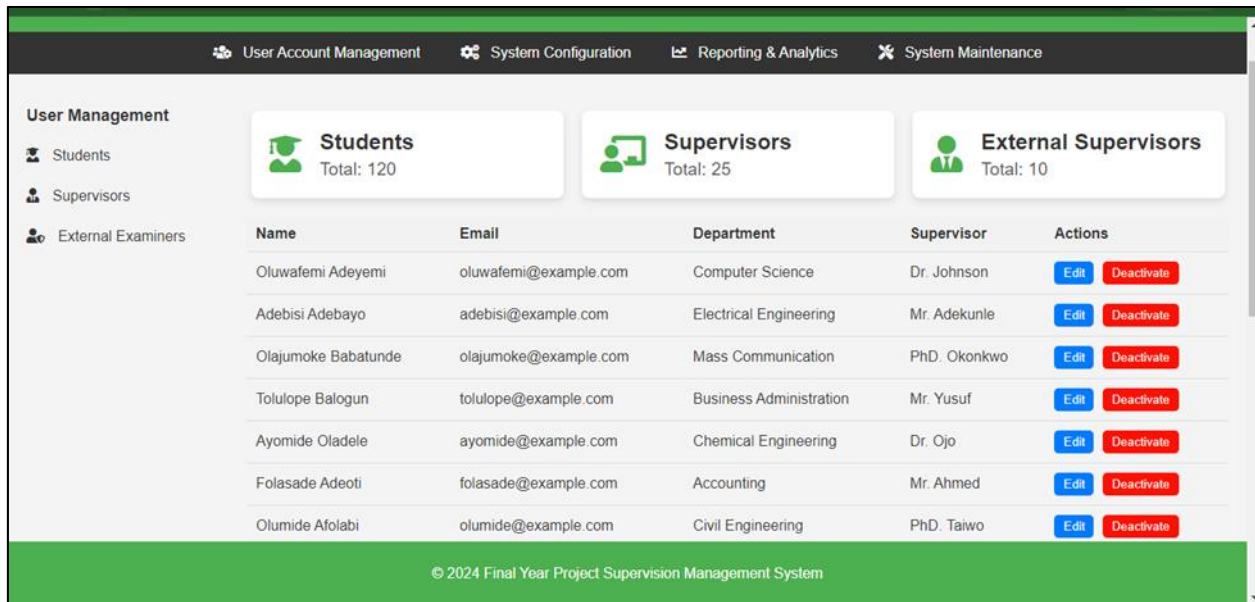

Figure 8 Admin Dashboard
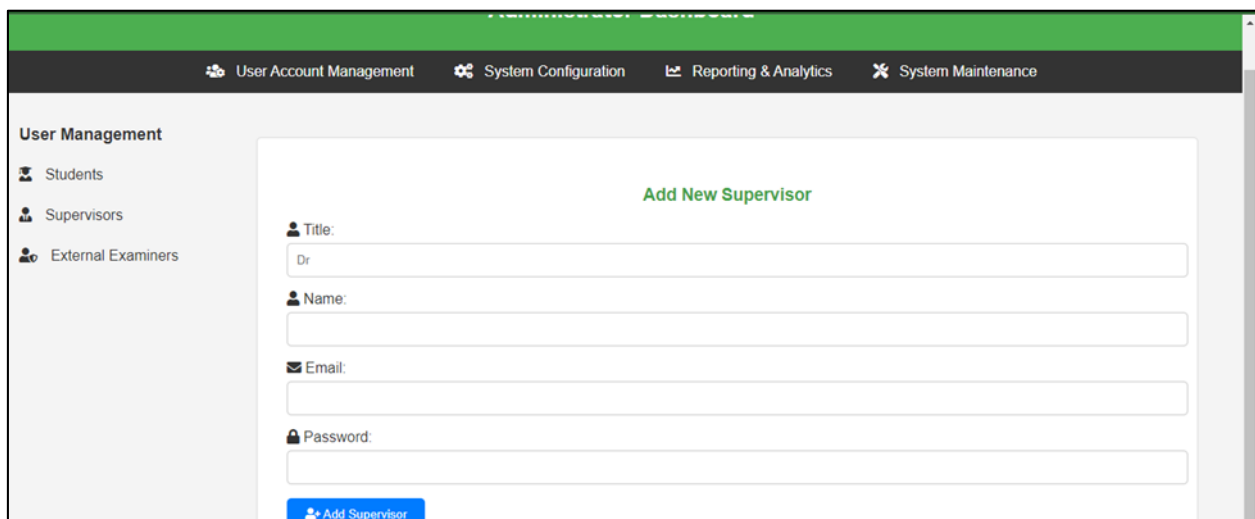
Figure 9 Student management

Figure 10 Add new supervisor

5.7. External Examiner Homepage

The homepage for external examiners will prioritize efficient project evaluation. A list will display projects assigned for evaluation, including details like title, student name, and supervisor information. This allows examiners to quickly identify the projects they need to review. Examiners can download project presentations for review and submit written feedback directly within the system. Additionally, a functionality will allow communication with project supervisors if needed. This facilitates collaboration and clarification during the evaluation process, ensuring a comprehensive assessment of student projects.
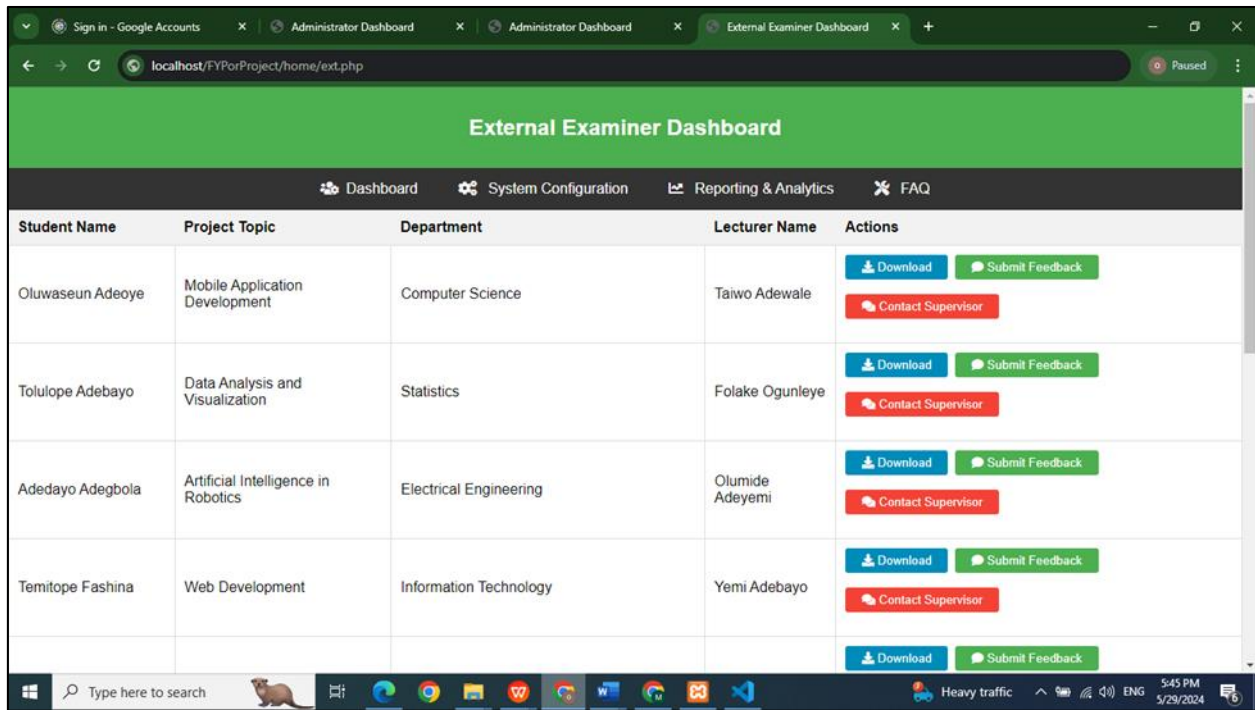
Figure 11 External Supervisor page

6. Conclusion

Final year project is very crucial to the overall educational development of a student. The quality and standard of a final project speak volume about the knowledge acquired by a student in an institution. Although various attempts have been put in place, especially with the application of Information and Communication Technology as a tool. However, none has been able to address the associated challenges with regard to yearly increase in students' enrollment that has led to increase in the number of final year projects allocated to lecturers to supervise.

This work not only provides comprehensive solution to the challenges but has efficiently and effectively applied the Information and Communication tool by deploying a web-based system that is user-friendly and can be used and operated with little or no expertise knowledge in Computing.

The stakeholders, including students, supervisors, external examiners and administrators will now have enough time to spent on the project through the web. Communication is enhanced and feedback from supervisors will be robust to provide the needed guidance for the students. The temptation of students engaging in 'copy and paste' of existing projects for supervisors is minimized. The standard and originality of students' final year project is made possible.

Therefore, the stated objectives of this work are achieved for the overall aim of quality assurance of final year projects in Nigeria tertiary institutions.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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