Student's Daily Activity Monitoring System

By

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DECLARATION

We declare that this written submission represents our ideas in our own words and we have adequately cited and referenced the original sources. We also declare that we have adhered to all the principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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I. Preamble

I.I Vision and Mission

The vision of our Institution is to evolve as an industry oriented, research-based Institution for creative solutions in various engineering domains, with an ultimate objective of meeting technological challenges faced by the Nation and the Society.

The mission of our institution is:

1. To enhance the quality of engineering education and delivery through accessible, comprehensive and research-oriented teaching-learning-assessment processes in the state-of-art environment.

2. To create opportunities for students and faculty members to acquire professional knowledge and develop managerial, entrepreneurial and social attitudes with highly ethical and moral values.

3. To satisfy the ever-changing needs of the nation with respect to evolution and absorption of sustainable and environment friendly technologies for effective creation of knowledge-based society in the global era.

The vision of our department, Computer Science and Technology is to continually improve upon the teaching-learning processes and research with a goal to develop quality technical manpower with sound academic and practical experience, who can respond to challenges and changes happening dynamically in Computer Science and Engineering.

The mission of our department, Computer Science and Technology is:

1. To inspire the students to work with the latest tools and to make them industry ready.

2. To impart research based technical knowledge.

3. To groom the department as a learning centre to inculcate advanced technologies in Computer Science and Engineering with social and environmental awareness.

I.II Program Outcome (PO) and Program Specific Outcome (PSO)

❖ Program Outcomes(POs)

PO1: Engineering Knowledge- Apply the knowledge of mathematics, science, engineering fundamentals and engineering specialisation to the solution of complex engineering problems.

PO2: Problem Analysis- Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering science.

PO3: Design & Development of Solutions- Design solutions for complex engineering problems and design system components, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO4: Conduct Investigations of Complex Problems- Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage- Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society- Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and Sustainability- Understand the impact of professional engineering solutions in social and environmental context and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics- Apply ethical principles and commit to professional ethics and responsibilities and norm of engineering practice.

PO9: Individual and Team Work- Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings.

PO10: Communication- Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance- Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team to manage projects and in multi- disciplinary environments.

PO12: Life-long Learning- Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

❖ Program Specific Outcomes (PSOs)

PSO1: Programming skills: Apply fundamental knowledge and programming aptitude to identify, design and solve real life problems.

PSO2: Professional skills: Students shall understand, analyse and develop software solutions to meet the requirements of industry and society.

PSO3: Competency: Students will be competent for competitive examinations for employment, higher studies and research.

I.III PO and PSO Mapping with Justification

College App	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**
	2	3	3	2	3	-	-	2	3	3	3	3	3	3	2

PO1: We have applied the knowledge of java programming language.

PO2: We have learned the functionalities and working methods of Android Studio.

PO3: Designing and developing various modules has been done.

PO4: We have consulted various websites and books to design the complex parts.

PO5: Various tools such as Android Studio, SQL Server. etc are used.

PO6: This application has a completely different purpose than health, legal and safety measures.

PO7: This application consists of no environmental impact.

PO8: Ethics and professionalism is maintained throughout the project.

PO9: The project needed effective contribution from team members.

PO10: Communication with team members and mentor has occurred effectively on a regular basis.

PO11: The project is broken down to smaller modules for the ease of implementation.

PO12: We have gathered knowledge about android development.

PSO1: This project needed a moderate to advanced level of programming knowledge.

PSO2: This project will efficiently handle real-life scenarios.

PSO3: If wished, more features can be added on this project and it can act as a stepping stone to Android Development as well

Abstract

The Online Teaching and Learning Process has become a part and parcel in our lives since lockdown. Though the ongoing method of study has shifted to offline lately, there is still a need to conduct a few essentials through online mode, such as posting assignments, submitting assignments, notifying students about important news or articles etc. Moreover it is essential now-a-days for each college to have their own website or mobile application as a portfolio. Developing an android application that caters to the daily activities of our college would be very useful for students and teachers as they can shift to modern online learning methods easily. Most of the available applications that function this way have a few disadvantages. Firstly, no application whatsoever serving the same purpose contains a search bar. The end user needs to scroll all the way up or down to find the desired assignment. Having a search bar embedded in the application minimises the searching time and makes the application efficient. Thereafter, this android application is built for our college only. Hence, it is a customised version of the general applications available in the market and apart from serving the obvious purposes, this application will act as a portfolio of our college. The software application is totally based on interactivity. As far as the project is concerned, this software will help the student to keep up with the required college assessments in day to day life. As per this software application is concerned, this application is individual-based, meaning that the user needs to login with a valid email ID and password to utilise the software at its fullest. This is an Android based application. It has been implemented with Android Studio. After the application is finished, end users will be able to download it from the Play Store. For uploading purposes, this application will need the help of a cloud-based storage space and hence, has to rely on a third-party software. Cloud-based storage system chosen for its high demand, cost effectiveness and backup-recovery property. The application has an easy to use main menu from which the rest of features can be accessed. The basic app consists of a navigation menu where the Homepage is set as default. The application is available for all android phones running Android OS 5.0 (Lollipop) and any higher versions of the Android OS. The main programming used is Java. The application includes a dashboard for various modules like Home, Assignments, Materials etc. The user may choose from the given options so as to make the application more interesting to the user. The application choices are very simple for providing an extensive user friendly environment.

1. Introduction

1.1 Problem Statement

Developing a software that will cater to day to day activities of our college.

1.2 Objective

In this project, our sole purpose is to build an application using Android Studio that will cater to the day-to-day activities of our college. The application contains both the user and admin side that makes it more efficient. Through this application, the faculties and students will be able to accomplish the required activities such as posting assignments, materials, submitting assignments etc.

1.3 Literature Survey

For the implementation of the application, the following materials are taken help of:

In[1] Some similar applications with the purpose of formulating an idea as to what features the application should contain are considered. ***Google Classroom***, being a widely used and efficient application with the same purpose, has proved to be beneficial for us in this case. The basic layout of how the application should look and what tasks it must accomplish is chalked out.

In[2] The technicalities of Android Studio are learned. In this case, the android courses provided by the authenticated Android Developers website are undertaken. With the help of this course, the terminologies, the built-in tools such as card, recycler view, ImageView and the working method of the software such as the file system, creating emulators etc. are learned. The hardware requirements for installing and working in Android Studio are proposed.

In[3] With the purpose of brushing up Java programming knowledge, a few websites and books are considered that proved to be helpful as the application is java-based. The concept of the most used built-in functions in java (such as toString(), parseInt()) are polished. Learning more java concepts resulted in making the application interactive.

In[4] As the language chosen is Java hence, ways of connecting the small modules with each other to actually form the application is learned. In this case, books written specifically about Java-Based Android Studio Development are read to learn more about the Java syntax and functions used in Android Studio (such as how to fetch data from an ID, fetch data from an element, display result on screen etc) as it is different from the conventional Java programming for problem solving syntax. Learning more advanced tools about Android Studio and their implementations will help in building the backend of our application consequently.

In[5] To be used for college purposes, the application must have a database to store data in an organised and secure manner. Hence the theoretical knowledge on Relational Database Management System needs to be put in practise and that too, on a moderately large scale. Therefore, help from books is taken to learn more about the Normal Forms, Entity Relationship Diagram, SQL, PL/SQL etc. as these concepts are a necessity to insert, fetch and maintain the data of students, teachers, assignments and additional required information.

In[6] Ways of incorporating a search bar in the project is proposed as this feature will prove to be a new add-on compared to the already existing softwares establishing the same purpose. When an entity tries to find something from a large area, this search bar will come in handy and make the work much easier and time saving.

1.4 Brief Discussion on Problem

The Project is an android application which aims to cater to the day to day activities in our college. The application, with its integrated view into the basic requirements and functionalities that a college needs to monitor, acts as an easy platform for both the teacher and students for teaching and learning process respectively. Moreover, this application will prove to be beneficial for getting college notices as well.

1.5 Organisation

The concept analysis is all about the major tool that is used to conduct the project and a little overview of that. In addition, problem analysis, as the name suggests, is about delving deeper into the problem, pointing out the requirements, learning the optimised way of solving the problems etc. The step-by-step process of solving the problem is recorded in this section.

2. Concepts and Problem Analysis

2.1 Concept Analysis

The Online Teaching and Learning Process never left the scene after lockdown. Though offline mode of learning has already started full-fledgedly, a fragment of the college activities are still conducted through online mode, such as posting assignments, submitting assignments, notifying students about important news or articles etc.

Moreover, a college portfolio that showcases the details of our college such as vision, mission, fee structure, important notices, gallery, contact information has become a necessity. This is how the inspiration is found for this project.

The project is developing an android application that caters to the daily activities of our college that would enable the students and teachers to conduct the essential assessments through online mode, without any hazard.

The main tool that is used in solving the problem is Android Studio.

Android Studio

Android Studio is the official *integrated development environmen*t (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems. It is a replacement for the *Eclipse Android Development Tools* (E-ADT) as the primary IDE for native Android application development. It supports Kotlin, java and c++.

The following features are provided in the current stable version

- Gradle-based build support
- Android-specific refactoring and quick fixes
- Lint tools to catch performance, usability, version compatibility and other problems
- ProGuard integration and app-signing capabilities
- Template-based wizards to create common Android designs and components
- A rich layout editor that allows users to drag-and-drop UI components, option to preview layouts on multiple screen configurations
- Support for building Android Wear apps
- Built-in support for Google Cloud Platform, enabling integration with Firebase Cloud Messaging (Earlier 'Google Cloud Messaging') and Google App Engine
- Android Virtual Device (Emulator) to run and debug apps in the Android studio.

2.2 Problem Analysis

The problem is to develop a college application that caters the daily activities of our college, using android studio. Hence, this application needs to have a few modules, all merged together, making the entire application running. Homepage, Navigation Bar, Assignments, Materials, Courses etc are the parts of the problem, all of which needs to be implemented separately.

2.2.1 Literature Review

It is essential to study about the project one is going to undertake. Having a clear understanding of the requirements of a project helps the developers to approach the problem properly and efficiently. Moreover, it is important to learn if any new tool or technology is going to be implemented in the project so as to minimise the chances of errors.

2.2.2 Project Development Approach

To solve actual problems in an industry setting, a software engineer or a team of engineers must incorporate a development strategy that encompasses the process, methods, and tools. This strategy is often referred to as a process model or a software engineering paradigm.

A process model for software engineering is chosen based on the nature of the project and application, the methods and tools to be used, and the controls and deliverables that are required.

Incremental Process Model is used for this project. This model, as illustrated in the figure below, derives its name from the way in which the software is built. More specifically, the model is designed, implemented and tested as a series of incremental builds until the product is finished. A build consists of pieces of code from various modules that interact together to provide a specific function.

At each stage of the Incremental Model a new build is coded and then integrated into the structure, which is tested as a whole. Note that the product is only defined as finished when it satisfies all of its requirements.

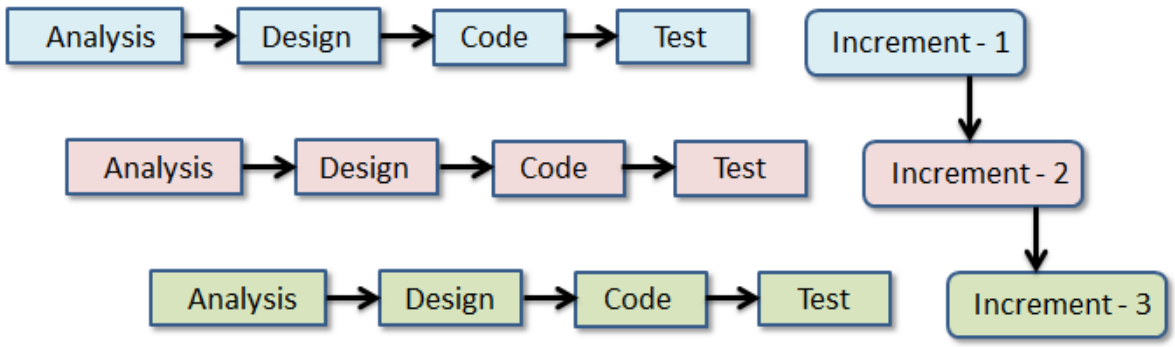

Figure 1: Illustration of the Incremental Model

This model combines the elements of the waterfall model with the iterative philosophy of prototyping. However, unlike prototyping the IM focuses on the delivery of an operational product at the end of each increment. An example of this incremental approach is observed in the development of word processing applications where the following services are provided on subsequent builds:

- ➔ Basic file management, editing and document production function.
- ➔ Advanced editing and document production functions.

- ➔ Spell and grammar checking
- ➔ Advance page layout

The first increment is usually the core product, which addresses the basic requirements of the system. This may either be used by the client or subjected to detailed review to develop a plan for the next increment. This plan addresses the modification of the core product to better meet the needs of the customer, and the delivery of additional functionality.

2.2.3 Building Wireframe Diagrams

Data Flow Diagrams and Entity-Relationship Diagram is built for better clarification of the data flow and database system of the project. It has proved to be essential in designing the layout of our application.

2.2.4 Steps of Implementation

The problem is broken down to three parts:

- The Front-end - Implementation is based on Android Studio UI/UX Designing
- The Back-end - Implementation is based on Java Programming Language
- The Database System - Implementation is based on MySQL

The management system of the application will be broken to two parts:

- Student User Management
- Admin User Management

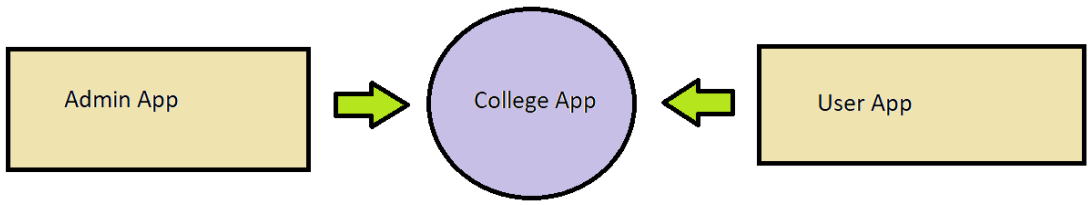

Figure 2: The management system of the application

2.2.5 Database Management System

The database management system is handled using SQL. This database is extremely essential for storing student's information, teacher's information, course details, assignments created by teacher and

submitted by students, materials uploaded by teacher etc. The database management system will be based upon the following Entity-Relationship Diagram.

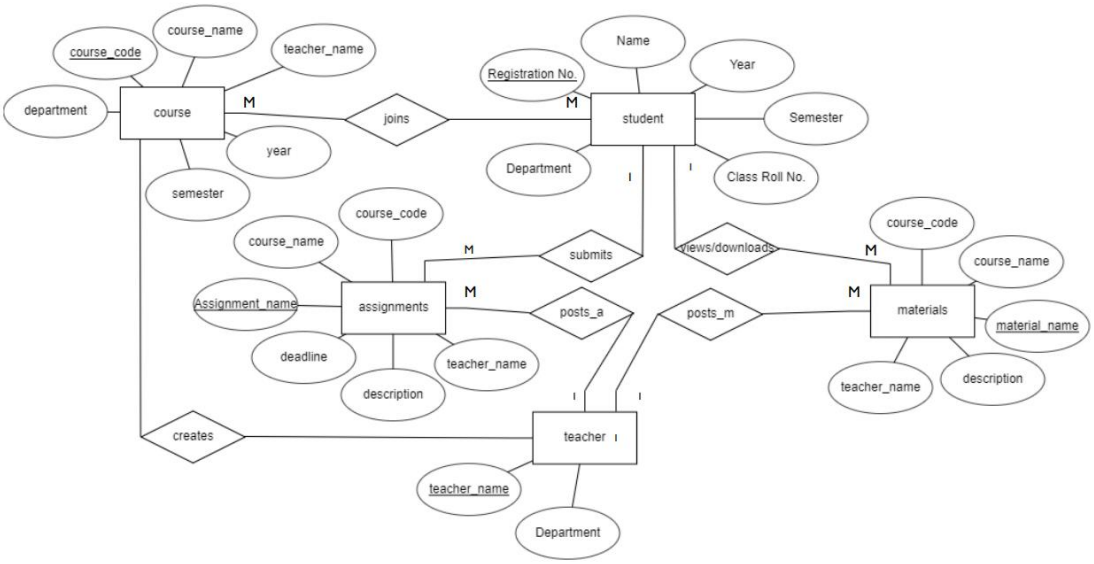

Figure 3: Entity-Relationship Diagram of the application

2.2.6 Graphical User Interaction

In the flexibility of the uses the interface has been developed with a graphics concept in mind. The GUI'S at the top level have been categorised as:

- Administrative user interface
- The operational or generic user interface

The administrative user interface concentrates on the consistent information that is practically part of the organisational activities and which needs proper authentication for the functions. The interfaces help the administrations aka the teachers with uploading materials, assignments, creating course modules etc.

The operational or generic user interface helps the users upon the system in transactions through the existing data and required services. The operational user interface also helps the ordinary users in managing their own functions such as submitting assignments, viewing or downloading materials, enrolling in a course module etc.

2.2.7 Modules

The entire project is categorised as modules. They are as follow:

1. **Login/Registration:** The user has to login using an email id and password to use the application properly. If the user is new, then the user needs to register as students or teacher with a valid email id and password.

2. **Home:** This module consists of basic information about our college. A photo of our college, a short description, vision and mission will be displayed.
3. **Notice:** Any important notice the college wants to inform the students and faculties about will be displayed here.
4. **Faculty:** The Faculty details will be shown in this section.
5. **Gallery:** This is an image gallery showcasing snapshots of happy moments in our college.
6. **About Us:** location, contact information, offered courses, fee structure etc will be displayed.
7. **Assignments:** This will be different for teacher and student.

   Teachers can create assignments in a particular course module with assignment name, an optional description and a deadline.

   Students can upload files as their submission against the corresponding assignment that will be stored in Google Drive.
8. **Materials:** Again, a slightly different sub-module for teacher and student.

   Teachers are able to upload materials for study but students are not granted to access this feature. They can either view or download the material.

2.2.8 Proposed Methodology

The proposition is to implement a Search Bar. During literature survey, it is seen that no such application contains a search bar but it will surely make the work easier for the end user. It will be implemented using *searchView* in Android Studio. It will fetch the matched values and display them on the current page. The values will be fetched by ID and *ifRoom|collapseActionView*. The method in the backend will be overridden and *onCreate()* function will the base method. The query will be passed through *setOnQueryTextListener()* method.

2.2.9 Timeline

Here is the tentative timeline of the project represented by the gantt chart:

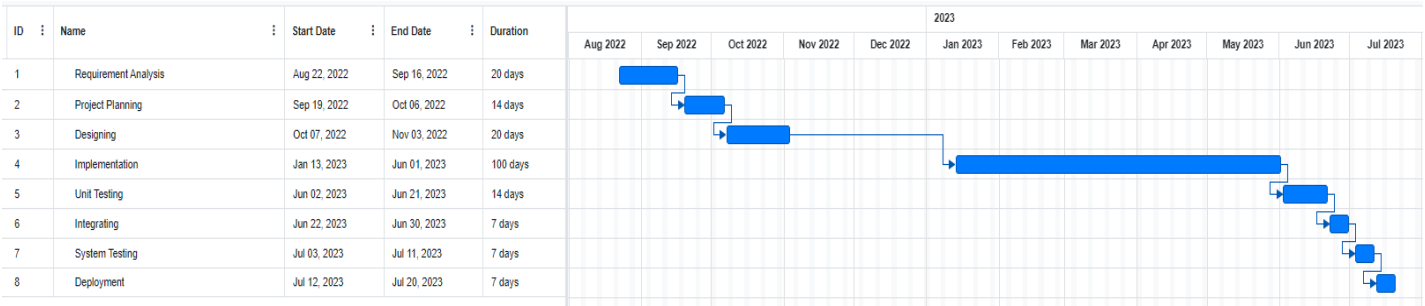

Figure 3: Gantt Chart of the project

3. Conclusion

Building an android application needs a lot of pre-implementation work such as expertise on a programming language and the terminologies and handling of android studio. A proper project planning is a necessity as it breaks the entire project into small modules. These modules, designed and analysed separately, are then merged together and the application is ready. Future work like adding more features in the application is possible.

4. References

4.1 Book Reference

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