

SAVITRIBAI PHULE PUNE UNIVERSITY

A PRELIMINARY PROJECT REPORT ON

“ Smart Campus An Android Application ”

submitted towards the
partial fulfillment of the requirements of

BACHELOR OF ENGINEERING (Computer Engineering)

BY

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UNDER THE GUIDANCE OF

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JSPM's
IMPERIAL COLLEGE OF ENGINEERING AND RESEARCH,
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2018-19**



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C E R T I F I C A T E

This is to certify that the seminar work entitled

Smart Campus An Android Application

Submitted by

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is a bonafide work carried out under the supervision of Dr. D. P. GADEKAR and it is submitted towards the partial fulfilment of the requirement of Bachelor of Engineering(Computer Engineering).

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Abstract

The objective of this project is to develop Smart Campus Management framework using Android. The application provides the facilities to access the courses which are distributed over the net. The application maintains the attendance system of staff and students, course details student entry, student attendance entry and activities. On selection, course details and faculty teaching learning process are addressed. Further the application accomplishes with various profiles and reports. The proposed system focused on android to develop improves the efficiency and performance of the framework, then sorting technique is used for analysis. The SMART CAMPUS is a mobile application. It uses smart phones of android platform on computer systems. The main objective is to develop an application that provides a smart and easy way for the execution of several academic operations to provide students with information regarding complaints, any placement activities, general notices, and important notices regarding all departments. The application has five types of users: Student, Teachers, H.O.D., admin and GFM. Each type of user will have own application view respective to their type. They will have privileges according to their designation or their types and have rights to post things on application so that other users can view that if they are supposed to or have permission to view it. We also provide multiple features so that they can have all the academic things and information at one location. For H.O.D. and admin we will provide features to look overall the operations over the applications and have control on it.

Keywords:PHP, SQL Server, Xamp, Javascript, Browser, college management, information system, document management system e.t.c.

Acknowledgement

It gives us great pleasure in presenting the preliminary project report on ”Smart campus An Android Application” and to express our deep regards towards those who have offered their valuable time and guidance in our hour of need.

*We would like to take this opportunity to thank our internal guide **Dr.D.P.GADEKAR** for giving us all the help and guidance we needed. We are really grateful for her kind support. Her valuable suggestions were very helpful.*

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*We are also glad to express our gratitude and thanks to our Principal **Dr. D. D. Shah** for his constant inspiration and encouragement.*

Finally, we would like to express once again our gratitude and thanks to all those who are involved directly and indirectly in achieving our project a success.

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Contents

Abstract	i
Acknowledgement	ii
1 SYNOPSIS	1
1.1 Project Title	1
1.2 Project Guide	1
1.3 Technical Keywords (As per ACM Keywords)	1
1.4 Problem Statement	1
1.5 Abstract	1
1.6 Goals and Objectives	1
1.7 Relevant mathematics associated with the Project	2
1.8 Names of Conferences / Journals where papers can be published	2
1.9 Review of Conference/Journal Papers supporting Project idea	2
1.10 Plan of Project Execution:-	5
2 TECHNICAL KEYWORDS	6
2.1 Area of project	6
2.2 Technical Keywords (As per ACM Keywords)	6
3 INTRODUCTION	7
3.1 Project Idea	7
3.2 Motivation	8
3.3 Literature Survey	8
4 PROBLEM DEFINITION AND SCOPE	10
4.1 Problem Statement	10
4.1.1 Goals and objectives	10
4.1.2 Statement of scope	10
4.2 Software Context	10
4.3 Major Constraints	10
4.4 Methodologies of Problem solving and efficiency issues	10
4.5 Scenario in which multi-core, Embedded and Distributed Computing used	11
4.6 Outcome	11
4.7 Applications	11
4.8 Hardware Resources Required	11
4.9 Software Resources Required	11
5 Project Plan	12
5.1 Project Estimates	12
5.1.1 Reconciled Estimates	12
5.1.2 Project Resources	12
5.2 Risk Management with respect to NP Hard analysis	13
5.2.1 Risk Identification	13
5.2.2 Risk Analysis	14
5.2.3 Overview of Risk Mitigation, Monitoring, Management	14
5.3 Project Schedule	16

5.3.1	Project task set	16
5.3.2	Task Network	17
5.3.3	Timeline Chart	17
5.4	Team Organization	18
6	Software Requirement Specification	19
6.1	Introduction	19
6.1.1	Purpose and Scope of Document	19
6.1.2	Overview of responsibilities of Developer	19
6.2	Usage Scenario	19
6.2.1	User profiles	20
6.2.2	Use Case Diagram	21
6.3	Data Model and Description	21
6.3.1	Data Description	21
6.3.2	Data objects and Relationships	21
6.4	Functional Model and Description	21
6.4.1	Data Flow Diagram	22
6.4.2	Data Flow Diagram	22
6.4.3	Activity Diagram:	23
6.4.4	Non Functional Requirements:	25
6.4.5	State Diagram:	26
6.4.6	Design Constraints	26
6.4.7	Software Interface Description	26
7	Detailed Design Document	27
7.1	Introduction	27
7.2	Architectural Design	27
7.3	Data design	28
7.3.1	Internal software data structure	28
7.3.2	Global data structure	28
7.3.3	Database description	28
7.4	Component Design	28
7.4.1	Class Diagram	28
7.5	Project Implementation	29
7.5.1	Tools and Technologies Used	29
7.6	Software Testing	31
8	Technical Specification	32
8.1	Advantages and Disadvantages	32
8.2	Disadvantages	33
8.3	Applications	33
9	Conclusion	34
9.1	Future Scope	34
10	References	35
11	RESULT	38

List of Figures

1.1	Execution Plan	5
5.1	Task Network	17
6.1	Use Case	21
6.2	DataFlow Diagram	22
6.3	DataFlow Diagram	22
6.4	Activity Diagram 1	23
6.5	Activity Diagram 2	24
6.6	Activity Diagram	25
7.1	Architecture	27
7.2	Class Diagram	28
7.3	Output 1	31
11.1	Output A	38
11.2	Output B	39
11.3	Output 1	40
11.4	Output 2	41
11.5	Output 3	42
11.6	Output 4	43
11.7	Output 5	44
11.8	Output 6	45
11.9	Output 7	46
11.10	Output 8	47
11.11	Output 9	48
11.12	Output 10	49
11.13	Output 11	50

List of Tables

5.1 Risk Table	14
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1 SYNOPSIS

1.1 Project Title

Smart Campus An Android Application

1.2 Project Guide

Dr.D.P.Gadekar

1.3 Technical Keywords (As per ACM Keywords)

- Campus Automation
- MD5
- Smart Phone Application
- Cryptographic Algorithm

1.4 Problem Statement

To provide solution for campus from manual documentation and making work digitally using smart phone

1.5 Abstract

The objective of this project is to develop Smart Campus Management framework using Android. The application provides the facilities to access the courses which are distributed over the net. The application maintains the attendance system of staff and students, course details student entry, student attendance entry and activities. On selection, course details and faculty teaching learning process are addressed. Further the application accomplishes with various profiles and reports. The proposed system focused on android to develop improves the efficiency and performance of the framework, then sorting technique is used for analysis. The SMART CAMPUS is a mobile application. It uses smart phones of android platform on computer systems. The main objective is to develop an application that provides a smart and easy way for the execution of several academic operations to provide students with information regarding complaints, any placement activities, general notices, and important notices regarding all departments. The application has five types of users: Student, Teachers, H.O.D., admin and GFM. Each type of user will have own application view respective to their type. They will have privileges according to their designation or their types and have rights to post things on application so that other users can view that if they are supposed to or have permission to view it. We also provide multiple features so that they can have all the academic things and information at one location. For H.O.D. and admin we will provide features to look overall the operations over the applications and have control on it. with the help of this application is a supervision of campus is happened. every user such as student, admin, GFM, Non-Teaching staff have their own credentials to login for smart campus App in this way we provide security by using various algorithm.

Keywords: PHP, SQL Server, Xamp, Javascript, Browser, college management, information system, document management system e.t.c.

1.6 Goals and Objectives

Goals

- To provide automation for campus activity.
- To adopt the trending technology.
- To mark the attendance for lecture wirelessly.

Objectives

- Provide online interface to college activity.
- Increase the security.
- Increase efficiency to access record related to college management.
- Reduce time required for non-value-added task.

1.7 Relevant mathematics associated with the Project

Let S (be a main set of) $= \{DB, C, U, S, A, R\}$

where,

DB-database. This database is responsible for storing user information related to user transaction. It also training dataset.

C-set of clients or user i.e. $C = \{C1, C2, C3, \dots, Cn\}$

U-set containing user based on their type i.e. $U = \{E, N\}$ E-existing user and N is a new user.

S-the server component of the system responsible for registering and authenticating users.

A-set of algorithms used for recommendation. $A = \{T, CB\}$

R-Result

1.8 Names of Conferences / Journals where papers can be published

- Central Universities or SPPU Conferences
- IEEE/ACM Conference/Journal 2
- IJARCCCE International Journal of Advanced Research in Computer and Communication Engineering
- IJCSIT International Journal of Computer Science and Information Technologies●
- IJSART International Journal for Science and Research in Technology

1.9 Review of Conference/Journal Papers supporting Project idea

- **Title:-** Towards a Smart Campus with Mobile Social Networking

Authors:- Zhiwen Yu, Yunji Liang, Bukan, Xu Yue, Yang Bin, Guo

Description:- With the development of wireless communication, the popularity of smart phones, the increasing of social networking services, mobile social networking has become a hot research topic. The characteristics of mobile devices and requirements of services in social environments raise a challenge on building a platform for mobile social services. In this paper, we elaborate a flexible system architecture based on the service-oriented specification to support social interactions in campus-wide environments. In the client side, we designed a mobile middleware to collect social contexts such as the proximity, the cell phone log etc. The server backend, on the other hand, aggregates such contexts, analyses social connections among users and provides social services to facilitate social interactions. A prototype of mobile social networking system is deployed on campus, and several applications are implemented based on the proposed architecture to demonstrate the effectiveness of the architecture.

- **Title:-**COLLEGE MANAGEMENT SYSTEM

Author:-Srikant Patnaik¹, Khushboo kumari Singh², Rashmi Ranjan³, Niki Kumar

Description:-This project is based on COLLEGE MANAGEMENT SYSTEM. It manages the college information, student information , placement information , various different types of event going on in our college . It also keeps track records of all the information regarding students those who are placed in the various organization. It has a notice board which contains information about various cultural or technical or any sports which is supposed to be held soon. With the help of this project, you can view the previous videos with the help of internet connection.

- **Title:-**Towards a Smart Campus with Mobile Social Networking

Author:-Zhiwen Yu Yunji Liang Bukan Xu Yue Yang Bin Guo

Description:-With the development of wireless communication, the popularity of smart phones, the increasing of social networking services, mobile social networking has become a hot research topic. The characteristics of mobile devices and requirements of services in social environments raise a challenge on building a platform for mobile social services. In this paper, we elaborate a flexible system architecture based on the service-oriented specification to support social interactions in campus-wide environments. In the client side, we designed a mobile middleware to collect social contexts such as the proximity, the cell phone log etc. The server backend, on the other hand, aggregates such contexts, analyses social connections among users and provides social services to facilitate social interactions. A prototype of mobile social networking system is deployed on campus, and several applications are implemented based on the proposed architecture to demonstrate the effectiveness of the architecture.

- **Title:-**Android Based College Campus App

Author:-Fadi Masalha Nael Hirzallah

Description:-Smartphones are becoming more preferred companions to users than desktops or notebooks. Knowing that smartphones are most popular with users at the age around 26, using smartphones to speed up the process of taking attendance by university instructors would save lecturing time and hence enhance the educational process. This paper proposes a system that is based on a QR code, which is being displayed for students during or at the beginning of each lecture. The students will need to scan the code in order to confirm their attendance. The paper explains the high level implementation details of the proposed system. It also discusses how the system verifies student identity to eliminate false registrations.

- **Title:-**”A Review of Student Attendance System using Near-Field Communication (NFC) Technology

Author:- Mohd Ameer Hakim bin Mohd Nasir¹, Muhammad Hazimuiddin bin Asmuni¹Norsaremah Salleh¹ , Sanjay Misra², Andre Bechu

Description:-The rapid growth of system development is no longer subtle and continuously improving today’s system. In education sector, the student attendance system is able to be applied by Near-Field Communication (NFC) technology. NFC can be referred to as a device that can detect information and/or command from a tag by bringing them together in a close proximity or even by touching together. Traditionally, the manual attendance system would require a lecturer to pass around an attendance sheet for students to sign beside their names and another method would require the lecturer to call out the students’ names one by one and register their attendance. The attendance system based on NFC is meant to improve the manual attendance system and therefore the aim of this paper is to review the existing research

- **Title:-**” A Study on the Cryptographic Algorithm for NFC, Indian Journal of Science and Technology, Vol 9(37), DOI: 10.17485/ijst/2016/v9i37/102543, October 2016

Author:- Department of Motion Art Design, Namseoul University, 91 Daehak-ro Seonghwan-eup Sebuk-gu Cheonan-si Chungcheongnam-do, 31020, South Korea; heonjunekim@gmail.com

Description:-Currently, NFC leads the mobile payment market. In such a situation, leakage and change of payment information and leakage of personal information by cracking can cause serious social problem. Accordingly, the coding technique used for security of NFC should be safer than now. Methods/Statistical Analysis: Though AES currently used in security of NSF is a safe coding technique, it is not equipped with certifying function

- **Title:-**Android Based College Campus App

Author:-

Description:-Technology has changed our daily life routine as well as living style. So, student of school or colleges or university require application that supports smart phone to get all type of information related to examination, lecture notes, placement regarding question, notification, events, transportation etc. instead of calling system because almost all mobile users has smart phone now days. Each and every educational institute provides limited services to their users including students, parents, guardian and public. If provided services are more than ease of using is very difficult. That is why students interest towards using college or school or university is decreasing day by day. We designed an application to fulfil the requirement of students or parents or employee based on present scenario of market and latest technology like java, android, GPS etc. to solve the students' problem.

1.10 Plan of Project Execution:-

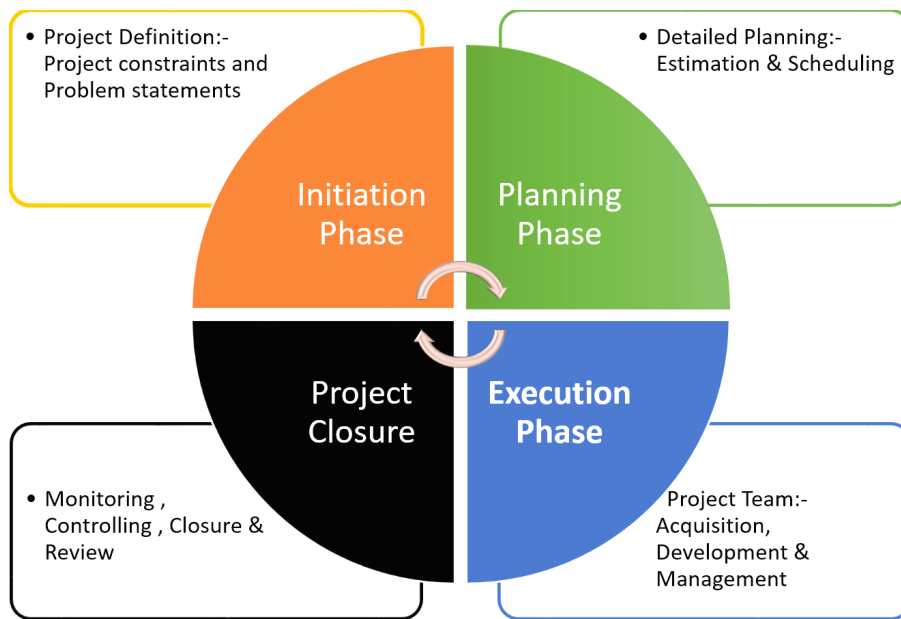


Figure 1.1: Execution Plan

2 TECHNICAL KEYWORDS

2.1 Area of project

Android and PHP

Android is a Linux based operating system it is designed primarily for touch screen mobile devices such as smart phones and tablet computers. The operating system have developed a lot in last 15 years starting from black and white phones to recent smart phones or mini computers. One of the most widely used mobile OS these days is android. The android is software that was founded in Palo Alto of California in 2003.

The android is a powerful operating system and it supports large number of applications in Smartphones. These applications are more comfortable and advanced for the users. The hardware that supports android software is based on ARM architecture platform. The android is an open source operating system means that it's free and any one can use it. The android has got millions of apps available that can help you managing your life one or other way and it is available low cost in market at that reasons android is very popular.

The android uses the powerful Linux kernel and it supports wide range of hardware drivers. The kernel is the heart of the operating system that manages input and output requests from software. This provides basic system functionalities like process management, memory management, device management like camera, keypad, display etc the kernel handles all the things. The Linux is really good at networking and it is not necessary to interface it to the peripheral hardware. The kernel itself does not interact directly with the user but rather interacts with the shell and other programs as well as with the hard ware devices on the system..

The application frame work layer provides many higher level services to applications such as windows manager, view system, package manager, resource manager etc. The application developers are allowed to make use of these services in their application.

2.2 Technical Keywords (As per ACM Keywords)

Please note ACM Keywords can be found : <http://www.acm.org/about/class/ccs98- html>

- Smart Learning
- Device to device communication
- Smart Phone
- Xampp
- MySQL
- PHP
- SQL Server
- HTML
- Javascript
- Browser
- college management
- information system

3 INTRODUCTION

3.1 Project Idea

The idea of “Smart Campus ” came out recent attention given to ‘smart cities’ world over and also with GoI announcing the development of 100 smart cities which essentially are aimed at deployment of internet based applications, content management platforms and broadband infrastructures in every sphere of public systems (such as healthcare, media, energy and the environment, safety, and public services).

As we students face various problem related to study material, updates regarding notices, etc. Few years ago, manual systems were used, which made storing and retrieving academic related information difficult.

To overcome this tedious problem, websites like ERP were developed, which made uploading and downloading the academic related information easier to some extent but had some drawbacks like : Every time we had to login to the system to access the data Uploading student information individually which is very time consuming process. Information is not updated time to time.

In today’s time most of the colleges have their own websites which displays college information, students can get timetables, test schedules, event schedules on these websites. But for retrieving this information the students have to log in to the website. The students can visit the website if they are having internet connection and these websites can be viewed on mobile phones as well. There is one problem with the websites that if there is no internet connection then these websites cannot be reached. Hence offline connectivity is the biggest issue with the websites. The college management involves execution of different activities, using different software for different purposes is very tedious job. So the best solution for this is to make one software for carrying out different activities involves in college management. The software can be made for mobile phones, this is called app. There are different operating systems for different mobile phones but the 83 percente of mobile users uses android based mobile phones. So this paper focuses on development of Android Based College management system development.

In today’s time the smart phone evolution has changed the lives of every individual drastically. On touch of a button the world is coming to our fingertips. This Mobile era has simplified our life by putting the world in our hands. The heart of these smart phones is their Applications. There are lots of free applications available at our service. We can order food, we can pay the bills, we can monitor our health, we can have our own personal assistant. So this list is endless. There are different college management applications available in market with the basic functionality of sharing notes, marking attendance, etc. “Android Based Campus Solutions” is the proposed system which mainly connects the students, staff, parents, alumni with the college using mobile phone. The staff can enter attendance of students, internal test marks, can share notes, etc. The students can get notifications time to time about the tests, events, etc. The parent can anytime check their child’s attendance, performance. The parents get notified with the achievements of college

Academic campuses, essentially for people who are expected to be engaged in intellectual progress, knowledge creation and guiding societies for better living, could also embody principles of a smart campus. A typical smart campus would have three pillars: infrastructure, operations and, of course, people. Each of these pillars would be infused with intelligence, but more importantly they would work in an interconnected and integrated fashion to utilise resources efficiently. Such a campus could incorporate the ‘Future of Internet’ involving Internet of Things and sensor technologies as the main facilitators of smart infrastructure. This College Management System project developed using PHP programming language. The main aim of this project is to develop an Android application which covers all the details of college i.e; Student attendance details, Event details, Students fees transaction details, Marks details, Photo gallery, etc. Admin is the Superuser of this project. All the record stores in MySQL Database. The proposed software will also reduce the cumbersome paperwork, manual labour as well as communication cost.

- Some of the key features of such a smart campus are:
 - Smart technology enabled automation

- Integrated services via dashboards
- Foster creativity and innovation via collaboration
- Results in best practices

3.2 Motivation

- Developing an application for student, staff, HOD and admin to efficiently using college facilities.
 - Day by day increase in manual work.
 - The need of an advanced system to serve the purpose for automation.
 - This device is an answer to all student and management work.

3.3 Literature Survey

- **Title:-**"A Students Attendance System Using QR Code", (IJACSA) International Journal of Advanced Computer Science and Applications, Vol. 5, No. 3, 2014

Author:-Fadi Masalha Nael Hirzallah

Description:-Smartphones are becoming more preferred companions to users than desktops or notebooks. Knowing that smartphones are most popular with users at the age around 26, using smartphones to speed up the process of taking attendance by university instructors would save lecturing time and hence enhance the educational process. This paper proposes a system that is based on a QR code, which is being displayed for students during or at the beginning of each lecture. The students will need to scan the code in order to confirm their attendance. The paper explains the high level implementation details of the proposed system. It also discusses how the system verifies student identity to eliminate false registrations.

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Author:- Department of Motion Art Design, Namseoul University, 91 Daehak-ro Seonghwan-eup Sebuk-gu Cheonan-si Chungcheongnam-do, 31020, South Korea; heonjunekim@gmail.com

Description:-Currently, NFC leads the mobile payment market. In such a situation, leakage and change of payment information and leakage of personal information by cracking can cause serious social problem. Accordingly, the coding technique used for security of NFC should be safer than now. Methods/Statistical Analysis: Though AES currently used in security of NSF is a safe coding technique, it is not equipped with certifying function

- **Title:-**Android Based College Campus App

Author:- Shiv Kumar, Shrawan kumar Sharma and Divya Dagwar 2018 Second International Conference on Computing Methodologies and Communication (ICCMC)

Description:-Technology has changed our daily life routine as well as living style. So, student of school or colleges or university require application that supports smart phone to get all type of information related to examination, lecture notes, placement regarding question, notification, events, transportation etc. instead of calling system because almost all mobile users has smart phone now days. Each and every educational institute provides limited services to their users including students, parents, guardian and public. If provided services are more than ease of using is very difficult. That is why students interest towards using college or school or university is decreasing day by day. We designed an application to fulfil the requirement of students or parents or employee based on present scenario of market and latest technology like java, android, etc. to solve the students' problem.

4 PROBLEM DEFINITION AND SCOPE

4.1 Problem Statement

To provide solution for campus from manual documentation and making work digitally using smart phone .

4.1.1 Goals and objectives

Goals

- To Reduce paper work.
- To provide Real Time Access
- To provide Security

Objectives

- Providing the online app for students, faculty .
- Increasing the efficiency of college record management.
- Decrease time required to access and circulate notices..
- To make the system more secure.
- Decrease time spent on non-value added tasks.

4.1.2 Statement of scope

This system is based on building a system for college campus. The system will help teachers to manage student's activities, Administrators to handle college digitally.

4.2 Software Context

- Android studio, JDK
- Windows, Linux
- Cryptographic tools

4.3 Major Constraints

- Determining the exact specific opinion about dairy products.
- Creating user oriented system to effectively mine and extract all the data to help the user.
- Result representation.

4.4 Methodologies of Problem solving and efficiency issues

- The single problem can be solved by different solutions. This considers the performance parameters for each approach. Thus considers the efficiency issues.
- We can use a divide and conquer approach for our problem.
- Divide and conquer strategy works better than a traditional linear approach, it also requires a distributed or multi-core environment.

4.5 Scenario in which multi-core, Embedded and Distributed Computing used

Client-server relationship exists in our Android application .Here Client is front end of the system Back end of the system is the server (database).User interacts through GUI and user queries are taken. Whereas server processes these user queries and generates result by using appropriate algorithm and sends the data to various users.

4.6 Outcome

- Student across the College Campus will get the notification regarding College Or Campus
- A attendance of student will be mark accurately and this automatic process will save Time.
- Identification of student sitting in class will be verified.

4.7 Applications

- Real time usage to achieve Automation In Campus.
- Interactive information exchange on the users.

4.8 Hardware Resources Required

- Hardware
 1. RAM : 4GB for faster processing
 2. CPU : 2GHz for sufficient processing power

4.9 Software Resources Required

1. Platform : Android Studio, Arduino, MySQL workbench, Eclipse
2. Operating System: Windows 7
3. Programming Language : Java, XML,embedeb C
4. Framework : JSP , ANDROID,Python

5 Project Plan

5.1 Project Estimates

5.1.1 Reconciled Estimates

- Cost estimates
 1. IDE - Free
 2. Hardware and software cost

- Time Estimates

Procedure	Time
Literature Research	15 days
System Analysis	30 days
Design and Planning and Database	30 days
Learning Required Technologies	30 days
Implementation	31 days
System Testing	27 days
Initial Report	15 days
Final Report	16 days

5.1.2 Project Resources

ID	Name of Person	Responsibility
1	Dr.D.P.Gadekar	Project Guide
2	Shivkumar Hegonde	Developer
3	Shyam Ambilkar	Developer
4	Rutuja Therade	Developer
5	Surbhi Lingamwar	Developer

- Hardware
 1. RAM : 4GB for faster processing
 2. CPU : 2GHz for sufficient processing power
- Software
 1. Platform : Android Studio, MySQL Workbench, Eclipse
 2. Operating System: : Linux Platform(Ubuntu 14.04)
 3. Programming Language : Java, Python
 4. Framework : Flask, Django, React, JSP.

5.2 Risk Management with respect to NP Hard analysis

Risk is a possibility of loss or injury. Risk management is the identification assessment and prioritization of risks followed by coordinated and economical application of resources to minimize and control that would probability and impact of unfortunate events or to maximise the realization of opportunities. Risk can come from uncertainty in financial markets, project failures (at any phase in design, development, production and sustainment life cycles), legal liabilities, credit risks, accidents, natural causes and disasters as well deliberate attack from an adversary of uncertain and unpredictable cause.

Using risk management techniques we alleviate the harm or losses in software project or risk cannot be avoided but by performing risk management we can attempt to ensure that right risks are taken at right time. Risk taking is essential to progress and failure is often key part of learning.

5.2.1 Risk Identification

Our development identified some potential risks to the project. These risks were analyzed and were classified into various categories depending upon the threat they posed to the project. Some of these risks were ‘generic risks’ while others were ‘product specific risks’. A considerable amount of time was spent in analyzing the product specific risks.

1. Have top software and customer managers formally committed to support the project?
 - The software manager and the customer managers are fully committed to the project
2. Are end-users enthusiastically committed to the project and the system/product to be built?
 - The end-users have also committed to the project and to the product to be built
3. Are requirements fully understood by the software engineering team and its customers?
 - Requirements for citizens are fully understood by whole team from consistent feedback of citizens
4. Have customers been involved fully in the definition of requirements?
 - Yes, citizens have been fully consulted and are involved in the process.
5. Do end-users have realistic expectations?
 - End users tend to have some unrealistic expectations, typically, on the various features of the product to be quickly delivered in a constrained manner.
6. Does the software engineering team have the right mix of skills?
 - The team consists of the people with Managerial, Designing as well as Developing skill set.
7. Are project requirements stable?
 - Project requirements are stable
8. Is the number of people on the project team adequate to do the job?
 - Number of people to do the job, are adequate, but interns may be necessary as the users grow in size.
9. Do all customer/user constituencies agree on the importance of the project and on the requirements for the system/product to be built?
 - Citizens have consistently agreed on the parameters of the project and its feasibility, and of the requirements for product to be built effectively.

5.2.2 Risk Analysis

The risks for the Project can be analyzed within the constraints of time and quality

ID	Risk Description	Probability	Impact	Quality	Overall
1	Usage of Product	Low	Low	High	High
2	Financial Requirement	Med	Med	High	High

Table 5.1: Risk Table

5.2.3 Overview of Risk Mitigation, Monitoring, Management

Risk ID	1
Risk Discription	unauthorised user access passowrd
Category	End User’s Environment
Probability	Medium
Impact	Medium
Response	Mitigate
Risk Status	Identified

Risk ID	2
Risk Discription	Database Maintenance
Category	Development Environment
Source	Registration of users
Probability	Medium
Impact	High
Response	Serious
Strategy	Access Control Methods are used
Risk Status	Identified

Risk ID	3
Risk Description	End User's Satisfaction
Category	End User's Environment
Source	During the actual use of the system
Probability	High
Impact	High
Response	Serious
Strategy	Maintenance of user's Req.
Risk Status	Identified

Risk ID	4
Risk Description	Knowledge of software developers
Category	Implementation Environment
Source	Software Developer
Probability	Low
Impact	High
Response	Mitigate
Strategy	Training to the Software Engineers
Risk Status	Identified

Risk ID	5
Risk Description	Low Acceptability and Usage
Category	User Base Generation
Source	S/W req. Specification document.
Probability	Medium
Impact	High
Response	Group for quick boost
Strategy	Endorsement and Advertising
Risk Status	May Occur

Risk ID	6
Risk Description	User Base not using the product
Category	User Base
Source	Software Design Specification.
Probability	Low
Impact	High
Response	Adding new features consistently
Strategy	Advertising in the Newspapers, Journals
Risk Status	May Occur

5.3 Project Schedule

5.3.1 Project task set

Project scheduling is a mechanism to communicate what tasks need to get done and which organizational resources will be allocated to complete those tasks in what timeframe. A project schedule is a document collecting all the work needed to deliver the project on time.

A project is made up of many tasks, and each task is given a start and end (or due date), so it can be completed on time. Likewise, people have different schedules, and their availability and vacation or leave dates need to be documented in order to successfully plan those tasks.

Major Tasks in the Project stages are:

- Task 1: Literature Research
- Task 2: System Analysis
- Task 3: Design & Planning and Data-set
- Task 4: Learning Required Technologies
- Task 5: Implementation
- Task 6: System Testing
- Task 7: Initial Report
- Task 8: Final Report

5.3.2 Task Network

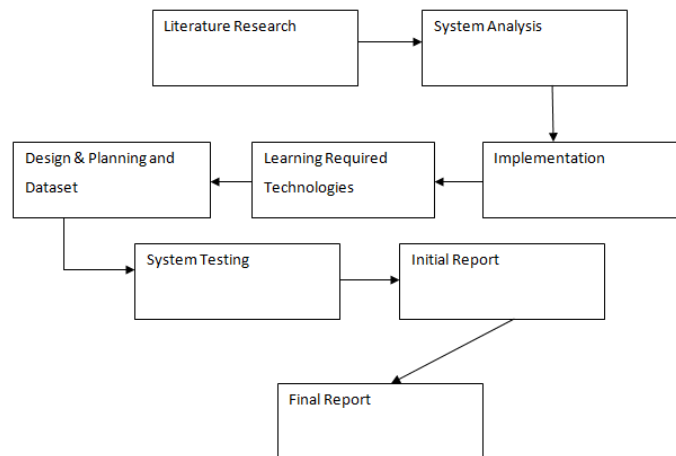


Figure 5.1: Task Network

5.3.3 Timeline Chart

Tasks	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Requirement Gathering	■											
Literature Survey		■										
Planning			■									
Designing				■								
UML Diagram					■							
Database Design						■	■	■				
Functionality Implementation							■	■	■			
Testing									■	■		
Documentation											■	■

5.4 Team Organization

Sr. No.	Design/Develop	Name of Designers/Developers
1	Design	1. Shivkumar Hegonde 2. Rutuja Therade 3. Surbhi Lingamwar
2	Backend	1. Shivkumar Hegonde 2. Rutuja Therade 3. Shyam Ambilkar
3	Front end	1. Rutuja Therade 2. Surbhi Lingamwar 3. Shyam Ambilkar
4	Documentation	1. Shivkumar Hegonde 2. Shyam Ambilkar 3. Rutuja Therade
5	Testing	1. Shivkumar Hegonde 2. Surbhi Lingamwar 3. Shyam Ambilkar

6 Software Requirement Specification

6.1 Introduction

6.1.1 Purpose and Scope of Document

- **Purpose :**

The main purpose of this project is to add mobility and automation to the process of managing manual work being done in an institute so that the data which is passed to the students in the form of documents is faster disseminated through the application. It summarizes all the information related to academics. It simply disseminates the Notes, Notices, Timetable, Exam details, etc. It has a discussion Forum in which students can interact with HOD and subject teacher. So this improves the interaction between students and teachers.

A software requirements specification (SRS) is a description of a software system to be developed, laying out function and non-function requirements, and may include a set of use cases that describe interaction the users will have with the software. Software requirement specification establishes the basis for an agreement between customer and contractor or suppliers (in market-driven projects, these roles may be played by the marketing and development division) on do. Software requirement specification permits a rigorous assessment of requirements before design can begin and reduces later redesign. It should also provide a realistic basis for estimating product costs, risks, and schedules.

- **Scope :** The software requirement specification document enlists enough and necessary requirements that are required for the project development. To derive the requirements we need to have clear and thorough understanding of products to be developed or being develop. This is achieved refined with detailed and continuous communication with the project team and customer till the completion of the software. the SRS may be one of a contract deliverable Data item Description or have other forms of organizationally mandated content.

6.1.2 Overview of responsibilities of Developer

The following activities are carried out:

- Design : Shivkumar Hegonde, Rutuja Therade, Surbhi lingamwar
- Backend : Shivkumar Hegonde, Rutuja Therade, Shyam Ambilkar
- Front end : Rutuja Therade, Surbhi gamwar, Shyam Ambilkar
- Documentation : Shivkumar Hegonde, Rutuja Therade, Shyam Ambilkar
- Testing : Shivkumar Hegonde, Surbhi lingamwar, Shyam Ambilkar

6.2 Usage Scenario

This section provides various usage scenarios for the system to be developed.

- Gathering opinion from databases
- Organizing Information

6.2.1 User profiles

The profiles of all user categories are described here.(Actors and their Description)

- Teaching and Non-Teaching Staff
- Administrator
- Students

6.2.2 Use Case Diagram



Figure 6.1: Use Case

6.3 Data Model and Description

6.3.1 Data Description

Data objects that will be managed/manipulated by the software are described in this section. The database entities or files or data structures required to be described. For data objects details can be given as below

- Queries
- Processing
- Processed
- Result

6.3.2 Data objects and Relationships

Data objects and their major attributes and relationships among data objects are described using an ERD- like form.

6.4 Functional Model and Description

A description of each major software function, along with data flow (structured analysis) or class hierarchy (Analysis Class diagram with class description for object oriented system) is presented.

6.4.1 Data Flow Diagram

- Data Flow Diagram

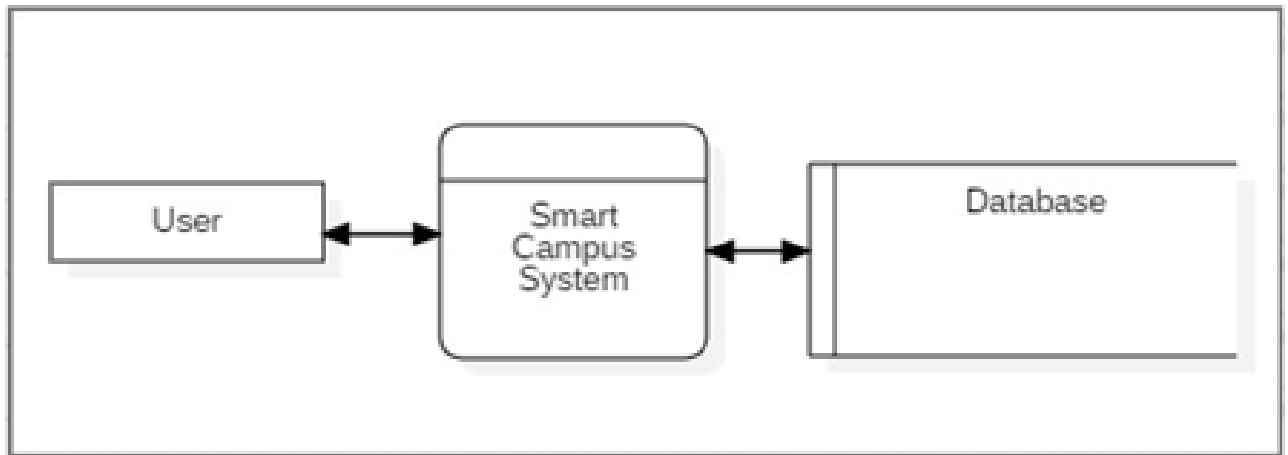


Figure 6.2: DataFlow Diagram

6.4.2 Data Flow Diagram

- Data Flow Diagram

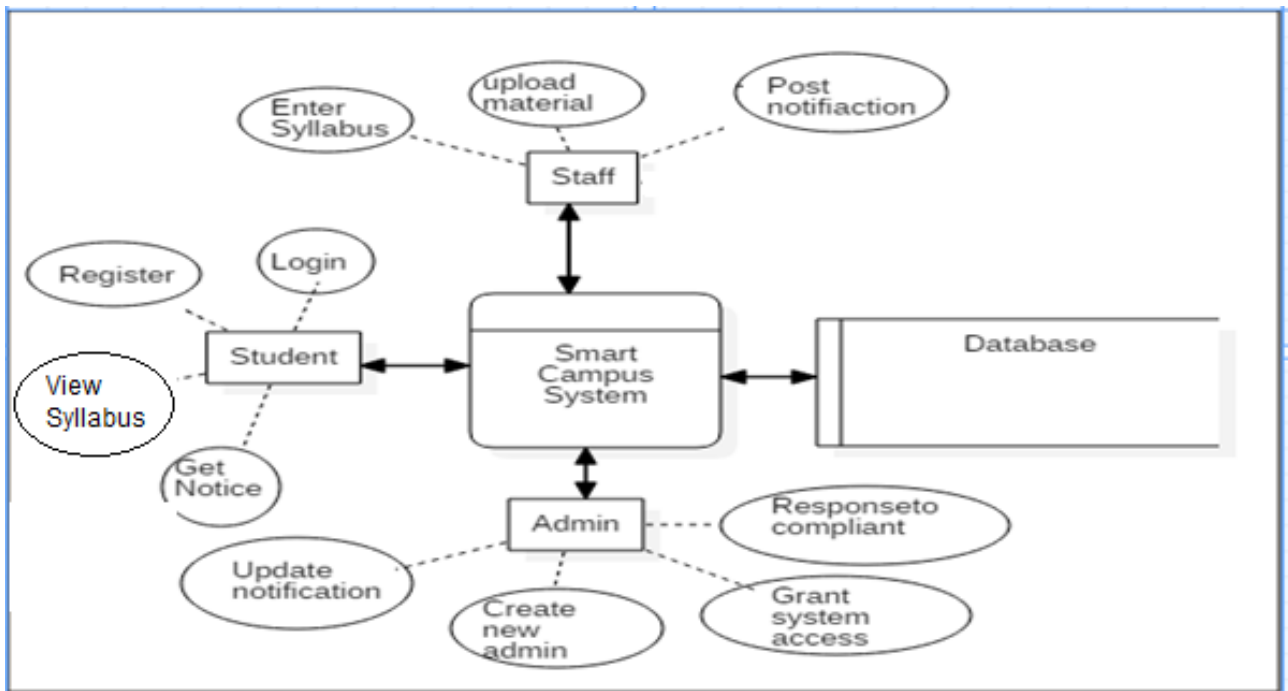


Figure 6.3: DataFlow Diagram

6.4.3 Activity Diagram:

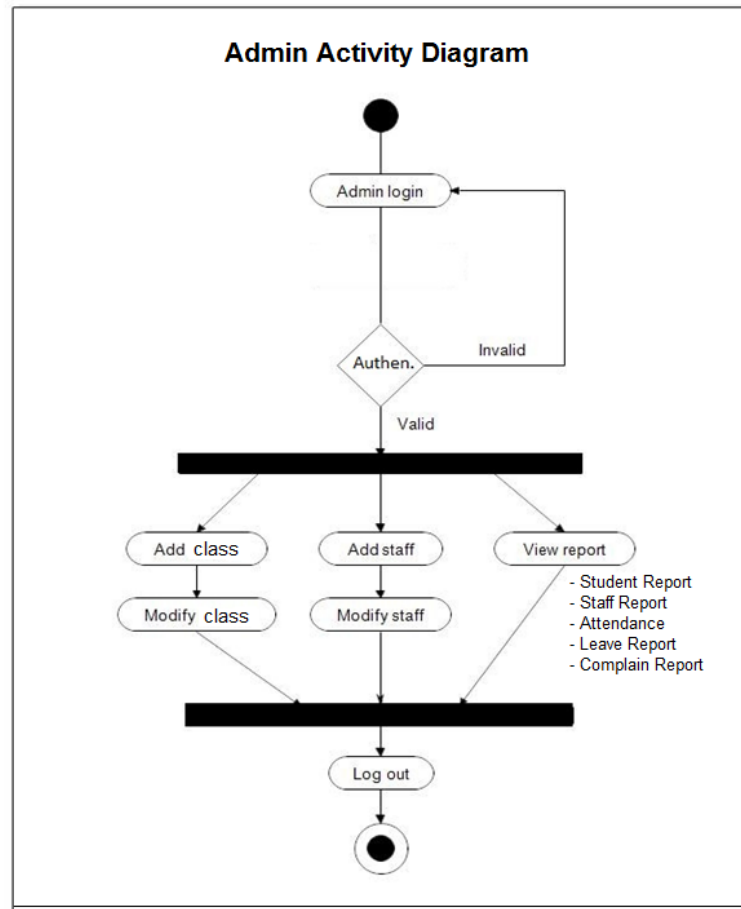


Figure 6.4: Activity Diagram 1

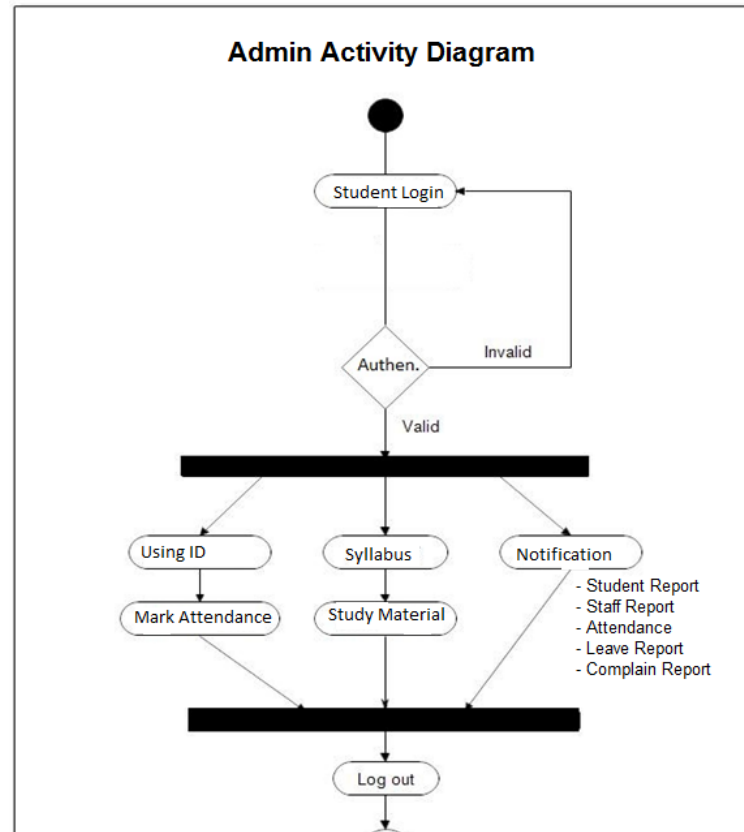


Figure 6.5: Activity Diagram 2

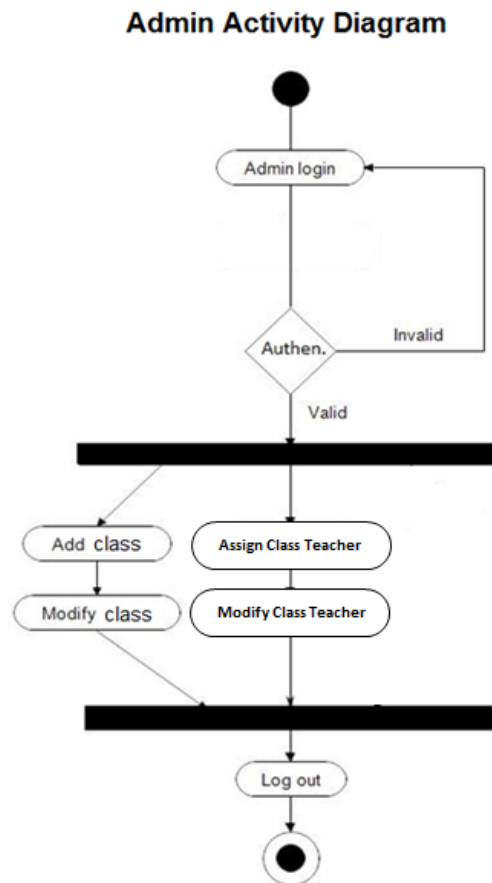


diagram 3.png

Figure 6.6: Activity Diagram

6.4.4 Non Functional Requirements:

- **Interface Requirements:** The interface should be easy to use and intuitive.
- **Performance Requirements:** The system should give an effective and high performance.
- **Software quality attributes:** Availability, Reliability, Re-usability, Scalability, Performance, Usability

The system considers following non-functional requirements to provide better functionalities and usage of system.

Usability: The system is designed keeping in mind the usability issues considering the end-users who are developers/programmers. Effort required in learning, operating, preparing input, and interpreting output are to be minimized. It provides detailed help which would lead to better and faster learning. Navigation of system is easy.

Agility: Improves with users able to rapidly and inexpensively re-provision technological infrastructure resources. The cost of overall computing is unchanged, however, and the providers will merely absorb up-front costs and spread costs over a longer period.

Consistency: Uniformity in layout, screens, colors scheme, via dynamic ("on-demand") provisioning of resources on a fine-grained, self service basis near real-time, without users having to engineer for peak loads.

Performance: Performance depends on the user’s familiarity with the usage of the system.

Extendability: Templates can be imported from different applications, adding more features in workflow.

Reusability: The native files provided in the system can be used any number of times for faster execution. New native files can be created and saved which again can be made available. Since the application is network host based, it can be used anywhere anytime by a single user.

Reliability: Protection of data from malicious attack and unauthorized access. Improves through the use of multiple redundant sites, which makes mobile agents suitable for business continuity and disaster recovery.

6.4.5 State Diagram:

State Transition Diagram:

The states are represented in ovals and state of system gets changed when certain events occur. The transitions from one state to the other are represented by arrows. The Figure shows important states and events that occur while creating new project.

6.4.6 Design Constraints

Any design constraints that will impact the subsystem are noted. There is a necessity to study design patterns in detail. Depending upon the various kinds of patterns available, different design constraints may be encountered such as supporting multiple operating systems which may not be possible due to using the .NET framework. The schedule is tight and deadlines prove a reasonable constraint while adding features.

6.4.7 Software Interface Description

The interface must be easy to understand and use. It must be intuitive and explain the use at a glance. The software also needs to interface with existing search engines. This will be handled using an API or a web scraper.

7 Detailed Design Document

7.1 Introduction

This document specifies the design that is used to solve the problem of Product.

7.2 Architectural Design

A description of the program architecture is presented.

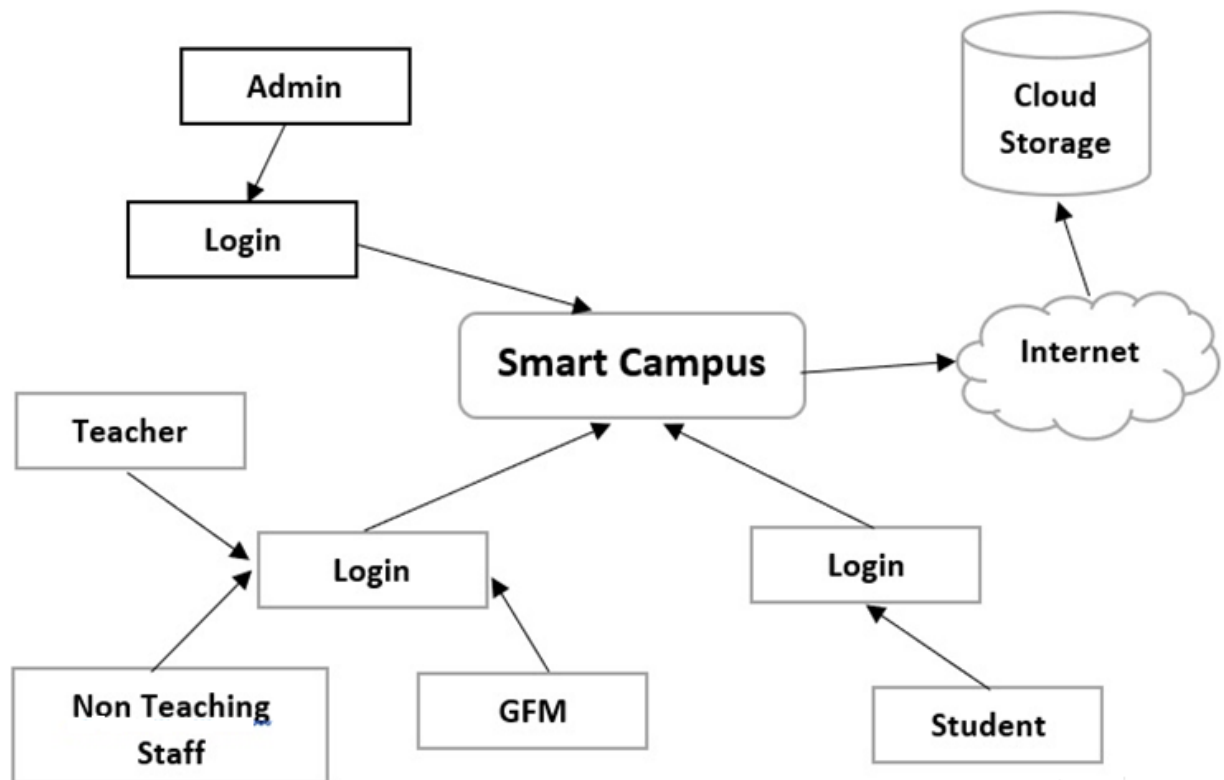


Figure 7.1: Architecture

7.3 Data design

A description of all data structures including internal, global, and , database design (tables), file formats.

7.3.1 Internal software data structure

- Android based

7.3.2 Global data structure

Data structured that are available to major portions of the architecture are described.

- Android Based

7.3.3 Database description

The database will be used to store user details.

7.4 Component Design

7.4.1 Class Diagram

Class diagrams are the most common diagrams used in UML. Class diagram is main building block of any object oriented solution. It shows the classes in system, attributes and operations of each class and the relationship between each class. Class diagrams are static in nature.

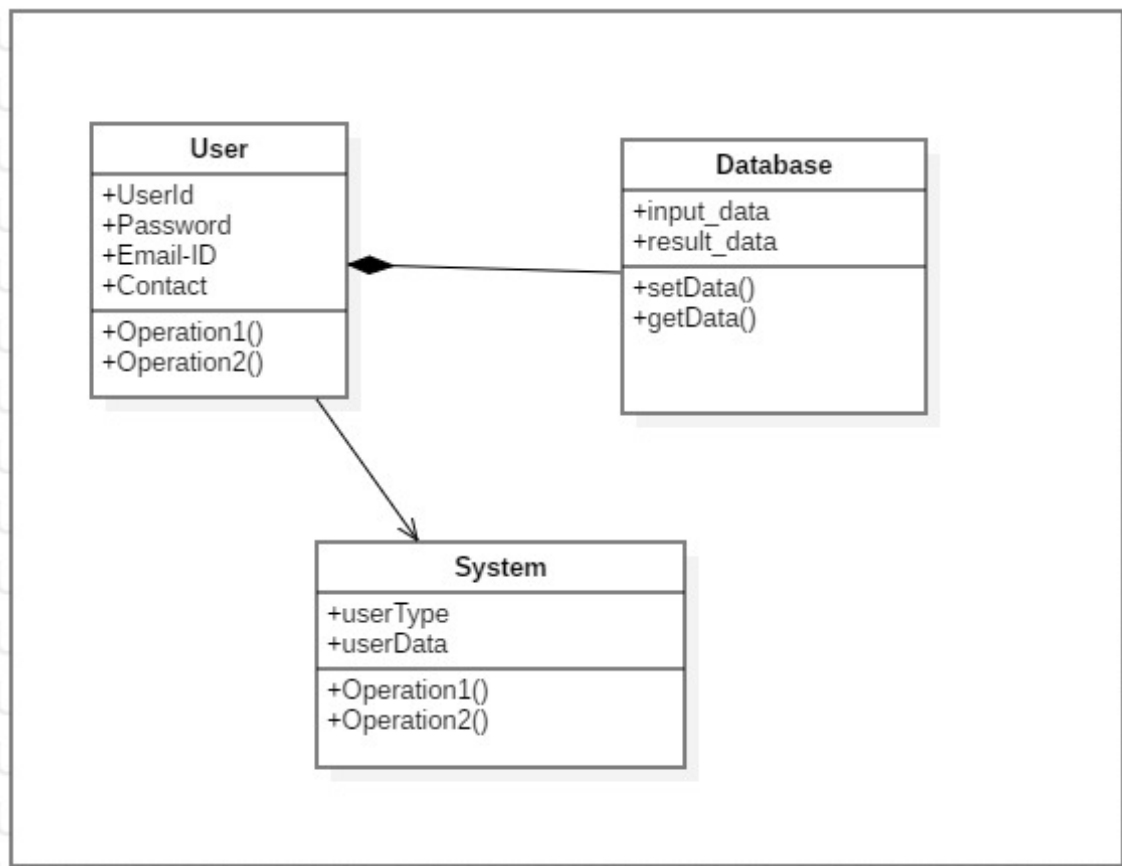


Figure 7.2: Class Diagram

7.5 Project Implementation

7.5.1 Tools and Technologies Used

1. Android Studio:

Android Studio is the official integrated development environment 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. Android Studio supports all the same programming languages of IntelliJ (and CLion) e.g. Java, C++, and more with extensions, such as Go;[18] and Android Studio 3.0 or later supports Kotlin[19] and “all Java 7 language features and a subset of Java 8 language features that vary by platform version.”[20] External projects backport some Java 9 features.[21] While IntelliJ that Android Studio is built on supports all released Java versions, and Java 12, it’s not clear to what level Android Studio supports Java versions up to Java 12 (the documentation mentions partial Java 8 support). At least some new language features up to Java 12 are usable in Android.[22]

Android Studio uses an Instant Push feature to push code and resource changes to a running application. A code editor assists the developer with writing code and offering code completion, refraction, and analysis. Applications built in Android Studio are then compiled into the APK format for submission to the Google Play Store.

The software was first announced at Google I/O in May 2013, and the first stable build was released in December 2014. Android Studio is available for Mac, Windows, and Linux desktop platforms. It replaced Eclipse Android Development Tools (ADT) as the primary IDE for Android application development. Android Studio and the Software Development Kit can be downloaded directly from Google.

Android Studio supports a variety of version control systems (VCS’s), including Git, GitHub, CVS, Mercurial, Subversion, and Google Cloud Source Repositories.

After importing your app into Android Studio, use the Android Studio VCS menu options to enable VCS support for the desired version control system, create a repository, import the new files into version control, and perform other version control operations

Multiple APK support allows you to efficiently create multiple APKs based on screen density or ABI. For example, you can create separate APKs of an app for the hdpi and mdpi screen densities, while still considering them a single variant and allowing them to share test APK, javac, dx, and ProGuard settings. IcedTea

2. Apache Tomcat:

Tomcat started off as a servlet reference implementation by James Duncan Davidson, a software architect at Sun Microsystems. He later helped make the project open source and played a key role in its donation by Sun Microsystems to the Apache Software Foundation. The Apache Ant software build automation tool was developed as a side-effect of the creation of Tomcat as an open source project.

Davidson had initially hoped that the project would become open sourced and, since many open source projects had O’Reilly books associated with them featuring an animal on the cover, he wanted to name the project after an animal. He came up with Tomcat since he reasoned the animal represented something that could fend for itself. Although the tomcat was already in use for another O’Reilly title, his wish to see an animal cover eventually came true when O’Reilly published their Tomcat book with a snow leopard on the cover in 2003 Apache Tomcat, often referred to as Tomcat, is an open-source web server developed by the Apache Software Foundation (ASF). Tomcat implements several Java EE specifications including Java Servlet, JavaServer Pages (JSP), Java EL, and WebSocket, and provides a “pure Java” HTTP web server environment for Java code to run .

3. **PHP:**

HP: Hypertext Preprocessor (or simply PHP) is a general-purpose programming language originally designed for web development. It was originally created by Rasmus Lerdorf in 1994;[5] the PHP reference implementation is now produced by The PHP Group. PHP originally stood for Personal Home Page, but it now stands for the recursive initialism PHP: Hypertext Preprocessor.

PHP code may be executed with a command line interface (CLI), embedded into HTML code, or it can be used in combination with various web template systems, web content management systems, and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in a web server or as a Common Gateway Interface (CGI) executable. The web server combines the results of the interpreted and executed PHP code, which may be any type of data, including images, with the generated web page. PHP can be used for many programming tasks outside of the web context, such as standalone graphical applications and robotic drone control.

The standard PHP interpreter, powered by the Zend Engine, is free software released under the PHP License. PHP has been widely ported and can be deployed on most web servers on almost every operating system and platform, free of charge.

The PHP language evolved without a written formal specification or standard until 2014, with the original implementation acting as the de facto standard which other implementations aimed to follow. Since 2014, work has gone on to create a formal PHP specification.[

4. **Java:**

Java is a general-purpose computer programming language that is concurrent, class-based, object-oriented, and specifically designed to have as few implementation dependencies as possible. It is intended to let application developers “write once, run anywhere” (WORA), meaning that compiled Java code can run on all platforms that support Java without the need for recompilation. Java applications are typically compiled to bytecode that can run on any Java virtual machine (JVM) regardless of computer architecture. As of 2016, Java is one of the most popular programming languages in use, particularly for client-server web applications, with a reported 9 million developers. Java was originally developed by James Gosling at Sun Microsystems (which has since been acquired by Oracle Corporation) and released in 1995 as a core component of Sun Microsystems’ Java platform. The language derives much of its syntax from C and C++, but it has fewer low-level facilities than either of them.

The original and reference implementation Java compilers, virtual machines, and class libraries were originally released by Sun under proprietary licences. As of May 2007, in compliance with the specifications of the Java Community Process, Sun relicensed most of its Java technologies under the GNU General Public License. Others have also developed alternative implementations of these Sun technologies, such as the GNU Compiler for Java (bytecode compiler), GNU Classpath (standard libraries), and IcedTea-Web (browser plugin for applets). The latest version is Java 8, which is the only version currently supported for free by Oracle, although earlier versions are supported both by Oracle and other companies on a commercial basis.

7.6 Software Testing

Software testing is the process of evaluation a software item to detect differences between given input and expected output. Also to access the feature of a software item. Testing assesses the quality of the product. Software testing is a process that should be done during the development process. In other words software testing is a verification and validation process.

Verification: Verification is the process to make sure the product satisfies the conditions imposed at the start of the development phase. In other words, to make sure the product behaves the way we want it to.

Validation: Validation is the process to make sure the product satisfies the specified requirements at the end of the development phase.

Test Case	Test case Objective	Expected Result
TC-001	Leave all fields as blank and click Log-in button	By leaving all fields as blank and on click Log-in button then mandatory symbol (*) should appear in front of Username and Password fields
TC-002	Enter Invalid Username	By entering invalid Username then an error message should appear as " Please Enter Valid Username "
TC-003	Enter valid Username	It should allow the user to proceed
TC-004	Enter password	The password field should display the encrypted format of the text typed as (****)
TC-005	Enter wrong password	By entering invalid password then an error message should appear as " Please Enter Correct Password "
TC-006	Enter Correct password	It should allow the user to proceed
TC-007	Correct Inputs	It should lead the user to the respective page

Figure 7.3: Output 1

GUI Usability and Test Scenarios		
TC-001	Check for Validation / Error Messages on all the Screen	Validation error messages Shall be displayed properly at correct position
TC-002	Check for all the Fields Label on all Forms	Field labels Shall be standard
TC-003	Check text on all pages for spelling and grammatical errors	All Spelling Shall be Correct and without Grammatical Errors
TC-004	Check functionality of buttons available on all pages	All Buttons on the Forms should be Functional
TC-005	Check all the Fields on the Page/ Forms	All fields on page (e.g. text box, radio options, dropdown lists) shall be aligned properly

Database Testing Test Scenarios		
TC-001	Check if correct data is getting saved in database	Correct data shall be saved in database
TC-002	Check values for columns which are not accepting null values	Enter Null/ Empty Values into database
TC-003	Check for data integrity.	Data shall be stored in single or multiple tables based on design
TC-004	Check for Primary Key	Tables shall have primary key column
TC-005	Check if data is committed to database only when the operation is successfully completed	Data shall not be committed to database before committing
TC-006	Check the Database name	Database name shall be given as per the application type i.e. test, UAT, sandbox, live (though this is not a standard it is helpful for database maintenance)
TC-007	Check if database fields are designed with correct data type and data length	All the filed shall have correct data type and size

8 Technical Specification

8.1 Advantages and Disadvantages

Advantages

- Faster and more accurate results.
- Reduce the manual process.
- System is very help-full for tracking Campus Related Information.
- New People can get the quick response in case of any problem related to Campus or any help.

Performance Testing Test Scenarios		
TC-001	Check if page load time is within acceptable range	Page shall be loaded within acceptable time range
TC-002	Check page load on slow connections	Page shall be loaded within acceptable time range
TC-003	Check response time for any action under light, normal, moderate and heavy load conditions	Page shall be loaded within acceptable time range
TC-004	Check database query execution time	Database query execution time shall be within acceptable time range
TC-005	Check CPU and memory usage under peak load condition	

- People can analyze the College by using System.
- This app is available in play store and users can download it use it.
- As this is an app, it facilitates the offline data access.
- The different notifications are sent easily and quickly.
- The design is very user friendly
- The app is designed by following the security guidelines hence protects the app from vulnerabilities.
- This app is very energy efficient and doesn't drain the mobile phones battery.
- This app integrates almost all major tasks in college management system hence provides one stop solution for the users
- The data is stored on backend server and can be retrieved at any point of time.

8.2 Disadvantages

- The user need to be install application everytime.
- The system need to access internet all time.

8.3 Applications

- The system helps user to manage manual work efficiently.
- All the data related to college can be gather at one place for further diagnosis

9 Conclusion

We learnt how proposed system is better than existing system. It is compatible to everyone; our system reduces the physical human efforts. Through proposed system the standard will maintain the particular security and also provides features those are not included in existing system. Proposed system provides a way to maintain records. It provides easy way for interaction between students and all college faculties. Student will improve their interaction skills by using our proposed system. Proposed system will also help the college to manage their records and save natural resources and job gets done in less time compared to existing system. All the users get the information without delays because of real time use of proposed system. It helps to reach to every student and faculties in the college in very less time. The data which is stored on database will help the management to take major decisions on the suggestion and ideas. Proposed system will also help to students to get their queries solved by the answers of other users such as fellow students and respected faculties of the college. Since there will be many users on system we planned to make it secure and spam free using various algorithms. Smart College application offers reliability, saves time and is user friendly. It can be used as a base for creating and enhancing applications for viewing results, tracking attendance for colleges. Students and their parents will also view results, attendance and curriculum details using this application. Also students can view details, notifications anywhere and anytime. The application will greatly simplify and speed up the result preparation and management process. It provides high security and a system that reduces the work and resources required in traditional process. The proposed system provides the new way of computing and displaying an operation with .

9.1 Future Scope

1. As the technology emerges, it is possible to upgrade the system and can be adaptable to desired environment.
2. Because it is based on object-oriented design, any further changes can be easily adaptable.
3. Based on the future security issues, security can be improved using emerging technologies.
4. Study can be further carried out to find the cost estimation for the implementation of project in college.

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11 RESULT

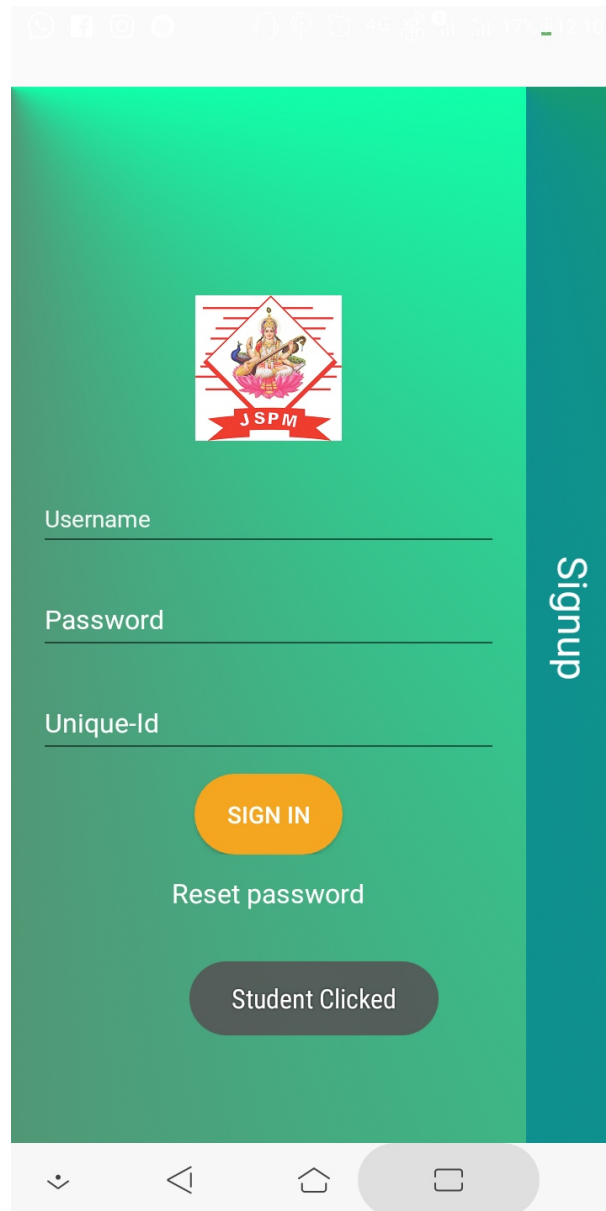
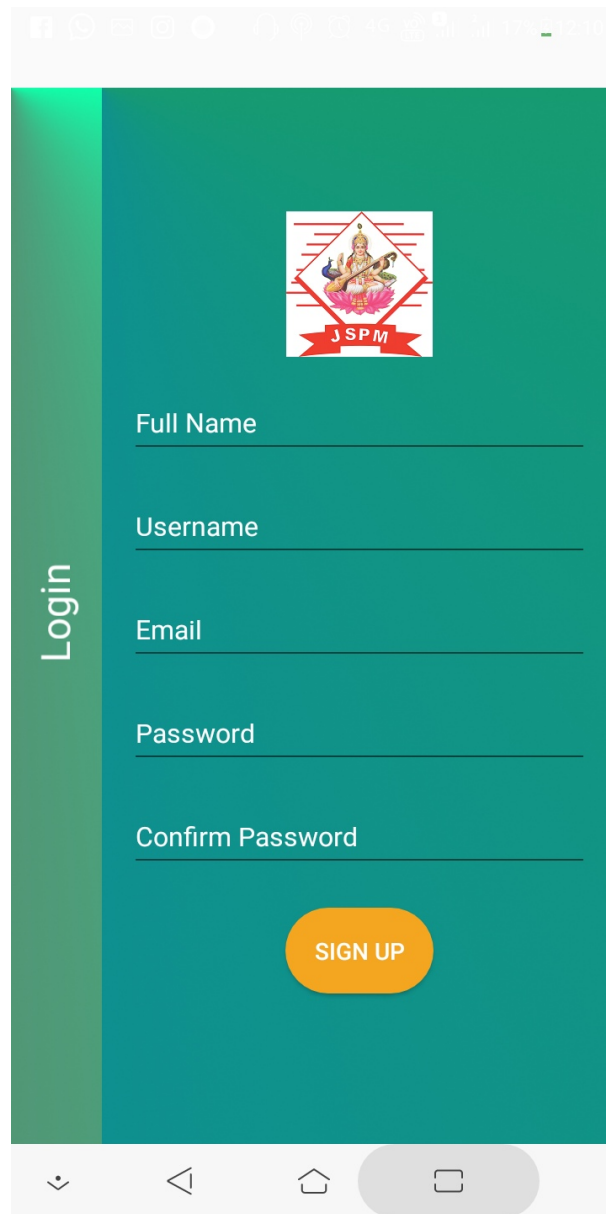


Figure 11.1: Output A



The screenshot displays the login interface of the JSPM Smart Campus Android application. The screen has a teal background with a vertical green gradient bar on the left side. The word "Login" is written vertically in white on the green bar. At the top center, there is a logo featuring a deity within a diamond shape, with "JSPM" written below it. Below the logo, there are five input fields with labels: "Full Name", "Username", "Email", "Password", and "Confirm Password". Each label is followed by a horizontal line for text entry. At the bottom center, there is an orange rounded rectangular button with the text "SIGN UP" in white. The top of the screen shows a standard Android status bar with icons for signal, Wi-Fi, battery, and the time 17:12. The bottom of the screen shows the Android navigation bar with icons for back, home, and recent apps.

Figure 11.2: Output B

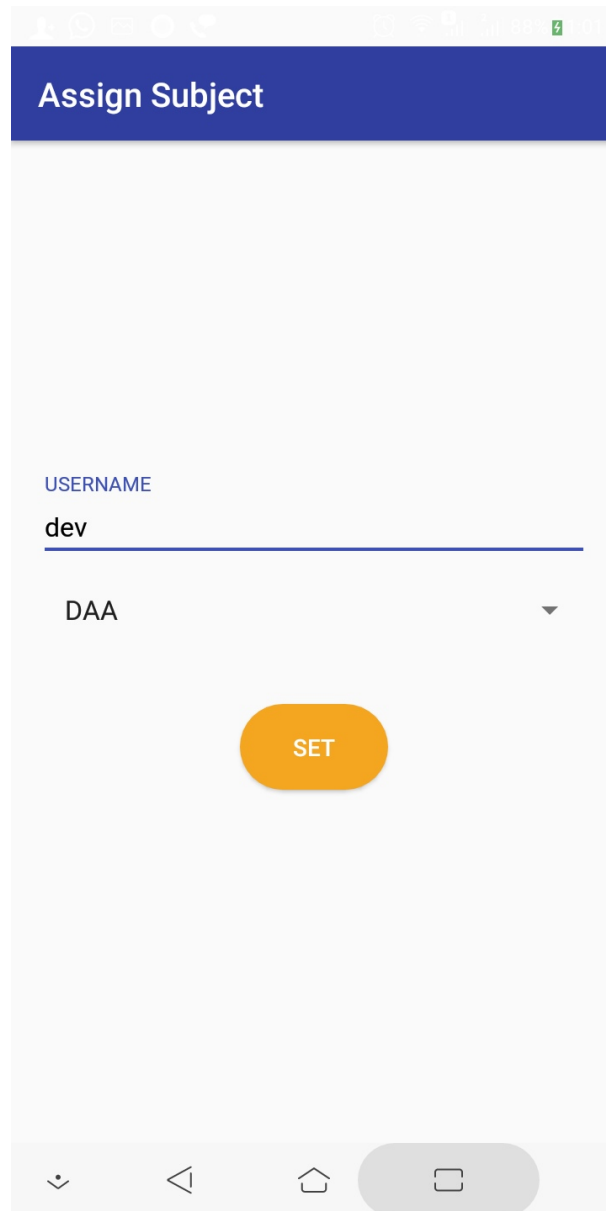


Figure 11.3: Output 1

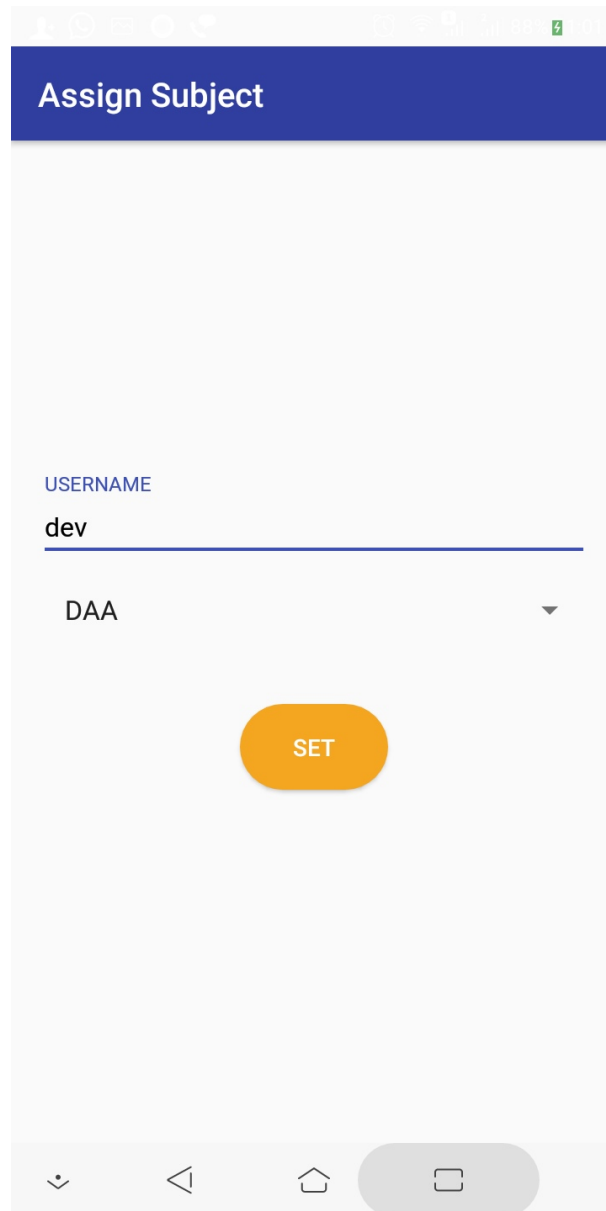


Figure 11.4: Output 2

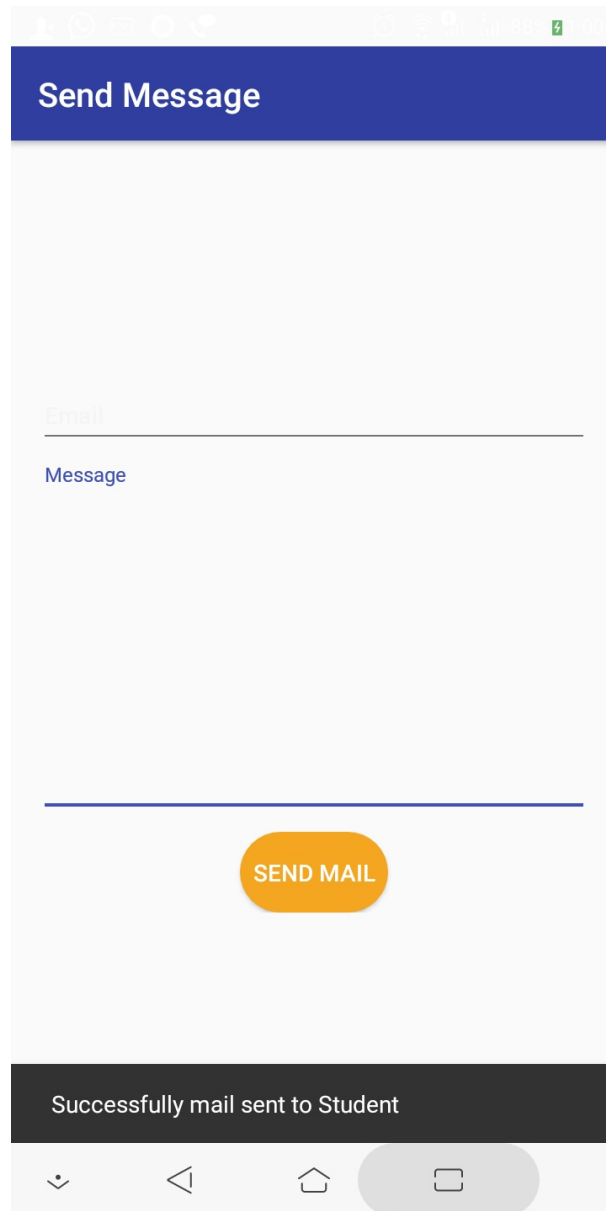


Figure 11.5: Output 3

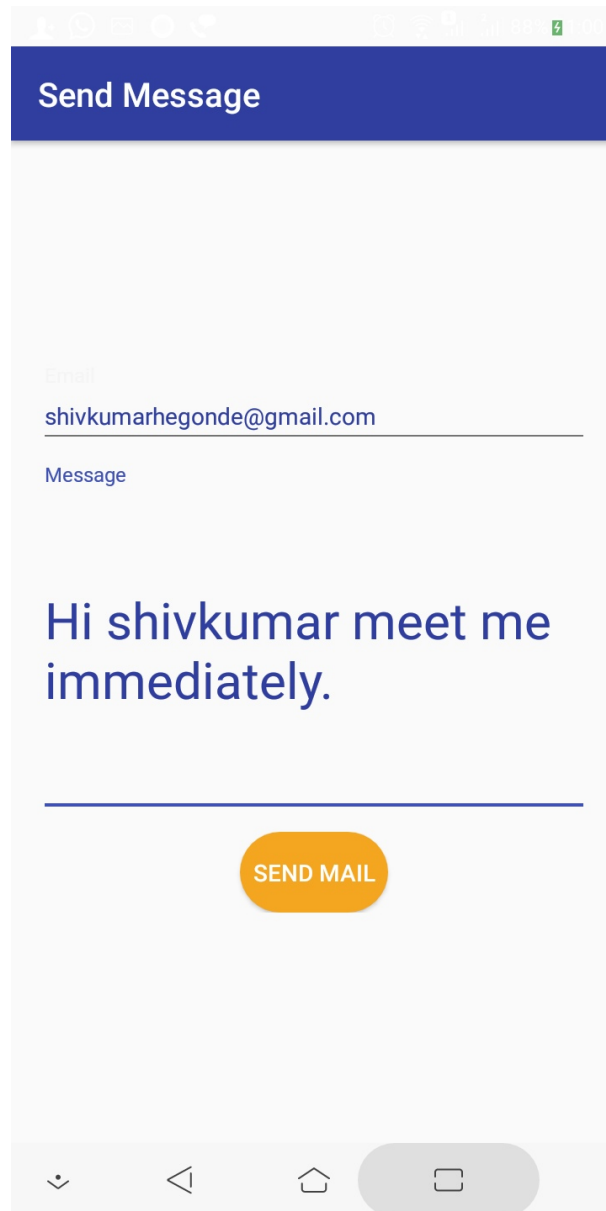


Figure 11.6: Output 4

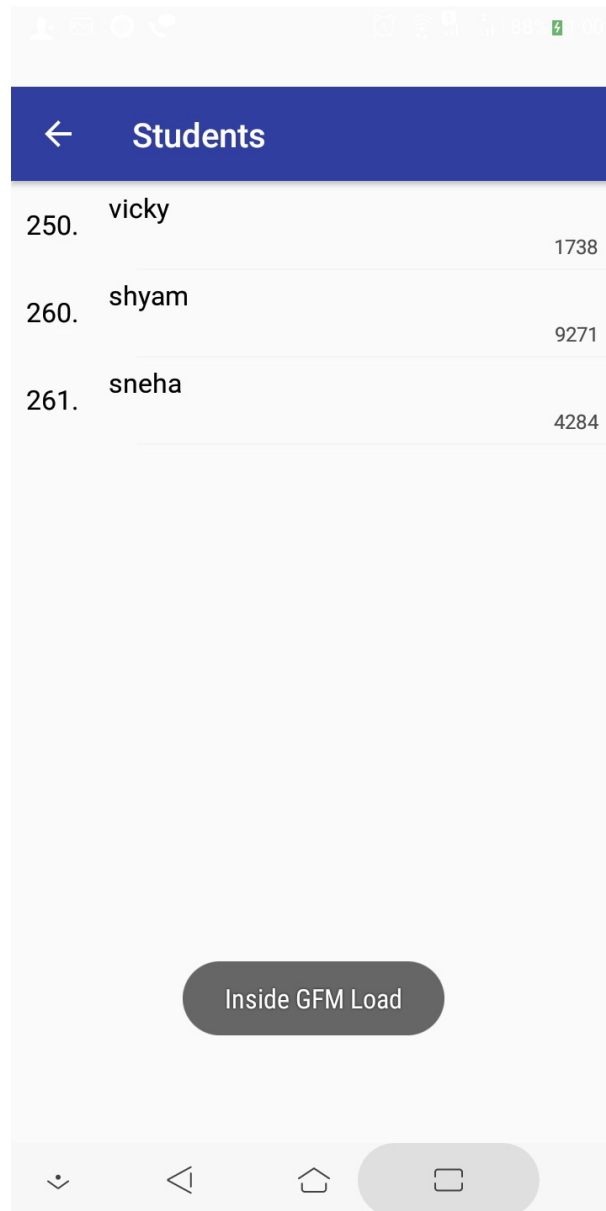


Figure 11.7: Output 5

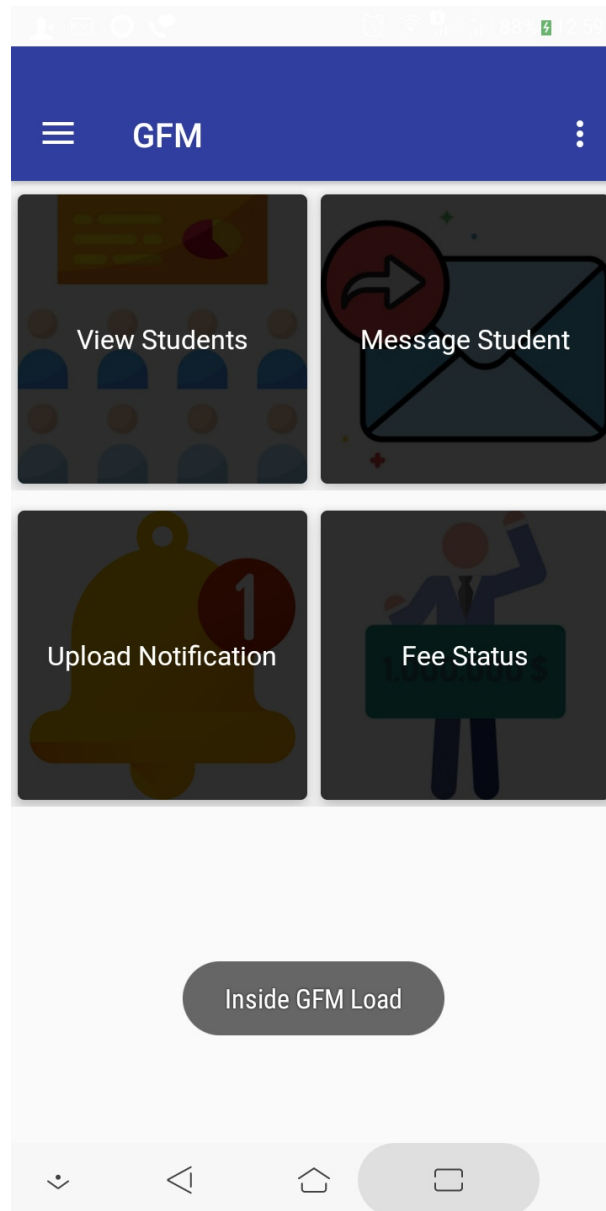


Figure 11.8: Output 6

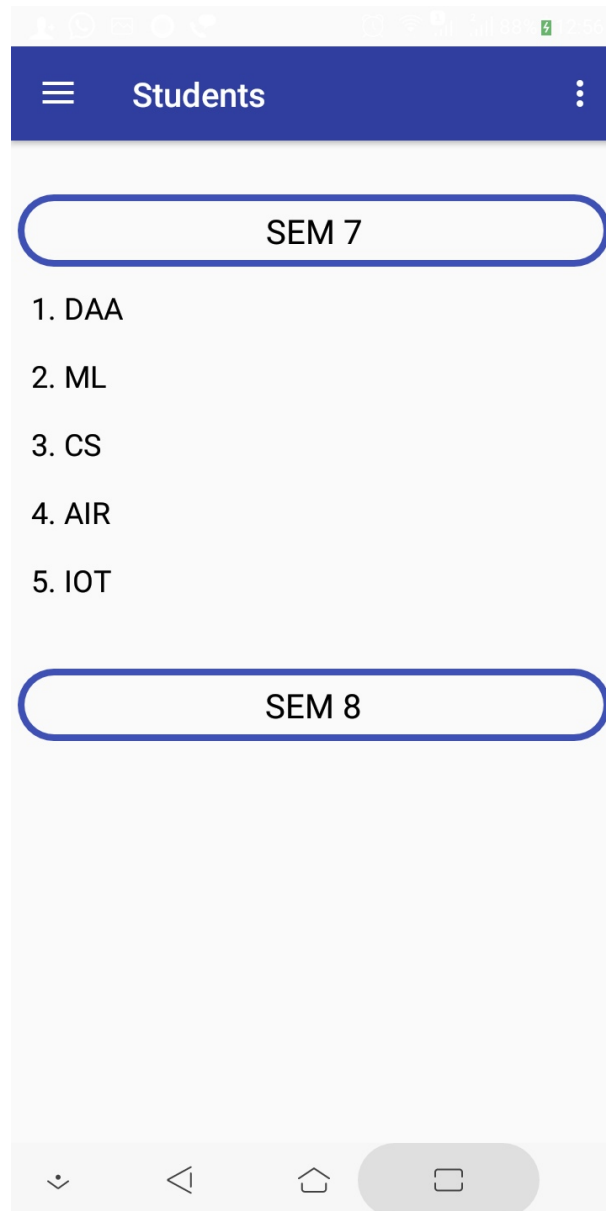


Figure 11.9: Output 7

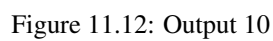


Figure 11.10: Output 8



Sn	Rollno	Total	Percentage
1	1	1	33
2	2	1	33
3	3	1	33
4	4	1	33
5	5	1	33
6	6	1	33
7	7	1	33

Figure 11.11: Output 9



The screenshot shows an Android application interface for attendance tracking. The title bar is dark blue with a back arrow, the text 'Attendance', and a menu icon. Below the title bar is a grid of 50 rows, each with a number and a checkbox. The first 7 rows (1-7) have their checkboxes checked, while the remaining 43 rows (8-50) have unchecked checkboxes. A blue circular 'Save' button is located at the bottom right of the grid. The bottom of the screen shows the standard Android navigation bar with icons for back, home, and recent apps.

1	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	3	<input checked="" type="checkbox"/>	4	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	6	<input checked="" type="checkbox"/>	7	<input checked="" type="checkbox"/>	8	<input type="checkbox"/>
9	<input type="checkbox"/>	10	<input type="checkbox"/>	11	<input type="checkbox"/>	12	<input type="checkbox"/>
13	<input type="checkbox"/>	14	<input type="checkbox"/>	15	<input type="checkbox"/>	16	<input type="checkbox"/>
17	<input type="checkbox"/>	18	<input type="checkbox"/>	19	<input type="checkbox"/>	20	<input type="checkbox"/>
21	<input type="checkbox"/>	22	<input type="checkbox"/>	23	<input type="checkbox"/>	24	<input type="checkbox"/>
25	<input type="checkbox"/>	26	<input type="checkbox"/>	27	<input type="checkbox"/>	28	<input type="checkbox"/>
29	<input type="checkbox"/>	30	<input type="checkbox"/>	31	<input type="checkbox"/>	32	<input type="checkbox"/>
33	<input type="checkbox"/>	34	<input type="checkbox"/>	35	<input type="checkbox"/>	36	<input type="checkbox"/>
37	<input type="checkbox"/>	38	<input type="checkbox"/>	39	<input type="checkbox"/>	40	<input type="checkbox"/>
41	<input type="checkbox"/>	42	<input type="checkbox"/>	43	<input type="checkbox"/>	44	<input type="checkbox"/>
45	<input type="checkbox"/>	46	<input type="checkbox"/>	47	<input type="checkbox"/>	48	<input type="checkbox"/>
49	<input type="checkbox"/>	50	<input type="checkbox"/>				

Figure 11.13: Output 11