

Attendroid : An Android Application in Attendance Management System

Asia Pacific Journal of
Multidisciplinary Research

Vol. 3 No. 4, 140-147

November 2015 Part IV

P-ISSN 2350-7756

E-ISSN 2350-8442

www.apjmr.com

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Date Received: September 28, 2015; Date Revised: November 2, 2015

Abstract— *This research involves an android application in attendance management system. The study sought to provide an alternative solution to the increasing demand for time management in the College of Engineering and Computing Sciences in Batangas State University ARASOF. Through the said Android application the attendance checking will be much easier, for it will reduce the roll call that takes a lot of time. It was developed to help the lecturers have sufficient time for teaching and the students for learning. The researchers used research design, development process, and programming procedures in their study. The “Attendroid”, was designed and develop using Eclipse, Java Script, Php and HTML. This application is for android phones and tablet which has portable hotspot. The android application for the students will run on 2.2versions of android and higher. The android application has gone through an evaluation to test whether the system is acceptable in terms of security, accuracy, reliability, maintainability and user-friendliness against the manual checking of attendance. The result shows that the respondents are more favorable in the Attendroid because it can be gleaned that they gave an excellent feedback to the application compared to the manual process of attendance checking. After thorough study of the old ways of attendance checking against the newly developed application, a necessity to improve the manual checking was observed, and therefore, strengthen the advantages of implementing Attendroid. Based on the result of the proposed users’ acceptability, Attendroid could become the formal attendance checking system of the College of Engineering and Computing Sciences.*

Keywords: *Attendroid, Android, Attendance, Technology, Excellent*

INTRODUCTION

Technology has given us almost everything. Because of technology people have an easy way of life. It is rapidly growing to solve and to satisfy the human wants. It helps to develop more advanced economies, and now it can be used for spending our leisure time. Social desires towards educational leadership in economics and academic matters rely on upon the integration of technology in each aspect of society [1].

There are so many things that technology gave us. One of the contributions that technology has given us is the mobile phones. The development of mobile innovations has turned handheld gadgets a part of individuals' day by day life, especially in entertainment and communication. In the interim, educators endeavor to encourage learning through the application of appropriate learning strategies and

mobile technology. These days, cell phones, for example, smart phones, are outfitted with location information receiver, RFID reader, camera, and other sensors for environmental awareness. These can give rich and intuitive mixed media learning content for educational reason. Moreover, proper learning procedures can assist teachers with encouraging mobile learning process and accomplish their educational objectives [2].

But ordinary phone offers limited application, which is some people keep on searching for something new in a phone that will satisfy their particular needs. That is why the android phone has risen and given a new hope for everyone asking and looking for more that phones can offer.

Android is an operating system that is primarily designed for touch screen mobile devices like smart phone and tablet computers. "Combining the

simplicity of Android software with its imminent availability on a range of mass-market phones from various manufacturers, and the trend in developing countries to go 'straight to mobile', makes Android an exciting global platform for the next few years," states Richard Warmley, T-Mobile's head of internet and entertainment. What truly separates it from its rivals is that it is based on the Linux working framework beloved by geeks around the world, and almost distributed "open source", which means anybody with the relevant technological expertise can add to its advancement by recommending and making changes [3].

The researchers have seen the growth of technology from simple like phone that only offer text messaging and voice calling up to one that features unlimited possibilities such as phone can offer to the users. Through this new idea gave the researchers an idea on how this technology could offer big benefits for the people who are inside the university like the students and instructor.

One of the main problems nowadays in Universities and other Colleges is lack of communication and lack of access between the instructor and the students, which includes attendance checking.

Many students and instructors are stuck in this way of attendance checking. The researchers are also a victim of this kind of system. Either the instructor does not hear you answer when they call your name, or you miss to write on the attendance sheet. The researchers are aware that people hate to endure the inconvenience of the way of checking attendance. That's why the researchers think of another way to escape on this kind of system.

The domination of android application gives us answer on this problem, an application that will help us have an easy and reliable checking of attendance. The ATTENDROID is an android application that will be used by the students and instructors to have an easy checking of attendance. Implementation of this kind of system will make a huge change in the field of technology especially in the field of education. This kind of implementation will not be too difficult because nowadays, as people are much able to use smart phones and other high tech gadgets like android phones. On the other hand, the amount of time for checking the class' attendance will be lessened. Creating this kind of application will increase the popularity of the android application."

OBJECTIVES OF THE STUDY

This study aims to develop an android application that has the ability to monitor the Attendance of the students in College of Engineering and Computing Sciences.

REVIEW OF LITERATURE

According to Dobson [4], tracking attendance can be a time-consuming and tedious chore. Typically, the professor takes attendance manually by requesting that every student state "here" when his or her name is called, or by scanning the classroom to figure out which students are there. The professor then records the data, and it is transmitted to the school organization, frequently by hand. They created one automated attendance monitoring system that requires the students to have their own personality labels or cards and wireless readers to track the students' physical location. Despite the fact that it is an incredible idea, it likewise experiences its own shortcomings as it doesn't give any verification means for the attendance data's integrity. Some errors could emerge for various reasons, for example, if the student forgets his or her card, or if she or he swap the tags or carried the tags of an absent student. Likewise, the past framework couldn't export or generate report in various formats that the school administration is requiring. The system is not capable of providing the teachers to generate instant attendance reports.

As indicated in the study of Codling, utilizing another time and attendance system that can have the capacity to deal with their 550 employees. Crown Computing has today reported that it has marked an agreement with Vitacress Salads Ltd to actualize another time and attendance system to oversee 550 representatives across two UK sites in an introductory take off. The system is expandable for use over Vitacress' different business territories incorporating its farms both in the UK and abroad. The prerequisite was to embrace an answer which is equipped for interfacing with existing financial, payroll and operational information to deliver up to date activity and work costs for the business at departmental levels, said Tony Alcock HR Manager, Vitacress Salads Ltd [5].

In the study of Dregde [6], they utilize a web-based hosted time and attendance system on their thesis studies. It is a web-based hosted time and attendance system including full features that can support labor management, including time keeping,

scheduling, accruals, budgets, incidents, and more. They call it Attendance on Demand. Organizations use it as a service, with month to month per-worker billing, exporting every labor data into any payroll system virtually.

Doyle, O'Brien and Timmins utilized as a part of their study on checking of nursing students' attendance. Seen by students as a patriarchal and draconian measure, the nursing profession truly value their ability to guarantee the professional and public bodies that nursing students completely engage with educational projects.

As indicated by Johnson, they introduce a paperless Labor and Attendance Network System (L/ANS) in both Northrop's professional environments and indirect labor, the aviation company has expanded work reporting precision to 98% or more. They additionally utilize it to monitor their employee's attendance. L/ANS are accounting control table's maintenance, planning files maintenance, recording and approval, temporary badge management, and upload to payroll. L/ANS has demonstrated a non-shop attendance and work reporting system can be created and utilized effectively to give the organization a really paperless environment [7].

Palm Secure was utilized as a part of an investigation of Ranch. It was chosen to give a secure identification system to address the privacy and security concerns connected with getting employee time and attendance and records. Palm Secure gives Bates County Memorial Hospital with a cutting-edge biometric solution for tracking the access of employees. This application exhibits Palm Secure's quick adoption to incorporate time and attendance system regularly found all through today's high tech industries and healthcare," said Jim Preasmyer, director of sales and business development with the new products group, Fujitsu Frontech North America, Inc [8].

According to Chauhan [9], a biometric (fingerprint recording) system is there way of monitoring and checking the attendance. It will be used to mark the attendance of students and teachers while a Global Positioning System (GPS) will track food grains for the Mid-Day Meal Scheme, Minister of State for HRD D Purandeshwari told HT. As for the researchers, they developed their project with the use of the latest trends of technology within our generation. Android is one of the most efficient technologies to use. Almost everyone in the world has

this kind of technology to use for their personal purposes like gaming, entertainment, education and etc. The researchers take this advantage and grab the opportunity to use this kind of technology in their studies. It would be a great help to our fellow students and to our beloved professor to have an easy way of checking the attendance of their classes and take advantage of using the latest trends of technology.

Attendroid can easily check attendance by the use of portable hotspot that is provided in every android devices. Unlike the use of Bluetooth technology, portable hotspot has an advantage when it comes to speed and radius that makes it easier for the instructors to check the attendance of the students. Attendroid provides generation of report that is not a feature of the application listed in the proponent's research literatures. Synchronization of data is also one of the feature of Attendroid. Management of student records is also a part of Attendroid..

MATERIALS AND METHODS

In the development of the proposed application, the researchers used the Incremental Development Model in order to have a high quality android application project. Incremental development is a fundamental part of agile approaches which interleaves the activities of specification, development, and validation. The system was developed as a series of versions (increments), with each version adding functionality to the previous version. This model is based on the idea of developing an initial implementation, exposing this to user comment and evolving it through several versions until an adequate system has been developed. Specification, development, and validation activities are interleaved rather than separate, with rapid feedback across activities [10].

Development Process

In developing the system the researchers used Eclipse ADT Bundle for the development of the android application for the students and instructors and SQL Lite database as its storage of data. The researchers also used PHP for the development of the website that will be used by the students and instructors in terms of viewing of attendance records. These programming tools were used by the researchers because they are suitable to the development of the project.

Testing Process

The researchers tested the project for errors and conflicts. System’s component was tested, and the whole system will run in order to find errors and then correct by debugging. There are several tests that are to be performed to acquire the desire level of confidence. This process started from unit testing, each module as which the researchers shall be tested. The researchers shall execute system testing. The last one will be the user acceptance testing which will include the evaluation process of the system that will be introduced to the faculty members, instructors and students of College of Engineering and Computing Sciences in the purpose of determining the level of acceptance of the attendance android application.

Debugging Process

The researchers of the system checked the consistency of data between the android phones local database and the data that has been uploaded to the web server. Maintaining the consistency takes a lot of time for the development process. Errors come up but the researchers successfully cope with this problem.

Programming Procedure

To develop the proposed system, the researchers were guided by the following procedure to ensure the functionality of the system. First, researchers shall analyze the needed software and hardware according to the importance. Knowing what material will be used in the development process is important to come up with a good output. Second, researchers started to design the system in which the aim is to provide user friendly and efficient user interface. Third, is the programming which is one of the most significant procedures in developing the application. This is where the creation of the application happens. The fourth step is the testing and evaluation. The researchers shall test the system and present the project to their thesis adviser. This system will be tested for errors until system has been approved. Testing will be performed carefully controlled situations. The researchers computed the total number of respondents for testing and evaluation of the system using a set of questionnaires. And last but not the least step is the acceptability and implementation. This is to be done, in order to know the acceptability of the proposed system.

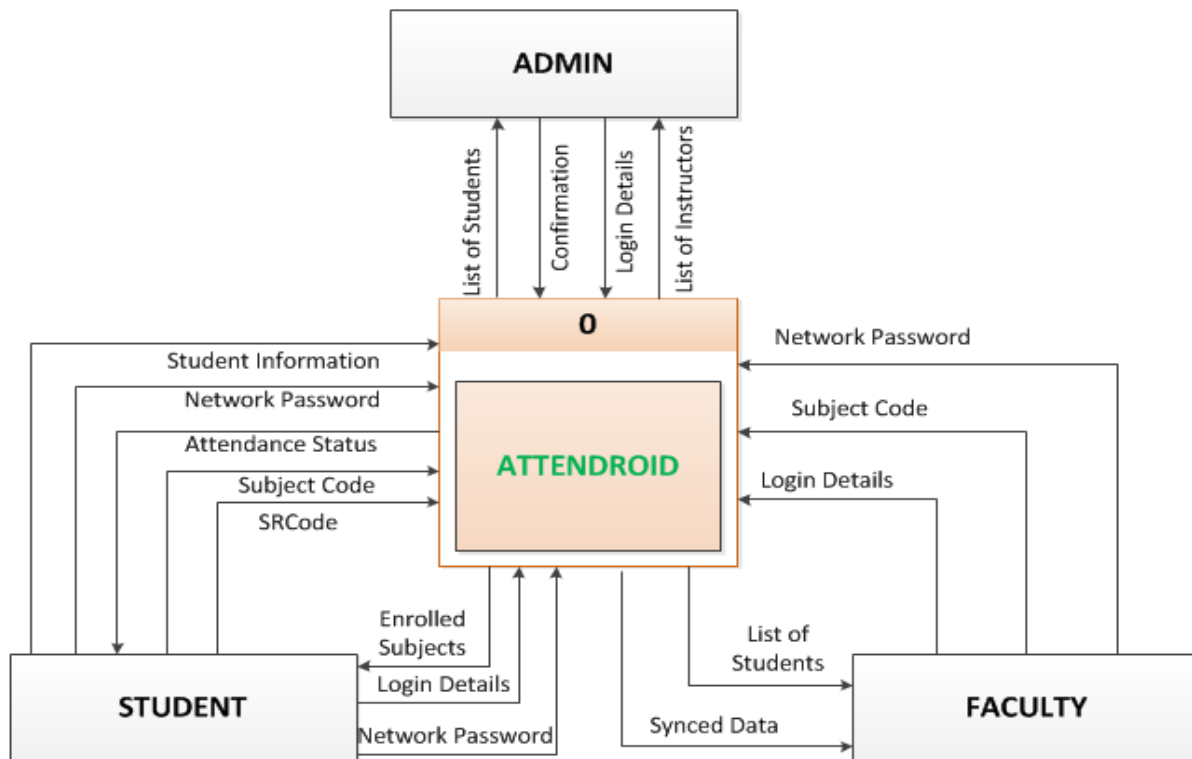


Figure 1. Context Diagram of Proposed System

The Figure 1 shows the actors outside the system that could interact with the system. It explains the procedure how the system is used for attendance management in an unexploded mode.

The Attendroid serves as the link between the students and the instructors. Through this, they will have an easy checking of attendance. It will reduce the time and effort exerted by the students and instructors.

The whole system of Attendroid is centered on the idea of having least interaction with the students and making the whole process almost fully automated. The developed application has two accounts the students and the instructor. For the checking of attendance, the students must login on to their desired subject. The instructor will broadcast a network for the desired subject every meeting.

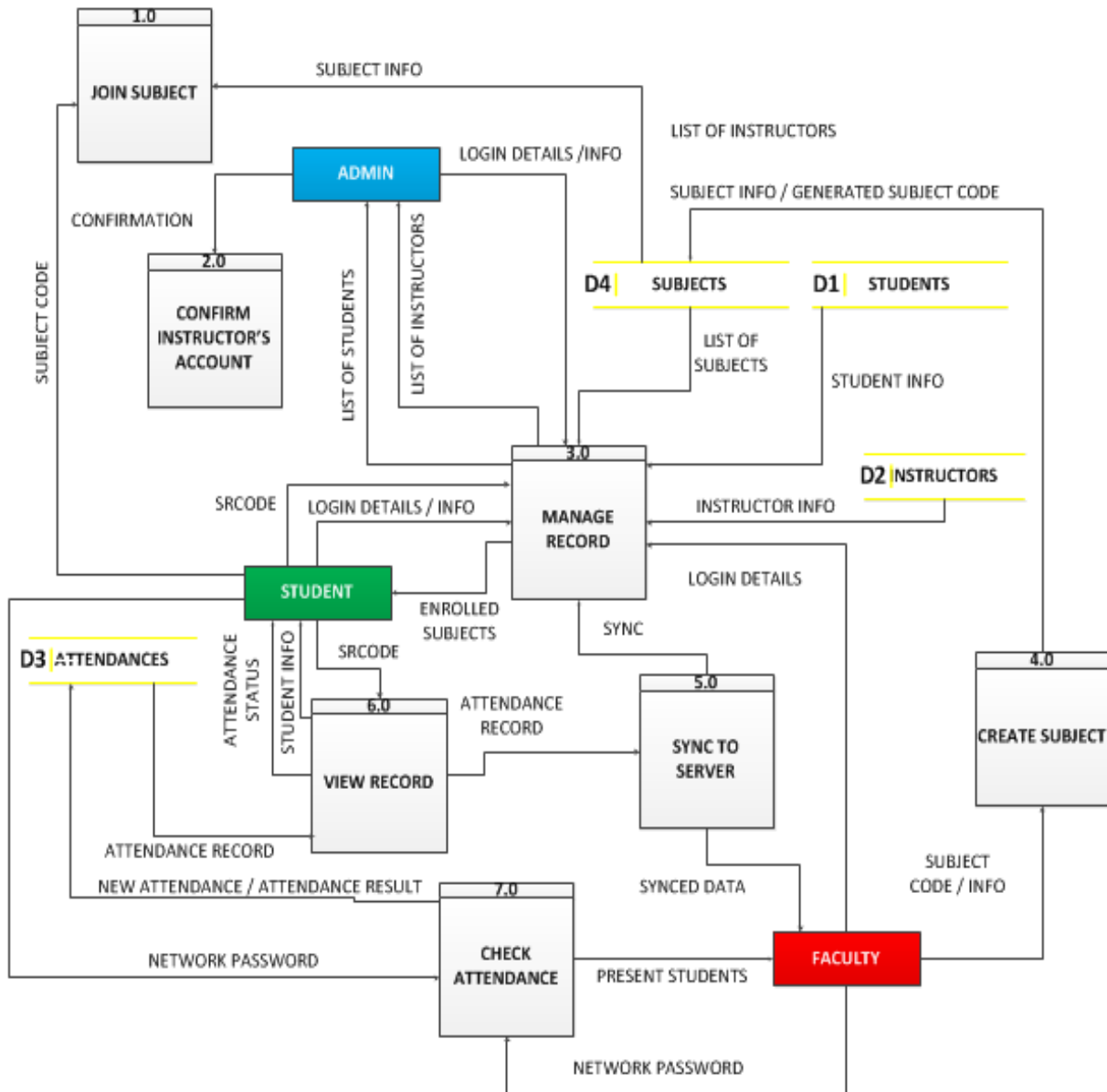


Figure 2. Data Flow Diagram of Proposed System

Figure 2 shows rectangles that represent the entities while the rounded squares represent the number denoting the particular processes. One instance is equivalent to one attendance, every instance that will be broadcasted is secured with a password. The password for every instance is changeable and it will be entered by the instructor.

The students and instructors are required to register on the website that will be created for this purpose. The website has three accounts: for students, for instructors, and for the admin. The registration is needed for the instructor to create a subject. Each subject that will be created will have a generated unique code that will be given to the students by the instructor for them to enroll on the subject. The website gives the capabilities for the instructor and students to view the report of attendance. Admin

account covers the approval of the registered account of the instructor.

The Attendroid has the capability to give warning for those students who have many absences that may reflect to their academic status. The website for this application has also the capability to generate reports of absences for the instructor to have an easy way of creating and submitting report of absences. In case the phone of the instructor gets lost, the data that has been uploaded to the website can be downloaded and sync to their new phone.

Figure 3 shows the presentation of structured data and the process of generating the models of entities (which are rectangular in shape) that represent discrete objects, while the relationship (verbs) denote how two or more entities are related to one another.

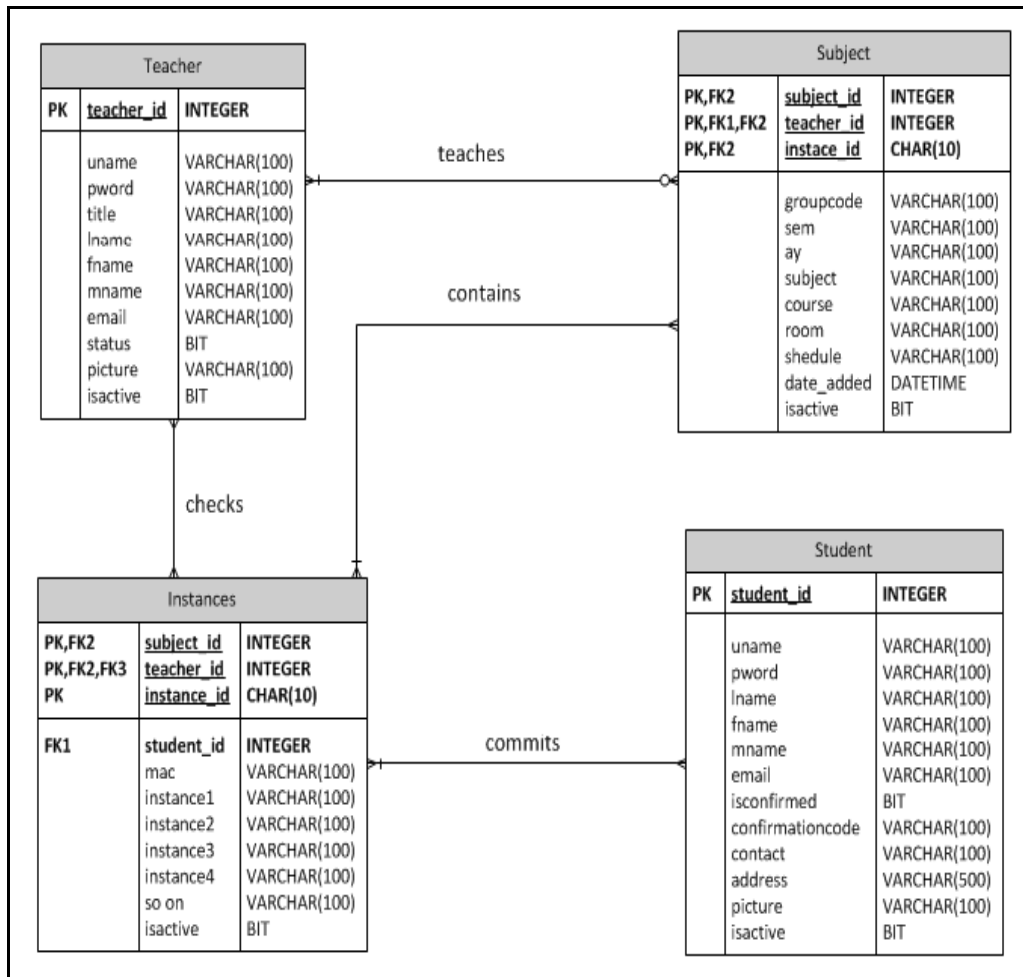


Figure 3. Entity Relationship Diagram of Proposed System

Software and Hardware Needed for Development

Table 1. Software Requirements.

Software	Minimum	Recommended
Operating System	Windows 7	Windows 8, Windows 7 Ultimate
Modeling Software	Illumination Software Creator version 6	Illumination Software Creator v6 and above
Developing Software	Android SDK, Eclipse ADT Bundle or Basic4Android	Android SDK, Eclipse ADT Bundle or Basic4Android

Table 1 shows the software requirements needed to develop the application. Operating System – is the program capable of running different application software. Researchers will use Windows 7 Ultimate or Windows 8 in the process of system development. Modeling Software – is a modeling and simulation tool in which the model of the system will be constructed for ease of development. The researchers used the easiest, fastest and simplest way to design, prototype and build native applications for platforms that are of wide range, which is, the Illumination Software Creator.

Developing Software is a type of application software in which applications are developed. To be able to develop an android application the researchers used Android SDK, Eclipse Android Development Tools (ADT Bundle)

Table 2. Hardware Requirements. Shows the hardware requirements needed to develop the application.

Device	Type / Specification
Laptop	Processor 1.20GHz Processor
	Video Card 1GB or Above
	Memory 1GB or Above
	Hard Disk 100GB or Above
Android Phone	OS Version Gingerbread 2.3 or Above
	Memory 1GB or Above
	Processor 1.2GHz Processor

Table 3 Attendroid Evaluation by the Students and Faculty Members in terms of User’s Acceptability

Criteria	WM	VI
Accuracy	4.44	Excellent
Security	4.46	Excellent
Reliability	4.42	Excellent
Maintainability	4.46	Excellent
User-friendliness	4.46	Excellent
General Weighted Mean	4.45	Excellent

The table shows the evaluation of Attendroid from two hundred twelve (212) students and five (5) faculty members. The result proved that the proposed system is Accurate for the reason that it provides correct and up-to-date information, Secured as it only those permitted users can change or modify the information, Reliable because the system produced correct information every time. The Maintainability was also high as it can maintain and hold the records as long as it is needed by the user. And lastly, the system is User-friendly since the users can easily use the application.

CONCLUSION AND RECOMMENDATION

The manual attendance checking needs to be improved to attain the convenience and necessity of the students and instructors of the College of Engineering and Computing Sciences in terms of attendance management. The amount of time for checking the class’ attendance will be lessened. The Attendroid is of big help to the Instructors because instead of the traditional roll calling of names, the students will just turn on their WiFi signals and then join the group created for attendance checking. From the series of tests made, the Attendroid can accept signals within thirty (30) meters, ideal for a classroom size to be used. Every five (5) seconds, the WiFi scans the nearby devices so it can check if a student is present. Based on the user’s acceptability of the proposed system, the “Attendroid” can possibly become the formal attendance checking system of the College of Engineering and Computing Sciences.

The proponents recommend the use of Attendroid in terms of attendance checking for the College of Engineering and Computing Sciences. The following features can be improved by the future researchers: (a) creation of accounts and joining to the subject of the students can be performed using the android application of the students; (b) The android application for the students should have the feature of viewing their attendance record; and (c) adding an android application exclusively for the administrator of the system. It is also further recommended that an application for other mobile platform like iOS be developed.

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