

# Development of an Android-Based Freshers' Guide for a University Campus

Iwara ARIKPO<sup>1</sup>, Godfrey LEBO<sup>2</sup>

**Abstract**— Mobile information technology has become so pervasive today, that every human activity tries have to have an aspect of it available on mobile. The purpose of this study was to develop an Android-based mobile application that navigationally guides University Freshers and manages their time on campus. The system design methodology was based on object-oriented analysis and design using the unified modelling language. The system was implemented using the Android Studio SDK, while the classes and methods that implement the systems logic were written in the Java programming language. The system was successfully used to guide people around using a Map of the University of Calabar campus displayed on their mobiles, as well as manage their time on campus using timetables and reminders.

**Index Terms**— mobile, android, campus, map, students, smartphone, timetable

## 1 INTRODUCTION

MOBILE technology is one of the single most rapidly embraced technology in the world today [1]. Mobile devices are very convenient, easy to carry around and readily integrated into a user's routine; and many people have their mobile phones on them all the time. A survey conducted for Pearson in the US by [2], found that, more than eight in ten (86%) of university students regularly use a smartphone, a number that can only be expected to increase with advances in mobile information technology.

In most big campuses, university students, especially freshmen find it difficult to find their way around the campus; locating lecture venues, administration buildings, faculty buildings, cafeteria, registration procedures, among other important places. They go about asking people for directions, in which case they could easily be misled, when everything, and more can just be a click away. In addition, studies like [3], [4], and [5], all affirm that, these "mini super-computers", designed to aid users access information across the world, can become a cause of distraction for the student-user, if not tamed. Developing an application that helps students to make good use of their smartphones is the goal of this study.

## 2 LITERATURE REVIEW

A number of studies have been conducted in the recent past in the area of application development that support campus users to take advantage of this cutting-edge mobile technology. [6], developed a mobile navigation application for the University of Calgary, Canada, designed to provide users

with location-based information using the GPS-based positioning and a location-tracking algorithm based on wireless network signals, to determine the geographical position of users while inside buildings. The strength of the application is the easy-to-use navigation feature which is able to find paths on the campus for user-defined locations, and the indoor location tracking feature which allowed the application to know where the user is located, showing the user context-based information about his/her environment. However, at the time of development, the Android SDK was still under development; thus, the developer community was not well informed to take advantage of SDK's extensive system development features.

[7] also developed a mobile appointment management system at the University of Ibadan, Nigeria using the Android platform. The application utilized two Application Programming Interfaces (APIs) from Google for the Map and Calendar. Other parts of the application were developed in Java. The results of the project showed a functional mobile application for appointment management. The user provides details about an appointment through a user interface. The details are stored by the Appointment Manager App which sends the date or time of the appointment to the Calendar API and the location of the appointment to the Map API. The Latitude API obtains the user co-ordinates which are sent to the Map API and then used to load the corresponding map on the user interface. The Latitude API was however not integrated into the application, and so could not calculate the time it will take to get to an appointment's destination, as probably anticipated.

At the Bowen University Campus, Nigeria, [8], developed a location-aware application which enables the user to locate himself/herself and landmarks within the University Campus. The system was designed with a view to providing maximum simplicity, quality user experience, an aesthetically pleasing user interface, and most importantly, accurate data. The project, being a Global Information System (GIS) application, requires a location-aware or location-detection device. The source of data for the application was the GPS device, collecting position data from the GPS Satellite. Although other features of the application include: searching for places, checking nearby landmarks and getting brief description of landmarks, what needed to be added were features such as class timetable, event reminder, academic calendar, and auto airplane mode setting during lecture time.

A Mobile University Student Guide (USG) has also been developed by [9], for the Islamic University in Palestine, that supports students with the University class schedules, organizing daily appointments within the campus, and notifications through alerts. However, the app does not provide a map-based direction guide to locations in the University, which would have been very useful to the Freshers.

One issue that these applications have not incorporated is a feature to checkmate distraction with the use of smartphones utilizing features like automatically setting to airplane mode during lectures. The purpose of this study is therefore, to build an Android-Based Campus Guide that, in addition to providing map directions around the campus, supports students in other aspects of their academic endeavours, such as, providing a reminder for events in the school; lecture and study timetable synchronization; auto switching of the smartphone to airplane mode during lecture or study time, and recording the audio lecture, if permitted, among other features.

### 3 MATERIALS AND METHODS

#### 3.1 System design

The design of the application developed in this study is based on the object-oriented analysis and design methodology (OOAD) using the unified modelling language (UML). The

system design components are shown in Figures 1 – 4.

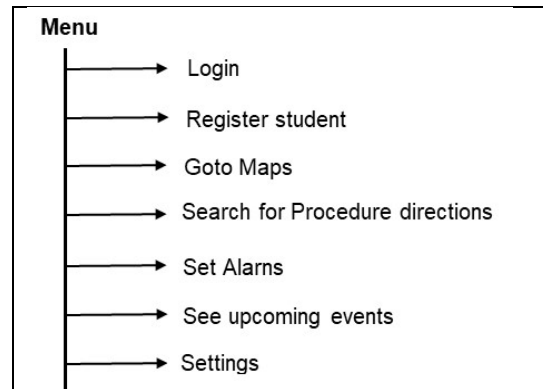


Figure 1: Menu for Freshers' Guide System

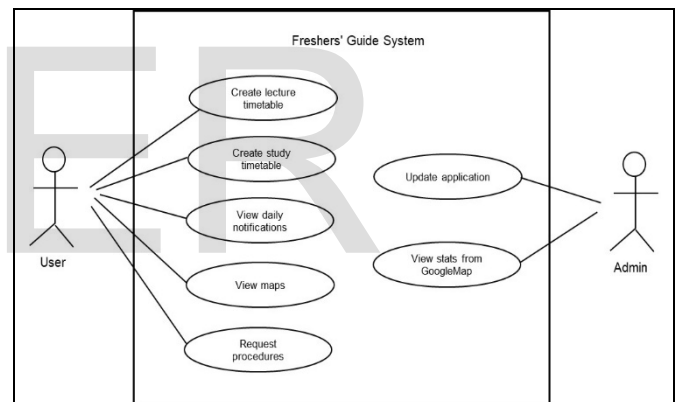


Figure 2: Use case diagram for the Mobile Freshers' Guide

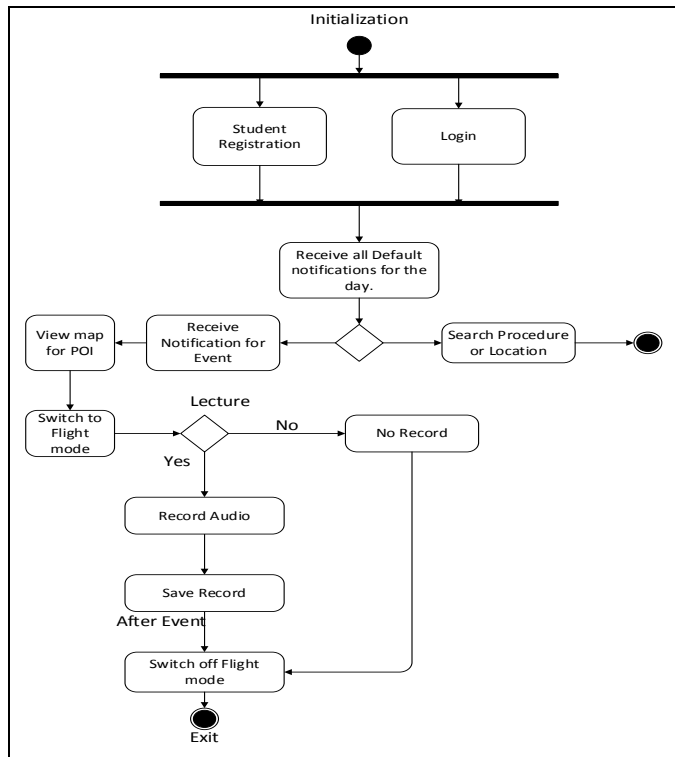


Figure 3: Activity diagram for the Mobile Freshers' Guide

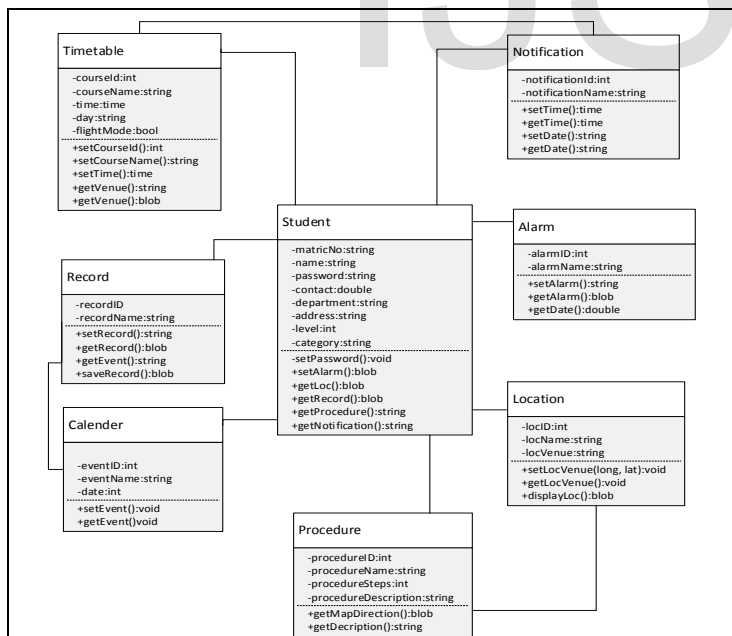


Figure 4: Class diagram for the Mobile Freshers' Guide

The system core was developed with Android Studio SDK (version 2.0), the official IDE for Android application development, which comes with all the necessary tools for developing Android applications and works based on IntelliJ

IDEA (<https://www.jetbrains.com/idea>). The classes and methods that implement the system logic were written in Java, while the user interface design of the application was developed using XML (eXtended Markup Language), and the resulting package was archived in a format able to run on an Android-powered device.

#### 4. RESULTS

The Android application developed in this study, guides students around a university campus and manages their relationship with their smartphones, allowing the smartphone to be an aid for academic pursuit rather than a distraction. This system provides features like direction and navigation guide around the University of Calabar campus, using Google Map to show routes, administrative buildings, lecture rooms, departments, library, security posts, gates, banks, ATMs, and so on. The system allows the student to input his/her lecture and study timetable, providing a notification beforehand for the activity and with permission, switches the phone to flight mode during lecture times to avoid the distractions from calls and messages, allowing the phone to record the lectures without calls or message alert interruptions. The system also creates reminder notifications for students on major University events (matriculations, convocations, inaugural lectures, etc.) using the University Academic Calendar. Figures 5 – 8 are screen shots from the Freshers' Guide App.

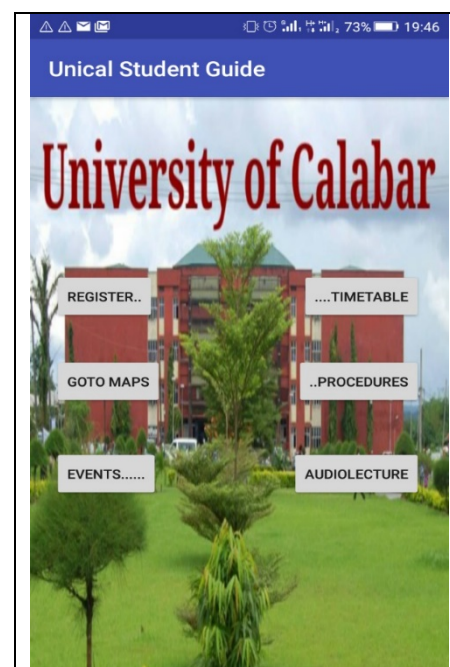


Figure 5: Screen shot of Home Page

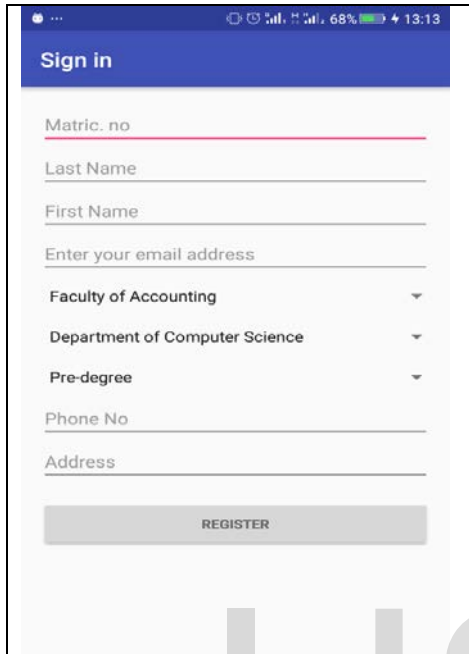


Figure 6: Screen shot of Registration

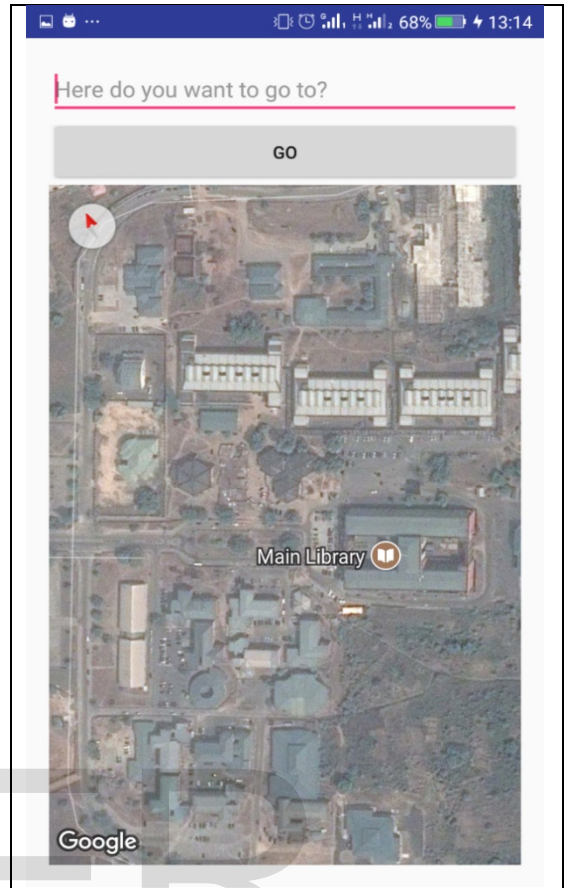


Figure 8: Screen shot of Map view

Day/Time	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6
Sunday	CSC101 NSLT 5						MTH101 M.RM 1				
Monday		GSS 101 NSLT 4							CSC 181 LAB		
Tuesday					GSS 113 PAV 3						
Wednesday	GSS 101 NSLT 5							CSC 113 PAV E			
Thursday						PHY 101 PAV 1				STA 101 M. RM 1	
Friday			CHM 101 CHM LAB					CSC 112 NSLT 2		CSC 111 PAV 1	
Saturday	CSC101 NSLT 5	CSC 101 NSLT 5						CSC181 Pav. 2			

Figure 7: Output view of student lecture timetable

## 5. CONCLUSION & FUTURE RESEARCH

With the Freshers' guide developed in this study, students can use their smartphones to find directions, store lecture/study timetable as well as receive notifications, search procedures for various processes in the school, and in overall better manage their academic life.

## 6. FUTURE RESEARCH

The software was designed to ideally switch the smartphone to airplane mode, then record lectures at lecture time. It only switches off the airplane mode, then stops to save recorded lecture at lecture end time from the timetable. This will only work perfectly in an ideal environment where all lectures in the timetable hold, and at the set time. However, in an unstable environment, where most lectures do not hold as scheduled, and others are postponed, future researchers could

look for a more suitable automated variable to switch airplane mode and record lectures.

## REFERENCES

- [1] Epstein, J. (2013). *Smartphone Applications in Clinical Practice*. Retrieved from questia: <http://www.questia.com/library/journal/1G1-348871975/smart-phone-applications-in-clinical-practice/>
- [2] Poll, H. (2015). Pearson Student Mobile Device Survey. *2015 National Report: College Students*.
- [3] Jesse, G. (2013). Smartphone and App Usage among College Students: Using smartphones effectively for social and educational needs. *Issues in Information Systems* 17(4) 8-20.
- [4] Odu, J. (2016). Evaluation of the Extent of Utilization of Electronic Library Resources and Services in University of Calabar Library Calabar: *Nigeria Education Journal* 4(2) 82-89.
- [5] Barnwell, P. (2016). *Do Smartphones Have a place in the Classroom?* Retrieved from The Atlantic: <https://www.theatlantic.com/education/archive/2016/04/do-smartphones-have-a-place-in-the-classroom/480231/>
- [6] Lautenschlager, B. (2012). *Design & Implementation of a Campus Navigation Application with Augmented Reality for Smartphones*. University of Calgary. Department of Computer Science, Alberta Canada.
- [7] Osunade, O., Osho, A., & Oyebamiji, S., (2014). Android appointment manager application development with Google APIs. *Transnational Journal of science & Technology*. 4(2) 80-92.
- [8] Akinwunmi, A., Aworinde, H., & Adewale, M., (2016). Development of a Mobile Location-Aware Campus Map Application. *British Journal of Mathematics & Computer Science* 15(3) 1-9.
- [9] Naser, S., Dawond, A., & Ali, K., (2016). Design and Development of Mobile University Student Guide. *Journal of Multidisciplinary Engineering Science Studies* 2(1), 193-197.

## AUTHOR DETAILS:

### Corresponding Author:

**Iwara ARIKPO<sup>1</sup>**: Department of Computer Science, University of Calabar, Nigeria. Email: [iwara.arikpo@unical.edu.ng](mailto:iwara.arikpo@unical.edu.ng); [iiarikpo@gmail.com](mailto:iiarikpo@gmail.com)

**Godfrey LEBO<sup>2</sup>**: Department of Computer Science, University of Calabar, Nigeria.