COLLEGE OF COMPUTING AND INFORMATION SCIENCES

ANDROID BASED COLLEGE ASSISTANT APPLICATION

By

CS17-33

DEPARTMENT OF COMPUTER SCIENCE

SCHOOL OF COMPUTING AND INFORMATICS TECHNOLOGY

A Project Report Submitted to the School of Computing and Informatics Technology

For the Study Leading to a Project Report in Partial Fulfillment of the

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Of Makerere University

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DECLARATION

We, group **CS 17-33** hereby declare that the information in this report is our own original gathered authentic work and the content of the document have never been previously submitted to any other university or institution for a higher degree or any other award. Except for Citations, Quotations and References to other people's work used where otherwise acknowledged.

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Approval

This project report titled **android based college assistant** application has been submitted for examination with my approval as the supervisor of group **CS 17-33.**

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Dedication

We dedicate this project to God Almighty our creator, strong pillar, source of inspiration, wisdom, knowledge and understanding.

We dedicate our dissertation work to our family and friends. A special feeling of gratitude to our loving parents, for all the resources.

Acknowledgements

First and foremost, we would like to express our special gratitude to the Almighty God for the successful completion of the Final year Project.

We also take this opportunity to express a deep sense of gratitude to Mr. Paul Bakaki, Mr. Emmanuel Lule for their coordination support, valuable information and guidance which helped us in completing various tasks successfully. We are so grateful to the staff members of College of computing and information sciences, for their cooperation during the course of the project in their various respects.

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Finally, we would like to extend our heartfelt gratitude to our family members, classmates and friends for their invaluable support throughout the course.

Abstract

Many students at the college fail to manage time due to delay in information delivery processes through notice boards, websites, physical access of administrator offices etc.

With the fast-growing mobile phone technology, smart phones speed up information delivery and access, this greatly improves communication and information delivery.

Since many college students have access to android smart phones this has led to the development of the ANDROID BASED COLLEGE ASSISTANT APPLICATION. This application miniatures college website with combination of other forms of information delivery at the college in real time. Our multipurpose program is considering users as guest users, students and college administrators individually. The project gives a total solution to the problems faced by different individuals involved in the information circulation process. It also provides more comfortable and better user interface with overview about the campus college history, departments, workshops, faculties, library and major Latest news and updates about college through notifications. Individual accounts are created for students and administrators. Students can share reading material. Department organizations can make publicity to their events. The android app is also a navigator where the application gathers your current location and shows the exact minimal route to the campus accessing through the use of GPS.

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Abbreviations/Acronyms

API---------- application programming interface

GPS ----------global positioning system

GUI---------- graphical user interface

HTML------- Hypertext Markup Language

HTTP-------- Hypertext Transfer Protocol

SDK--------- software development kit

FCM --------Firebase Cloud Messaging

JSON --------JavaScript Object Notation

APK---------Android Package Kit

XML---------Extensible Markup Language

SMS----------Short Message Service

CHAPTER ONE

1.0 Introduction

In today's university environment, most students are facing significant pressure to manage their time, access to materials, and other college important activities more efficient and effective. Students always face challenges in accessing information due to lack of clear and instant feedback from the administrators. With the advance in time and technology, there is a need for faster dissemination of information to students within the college.

1.1 Background

In a real-world scenario like the college at campus, information is provided in the form of notices, hand written manuals, oral communication spread among the students. (Shilpa, Thakur & Syed, 2014). Taking the manual work into consideration, we find that the Student has to interact with the person in Office, briefed on the requirements they expect and so on. All these require more time and labour. The data collected may be redundant and getting in touch with a remote student becomes impossible. Instead of manual notice boards, colleges started using electronic means to pass on information to students. In this case, MUELE and other college websites have been in existence where students have to visit, login and then access information. These websites usually run down, have a poor usability experience and don't notify users whenever there is new information uploaded. According to IJFEAT International Journal (n.d) There are also a lot of procedures involved in opening up accounts with these websites making them inconvenient.

Today it's not essential to use the traditional forms of communication because newer forms such as mobile technology for quicker and easier communication among the students have come into existence. Therefore, in this project, college assistant application has been developed for college students. The purpose of this application is to enable students manage time through being updated and access the study materials at anytime and anywhere.

This suggests for an Android Based college application to provide students with information regarding college activities such as events organized at college level and departmental level as well, curricular activities, conferences, attendance, marks, general notices, placement activities and many others. In this case students can access information using Android enabled mobiles. Eliminating queuing up at the notice board or log on to college website for any of the above-mentioned details.

This provides information to students in an effective and faster way.

1.2 Problem Statement

College students always spend a lot of time and delay while checking for important updates from the notice boards, administrators, lecturers and the college intranet e.g. websites and e-learning systems. The different modes of information delivery at a college are associated with different problems. For notice boards, these require students to travel from their residential places incurring costs for individuals in distant places from the university.

And the problem with acquiring information from administrators involves miss communication absence of administrators, and lastly the problems associated with intranet are lack of real instant updates, and of lack updated information. Therefore, there is need to come up with a mobile application that will help students be notified on their mobiles whenever there is important information from the administrators**.**

1.3 Objectives

1.3.1 Main Objective

To develop a mobile application that notifies students about important college updates instantly regardless of their location.

1.3.1.1 Specific Objectives

i. To gather the requirements for the college student assistant application.
ii. To study and analyze the requirement specifications for the college student assistant application.
iii. To design a database that supports the college student assistant application.
iv. To build a running prototype of college student assistant application.

1.4 Scope

Our case study was the College of computing and informatics Technology at Makerere University, Kampala Uganda. A sample size of 5 students per course were randomly selected for data collection.

1.5 Significance

- Application prepares student through timely delivery of information from administrators.
- It also reduces issues of miss communication since it keeps record of information communicated i.e. assignment, course work deadlines.
- Ease access to the different college resources i.e. time tables and reading materials.
- Provides information about the college like different courses and departments, fees structure and navigation to the college.

CHAPTER TWO

2.0 Literature Review

This project mainly targets colleges and the synchronization of all the sparse and diverse information regarding regular college schedule. Generally, students face problems in getting important information instantly, sometimes important notices such as campus interview, training and placement events, holidays and special announcements. Android college assistant application tries to bridge this gap between students, teachers and college administrators. Therefore, in the real-world scenario, such as college campus, the information in the form of notices, oral communication, can be directly communicated through the android devices and can be made available for the students, teachers directly for their android devices.

2.1 Existing systems

Currently our college has manual system of putting notices on notice board. It's outdated now as nobody has a time to stand in rush in order to read the notices on notice board this requires a Mobile software programs serving various purposes of the users powered by Android platform are called Android applications, commonly known as 'apps' this is according to Wikipedia (2017).

2.1.1 Mobile Learning Applications

2.1.1.1 Mobile-campus

According Smart Travel Guide: Application for Android Mobile (2014) Dapade and colleagues proposed the android mobile application called MOBILE-CAMPUS, with which mobile users can get valuable information on different landmarks of a university campus and guide students/parents/visitors to find the desired places at campus with more ease anytime and anywhere. To develop this application, they used java programming language, which is used for android platform applications. This application just provides information without notifying its users therefore it is not real-time unlike the proposed system and there is no aspect of sharing.

2.1.1.2 e-notice

Biennial National Conference on Nascent Technologies proposed the application where student can get the information such as displaying notices, results, attendance timetables, etc. (Vahi & Navi, 2012). With the help of this application, not only students can access the information from a remote place but also can avoid the inconvenience of travelling all the way to the college. This system will benefit the students and help them utilize time effectively. At some colleges, certain data is passed onto the students using SMS facility. But this transfer is only on the side of college. It doesn't take into consideration which information is needed by which student and at what time. For example, a student may be interested in timetables but the application is providing assignments at that time since there is no element of search. Also, the delivery of the SMS to the students is based on the student's mobile network. The college website which partially displays the information is heavy and requires flash, java, shockwave player and more time for loading content. Our proposed system enables students share and be notified through the use of push and SMS notifications therefore the issue of mobile network can be solved.

2.1.1.3 Android Academic Assistant

This android application is used for academic aid of students, teachers and staffs of educational institution. Its features are- providing class and laboratory schedule, notice board, notes, CGPA (cumulative grade point average) calculation. Its goal is to provide assistance in academic works by making communication easier, provide easier and faster access to information (Namrata, shadade, priya, statish & Thombre, 2014). Though it has been developed for a specific institution, this application has the potential flexibility to include more assisting function and have extended version for wider range of users. To run the android application, the mobile phone should have minimum Android version 4.2 (jelly Bean), 2MB memory space is required on the android device. This is a limitation since it requires a lot of space to run the application. The device must be connected to internet settings therefore it doesn't take users without mobile data into account. This application uses a web server to hold the required data for processing. Again, this application is different from the proposed system in the way that it doesn't notify users whenever there are new updates on board.

Problems in the Existing Systems

Despite the existence of system characteristics mentioned above, there are several challenges and issues have to be compelled to be solve so as to reinforce the effectiveness of mobile learning applications.

- **Bandwidth issue and connectivity**. Some academic content needs a mixture of multimedia system parts. And there is also need for internet whenever using the system in case for website.

- **Different interface of different subject**. The usage of many interfaces of different subjects enrolled by students in MUELE system may give a contribution to a lot of wasting space. There is no need to do a different interface of different subjects as the students may have difficulty in accessing to their subjects due to enrollment key and so on.

- **Non-portable**. Here, authorized person can make services only in specified place because he cannot carry the system everywhere.

- **Unavailability.** Due to the non-portability of this system, authorized person can make the services in specified college time, so this may cause restricted service.

- **Maintainability**. This system is complex to use and control the services.

- **not user friendly**. The existing system is not user friendly because the retrieval of data is very slow and data is not maintained efficiently.

- **Inconsistency of data:** There will be an unavailability for future use, since notice might get misplaced if copied from system manually notices due lack of portability. So, notice won't be preserved properly for future use in a form that can be easily transmitted.

2.2 proposed system

In this proposed system, we will implement an android college assistant application, which will be beneficial to the students and reduce the manual work, enable sharing notes between lecturers and students, send notices directly to students instead posting it to notice board. With the help of this application, not only students can access the information from the

remote place but also can avoid the inconvenience of travelling all the way to the institute. This system will benefit the students and help them utilize time effectively. This concept provides

2.2.1 General notices

This consist of college notices such as information about any events, campus interview dates etc. these notices are sent to students through server and students can view these notifications through their Android Phone.

2.2.2 Documents

The documents such as lecture notes, previous year question paper, assignments or any other files related to academics that are sent by lecturers and these are uploaded files can be downloaded and notifications are view by the students through their Android phone.

Advantages of proposed system

- The system is user friendly. The proposed system is user friendly because the retrieval of data is fast and data is maintained efficiently.
- It is time efficient. This is because availability and due to the portability of this system authorized person can provide service anytime.
- Ease of use and portability. In this system, an authorized person can carry android application anywhere so that he can control the system
- It provides “better and efficient” service to the user.
- Reduce the work of load of user.

Comparison between proposed and existing system

Existing system	Weakness of the existing system	Strength of the proposed system
Mobile campus	• Doesn't notify or alert users in case there is any new information available	• Notifies users whenever there are updates
E-notice	• Uses SMS notification which are greatly affected the network in a given area • Can't be used by guest users since only registered users can only use the application	• Uses both push and SMS notifications therefore it's not affected by network. • Is used by both nonregistered and registered users.
Android Academic Assistant	• Its only used online • There is no element of notifying users about any updates	• It's both online and offline • It notifies users for new updates

2.3 Conclusion

Android application for the college through mobile devices is a very effective tool which can be used to a great extent. The application offers reliability, maintaining records, time savings and easy control, portable and can be easily installed and used on any mobile phones supporting Android OS not only the institution members, but also the other users can also view the college details through this application real time. It also provides an interface which is easy to understand by the users and greatly helps in adapting to the use of this application. We learnt how proposed system is better than existing system. It is compatible to everyone. Through the proposed system, the standard will maintain the particular security and also provides features those are not included in existing system. Student will improve their interaction skills by using our proposed system. The data which is stored on database will helps the management to take major decisions on the suggestion and ideas

CHAPTER THREE

3.0 Methodology

3.1 Research method

We used case study, here sample students from the college were selected using simple random sampling. We then carried out a study of the methods used by students to know ongoing college activities, updates. Case study provides detailed information about the study and this helped us adapt new ideas of how best to approach the problem.

3.2 Data collection techniques

3.2.1 Interview

This is a formal meeting between two people (the interviewer and the interviewee) where questions are asked by the interviewer to obtain information about a particular research topic? Since unstructured interviews offer flexibility in terms of the flow of the interview, thereby leaving room for the generation of conclusions that were not initially meant to be derived regarding a research subject. We conducted interviews on students selected, the research tools that we used in interviews include pens and papers. For further analysis, Audio and video recording of such interviews were also taken for further analysis. Interviews offered primary and sufficient information to define user requirements and also interviews where better in that they involve personal and direct contact between interviewers and interviewees, as well as eliminate non-response

3.2.2 Questionnaires

A questionnaire is a document that contains either structured or unstructured questions regarding a specific research topic that is used in data collection process. In particular, we used both structured and unstructured with both open ended and closed ended questions given to the students. This involved quantitative and qualitative data analysis respectively. The questionnaires were delivered physically and electronically through email due the different level of convenience of the sample selected and it reduced chances of evaluator bias because the same questions are asked of all respondents

3.2.3 Observation

Observation is a systematic data collection approach where researchers use all of their senses to examine people in natural settings or naturally occurring situations. Observation of a field setting involves: prolonged engagement in a setting or social situation. We used direct method of observation some of the existing applications and systems with the aim of identifying out their weaknesses and bridge research gap.

3.3 Data Analysis

Data Analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and evaluate data which was gathered from data collected. The collected data was analyzed using different tools e.g. Microsoft excel, word so as to identify the functional and non- functional requirements of the system. The advantage of data analysis is that it helped in reduction and simplification of collected data, while at the same time producing results that were measured using quantitative and qualitative techniques. More so analysis provided the ability to structure the qualitative data collected in a way that satisfies the accomplishment of project objectives.

3.4 Document Review

This involved coming up with a requirements documentation for the system. Document review helped us to understand other important written material on problem area and how other researchers and system developers have tried to solve similar problems. Review of the existing documents from the department that are related to the study that will be carried out by the project group.

The Qualitative data collected was categorized and indexed in order to highlight the important messages, features or findings. The various coding techniques include: open coding which involved the first organization of the data to make some sense of it ,axial coding this was a way of interconnecting the categories and selective coding which involved building of a story that connects the categories

3.5 System Design

Systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. In system design, we used case diagrams. This enabled us have a graphical representation of data, spot possible design errors in the system and facilitate decision making in system implementation.

3.5.1 Architectural Design

The architecture of a system is a comprehensive framework that describes its form and structure, its components and how they fit together. It demonstrates the external systems that interact with the major system and the relationship between them.

3.5.2 System Design

This section was used to provide sufficient information for a development of the system. The detailed content of the application depended upon the approach to the design process that was to be used.

3.5.3 Conceptual design

This involved object oriented design in the process modelling where we used interactive diagrams to illustrate the processes that are involved achieving the objectives of the system. Android college assistant application contains these main components: Mobile Application and Database. An interactive diagram was used to show how data is processed by the system and how the data associated with a particular process moves through the application.

3.5.4 Logical design

We used class diagrams to show the relationships between our different objects used. These included students, guest users and administrators. Both the students and administrators have to register and then log into the application to access their privileges.

3.5.5 Physical design

This involves both database design and interface design. Different low level prototypes were built using pen and paper these included different screens showing navigation from one particular screen to another. The prototypes showed the design of various interfaces for the users of the application.

For database design, we used Microsoft word to draw the different entities and show the different relationships among them.

3.6 System Implementation

System Implementation uses the structure created during architectural design and the results of system analysis to construct system elements this includes application development which involves coding.

3.6.1 Java

Since Java incorporates many of the powerful features of those powerful languages while addressing some of their drawbacks with different libraries. These libraries exist to help developers build applications. Some of the Javas important core features are:

- It is easy to learn and understand.
- It is designed to be platform-independent and secure, using virtual machines.
- It is object-oriented.

Android SDK relies heavily on these Java fundamentals it also includes many standard Java libraries as well as special Android libraries that will help you develop Android applications.

3.6.2 Android Development Tools

Android SDK

- The Android Software Development Kit contains the necessary tools to create, compile and package Android applications. The primary way to develop Android applications is based on the Java programming language.

Android Debug Bridge

- The Android SDK contains the Android debug bridge which allows you to connect to a virtual or real android device, for the purpose of managing the device or debugging your application.

Android Developer Tools and Android Studio

Google provides two integrated development environments (IDEs) to develop applications. The Android Developer Tools are based on the Eclipse IDE which extend the Eclipse IDE with Android development capabilities. Google also supports an IDE called Android Studio for creating Android applications based on the IntelliJ IDE.

3.6.3 Firebase cloud messaging

Using the available libraries different functions e.g. storage, messaging, authentication is implemented with the Google's Firebase Analytics service in the Firebase SDK that automatically collects basic app usage data for you.

3.6.4 MySQL

This is used for developing the client's back end with the different functionalities and technologies. We used both json and http markups for querying MySQL database.

3.7 System Testing and validation

Testing involves running the implemented system in order to identify and correct errors in the system. The individual modules application prototype (unit tests) is evaluated by the sample selected students. Then Integration testing is done to ensure that all modules work together as a system to produce the required functionalities Acceptance testing is done to ensure that the system meets the user requirements. We used the feedback from the students to add the necessary components to the system. This process was repeated until all the specified system requirements have been implemented and satisfy the user's requirements.

CHAPTER FOUR

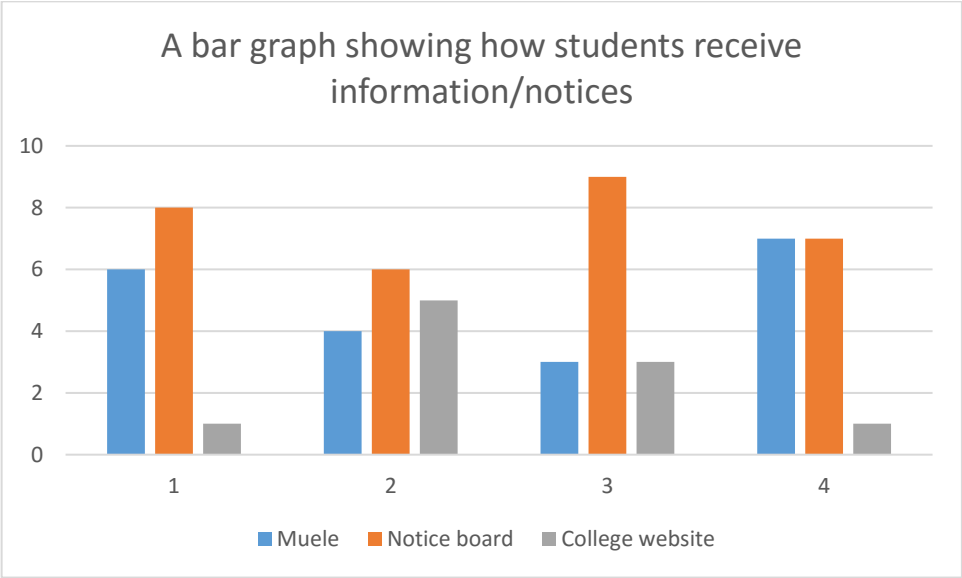
System Study, Analysis, and Design

4.0 Introduction

This chapter highlights the application's operations clearly articulated in terms of how information flow through the different modules within the system, for fully functional of the Application.

4.1 System Study

It involves investing and exploring the current systems in depth these leads to new requirements of the new system that meets user requirements. We used the different techniques these include questionnaires, interviews to generate information about the existing systems. The collected data was analyzed and different findings were discovered.



Where 1: BCSC2: BIT3: BSSE4: BIS

Figure 4.1: Shows how students from different receive information/notices

Strength of the existing system

- The system provides students with a forum to discuss their studies this is in case of college website and eLearning system(MUELE).
- Provides accurate information

Weakness of the existing system.

- Lack of flexibility since pinned documents on the notice board cannot be changed easily at any time.
- Time consuming because communicated information takes time to communicate with others.
- Need constant checking on emails, websites and notice boards for up-to-date information or communication.

The different challenges with the existing system create need for a better system (Android college Assistant Application). These provides instant updates, information to every user in a real time irrespective of the user location.

4.2 System analysis

This involves studying an activity in order to define its goals or purposes and to discover operations and procedures for accomplishing them most efficiently. The collected data was analyzed in order to identify end user functional, nonfunctional software and hard ware requirements.

4.2.1 User requirements

- Provide instant updates from in real time
- It provides information about the college e.g. courses offered, departments fees structure.
- It improves navigation to the college for first time visitors by providing directions using google maps.
- It enables administrators make communication to students at any time e.g. in case of emergencies

From analysis of user requirements, we generated both functional and nonfunctional requirements

4.2.2 Functional Requirements

Functional requirements capture the intended behavior of the system. This behavior may be expressed as services, tasks or functions the system is required to perform.

- The application requires internet connection in order to send and receive push notifications
- The application requires GPS enabled for accurate navigation when using a map
- The application should verify/authenticate user accounts easily.
- The system provides procedure to follow /trouble shoots in case the user fails to login.
- The application provides the reset password incase password is forgotten.

4.2.3 Nonfunctional Requirements

The requirements in this section provide a detailed specification of the user interaction with the software and measurements placed on the system performance.

- The application should provide realtime up-to-date information. It displays the latest results at all times, and if it lags behind, the user should be notified.
- The application should be capable of operating in the background should the user wish to utilize other applications.
- The application should support use of multiple users at the same time.
- The response time should be less than 5 seconds.
- The application should inform the user loses connection to the Internet

4.3 System design

We used Object Oriented design approach to guide the overall goal of the design. In this specific method, we partitioned the design into subsystems and modules, this helped handling of functions. The partitioned modules and sub modules made, based on their functionality.

4.3.1 System Architecture

This gives a high level view of the system with the components of the system and the services they provide and how they communicate. The system is implemented using a layer architecture that comprises of user interface for the user to interact with the system and a process management for process manipulation. The architecture includes various components i.e. FCM implementation which includes two main components for sending and receiving:

one is a trusted environment such as Cloud Functions for Firebase or an app server on which to build, target and send messages. And the other is android, client app that receives messages. Messages are sent via the Admin SDK or the HTTP and XMPP APIs.

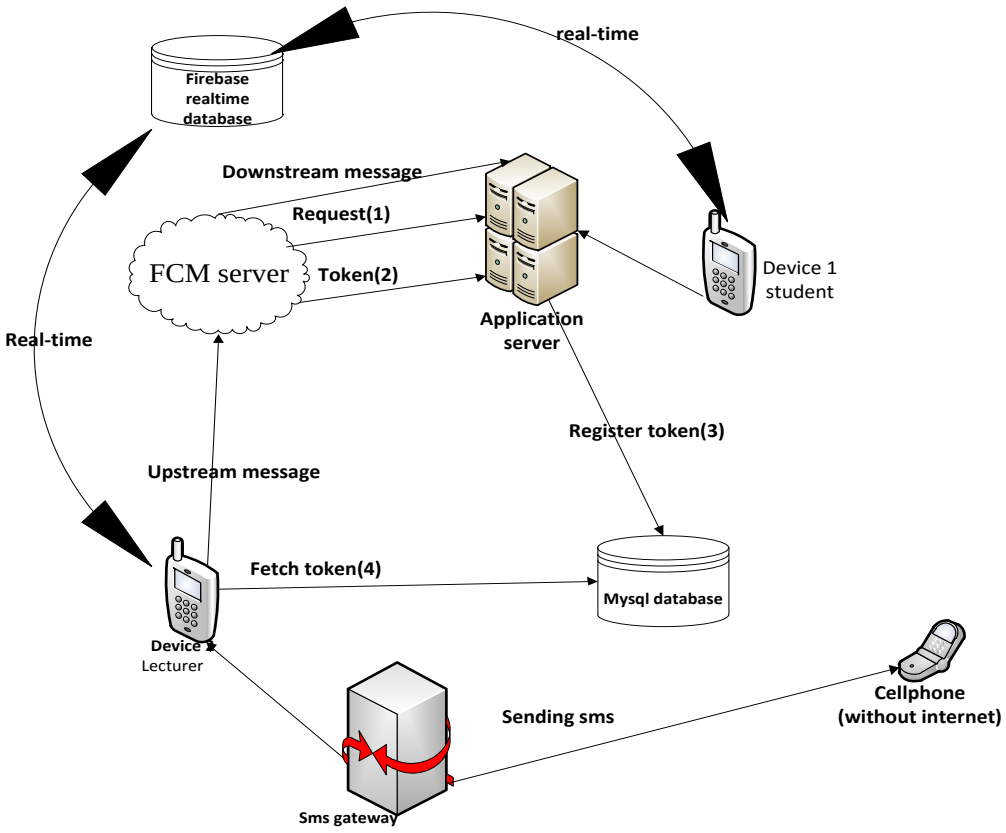


Figure 4.2: shows a detailed architecture of android college assistant application

4.3.2 Conceptual design

It is an early phase of the design process that shows the functional elements of the system and defines the boundaries of the system. It specifies the information flow into and out of the system and the required resources.

Process name	**Description.**
Registration process	This is a process for the students and administrators to register for the use of the application

Authentication process	This is a process enhances security issues it allows only registered users to log onto the system by entering their valid usernames and passwords. Basically, it validates authentic users to carry out their respective functions.
Notification Process	This is a process that involves sending notifications to registered student user upon any communication update from administrator.

Table4.1: Showing the different process performed by users

Administrator use case diagram

This shows the processes done by the administrator. For the processes of deletion, editing, searching, the user has to be logged in and registered.

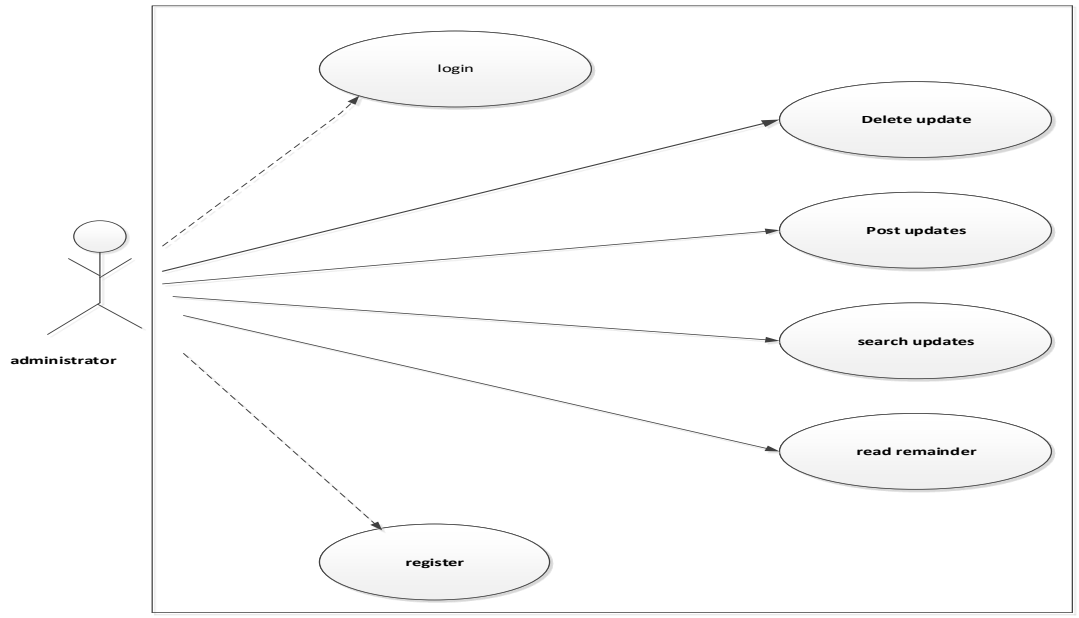


Figure 4.3: showing a use case diagram for administrator

Guest user use case

The main process is view which includes other processes like viewing map, about college, courses offered, departments etc.

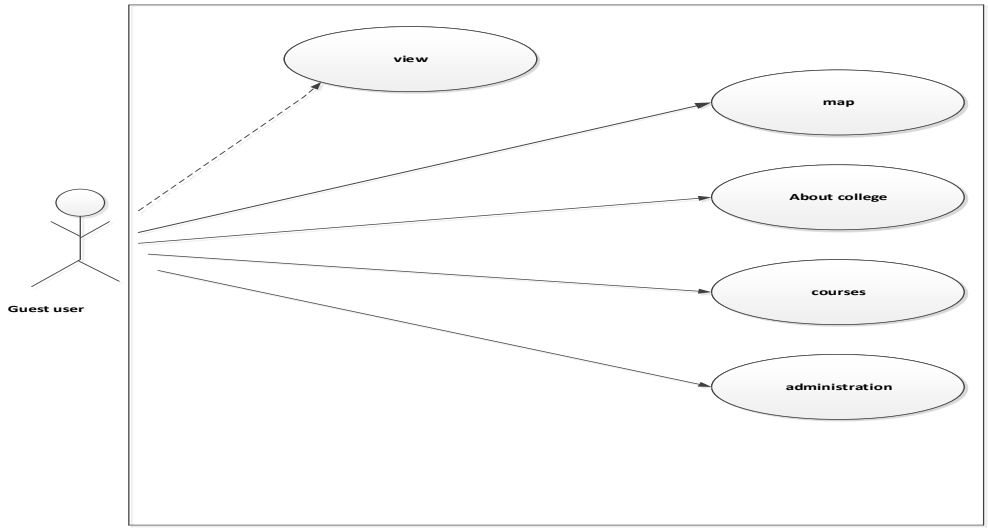


Figure 4. 4: showing a use case diagram for a guest user

Student use case

This shows processes performed by the student. The main process is registration and logging in which enables a user to perform other processes like viewing notice/updates etc.

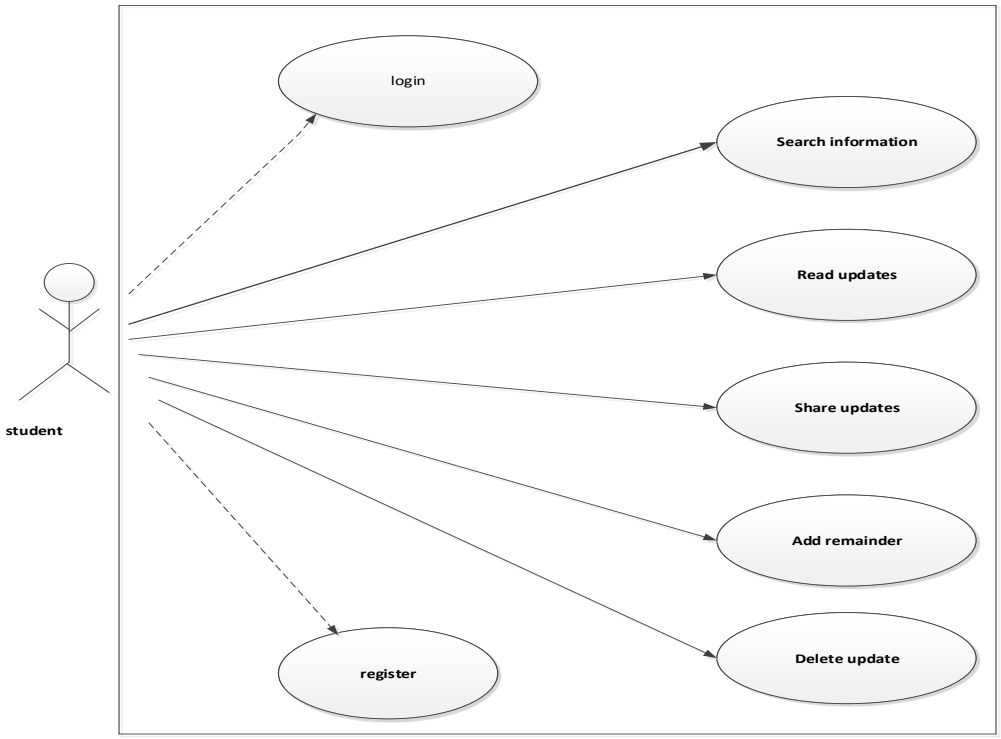


Figure 4. 5: showing a use case diagram for a student

4.3.3 Conceptual design

It includes the design of interactions, experiences, processes and strategies.

Administrator posting notice

The administrator posts notices either as SMS notifications which go to specified users whose telephone numbers are captured during the registration process or push notifications that depend on tokens of registered users.

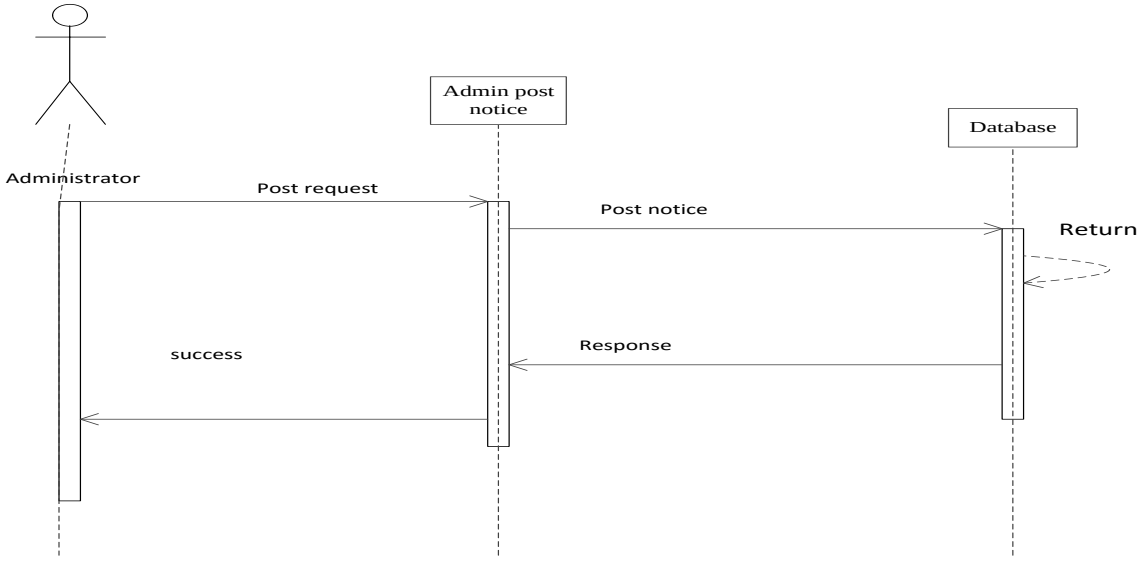


Figure 4. 6: shows administrator post notice sequence Diagram

Student viewing notice

Push notifications received by a user are displayed on a screen categorized by dates and time of arrival. These are sent and received in real time with internet access.

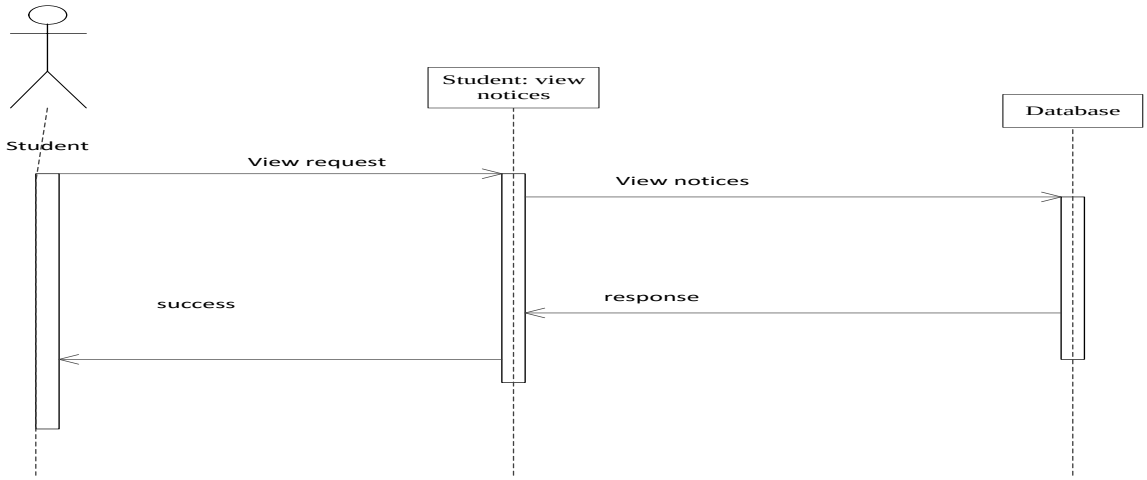


Figure 4. 7: showing student view notice sequence diagram

Student/administrator Login

During login, avalid user ID(email) and password are captured and compared to those in the database if the input records exist, the user is logged into the system.

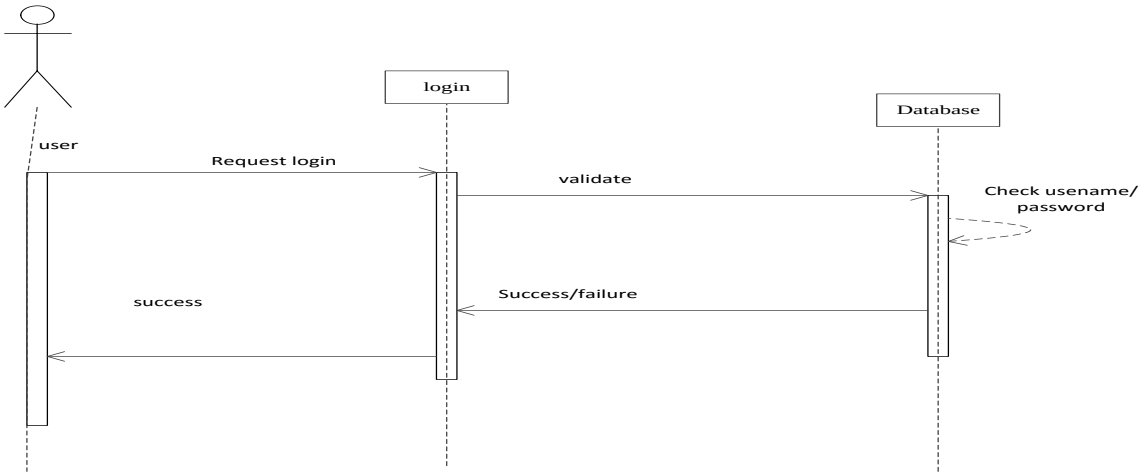


Figure 4. 8: shows user (student/admin) Login Sequence diagram

Administrator deleting notice

This happens in real time in that a notice in the cloud sever is deleted this results into deletion of the notice form the user(student) notice dash board.

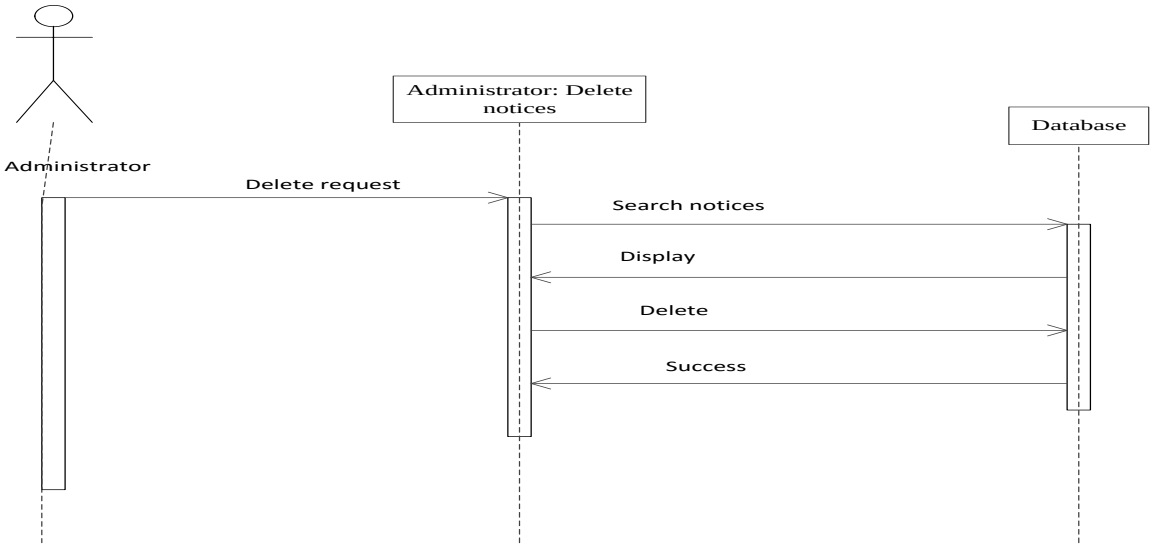


Figure 4.9: shows Admin Delete Notice Sequence Diagram

Editing notice

This involves change in the notice in the database. For this to occur a particular title of a notice is searched since there are various notices stored and then edited

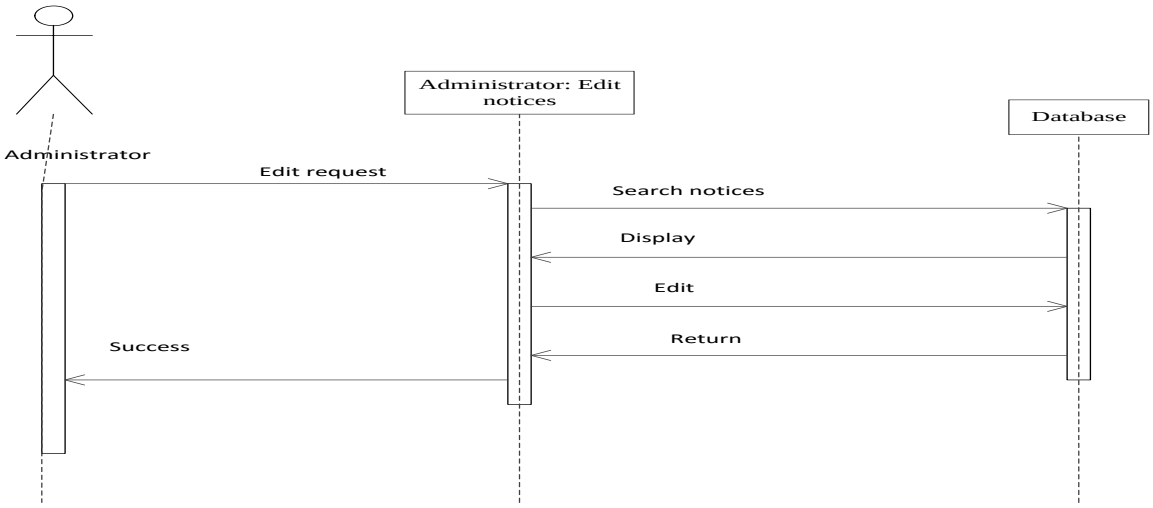


Figure 4.10: shows admin edit Notice sequence diagram

Search Notice

This functionality is used by both the student or administrator to search for a particular which can be edited or deleted.

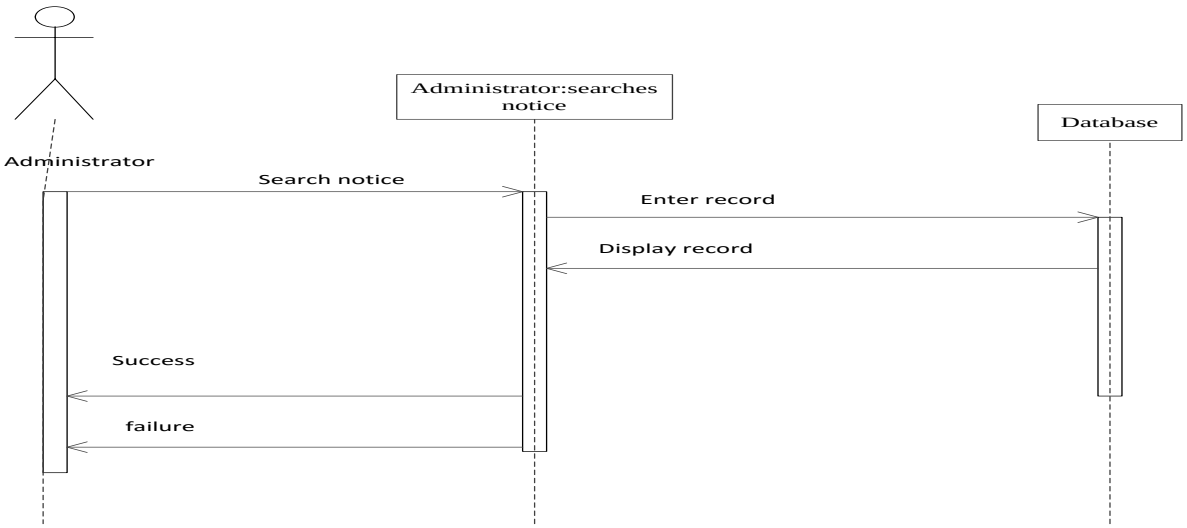


Figure 4.11: showing search notice sequence diagram

4.3.4 Logical design

This involves arranging data into a series of logical relationships called entities and attributes. The Data requirements also known as data items define the content and structure of data instances and values

4.3.4.1 Data Dictionary

Data dictionary is the centralized collection of information about data. It stores meaning and origin of data, its relationship with other data, data format for usage etc.

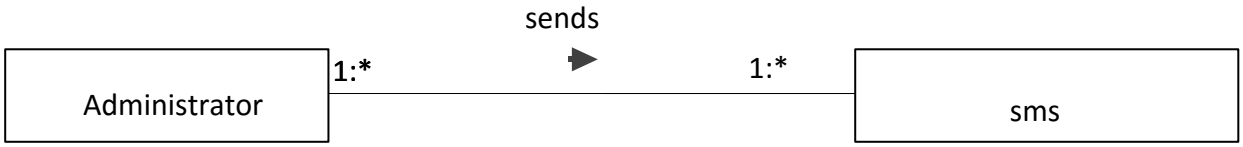
Entity	**Attributes**	**Data type**	**constraint**	**Description**
Student	StudentId(PK) FirstName LastName Course Email Sex TelNo Password	Int(10) VarChar(15) VarChar(15) VarChar(20) VarChar(50) VarChar(6) Int(12) VarChar(35)	Not null, Auto increment Not null Not null Not null Not null Not null Not null Not null	Is a person who is studying at a school or college persuing a given course.
User	UserId pasword	Int(15) VarChar(25)	Not null	These are different individuals using the application they include parents, studentsetc.
Course	courseId CourseName CourseCode Department	Int(10) VarChar(25) VarChar(25) VarChar(25)		Is program persued by students at the college
Department	DeptId DeptCode DeptName College	Int(15) VarChar(25) VarChar(25) VarChar(25)		This heads different courses and lecturers in the college
CourseMaterial	materialID(PK) Subject Title Size	Int(10) VarChar(25) VarChar(25) Int(15)		This is learning material provided by lectures to students

	FileType	VarChar(25)		
Notice	NoticeID(PK) NoticeTitle DateofNotice Notice	Int(50) VarChar(25) VarChar(25) VarChar(25)	Not null Not null Not null Not null	This is a pus notification sent in real time to students mobile smart phones
Sms	SmsID(PK) Message DateSent	Int(20) VarChar(25) VarChar(25)	Not null, Auto increment Not null Not null	This is a short message sent to individuals to their registered telephone numbers in the database.

Table4. 2: Showing the different process performed by users

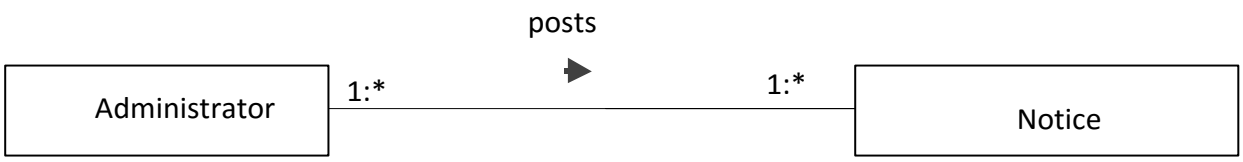
4.3.4.2 Entity relationships

This section shows relationships between data objects and corresponding cardinalities and degree of participation with mappings attached to the entities



An administrator sends more than one SMS notification

College departments can be viewed more than one guest user



An administrator posts more than one push notification

A student can view or receive more than notice

An administrator can fall under one department

A guest user can view details of more than one course

4.3.5 Physical design

This provides the working system by defining the design specification that tells programmers exactly what that candidate system must do. This is implementation of the logical design

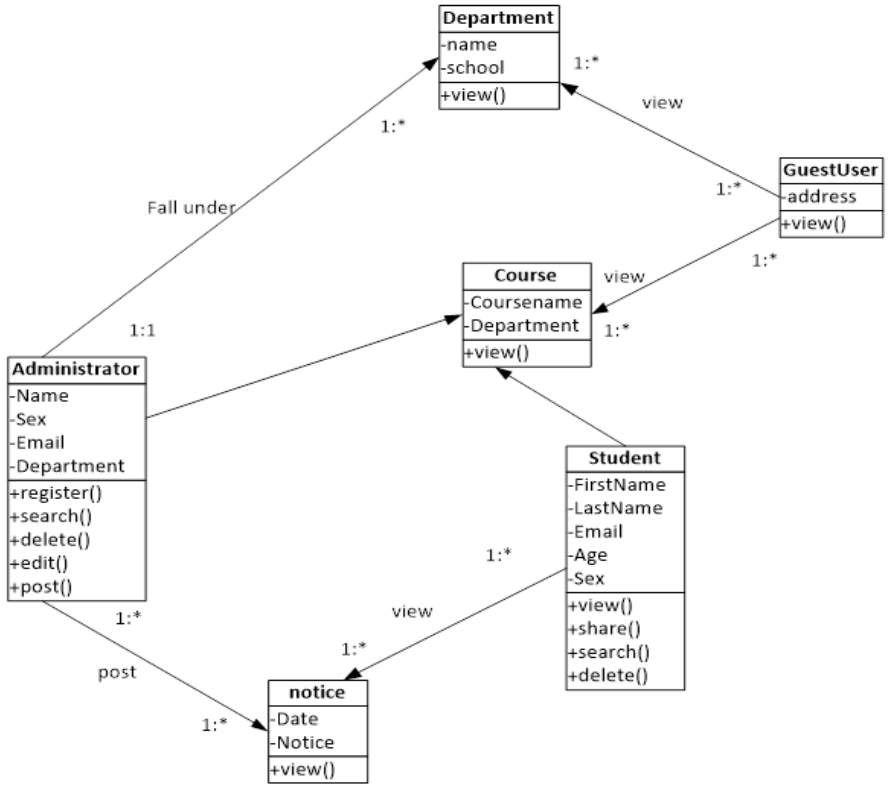


Figure 4. 12: Shows a class diagram for the android based college assistant application

4.3.6 Database Design

Administrator falls under one department

Admin(adminID{pk}, name, sex, position, schedule)

Department(DepartmentID{pk), name, school, adminID{Fk})

Administrator sends sms

Admin(adminID{pk}, name, sex, position, schedule)

Sms(smsID{PK}, date, message)

Send(adminID{pk},smsID{FK})

Administrator posts notice

Admin(adminID{PK}, name, sex, position, schedule)

notice(noticeID{PK}, date, notice)

post (adminID{PK},noticeID{FK})

Guest user view department

Guest(userID{PK}, location)

Department(DepartmentID{PK), name, school)

View(userID{PK},DepartmentID{FK})

Guest user view course

Guest(userID{PK}, location)

course(courseID{PK), department, courseName)

check(userID{PK},courseID{FK})

studentviews notice

student (studentID{PK}, name, sex, course, email)

notice(noticeID{PK}, date, notice)

new_view(adminID{PK},noticeID{FK})

Chapter Five

5.0 Presentation and Discussion of Results

In this section are discussing the findings from system analysis and design. We designed interfaces and databases basing on the user requirements acquired from system study

Guest users need to get directions to the college from any particular place, while for students need to receive updates in real time at any time. This therefore proposes for an android college assistant application to achieve the different user requirements

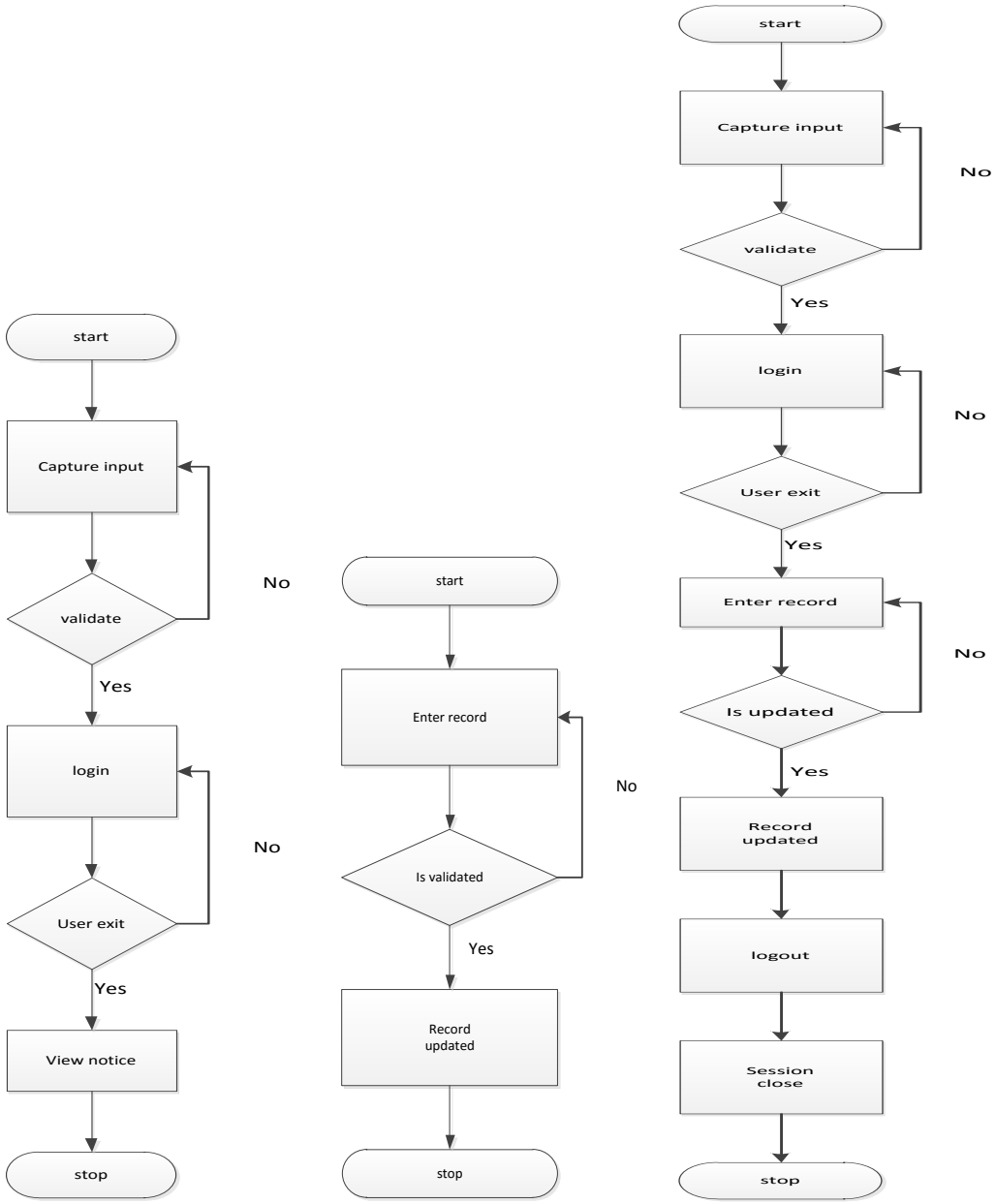


Figure 5.1: shows flow charts of the android based college assistant application

Problems faced during the design and implementation

- Underestimations of the project scope hence a delay of the system design.
- Implementation was hard since codes from different modules could not easily be integrated
- Difficulty in identifying errors in the system code.
- Design was quite hectic since the system had many components that required to be delivered on time with full functionality.

5.1 GUI Design

Graphical User Interface Design focuses on anticipating what users might need to do and ensuring that the interface has elements that are easy to access, understand, and use to facilitate actions. It also brings together concepts from interaction design, visual design, and information architecture

5.1.1 Snapshots of the system

Splash screen

This has a progress bar which shows speed at which the college application is opening for use

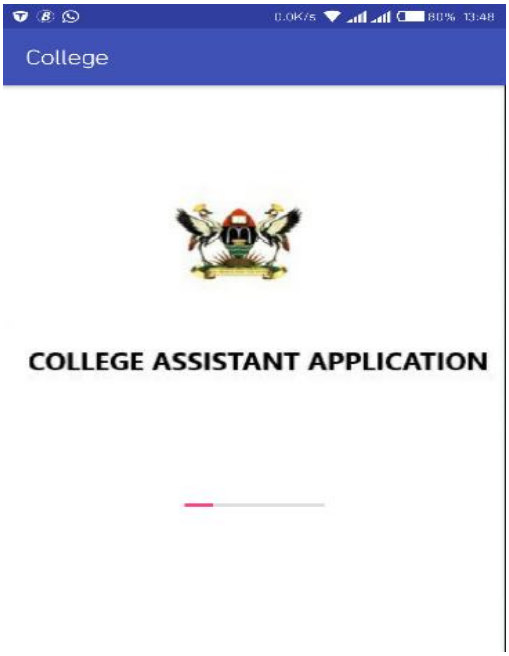


Figure 5. 2: Shows login screen of the application

Welcome screen

This has three card view buttons each for guest, student and administrator respectively these are used to access the different services provided by the application

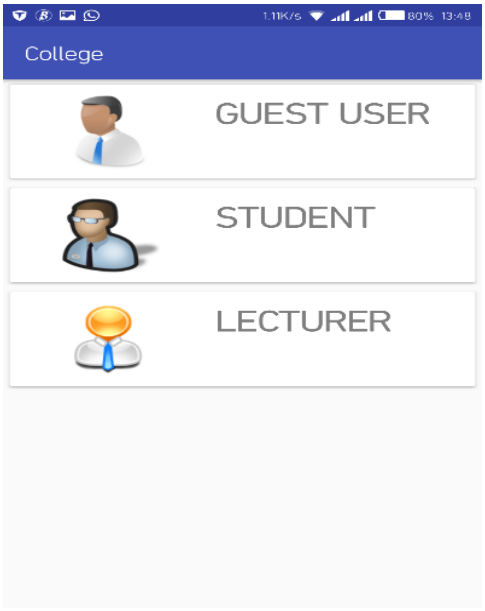


Figure 5. 3: Shows the welcome screen for the users

Guest user screen

This has different sliding tabs with particular tabs for different function e.g. colleges, courses, map, fees structure and about college.

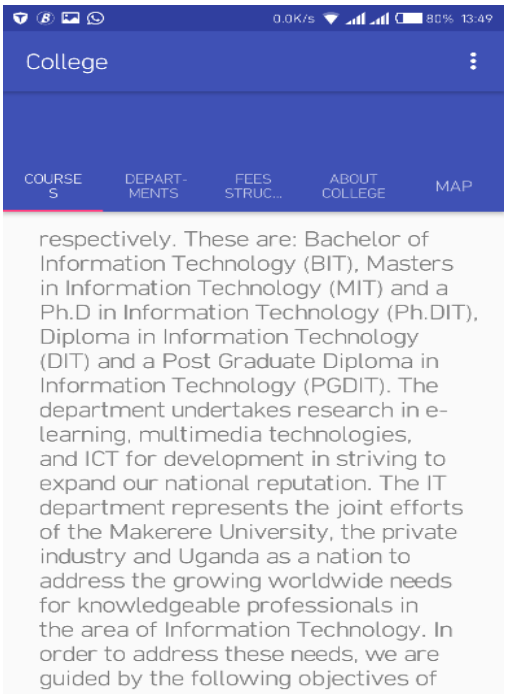


Figure 5. 4: Shows the guest user screen

Map screen

This shows how a particular user can navigate from one place to another the different types of users include cyclists, pedestrians, motorists. The application calculates the shortest time and routes plus shows directions.

Figure 5. 5: shows the administrator drawer view screen

Login screen

The login page is for both the students and the lecturers it requires a valid email address and password used when registering. The remember me check box helps the user to keep logged in the system. The login button takes respective users to their different drawer views and the signup button takes user to signup page

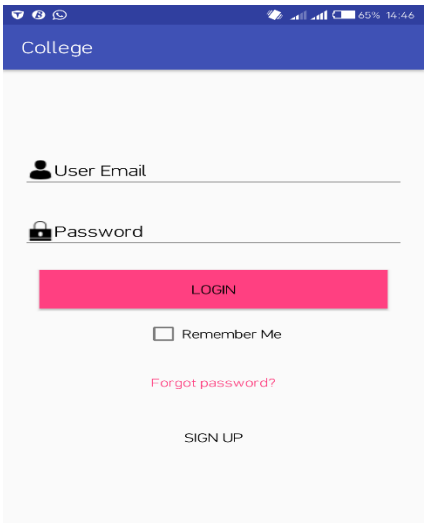


Figure 5. 6: shows login screen of the application

Administrator navigation drawer screen

This **s**hows the different activities performed by the administrator which include send push notification, send SMS bulk notification, edit notice which involves editing and deleting notifications in real time, logout.

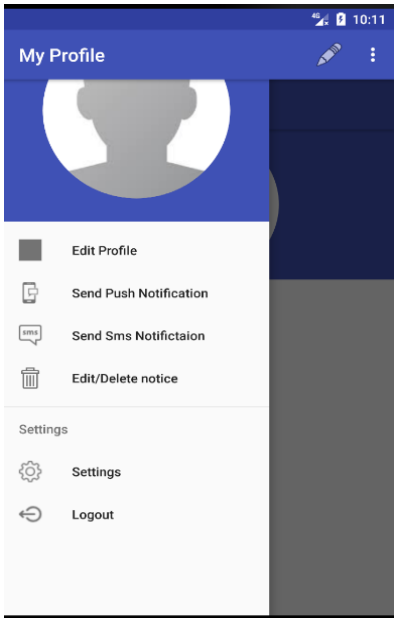


Figure 5. 7: Shows the administrator drawer view screen

Student navigation drawer screen

This shows the different activities performed by the student which viewing updates, searching notices, adding remainder.

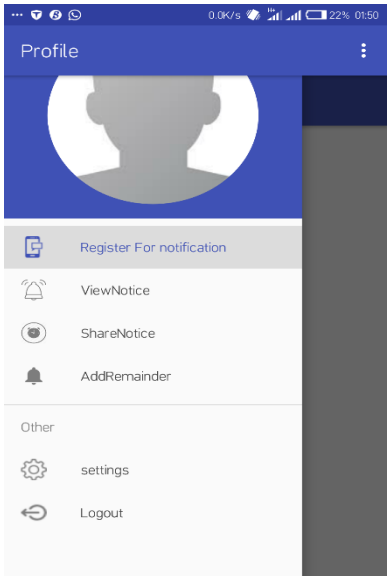


Figure 5. 8: Showing navigation drawer of student

Profile Screen

This enables a user specifically administrator to view his or her details and it also provides a functionality of editing details after registration.

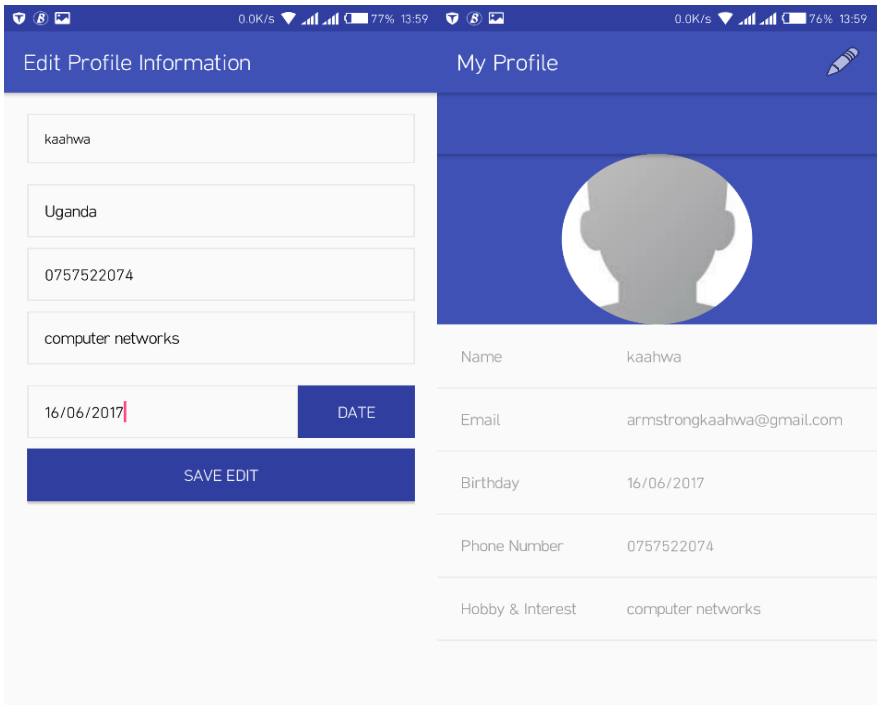


Figure 5.9: showing both edit and profile screen

Register device screen

This is used to register every device that needs to receive broadcast messages from messages. A valid email address is used for registration then it is assigned a token that is used to identify device(phone) to send notifications.

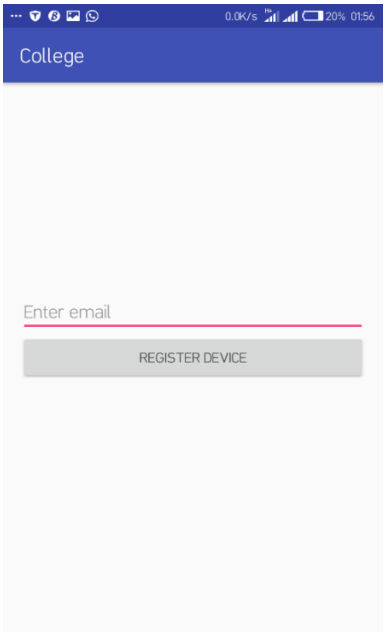


Figure 5.10: Showing register device screen

Send Push notification screen

This involves the fetching registerd devices particularly using their tokens from the database and broadcasts the notifications to the different devices.

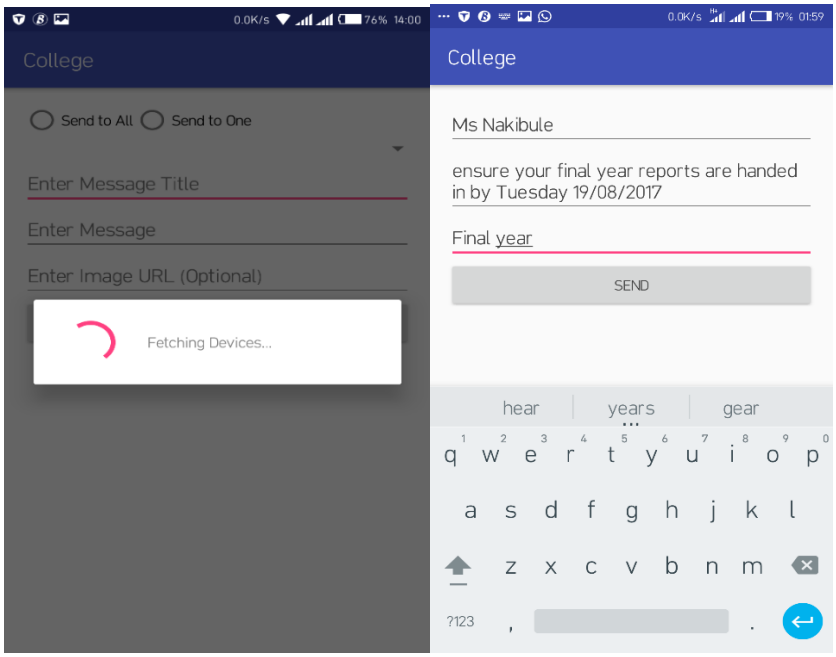


Figure 5. 11: shows the process of sending notification

View Notice screen

This lists the notifcations from a centralised database sent from various individuals, it also includes the deleting option by swipping. This completely removes the messge from a users dashboard.

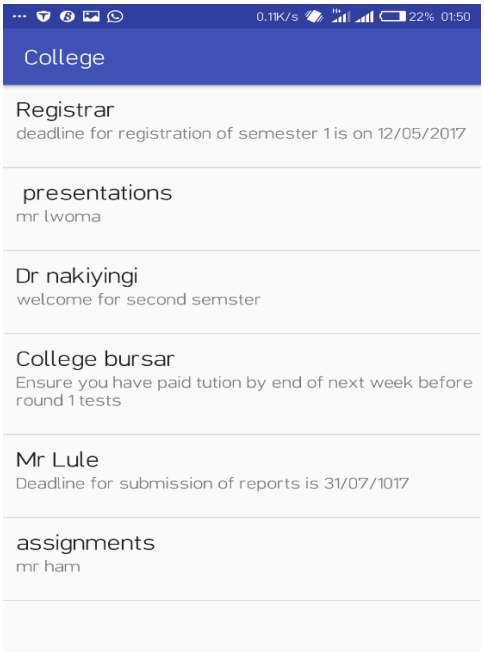


Figure 5. 12: showing view notification screen

Setting and receiving remainder

Under this, the student after receivesnotification and sets remainder for a particular notice received This involves selecting the date for the remainder.

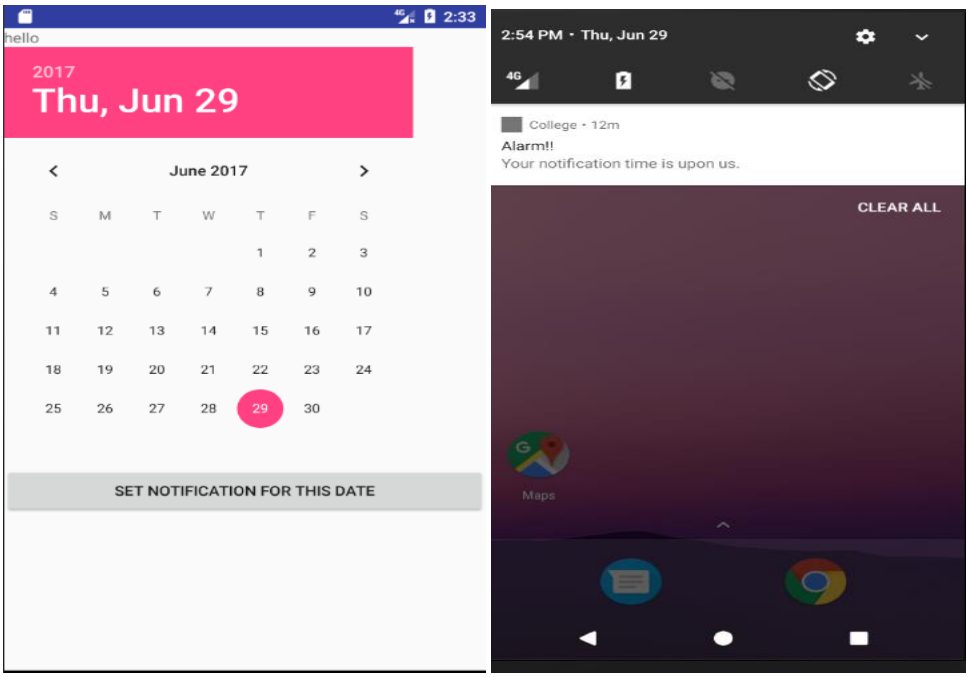


Figure 5.13: Showing view notification screen

Registering user screen

This has different filled in if the user enters incomplete information in the username and password fields, an error message appears next to the column, indicating that a value is required. The error message next to the column appears in the red text and stays there until the user does not provide the correct information

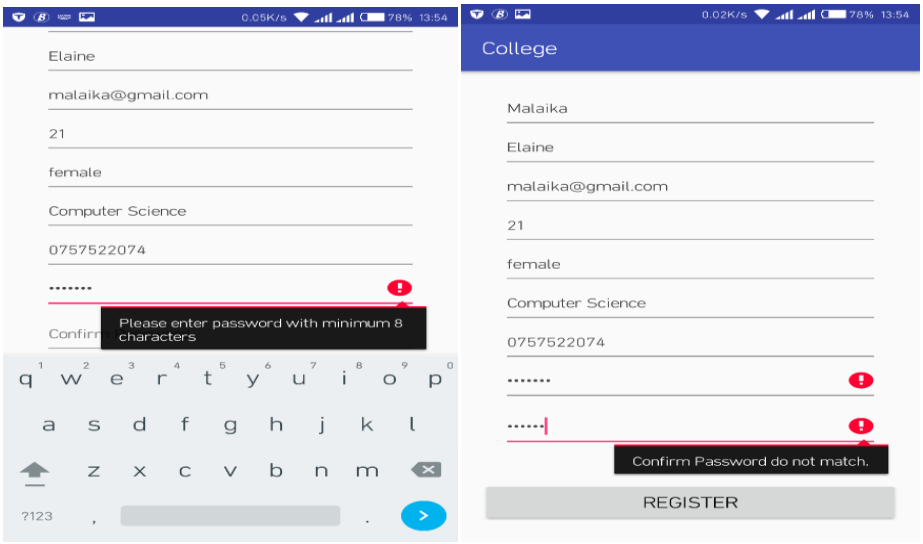


Figure 5. 14: Showing validationwhen registering

Send SMS notification screen

For this page, registered telephone numbers stored during registration/signing up are fetched from the database and displayed so that administrator selects to whom SMS are sent. The selected telephone numbers are sieved to form certain groups these can be defined by the course, department etc. This avoids broadcasting irrelevant SMS to particular group of users.

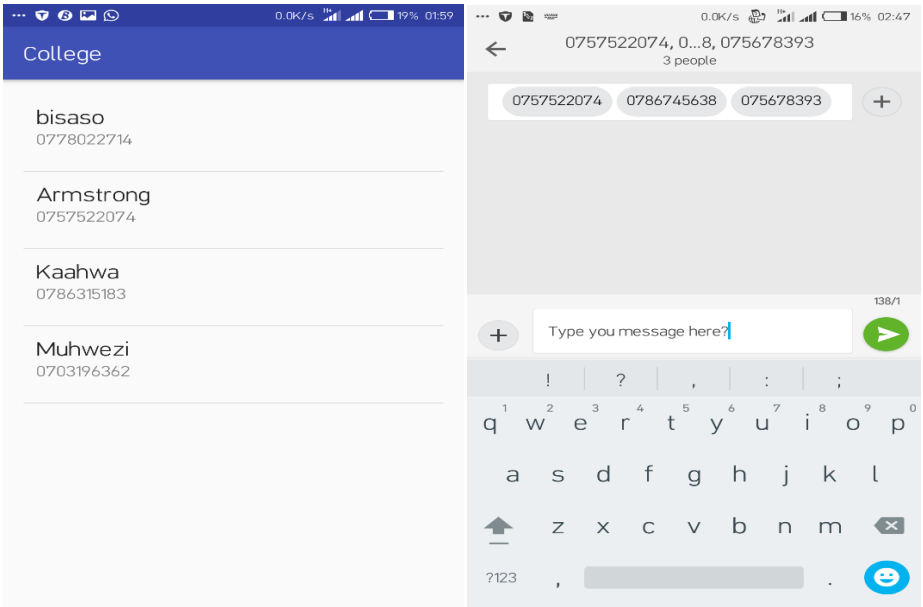


Figure 5. 15: Showing send SMS notification screen

Forgot password screen

This shows how a registered user can reset his password by inputting correct email and then using link sent to email to reset password.

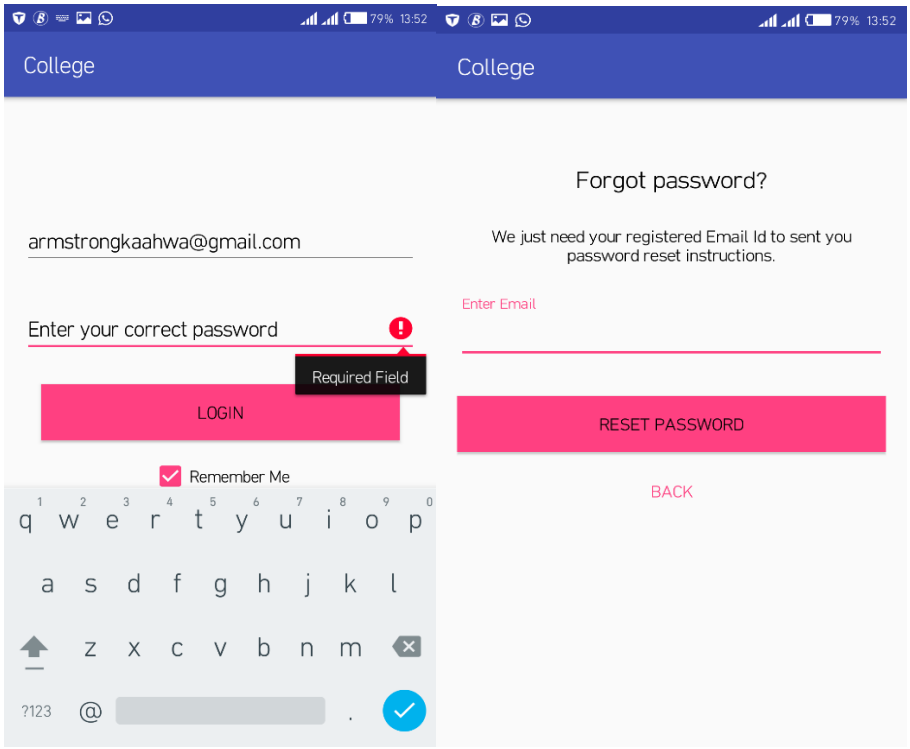


Figure 5. 16: shows the forgot password screen

5.2 Testing

This is an internal process done to check for errors in the system. Testing was done through the

entire system development process. Although being tasking and tedious, it was an important. All functions where checked with the test data to see if the modules work together with one another. The system was also checked as whole to ensure full functionality such as the interfaces,

the correctness of the output.

5.3 System Requirements

System requirements include both hard ware and software requirements that are sufficient for the smooth operation of the android based college assistant application

5.3.1 Software requirements

Software component	**Specifications**
Operating system of the server	Windows NT or above
Web server	Apache Web Server Version 3.2.1
DBMS	MySQL sever version 3.2.48
Development environment and tools	• Android API 17 • Android emulator 5554 • Android Smart phone 4.2 and above • Android studio • Java jdk
Developer Operating system	Windows 7 and above

Table 5. 1: shows different software requirements

5.3.2 Hardware requirements

Hardware component	**Specification**
Process speed	800MHZ or above
Bandwidth	100Mbps
Mobile device	Internet capability
Disk space	1 1GB or above
RAM	Above 1GB and 512MB (android Smart phone) 1024 MB recommended

Table 5. 2: Shows different software requirements

Chapter 6

6.0 Recommendations, Future Works and Conclusion.

6.1 Recommendations

- We recommend telecommunications companies to provide a fast and reliable internet to encourage internet usage.
- We recommend the college of computing and information science in Makerere University to adopt the use of mobile technology in its system of education.
- We also recommend the users of the system to be advised against revealing their login information to non-authorized users.

6.2 Future Works

This application can be further extended to include the following features:

1. **Categorization of Notice:**

Notices can be categorized in different categories, so that it's possible for user to easily manage the notices. Categorization can also be done by making groups for example notices about groups like computer science, information technology and many others. Defining the notice to be circulated in a particular group can make it more secure.

2. **Feedback:**

Feedback on the notices can also be taken. It can increase communication among connected members and any issue can be easily sorted out on the spot.

3. Deployment to other platforms for example I-phone and windows to cater for other smart phone users

6.3 Conclusion

In conclusion, the primary objectives of the study were to a great extent achieved. Basingon the results and findings, the android based college assistant application was worth. This is because we how the use of different technologies i.e. languages Java, xml, PHP for backend and MySQL, server technology WAMP and google cloud Server(FCM).

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Appendices

PROJECT TIME PLAN

Date	Activity
Week 1 to week 3	Formation of groups and identification of supervisor Drafting of concept paper and meeting of supervisor for necessary changes.
Week 3 to week 6	concept paper Submission
Week 3 to week9	Drafting of Project proposal and meeting of supervisor for changes.
Week 9 to week 10	Submission of final copy of the Project proposal
Week 9 to week 10	Project proposal presentation
Week 10 to week 20	System Design (Application Design, Architectural Design, interface design)
Week 20 to week 34	System implementation, Testing and validation
Week 35 to week 34	Software Requirements Specification (SRS) System implementation
Week 35 to week 40	Handing in of the final project report

Questionnaire1

COLLEGE OF COMPUTING AND INFORMATION SCIENCES

SCHOOL OF COMPUTING AND INFORMATICS TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

Questionnaire about information delivery at the college

Tick against box of your interest.

Section 1

Are you male or female? 1. Male ☐ 2. Female ☐
Through which do you usually access information at the college? 1. MUELE ☐ 2. Notice boards ☐ 3. College website ☐ 4. If others specify…….
What is the programme/course you study? 1. BCSC ☐ 2. BIT ☐ 3. BIS ☐ 4. BSSE ☐
What is your year of study? 1. Year 1 2. Year 2 3. Year 3 4. Year 4
Where do you reside? 1. Hostel ☐ 2. Hall ☐ 3. Commute ☐ 4. If others specify……...

Section2

Evaluation of information delivery mechanisms at the college of computing and information sciences

Available systems	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
1. Do the system provide alerts of new information.				
2. Do the systems provide correct information.				
3. Do you think they are effective information delivery mechanisms.				
4. Has good relationship with learners.				
5. Isinformation received in time.				
6. Are the systems used by the students.				