



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 Proposal Submitted to the School of Computing and Informatics Technology

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

Requirements for the Award of the Degree of Bachelor of Science in Computer Science

Of Makerere University

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CHAPTER ONE

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 college campus, information is provided in the form of notices, hand written manuals, oral communication spread among the students. [1] 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. To provide all this information at ease, we are developing an application where students can access information using Android enabled mobiles. So now students need not queue up near the notice board or log on to college website for any of the above-mentioned details.

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. There are also a lot of procedures involved in opening up accounts with these websites making them inconvenient [2].

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 will be 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.

The Android Based college application is to be developed 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. This information will be provided to students in an effective way.

1.1 Problem Statement

College students always spend a lot of time and delay while checking for important updates from the administrators on the college websites. At times information displayed on the notice boards requires them to travel from their residential places incurring costs for those that stay in distant places from the university. 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.

1.3.2 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 will be the College of computing and informatics Technology at Makerere University, Kampala Uganda. A sample size of 5 students per course with android Smart mobile devices will be randomly selected for data collection.

1.5 Significance

- Administrators will be able to upload information about any activity and this will reach to all students inform of notifications on their smart mobile phones. This will enable them prepare or take action in time about that activity for example the release of timetables, course works, and many others.
- Reduced issues of missing assignment marks since the lecturer can avail both done and undone assignments and the student gets to know about it earlier.
- Students will also be able to share resources like time tables and reading materials.

CHAPTER TWO

2.0 Literature Review

This project is mainly targeted at colleges and the synchronization of all the sparse and diverse information regarding regular college schedule. Generally, students face problems in getting correct notifications at the correct time, 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 noticeboard this requires a Mobile software programs serving various purposes of the users powered by Android platform are called Android applications, commonly known as 'apps' [9].

2.1.1 Mobile Learning Applications

2.1.1.1 mobile-campus

Dadape Jinendra R [3] 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.

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 [4]. 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 able to notify students through the use of push and SMS notifications therefore the issue of mobile network will be solved.

2.1.1.2 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 [2]. 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.** Participating the academic content needs a mixture of made multimedia system parts. However, as a result of the restrictions of information measure and property, downloading content to the students concerned are slow. This creates disappointment and boredom among students and affects the educational facilities.
- **Difficulty in engaging learners online.** Engaging actively students is one among major problems considered in the crucial success of an e-learning program. On-line learning needs a really high degree of self-motivation and is a smaller amount among our students.
- **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 uploaded by the staff through their Android phone with a proper login. And these 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	<ul style="list-style-type: none"> Doesn't notify or alert users in case there is any new information available 	<ul style="list-style-type: none"> Notifies users whenever there are updates
E-notice	<ul style="list-style-type: none"> Uses SMS notification which on the network in a given area Doesn't favour guest users since only registered users can use the application 	<ul style="list-style-type: none"> Uses both push and SMS notifications therefore it's not affected by network. Favours both guest and registered users.
Android Academic Assistant	<ul style="list-style-type: none"> It's only online therefore doesn't favour users that don't have mobile data There is no element of notifying users or updates It doesn't also favour guest users 	<ul style="list-style-type: none"> It's both online and offline It notifies users for new updates It also favours guest users

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 3

3.0 Methodology

3.1 Research method

We intend to use case study, here sample students from the college will be selected using simple random sampling. We will then carry 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 will help 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 will conduct interviews on students selected, the research tools that will used in interviews will include pens, paper and paper for further analysis. Audio and video recording of such interviews will also be taken for further analysis. Interviews will offer primary and sufficient information to define user requirements and also interviews are 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, will use both structured and unstructured with both open ended and closed ended questions will be given to the students. This will involve quantitative and qualitative data analysis respectively. The questionnaires will be delivered physically and electronically through email due the different level

of convenience of the sample selected and it will reduce 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 will use 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 data will be analyzed using analysis tools such as SPSS (Statistical Package for Social Sciences) so as to identify the functional and non- functional requirements of the system. The advantage of data analysis is that it helps in data collected being reduced and simplified, while at the same time producing results that may then be measured using quantitative techniques. More so analysis gives the ability to researchers to structure the qualitative data collected in a way that satisfies the accomplishment of research objectives.

3.4 Document Review

This will involve coming up with a requirements documentation for the system. Document review will help 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.

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 will use, use case diagrams. This will enable 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. A context diagram will be used to represent the system architecture.

3.5.2 System Design

This section provides sufficient information for a developer to the system. The detailed content of the application will depend upon the approach to the design process that is to be used.

3.5.3 Conceptual design

This will involve object oriented design in the process modelling. The technique of interactive diagram will be used to illustrate the processes that are to be involved to achieve the objectives of the system. Use Case diagrams will show the various actors and activities done by each actor. Android college assistant application contains of three main components: Web portal, Mobile Application and Database. An interactive diagram will be 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 shall use class diagrams to the relationships between our different objects used. These will include students, guest users and lecturers. Both the students and lectures will have to register and then log into the application to access their privileges.

3.5.5 Physical design

This application will be using cloud google fire based database, MySQL, SQLite. Technics used will be the authentication and fire based cloud messaging and the PHP script for connecting to the Web server. We shall have interfaces like;

- **register users.** The first step in this application will be to get the users registered to the FCM Server. For this, users will provide all the necessary details and press the register button. The request will first go to Firebase Cloud Messaging Server. FCM Server will provide the registration id for that device. After that, all the information along with registration id is stored on Web Server and the user gets registered.
- **User Login.** After registering, the user will be allowed to log in. Username and password after validating at client side will be sent to app server side for authentication. After authentication response is sent by the server to client, and then user gets logged in.
- **View Updates.** At the first time, when you are using this application, it will fetch all the notices from server. In all the other case, all previous notices are fetched from application's own database stored inside client mobile. It then checks for new notices from the server. If there are new notices on the server, it will fetch all those new notices.
- **Post Notice** For an admin, he will be able to post a notice inform of a simple text notice. Another option will allow him to send some attachment file with the notice. After that, the notice will be posted

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 eg storage, messaging, authentication will be implemented with the Google's Firebase Analytics service in the Firebase SDK that automatically collects basic app usage data for you.

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) will be evaluated by the sample selected students. Then Integration testing will be done to ensure that all modules work together as a system to produce the required functionalities Acceptance testing will be done to ensure that the system meets the user requirements. We will use the feedback from the students to add the necessary components to the system. This process will be repeated until all the specified system requirements have been implemented and satisfy the user's requirements.

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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

Proposed Budget

Item	Details	quantity	Unit price	Total price
Smart Phones		3	500,000 200,000 300,000	1,000,000
Laptop PCs		3	1,000,000	3,000,000
Other peripherals	<ul style="list-style-type: none"> • Mouse • Keyboard • Earphone • Laptop bag 			
Stationary	<ul style="list-style-type: none"> • Pens • Ream of Paper • Note books 	10 2	30,000	30,000
Airtime	<ul style="list-style-type: none"> • Communication • Internet bundles 		5,000 5,000	30,000
Services	<ul style="list-style-type: none"> • Printing • Binding • photocopying 		1,000 1,000 1,000	3,000
Transport				15,000
Total				4,078,000

Questionnaire1

In each particular document, you are required to tick according to your personal decision

Thank you for taking time to fill in this questionnaire, you will remain anonymous. I need a sample of an audience (COCIS students) to use as an example for our research project.

Are you male or female? Male Female.....	
Through which do you usually access information at the college? 1. MUELE 2. Notice boards 3. Others.....	
What benefits do you enjoy from using the system that you do use? 1. 2. 3.	
What barriers do you face from using the above system? 1. 2. 3.	

Questionnaire 2

COLLEGE OF COMPUTING AND INFORMATION SCIENCES
SCHOOL OF COMPUTING AND INFORMATICS TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE

Research questionnaire about college e-learning platforms

Tick against box of your interest.

Section1

1. Please choose your gender

Female ☐

Male ☐

2. Do you own any a mobile device?

Yes ☐

No ☐

3. If Yes, which type of mobile device do you have?

Mobile phone ☐

Laptop ☐

PDA ☐

Tablet ☐

4. Specify Other

.....

5. How often do u buy data bundles?

Daily ☐

Weekly ☐

Monthly ☐

6. Are the resources sufficient?

Yes ☐

No ☐

7. Are you able to utilize all your data bundles?

Yes ☐

No ☐

Section2

Available system	Strongly Agree	Agree	No Strong Feelings	Disagree	Strongly Disagree
1. Does means of getting notices encourages students to participate in college activities.					
2. Does system allow opportunities for asking questions.					
3. Has an effective information delivery.					
4. Has good relationship with learners.					
5. Is user friendly.					
6. Is respectful towards students.					
7. Is able to perform to the students' level.					
8. Enables easy reminder of pending events, assignments.					
9. Provides easy access to class materials					