

Educational Project Management System

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Abstract—In the modern era of the education system, students have various projects and assignments. Due to the increase in academic requirements, the administration of such information becomes difficult. So, there is a need for proper software to address the administrative issues of the assessment scheme. The purpose of this study is to develop a framework for student information regarding their project assessment work. This system is developed to enhance the administration and control to make the task more convenient for academic faculty. The desktop application provides an individual login option for both students as well as faculty guide/supervisor. This software helps to administer the project information like student credentials, group details, project topics, project domain, guide details, etc. This system is developed using Java Swing and Apache Derby is used for Data storage. In this system, the tree map algorithm has been implemented for Data exporting such that the faculty got the data in the form of an excel file. Implementing this project in the college/school will be beneficial for faculty to maintain data of students on one screen instead of managing the data traditionally like on project sheets or maintaining different files for different courses.

Index Terms— Java, Project Management, Database, etc.

I. INTRODUCTION

The students in the modern educational system are assigned a variety of projects and assignments like course projects (CP), seminars, Engineering development and Innovation Projects (EDI), Software Development Projects (SDP), Home assignments (HA), Group Discussion (GD) etc [1]. For a better understanding of their course applications. Managing student's topics manually is a time-consuming job as you need to write these things on paper or make an Excel sheet rather than this technique project management system is a simple software which allows students to fill their topics on their own and coordinators or faculties or guides can verify that on their system [2]. Because of this staff workload can get reduced and they can engage more time in the classroom. This project is developed on Java in Apache NetBeans. This system utilizes Java Swing for the graphical user interface and Java Derby database for storing the inputs. In this student has only access to enter their respective topic for projects, assignments, etc. Updating the topic like changing topics, or deleting the topics can be done by the faculty or guide (admin) only [3]. Faculties can also export all the data of students into pdf or Excel format.

II. LITERATURE REVIEW

Companies work on multiple projects at the same time, necessitating an efficient project management system for

resource allocation and project planning. A web-based project coordination, monitoring, and management system provides a solution for automating project management functions such as document management, resource management, and team collaboration, covering all aspects of the project management process [4]. Assessing genuine progress, team collaboration, updating email reviews and brief messages, server login administration, client portfolio management, online payment bills, and delivering management reports are all components of the framework that help with successful decision-making [5]. Today, many web development organisations use a variety of project management solutions to boost product productivity. An organisation can execute multiple projects at the same time and need feedback from a variety of people or teams in order to establish a multi-level development strategy that incorporates a robust project management system [6]. Project management systems are a rapidly evolving technology in the IT sector. Web-based project management solutions are becoming increasingly important in many organisations as the number of people utilising project management software grows. As a result, a strong project management system is critical in ensuring that clients receive accurate, robust, and high-quality web apps [7]. Develop a web-based project management system and show how users handle jobs one by one. In everyday working life, these processes are the subject of study [8]. The current work's structure has also been explained, as well as the dependability and robustness of a web-based project management system. Finally, a web-based project management system was developed that met the company's requirements. The TRAC programme is used in the web-based project management framework, which has been developed to match the needs of the companies involved [9]. The traditional manual method of arranging and tracking student work is a very exhausting job. The goal of the project is to create an integrated framework for project management and control. This is a web-based platform that serves as a resource for students, project coordinators, HODs, and faculty. The technology allows administrators to add students and faculty to the system [10]. The students can then access the. Faculty members must also sign on to the system. Faculty members can delegate projects to a group of students and give them homework. You can apply a weight to a task while generating it as a faculty member, and when the work is generated, an email is automatically sent solely to a group of students [11]. The research is about applying the different Machine Algorithms for Performance Analysis of the Smart Team Management Application. This Project also predicts the productivity of the users with the help of Artificial intelligence and Machine Learning Algorithms that can be used on any device or any operating System and the study shows that the Random Forest Algorithm Classifier has the maximum accuracy score compared to others [12]. The proposed system is about hybrid mobile application for managing the registration of the school students by using the Flutter Framework and Firebase Database by allowing the permissions of Teachers, Managers and Students via verification account [13]. For the hybrid application, this project suggests Flutter as it is more reliable and easier as compared to other frontend languages such as React, Java and Swift. For the Database Firebase is used for secure access allowing directly from the client -side code. In this Project facility of communication between teachers and student is also suggested by [14].

III. EXISTING SYSTEM

In the existing system, faculties or guardians have to write the topics of each student or group of students on paper or else have to make an Excel sheet and give access to the student to edit the sheet. It is a time-consuming job [15]. The drawbacks are that the papers can get misplaced and, in the case of the Excel sheet, students can edit the topic at any time without asking or discussing it with their guide. Also, faculty or guides do not get to know that students are taking the topics that were already done by the previous batch/year students.

IV. PROPOSED SYSTEM

In this proposed system, a system can be executed which can manage projects. In this, students and faculty both have different logins. In this system, students are only able to add their projects in that they have to first add the details of their group, branch, course, faculty name, etc., and then fill in the details of their project. In the case of Admin (Project Guide), it has various features like updating the details, viewing records, searching in records by which faculty can check if the topic is repeated from the previous batch and they can export the data into a Pdf or Excel sheet, and printing the record directly [16]. All the details get stored in the database, and only admins can access them.

V. SOFTWARE USED

A. Developed On- Apache NetBeans

NetBeans is an IDE that is based on Java and allows developers to create applications using modules. It can be used on various operating systems such as Windows, Mac OS X, Linux, and Solaris. It also supports development in PHP, C, C++, HTML5, JavaScript, and Java. Additionally, third-party developers can enhance NetBeans-based applications, including the IDE itself.

B. Programming Language- Java 8.

C. Graphical User Interface- Java Swing.

Swing is a toolkit for creating graphical user interfaces in Java. It is a component of the Java Foundation Classes (JFC), which provides Java developers with an API for designing GUIs. The aim of Swing was to offer a more comprehensive selection of GUI components than the earlier Abstract Window Toolkit (AWT).

D. Database- Java Derby

The Java Derby database is the version of Apache Derby that is officially supported by Sun. It is a secure, transactional database server that is entirely Java-based and adheres to SQL, JDBC API, and Java EE standards. The Glassfish application server ships with Java Derby, and it is also bundled with JDK 6.

VI. BASIC SYSTEM DESIGN

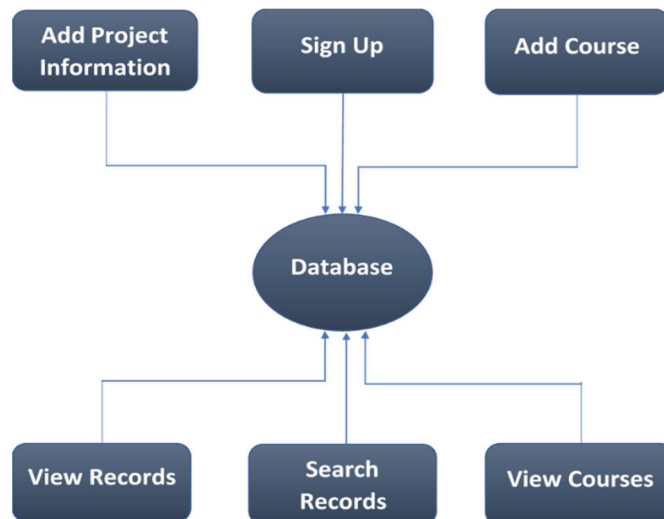


Figure 1. Basic Design for Project Management System

VII. METHODOLOGY

A. System Framework

Java Swing:

For this project, java swing is used as a widget toolkit for GUI which is part of Oracle's Foundation Classes (JFC). It gives a more advanced set of graphical user interface components than the previous Abstract Window Toolkit (AWT). For Organizing the components of the system and its various layout the JPanel of the Java Swing Package. For Editing Text and single lines the JTextField of Java Swing Package is used in this project.

For Image icons and display of short strings for indication purposes which will be user-friendly. Labelled Buttons are implemented by using JButton Class. This project allows editing of a single line of text where it displays only something that was typed but doesn't show actual credentials using JPasswordField class, and for showing the password field JCheckbox used. For arranging data in tabular forms and editing JTable class is implemented. A search box is implemented to search an individual valve from the table by which faculty can get data on a particular student with ease. For fascinating users to choose an option from the popup menu that shows a list the JCombo Box feature is used. In this project, it is used by which users can select a particular subject to add its information.

B. Data Handling and Data export

Apache POI Library

One of the important features of this project is that the data from the database can be exported to an excel file for the faculty to download the data in the form of Docx. An open-source java library Apache POI Library is implanted for this feature. Apache POI can be used to create and modify that are based on Microsoft Office.

TreeMap

In Java, the implementation of the Map interface and Navigable Map involves utilizing the TreeMap functionality, which allows for sorting the map either by its key's natural ordering or a comparator specified during map creation. This feature can be utilized by faculty members to organize and manage official project information submitted by students.

VIII. MODULES

Student and Admin Module:

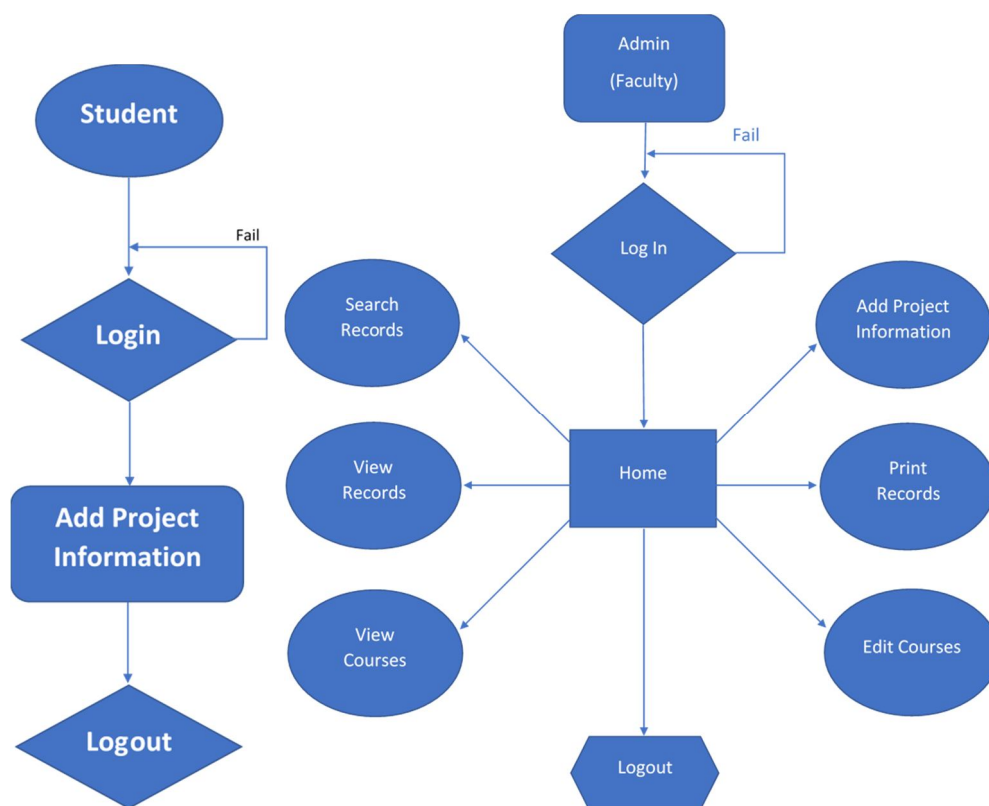


Figure 2. Student and Admin Module for Project Management System

IX. FEATURES OF THE SYSTEM

A. Student Features

Signup: Students have to register on the system and fill in some basic details about themselves and have to set a password.

Login: After successful signup, students have to login into the system with their unique username (e-mail) and password.

Add Project: After successfully logging in, add projects page will appear directly, in which students must first fill in the details of their group, such as group members, roll no., branch, course, batch, division, and so on, and then fill in their project titles in their respective projects.

Logout: After filling in the project details, students can log out.

B. Admin Features

Login: Faculties have to select the admin option while logging into the system and fill in their username and password.

Home Page: After successful login, the system will redirect them to the home page where they can choose various options like viewing records, adding projects, searching for records, printing records, etc.

View Records: With this feature, faculty can check the records filled in by the students.

Search in Records: This feature allows Project Guides to determine whether a topic has already been completed by a previous batch.

Print records: Records can be printed directly from the database or else they can be converted into pdf or Excel format. HashMap structure is used to convert this data.

Add projects: Faculties can also add project details for students or can edit the topics of the students.

Edit Courses: This feature helps admins or faculties to add new courses or update the previous courses.

View Courses: With this, the courses that have been added can be seen.

Logout: After the work is completed, the admin can log out.

X. SOFTWARE INTERFACE

A. Login Page

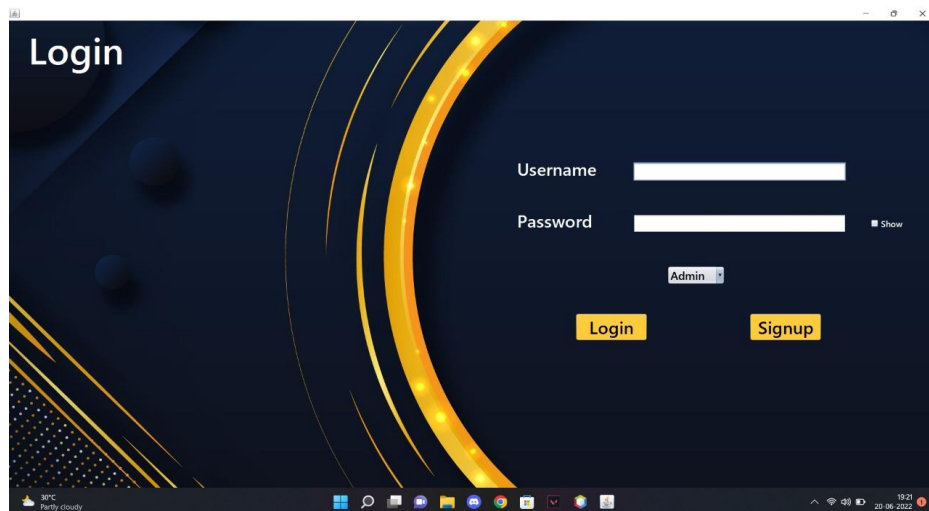
The screenshot shows a web browser window with a dark blue background and yellow curved lines. The title "Login" is in the top left. There are input fields for "Username" and "Password". A "Show" button is next to the password field. Below the password field is a dropdown menu with "Admin" selected. At the bottom are "Login" and "Signup" buttons. The Windows taskbar is visible at the bottom with a date of 20-06-2022 and time of 19:21.

Figure 3. Login Page

B. Add Project Page

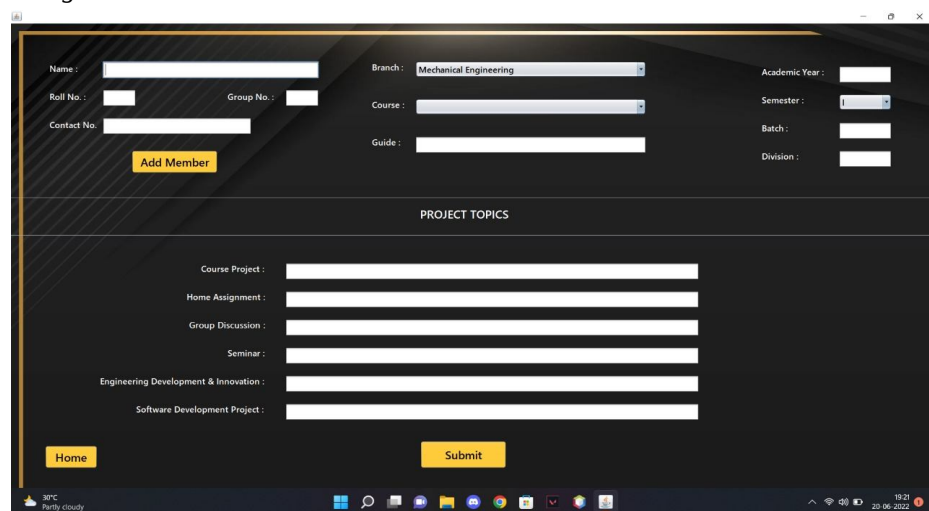
The screenshot shows a web browser window with a dark background. The top section has form fields for "Name", "Roll No.", "Group No.", "Contact No.", "Branch" (set to "Mechanical Engineering"), "Course", "Guide", "Academic Year", "Semester", "Batch", and "Division". An "Add Member" button is below the contact number field. The middle section is titled "PROJECT TOPICS" and contains several text input fields for "Course Project", "Home Assignment", "Group Discussion", "Seminar", "Engineering Development & Innovation", and "Software Development Project". At the bottom are "Home" and "Submit" buttons. The Windows taskbar is visible at the bottom with a date of 20-06-2022 and time of 19:21.

Figure 4. Add Project Page

XI. CONCLUSION

Project Management System is an effective and useful application. This system can be implemented in colleges or schools. Implementation of this system in college or school can reduce the time as well as effort for maintaining the project-related data. Providing two different modules i.e. Student module and admin module. In this system, the TreeMap structure is used for exporting the data into the Excel format which will later use by faculty for evaluation purposes. A search record option is also provided for quick access to data and helps to avoid repetition in the topics. The user-friendly interface is provided for the faculty and student.

FUTURE SCOPE

Currently, this system is made to manage only the topics of students' projects. Future modifications can be made, like live chat of students with the mentor or the project guide. More features can be added, like signing in with Google and also the facility to submit project reports on the system.

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