Design and Implementation of Undergraduate Degree Projects Monitoring System

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Abstract- ***Ease of accessibility while ensuring quality data representation is the onus of modern day "computerization". In the university system, a project (a term used interchangeably with thesis) is a research work done as part of conditions for awarding a particular degree to students. A student is being allocated to a supervisor, who is to mentor and monitor the progress of the student during the period of the research work. In most cases, the Head of Department determines the allocation of students to supervisors, with the examination officer responsible for the computation of the students' scores. The major challenge of providing a repository for the past projects while ensuring that a check is done to eliminate topic duplication is still being worked on by researchers actively. In this paper, we present a project monitoring system that caters for the allocation of students to supervisors, uploading and archiving of projects, tracking of the students' progress while keeping a chat line open for ubiquitous real-time assistance to students.***

Index Terms- ***Project Monitoring, Project Supervision, Project Management System, Software Development.***

I. INTRODUCTION

Automated Systems are increasing in its everyday use especially in the education sector [1] [3]. They are often seen as special form of computerized systems designed to provide access to information. These days, every sector is known with the word – computer, as we can find computers at everywhere around us. The modern world will be incomplete without computers and their applications [18]. It is almost impossible to even imagine the modern facilities without the use of computers [14] [16].

According to [6][21], monitoring is the act of checking actual progress and actual resource usage against the planned progress and resource usage, and the act of taking decisions to alter the likely future outcome and bring the project back on the planed schedule. Thus, the planner must collect the information on the rate of progress to date and current resources usage in order to update the computer model and monitor progress [4] [7]. Project monitoring system allows the supervisor to monitor project topics submitted by the student and verified them [8] [15] [19]. In the design of a project archive, the old, current and project progress monitoring methods within the Department will be stored in a central database, this helps in keeping a repository of projects. Project progress monitoring and control is one of the most important tasks of project management and every team needs to know in a timely and accurate manner how project is progressing, where they are currently in comparison to the initially set plans [7][9][22].

According to [11][12][17][5], project performance monitoring system is described as ways of exercising project control and at the same time acting as a project monitoring tool. To inculcate research skills for students, research elements need to be incorporated into teaching and learning at all levels including undergraduate studies [15[2]. To fulfill this objective, final year project is an appropriate avenue to introduce research to the undergraduates, since students are required to undertake research in a specific domain and develop software prototype as part of the requirements for the first degree award in Computer Science. Students are also required to write a dissertation as part of the programme requirements [19][13].

Arguments arise due to the manual approach used by supervisors in verifying repetitions in the allocation of project topics to students in the department, thus, slowing down the students' work due to duplications of projects [10][20]. The Project

approval and monitoring system (nicknamed "Pro_Mo") aims to verify each phase of project submission. Also, it searches the database for existing project topics and abstracts while topics are allocated to students. In this paper, a framework for "Pro_Mo" will be developed and implemented, with focus on how projects can be keenly monitored in real-time.

II. RELATED WORKS

The vast interest on how projects are being allocated and approved has soared over time. With researchers looking for the optimal way to minimize topic repetition, while ensuring that the research work is completed on time. The work of Memon et al [16] on "Project Progress Monitoring System" discusses the current project progress monitoring methods within the Malaysian projects Industry (MPI) and proposes a prototype model to automate the process of project progress reporting that enables a scheduled control and update the project progress. The authors in [10] presented "A Web-Based Final Year Students Projects Duplication Detection System" in monitoring the undergraduate final year students' projects. It is a common phenomenon in higher institutions of learning that final year students' projects are often managed in paper-pen system where most of these students lay their hands on already completed projects, and present the same to their supervisors as original work of theirs. This common scenario had caused so many duplications of project works occasioned by the laziness of the students to initiate original work of theirs.

It has been discovered that students are becoming very lazy and are no more original in their projects for the purpose of qualifying for the award of degree they enrolled for. The practice within the higher institutions of learning is for students to be allocated to different supervisors, a project carried out by a student in a particular year with certain supervisor could therefore be picked up by another student in another year and replicate same to another supervisor within the same department without the supervisor's knowledge. The work of Romdhani et al [19] titled "Student Project Performance Management System for Effective Final Year Projects and Dissertation Supervision" presented an integrated and collaborative online supervision system for final year projects and dissertation.

The proposed system in this paper aims to ease the supervision process, federate the tasks of all involved actors and enhance the students learning experience. The feedbacks from students and academic staff showed that such a system can help in maintaining an effective and efficient supervision relationship among all parties. Many supervisory issues may appear at any stage of the project lifecycle. For example, a supervisor may face challenges in helping his/her students to control and conduct their research projects independently with minimal assistance and interference, while in other circumstances supervisor may face difficulties in building students' autonomy of reflection, motivation and self-initiative to control their projects.

III. THE PROPOSED SYSTEM

The system is built using water fall model, which consist of the requirement analysis stage, the planning stage, the design stage, the coding stage and the implementation stage. In other to avoid duplication of project work, uploading of concluded project topics and abstract would be available for both supervisors and student, but uploading of project topics and abstract would be uploaded after the project has been concluded which has earlier been approved, hence new topic can be verified and classed as non-existing. Supervisors would have to verify the project topic student submitted to him/her from the system, either through the system or physically and if the project does exist and the verification has been done. Supervisors would have to deny project work that exists before. Also, the system can automatically deny project if it captures it existence once is submitted. Student can submit his/her project topic for supervisor's approval and also read through old project works to have an idea on how a project works.

A. The Conceptual Model

The conceptual model of the proposed system for Pro_mo is shown in figure 1; this involves the use

case of the supervisors, Administrator (Head of the department), Examination officer and the students.

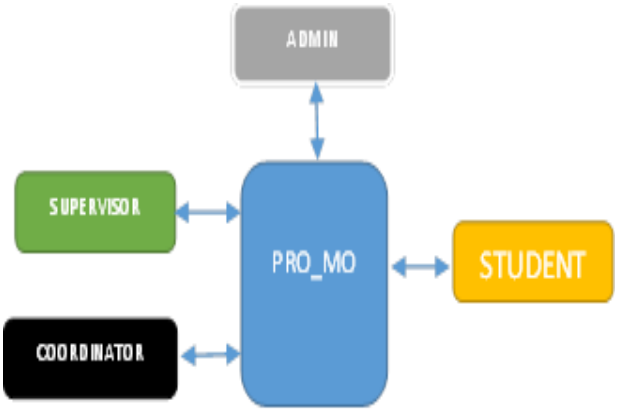


Figure 1: The Conceptual Model of PRO_MO

B. The System Use Case Model

The use case model of a system is a model of how different types of users interact with a system to solve a problem. As such, it describes the goals of the users, the interactions between the users and the system, and the required behaviour of the system in satisfying these goals. The model describes the proposed functionality of a new system and represents a discrete unit of interaction between a user (human or object) and the different use cases in which the user is involved. The use case model of the system represents the interaction of the users (The Administrator, The Coordinator and The Supervisor) with the PRO_MO system.

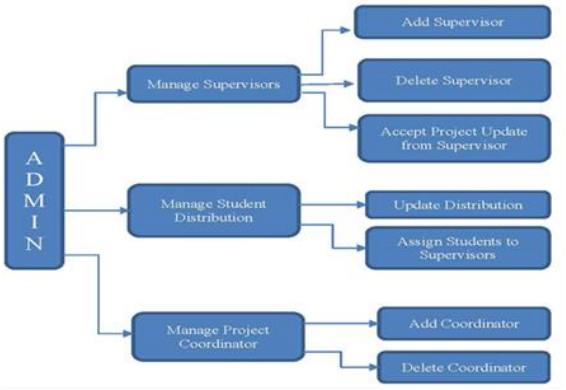


Figure 2: The Use Case Model for Administrator

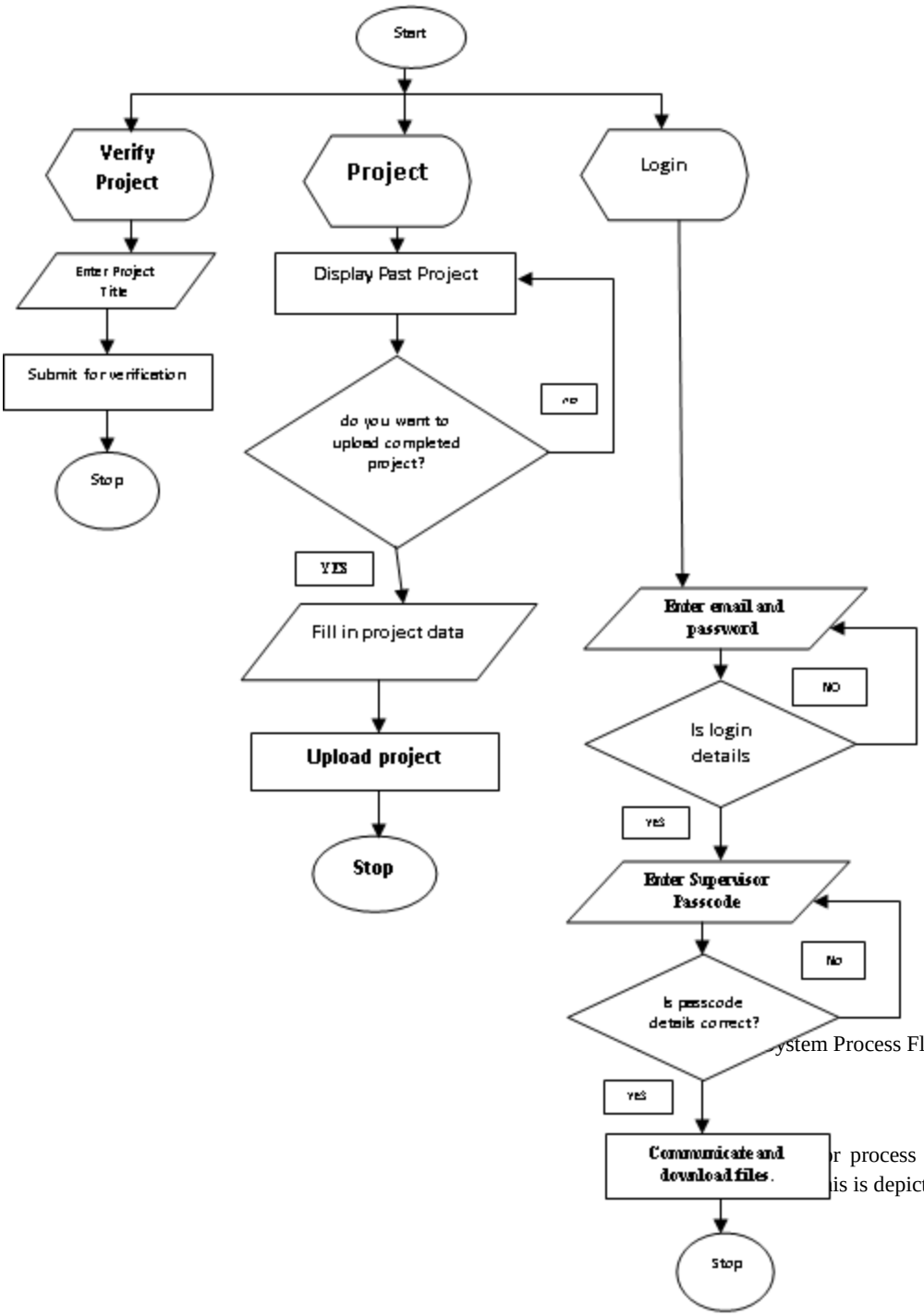
Figure 3: The Use Case Model for Coordinator

Figure 4: Use case for Supervisor in Pr

Figure 4: The Use Case Model for Supervisor

C. The System Process Flow Diagram

The process flow data model for Pro_Mo is presented in three phases, viz; Administrator process



ystem Process Flow Diagram

r process flow model, and Student is is depicted in figure 5.

IV. DEVELOPMENT AND IMPLEMENTATION

The system is developed using Java programming language alongside XML which are all components of Android software development kit (SDK)

A. The System Database

The database structure for Pro_Mo is presented in figure 6. The schema for students, supervisor and project topics are shown in the snippet, with * indicating primary key.

Student	Supervisor	Project Topic
surname	surname	id* topic
othernames	othernames	matric_number
id*	id* staff id	abstract
matric_number	gender	supervisor
gender	password	status
phone_number		session

Figure 6: Database Snippet for Pro_Mo

B. The Input Interface

Figures 7 to 10 shows the input interface for Pro_Mo, indicating the splash and the navigation screen, the sign up page, the sign in page and passcode screen for authentication (used as second authentication for administrator).

Figure 7: Splash and navigation screen

Figure 8: Sign up page

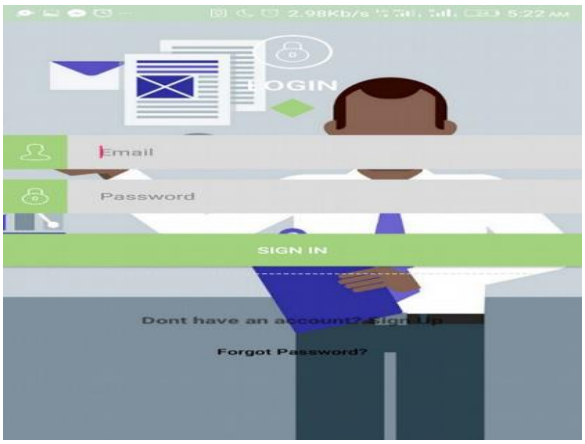


Figure 9: Login Screen

Figure 10: Passcode Screen

C. The Home and Conversation Screen

In this window, student or lecturer can view his/her recent conversation. Also, a student can have a conversation with supervisor(s). Figure 11 shows Pro_Mo's Conversation screen.

Figure 11: Conversation Screen

D. Add Project Screen

This interface allows students to upload their completed project work. Figure 11 shows the add project screen.

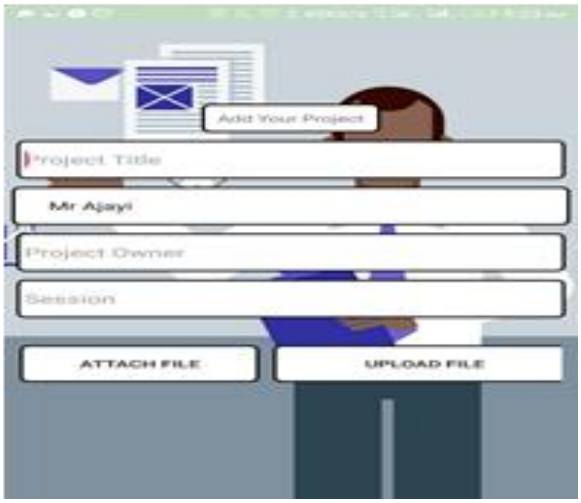


Figure 12: Add Project Screen

E. The Project Screen

This interface allows students or other users to download all previously uploaded projects. Figure 12 shows the diagram of this screen.

Figure 12: Project Screen

V. CONCLUSION

Project approval and monitoring activities are pivotal in any higher institution of learning. These activities are very sensitive, require accuracy and are time-bound. In addition, these records have to be properly and securely kept for future reference and to forestall any alteration. Manual method of student final year project management is challenging and time consuming. The newly developed software allows supervisors to have access to existing projects, download projects and project topics to guide the students in choosing appropriate research topics to bring out novel contribution that will add to the body of knowledge, also students gain access to some project topics and project write-ups to guide them in picking their own topic and tailor them towards successfully completing their own research, while the department have a repository of past projects.

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