

# INTRODUCTION

## 1. PURPOSE

The purpose of this report is to provide a detailed description of the functionalities for the College Information System. This document will cover each of the system's intended features, as well as offer, a preliminary glimpse of the software's User Interface (UI). The document will also cover hardware, software, and various other technical dependencies.

This document is intended for all individuals participating in and/or supervising the Android based college information system. Readers interested in a brief overview of the product should focus on the 'Introduction' as well as 'Overall Description' of the document, which provides a brief overview for each aspect of the project as a whole. Readers who wish to explore the features of application in more detail should read the 'System Features', which expands upon the information laid out in the main overview.

## 2. SCOPE

The Application system is composed of:

- A client-side: This will run on Android handsets for students and web bases for faculty,
- An admin-side: application which would be web based, and
- A server-side: this will support and interact with various client-side features.

The system would be designed such that information is sent from some users and are delivered to a large set of users.

### **3. OVERVIEW**

Currently there is no electronic system that is effective in conveying the information quickly to the students and also notices are displayed on notice boards, which are not a quick way of communication. Sometimes students do not see the notice boards and thus are unaware of the information being displayed.

There isn't a Mobile based system where students can access the information about the library like Authors, Location of books in Library, etc. There is also a lack of a system which can facilitate the faculties or a department to quickly convey information to the students about spontaneous changes that occur in the institution like rescheduling of classes. Notifications on cell are also not sent to targeted students regarding any information, they first have to login and then search their notices from the whole lot of notifications for every branch.

The proposed system can help to overcome these drawbacks in the current system by providing a fast and efficient communication link between the Institution, faculties and the students. It will also help the students in accessing the library resources more efficiently and will also save student's valuable time. Students will also receive notification on cell at the same time notice is issued and only the targeted students will receive it.

**CHAPTER 2**

# **LITERATURE SURVEY**

We had developed an Android based application which will be useful to every student of college. Android as a Server Platform is proposed that enables many users to use resources on remote cloud servers. Android is an open source mobile OS initiated by Google. The main reason to use Android is that, that it has high penetration among the targeted audience . Android is simply an Operating System (OS) created by Google to run on any small electronic devices such as cell phones, e-books, Media Internet Devices (MID), net books, Internet tablets, and many others devices in the future. An OS is similar to Windows that controls your desktop or laptop personal computers. Google fully developed Android and make it into an Open Source. Now, any phone manufacturer can use Android without expensive license fee from Google. Because it is Open, manufacturer can modify Android without restriction, allowing it to fit the device they are making -total freedom. This makes it a big incentive for any device manufacturers to adopt Android. Android is very easy to learn and implement by using Android SDK/IDE and it's free. Deploying any application in Android market is also very cheap comparatively.

Android is a Linux-based operating system designed primarily for touch screen mobile devices such as smart phones and tablet computers. Initially developed by Android, Inc., which Google backed financially and later bought in 2005. Android was unveiled in 2007 along with the founding of the Open Handset Alliance: a consortium of hardware, software, and telecommunication companies devoted to advancing open standards for mobile devices.

Our application is being developed for the college students. For this purpose the existing systems were studied. The existing system for sending information to students include

- a) Notices on notice board and
- b) Information sent to the student through the blackboard application.

Every notice issued is displayed on the notice board which is at various locations in the college. This method is efficient, but if the information has to be sent in a short period of time, then this method is inefficient. For eg. If there is a class reschedule then the students are not informed in a quickly manner. There is a information gap between the faculties and the students. Students were also questioned about it. They said that sometimes the information is not conveyed to them in a timely manner. Notices issued on the blackboard are often overlooked.

The same problem was also asked to faculties, they said:

- a) It is difficult to make announcements, since for each announcement a notice has to be issued which is time consuming.
- b) Class rescheduling is difficult, as they generally inform Class representative which in turn inform other students. This is a time consuming problem.

The survey was also done about the problems students face in library. This system would also try to address, those problem. In library books are located at various locations. Although most of the books are stored in their respective department section, yet it becomes very difficult to locate the books in the library. The library has LIBSYS software to manage the library information. It has its server in Mumbai. The library database has information like book account number, book author, subject to which a book belongs, location of the book in the library etc. Librarian maintains these databases. Every day, this database is shared on Google drive with other librarians. This database can be obtained in MS-Excel file.

Problems faced by the student in the library:

- a) Search for the book available in library.
- b) Locate a particular book in the library.

For this we first drew map of whole library on paper. Then we needed a tool to draw a map so that we could show the location of book. So we first made the map in paint but that didn't worked. So we decided to work on Canvas for creating map. As we

found that canvas is very easy to implement. So we learned everything about canvas. Many online tutorials were present, we learned all that and implemented our library module.

A survey was also done with the IT-Administration of the campus, about the project. The campus has servers, which would be used as backend for the project.

# **PROBLEM DEFINITION & PROPOSED SOLUTION**

## **1. EXISTING SYSTEM**

In current system the information conveyance between the teachers, administration and students is inefficient. Blackboard system exists which is used to send information from students, administration to students. But this system is inefficient as students get information only when they login to the Blackboard website. Secondly, Blackboard broadcasts the message to entire students, so it becomes difficult for students to browse from unnecessary information and get required information. Currently notices are displayed on notice boards, which are not a quick way of communication. Sometimes students do not see the notice boards and thus are unaware of the information being displayed. There is not a Mobile system where students can access the information about the library like books available, Authors, Location of books in Library, etc. There is no mobile system where a faculty or department can convey information to the students if there is a rescheduling done for the classes. Sometimes if the classes are rescheduled or shifted spontaneously, the students are unaware of that fact which is quite troublesome.

## **2. PROPOSED SYSTEM**

This system helps in overcoming the above mentioned drawbacks. Using this system, the students will have all the information at their disposal, at the right time which will help saving their time and keep them updated. The notices that are displayed on the notice boards will be send to the devices of the students using push notifications so that they are informed about the notices as soon as they are issued. Sometimes when the students have to be informed about the rescheduled or swapped or extra classes, the announcements have to be made in every single class. Instead of that, the students

will receive a push notification informing them about any change in their time table as early as possible so that they can be prepared regarding the same. In situations when a student wants to issue a book from the library, they normally don't know about the availability of that book in the library. So, just to check on the availability, they have to come to the library and sometimes return empty handed. This wastes times, especially during the exams. This system helps overcoming this situation by informing the student about the availability of the book in the library, it will also help in finding a book in the library. Given the fact that the libraries are decently large in size, finding the required books can be troublesome. So, when someone wants to find a particular book in the library, all they have to do is select the book and track it. The system will inform the person about the detailed location of the book for easy access.

## CHAPTER 4

# DESIGN

### 1. DATABASE DESGIN

The application uses data for students, library, and data about faculty. As application needs that a user is able to send the data to the target audience, therefore it must store these data about students at the server side. The database about the students would be stored in the MySQL database.

There are 2 different databases present in our application.

#### *i. College informer*

The database contains 7 tables mentioned below:

##### *Admin\_information*

This table contains fname, lname, username and password. Fname is user for admin's first name and lname for last name.

##### *Faculty\_information*

This table will also contain fnme, lname, username and password. Fname is faculty's first name and lname is last name.

##### *Student\_information*

This table contains lname, lname, SAP, ss\_id, year, branch, course and gcm\_regid. Fname is student's first name, lname is last name and ss\_id is student id assigned to subject associated with student.

##### *Notices*

This table contains time, notice and sub\_id.



***Student\_subject***

This table contains sub\_id and ss\_id.

***Subject\_information***

This table contains sub\_id, subject\_name, year, username and branch.

***ii. Library\_info***

Under this there are 5 tables for each department that is EXTC, CS, IT, MECH AND CIVIL. This entire table contains serial, title, author, loc, location.

## 2. DATA DICTIONARY

The database would have mainly following tables with attributes and data types:

### *i. College Informer-*

#### *admin\_information*

- a) fname – varchar(30)
- b) lname-varchar(30)
- c) username-varchar(20)
- d) password-varchar(20)

#### *faculty\_information*

- a) fname – varchar(30)
- b) lname-varchar(30)
- c) username-varchar(20)
- d) password-varchar(20)

#### *student information*

- a) SAP-varchar(11)
- b) Fname-varchar(30)
- c) Lname-varchar(30)
- d) Branch-enum('CS','EXTC','CIVIL','MECH','IT')
- e) Year-enum('I','II','III','IV','V')
- f) Course-enum('B.Tech','MBA.Tech')
- g) ss\_id-varchar(10)
- h) gcm\_regid-text

***notices***

- a) time-timestamp
- b) notice-varchar(1000)
- c) sub\_id-varchar(20)

***student subject***

- a) ss\_id-varchar(10)
- b) sub\_id-varchar(20)

***subject information***

- a) sub\_id-varchar(20)
- b) subject\_name-varchar(30)
- c) year-enum('I','II','III','IV','V')
- d) username-varchar(20)
- e) branch-enum('CS','EXTC','CIVIL','IT','MECH')

***ii. Library\_info***

***CS Dept.***

- a) Serial-int(2)
- b) Title-varchar(172)
- c) Author-varchar(64)
- d) Loc-int(2)
- e) Location-varchar(14)

***Extc Dept.***

- a) Serial-int(2)
- b) Title-varchar(172)
- c) Author-varchar(64)
- d) Loc-int(2)

e) Location-varchar(14)

***IT Dept.***

a) Serial-int(2)

b) Title-varchar(172)

c) Author-varchar(64)

d) Loc-int(2)

e) Location-varchar(14)

***Civil Dept.***

a) Serial-int(2)

b) Title-varchar(172)

c) Author-varchar(64)

d) Loc-int(2)

e) Location-varchar(14)

***MECH Dept.***

a) Serial-int(2)

b) Title-varchar(172)

c) Author-varchar(64)

d) Loc-int(2)

e) Location-varchar(14)

### 2. USE CASE DIAGRAM

A use case diagram at its simplest is a representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system.

In our project we have 4 actors that is student, admin, server and faculty. The fig: 4.1 below shows what actions all this actor performs.

Student performs login (if new he/she register), select department, select book then view location. Admin add user, delete user, manage database and send notifications. Server verify login, fetch all the data from database and maintain it. Faculty issue notices, send them and issue timing for notices.

Fig: 4.2 shows the interaction between all these actors in our system. The server registers first then retrieves data from database to delete or modify or to send messages. Server send message first to push notification server to send push notifications to user. Server and administrator both manage data in database. Admin and faculty send messages and a notification which first goes to server then server send it to push notification server to send it to target audience. Student can only register and view information.

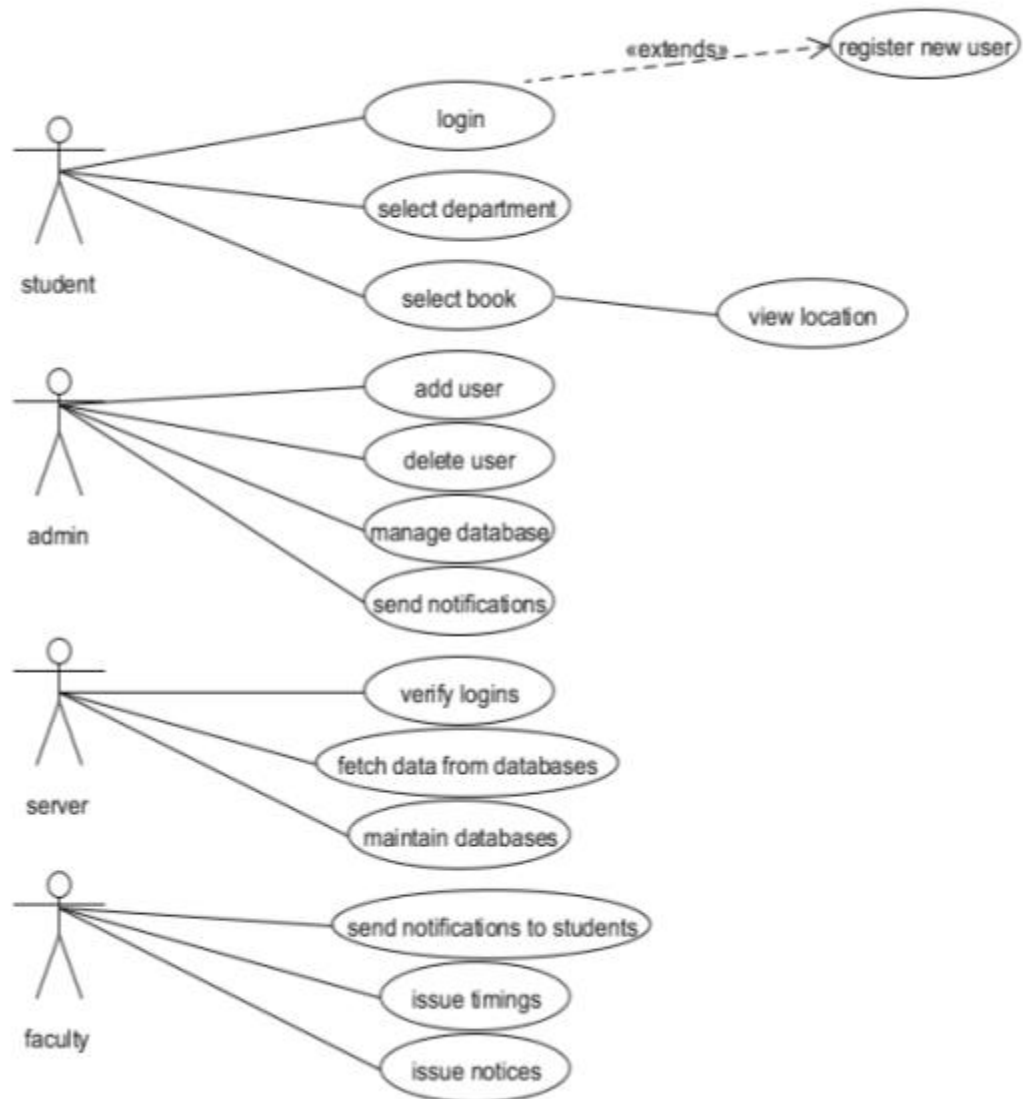


Fig: 4.1 Use Case Diagram

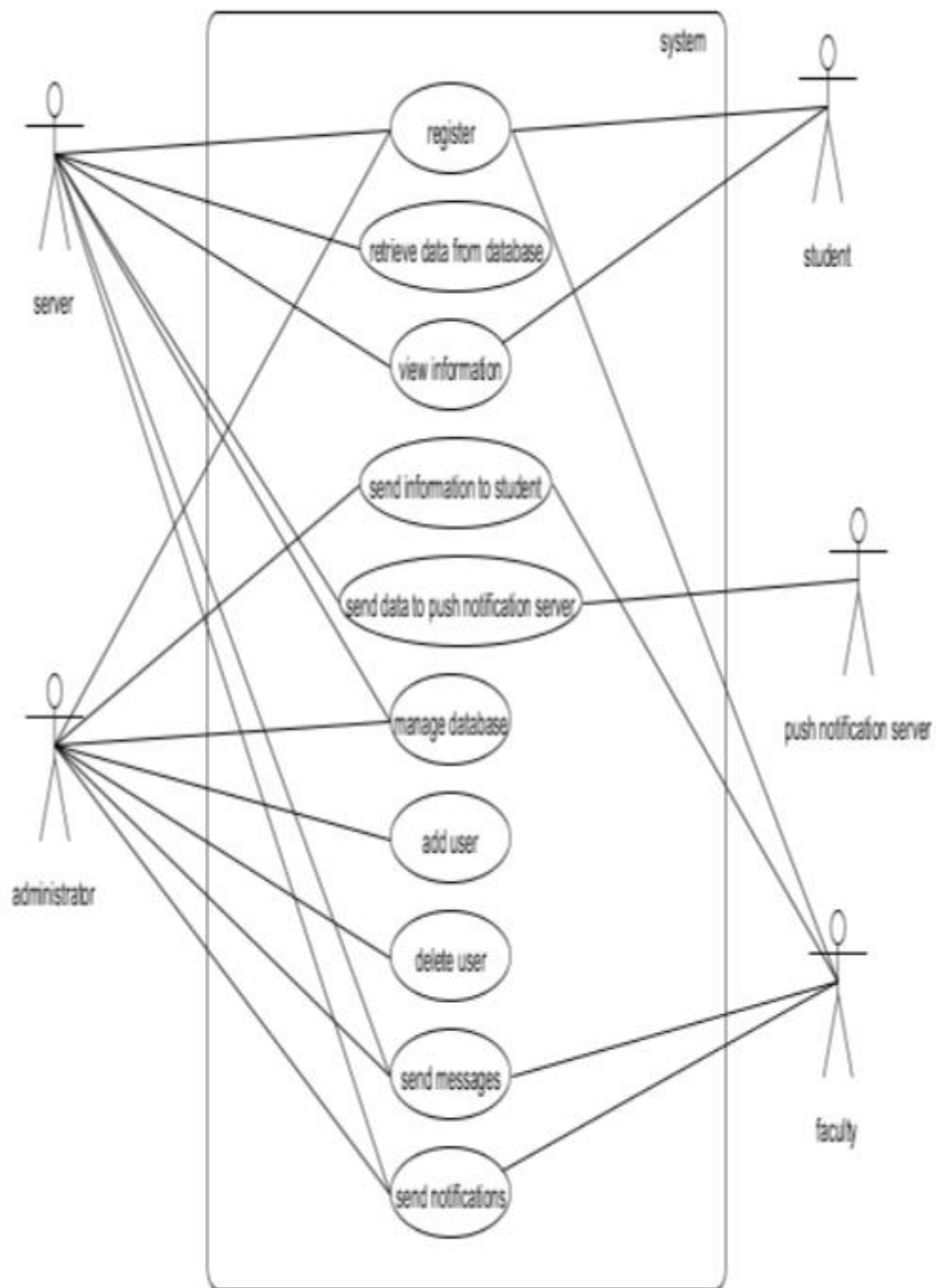


Fig: 4.2 Use Case Diagram (System)

## ANDROID BASED COLLEGE INFORMATION SYSTEM

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USE CASE	USE CASE NAME	ACTIVE PARTICIPANTS	DESCRIPTION
1.	Register	Server, admin, student and faculty	Server, admin, student and faculty first register to the system.
2.	Retrieve Data from Database	Server	All the data requested is retrieved by server from database.
3.	View Information	Student and server	Student and server can view information sent.
4.	Send information to student	Admin and faculty	Admin and faculty send information to student.
5.	Send Data to Push Notification Server	Push notification server	Push notification server is used to send data to student in the form of push notification.
6.	Manage Database	Admin	Admin manages all the data in the database.
7.	Add user	Admin	Admin adds the new user.
8.	Delete user	Admin	Admin deletes the inactive user.
9.	Send messages	Admin, faculty and server	Admin, faculty and server send messages to student.



10.	Send notifications	Admin, server and faculty	Admin, server and faculty send push notifications to user.
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Table: 4.1 Use case description

### 3. ACTIVITY DIAGRAM

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. Here Fig: 4.3 shows the activity diagram for student. Student first opens the application and then login application, if username and password is incorrect user again login. If correct then goes to next page that is of select module which contains two things one is subject and second is library. If user chooses subject then after that user selects required subjects and now can see notices regarding it. After that he exits. If user chooses library then user enter book name to be searched then can see the related books, after that user selects the required book and at last can see location of book. After that user exit.

Fig: 4.4 shows activity of faculty. At first faculty open the web page, and then he/she has 2 options edit profile and select audience. If faculty selects edit profile, he/she gets again 2 options one is change name and other is change username. Faculty selects required option and then exit. If faculty chooses select audience then he/she gets 3 options that is notices, lecture timings and messages. Faculty chooses the required type of activity he wants to perform and then exits.

Fig: 4.5 show activity of admin. Admin open the web app then login the system. After that admin has various options to do such as send message, faculty operation, subject operation, student operation and advance. Admin selects the required option and then exit.

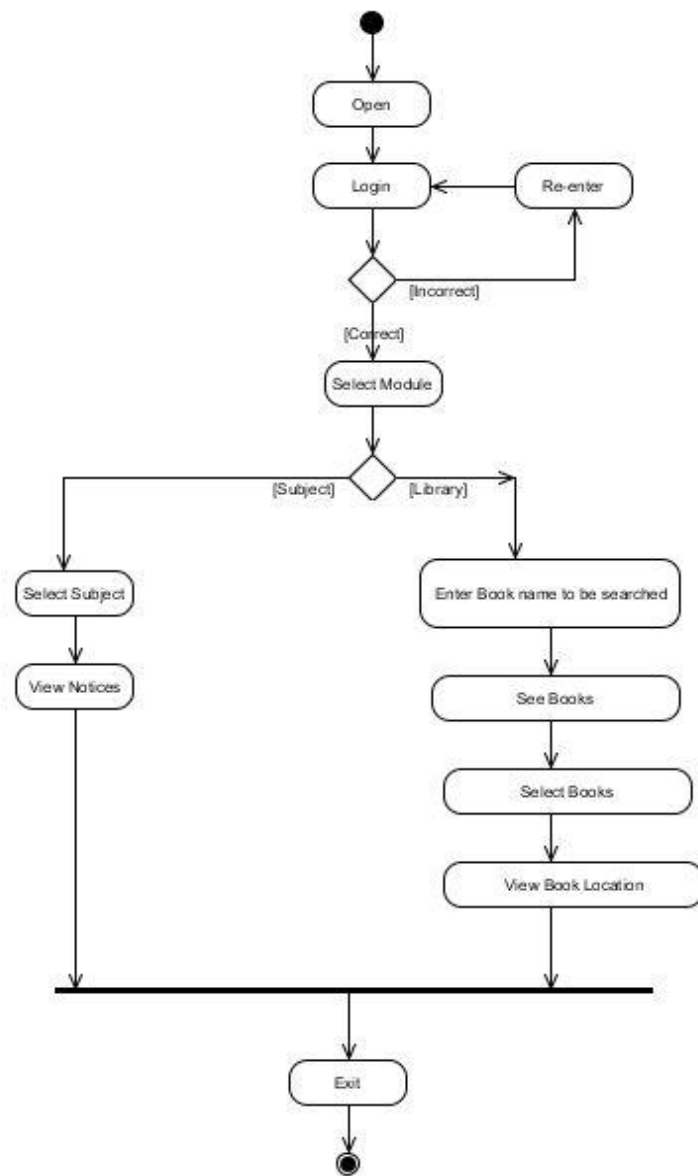


Fig: 4.3 Activity Diagram(Student)

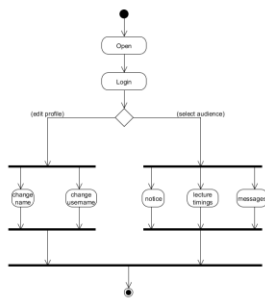


Fig: 4.4 Activity Diagram (Faculty)

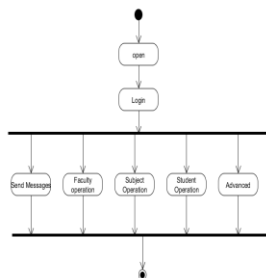


Fig: 4.5 Activity Diagram (Admin)

#### 4. CLASS DIAGRAM

In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

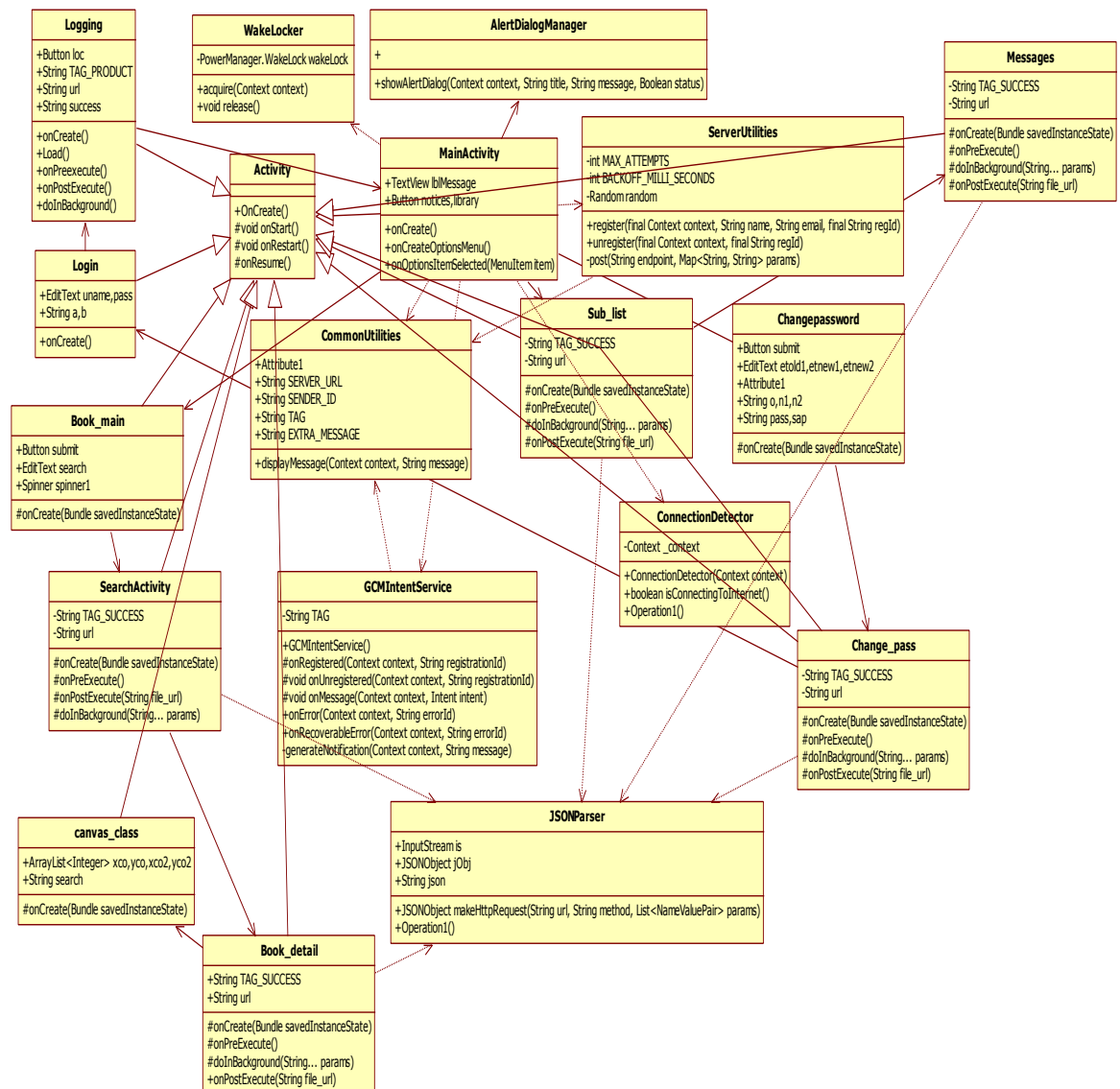


Fig: 4.6 Class Diagram

### 5. SEQUENCE DIAGRAM

A sequence diagram is an interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario.

Fig: 4.7 shows sequence diagram of faculty. Faculty login application then username and password are send for verification to server, then server gives respond to application. Here one activity is performed. Then faculty select subject and then select audience from application, application then send request to server for audience. Here one more activity is done. Now faculty type message and send message from application, then application send that message to server. Server then send that message to GCM server, then GCM server sends respond to server and at last server gives respond to application. Faculty then exits application.

Fig: 4.8 shows the sequence diagram of student. User at first enters the username and password. Then both are sent for verification to server. Server then request that username and password from application database and gets the response. Then server gives response to application. User then select subject and view notices, applications request that notices from application database and gets the display of notices as respond. User if selects library module and then search books, then population search the book from library database and gets the book details. The user request book location. Then application fetches location from library database and gets the location.

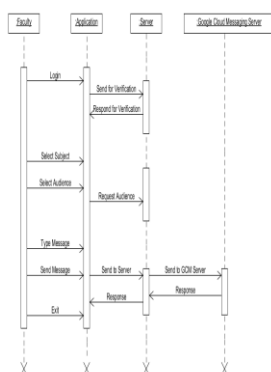


Fig: 4.7 Sequence Diagram (Faculty)



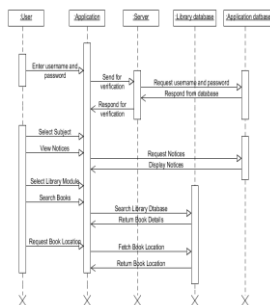


Fig: 4.8 Sequence Diagram (Student)

### 6. ER DIAGRAM

A use case diagram at its simplest is a representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system.

Fig: 4.9 shows that the users of the application are faculty, admin and student.

Fig: 4.10 shows that student has attributes such as year, branch, S.A.P I.D and GCM registration I.D. Student is a member of library which has attribute sections. Library has books and books have attributes such as author, location of book and subject.

Fig: 4.11 shows that admin with attributes name and I.D sends information to student with the attributes mentioned above, admin also manages and modify database of student and faculty.

Fig: 4.12 shows faculty with attributes name, designation and I.D sends information to student with the attributes mentioned above.

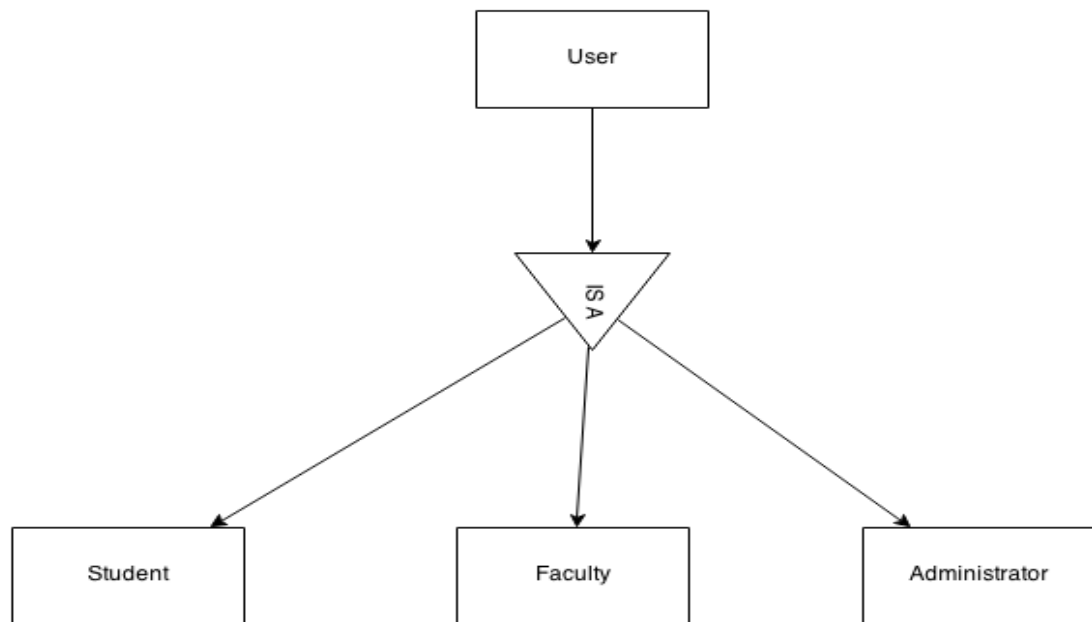


Fig: 4.9 Generalization of User



Fig: 4.10 ER Diagram for Student and Library



Fig: 4.11 ER Diagram for Admin and Student

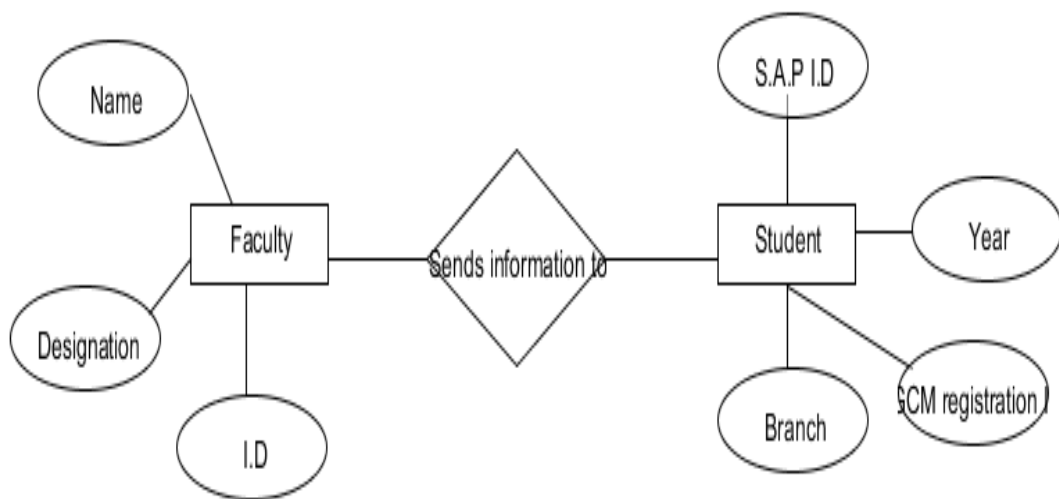


Fig: 4.12 ER Diagram for Faculty and Student

### 7. DATA FLOW DIAGRAM

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modeling its process aspects. Often they are a preliminary step used to create an overview of the system which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design).

In fig: 4.13 context level is shown, flow of data is between system, administrator, user and faculty. System gives right to administrator to do changes in database and admin has all access to database. Admin login system and send messages. User login and select module from system and system shows book details and notifications. Faculty login system and send notification to system. System shows subject faculty is teaching currently.

In fig: 4.14 level 1 is shown, student request library or notice information to system and system return the information. Faculty send message to system and request subject and student list. System return the lists. Administrator add subjects, faculties, students to the system and send message. Administrator returns faculty, subject and student information.

In fig: 4.15 level 2 is shown, student login the system, system request login info from college informer database and verify the login credentials. Student request library information, system request that information to library database and gets the reply and return library information to student. Faculty login, fetch year and subject from the system and send messages. System reply if the message is successful or not. Administrator send messages, add faculty, students and alter information. Administrator gets reply by system is the message successful or not. All messages sent by faculty and admin are further sent to GCM server, then server sends failure or success reply and at last send push notifications to student.

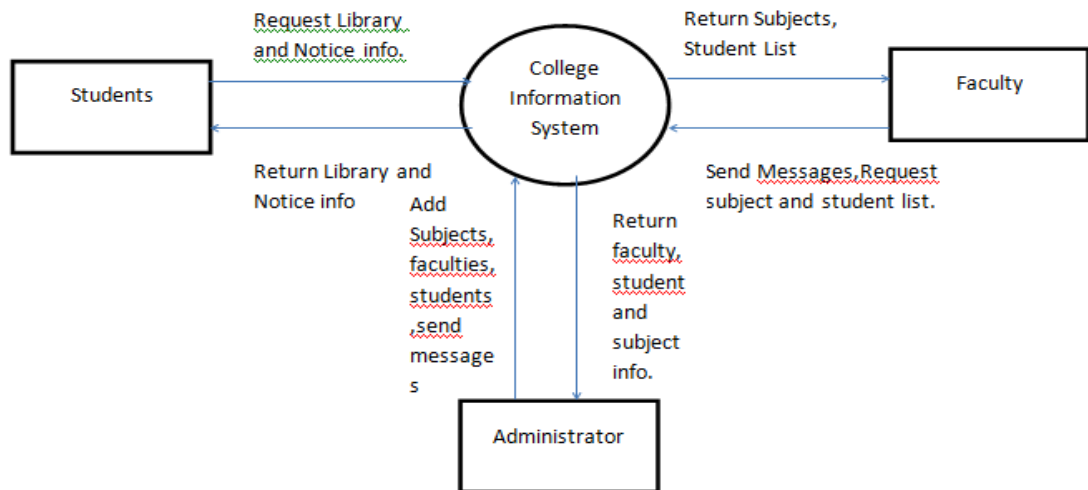


Fig: 4.13 DFD (Context level)

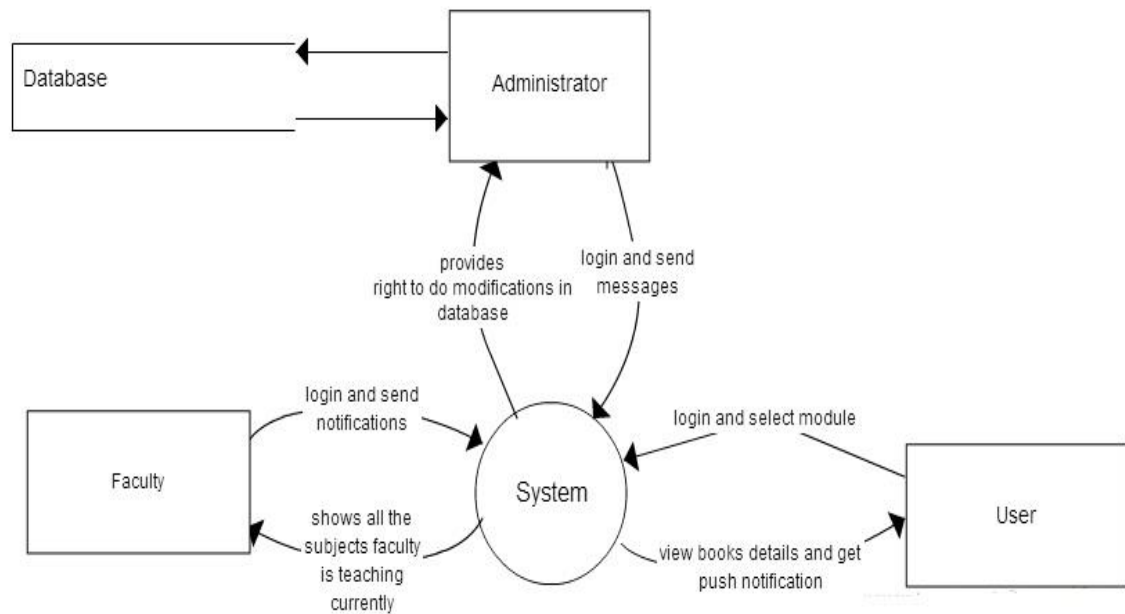


Fig: 4.14(Level 1)

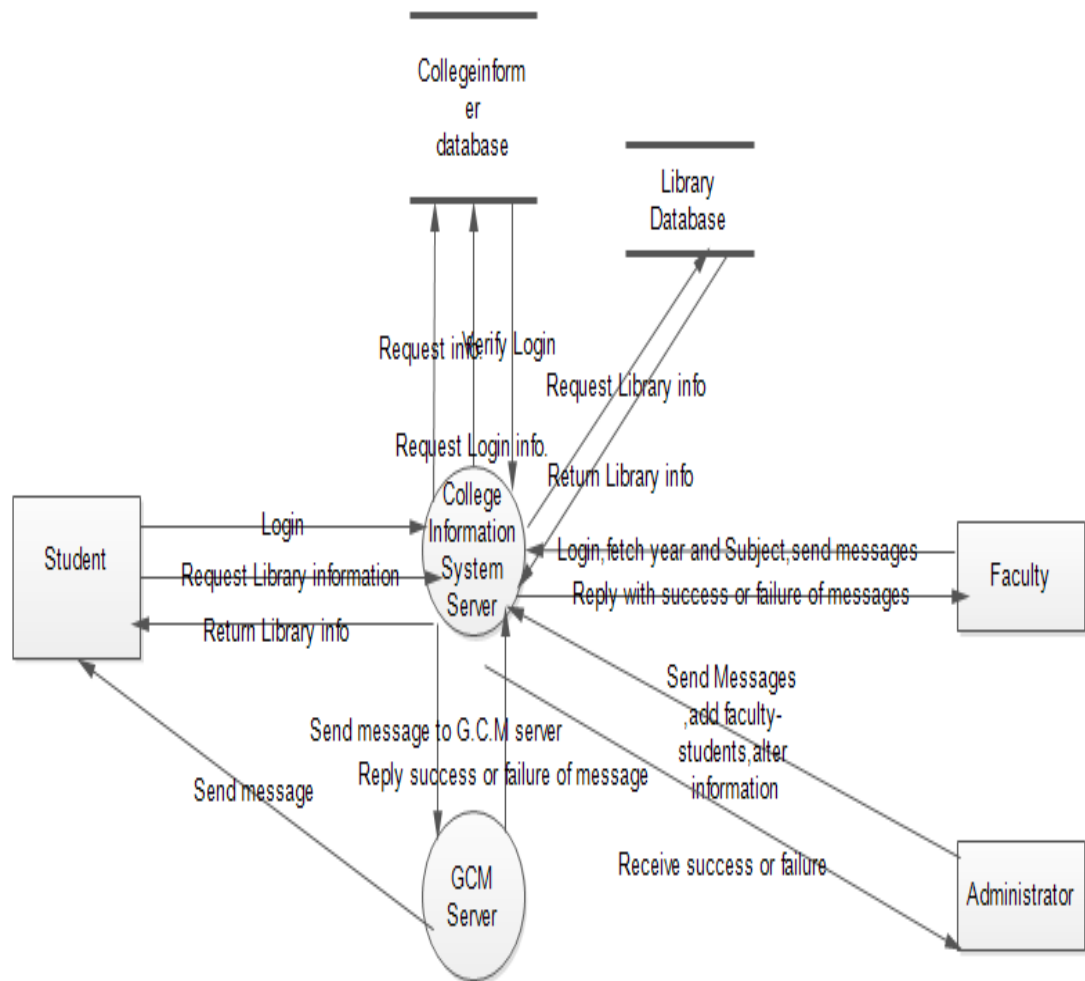


Fig: 4.15 DFD (Level 2)

## RESULT ANALYSIS

### SNAPSHOTS-

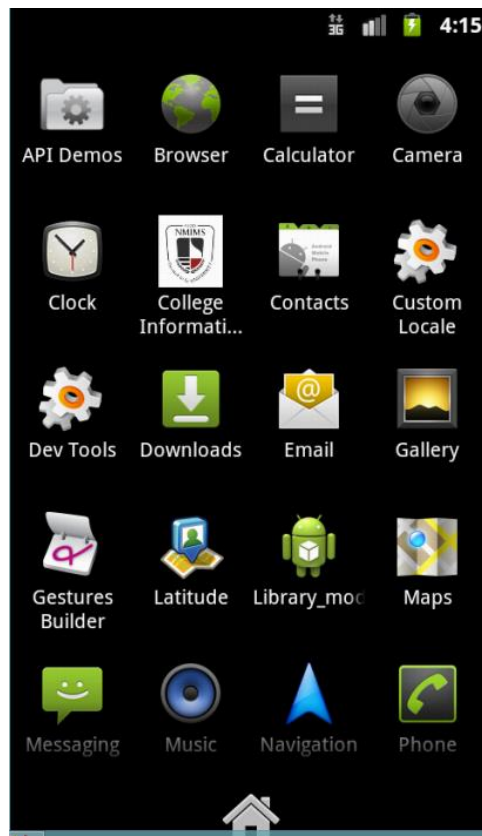


Fig: 5.1

Logo of our Android Application in mobile phones.



## ANDROID BASED COLLEGE INFORMATION SYSTEM

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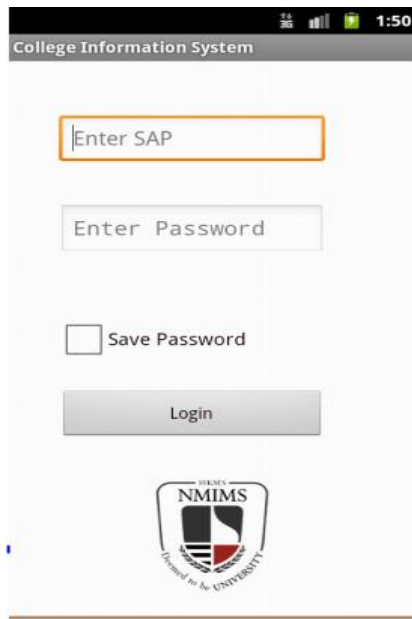


Fig: 5.2

Login page

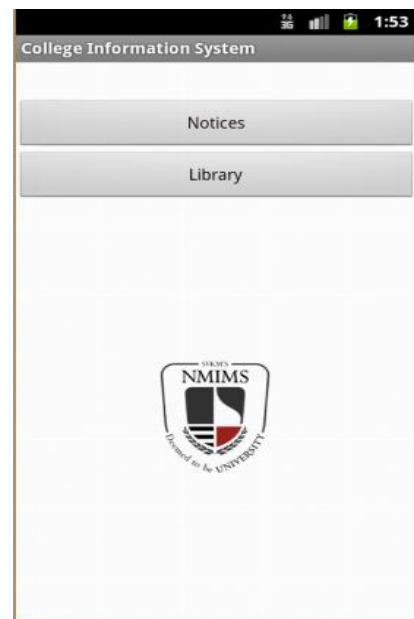


Fig: 5.3

next page with options notices and library.

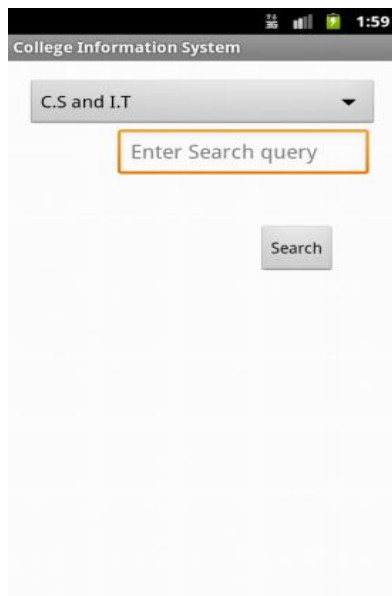


Fig: 5.4

After Selecting Library option



Fig: 5.5

Search results



Fig: 5.6

After selecting a book

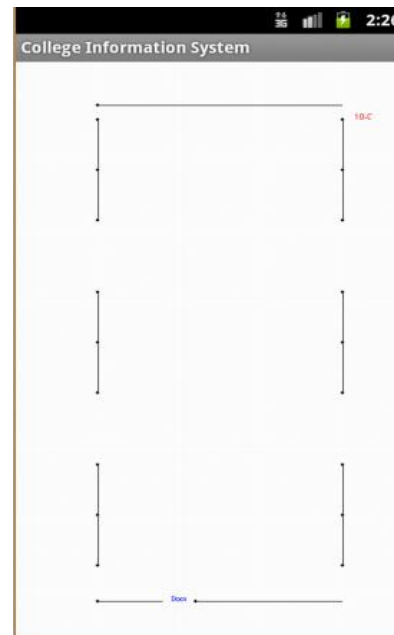


Fig: 5.7

Location of that book in library

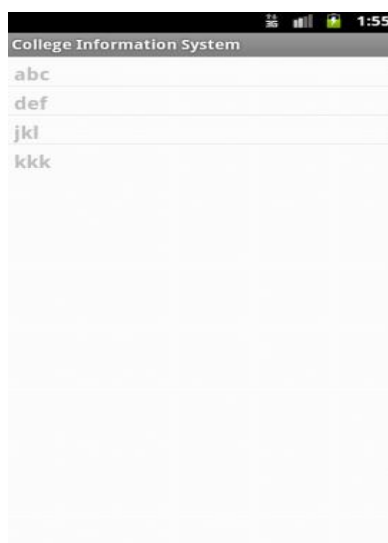


Fig: 5.8

List of subjects a student is studying

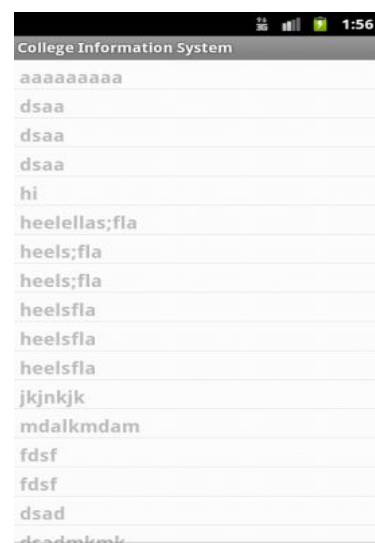


Fig: 5.9

List of notices issued for that subject

## ANDROID BASED COLLEGE INFORMATION SYSTEM

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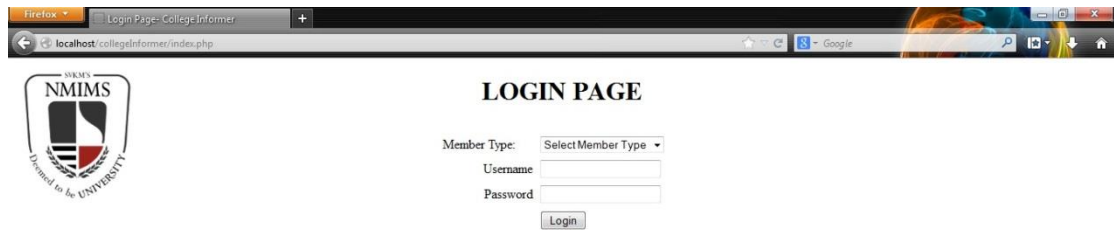


Fig: 5.10  
Login page of web app

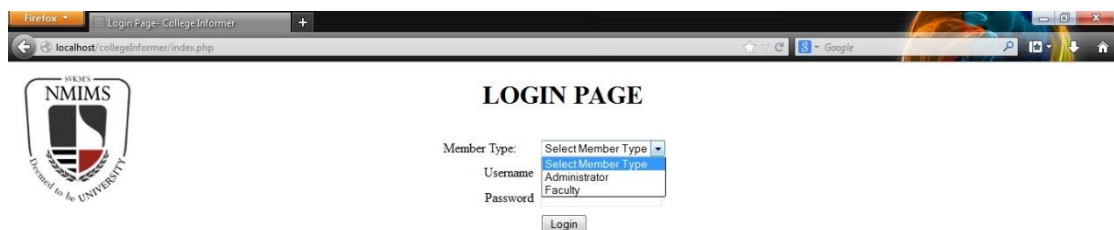


Fig: 5.11  
Option to select different member type.

## ANDROID BASED COLLEGE INFORMATION SYSTEM

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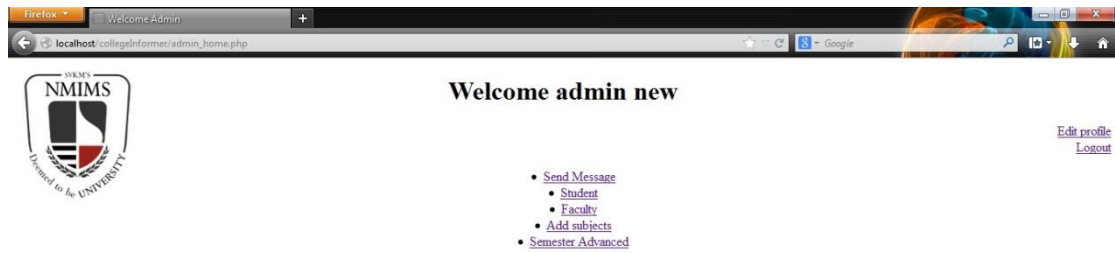


Fig: 5.12  
Admin Home Page



Fig: 5.13  
Faculty Home Page

## ANDROID BASED COLLEGE INFORMATION SYSTEM

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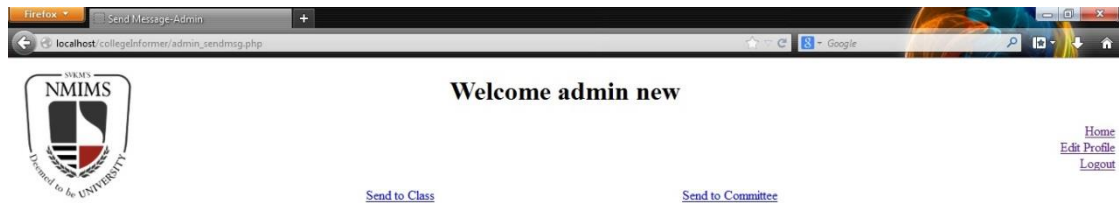


Fig: 5.14  
Status after sending message

# TESTING

## ACCEPTANCE TESTING

The first step of testing any application is acceptance testing. In this, the following are defined:

- a) Use cases – defines what the user will do and the expected result/outcome
- b) Non-functional requirements – defines expectations for performance, upgrades, reliability, etc)
- c) Target devices and OS versions – defines what devices and OS versions the service shall work on
- d) The Acceptance Criteria will be used for the final User Acceptance Testing (UAT) below.

So we planned each and every point mentioned above before starting our project precisely. Our application will work on every android handset with the minimum version 2.2 to maximum 4.4. Application will help both faculty and students to exchange information easily.

## DEVELOPMENT TESTING

Testing should start from the first prototype release of code with some kind of working functionality and continue until the end of the project.

Unit testing is performed by the developer. Before any release, whether it is the first release, bug fix or feature update – the application must be tested by the developer prior to releasing it for further testing or to any users.

In this, we checked our code time to time manually to check its functionality. And at the end of each module we compiled the code and removed all errors to attain an error free and properly functioning application.

### **INTEGRATION TESTING**

Integration testing is usually performed as soon as access to back-end services, web services and APIs are available. Integration testing ensures that all APIs work as expected, that all areas of the system communicate with each other correctly and that there are no gaps in the data flow. The final integration test proves that the system works as an integrated unit when all the fixes are complete.

In this testing we integrated each and every module with each other. At the end we got a whole application we required.

Users are able to see and select their branch by logging into the application. After selecting user is able to see all the books of that branch. Then by selecting any book user is able to see the author and location of the book. Similarly in the web application faculty and admin are able to login easily and also able to send notifications to user. Admin is able to manage all databases of faculty, students and books.

### **USER ACCEPTANCE TESTING (UAT)**

Finally the service is ready to go live, but before this there is one final step. The customer (external or internal) of the project goes through the Acceptance Criteria one final time to ensure that the agreed minimum criteria are met. Depending on the preparations prior to this it can be a formality or it can go on for months with additional iterations with development and testing above. Once the UAT is completed the service is ready to go live.

In this we installed our application on several students' handsets and asked them to login. The students then used the application and tested all its functionalities such as book search, book location search, notice history, push notifications etc. The application functioned properly and is now ready to get deployed.

## ANDROID BASED COLLEGE INFORMATION SYSTEM

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S.NO.	MODULES	OPERATIONS	EXPECTED RESULTS	END RESULTS
1.	Login Module (Student-android app) (Faculty and Admin-web app)	Initiation  Input credentials  Login	Successful  Input into the Text Fields  Successful	Successful  All credentials entered  Moved to the next page.
2.	Library Module	Select branch   Select book   View location	Shows all the available branch   Shows all the books of selected branch   Give the location of book	Successfully moved to the books page.   All the books are shown of selected branch   Got the location of selected book
3.	Notice Module	Select subject	Shows notices of selected subject	All the notices are shown of selected subject.
4.	Admin Module	Edit profile	If any user make changes, profile is edited.	Profile is edited when the user change their credentials.



		Send message	Message is sent to targeted students.	Message is received by users.
		Edit student	If any student gets year back is deleted and whole student database is edited at the end of each year.	Student database is edited.
		Edit subject	Students promoted to next year, the subjects associated with them are edited.	Subjects are edited.
		Advanced	All data of semester is deleted after it's completion.	Data of semester is deleted.
5.	Faculty Module	Edit profile	Faculty can edit profile.	Faculty's profile is edited
		Send message	Messages sent to students.	Students receive the push notification sent by faculty.

Table: 6.1 Test case description

## CONCLUSION & FUTURE WORK

The system would help the student and the faculties to convey information quickly. It would help the students in knowing the location of the books in the library. The proposed system can help to overcome drawbacks in the current system by providing a fast and efficient communication link between the Institution faculties and the students. Students will be informed immediately about any notice or rescheduling of class by receiving notification in seconds. It will also help the students in accessing the library resources more efficiently and will also save student's valuable time by giving the exact location of book in the library. Given the fact that the libraries are decently large in size, finding the required books can be troublesome. So, when someone wants to find a particular book in the library, all they have to do is select the book and track it. The system will inform the person about the detailed location of the book for easy access.

Future work may be including modules like examination. By this module, a student would be able to receive the results on his mobile phone whenever they are available. Administration section can also be added to this application, by which a student would be able to view information regarding their fees, administrative notices, etc.. Application can also be extended such that a student is also able to send information to the faculty. He can ask problems over the phone whenever needed.

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