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Android Based Smart Learning and Attendance Management System

Rakhi Joshi[1], V. V. Shete[2], S. B. Somani[3]

PG Student, Department of E&TC, MIT College of Engineering, Pune, India [1]

Professor, Department of E&TC, MIT College of Engineering, Pune, India[2]

Associate Professor, Department of E&TC, MIT College of Engineering, Pune, India[3]

Abstract: An Education system in India has become so advanced in last decade due to the development of the technology. Smart class, video conferencing are some of the examples of modern trends in educational system. These applications help the institute to move forward quickly, fulfil their vision and accomplish their goals, E-way. The core idea of research project is to implement Android based application for attendance management system for advancement of institution and educational system. The proposed project will be implemented in applications such as online study material, notices, academic calendar and online reminders of examination, online attendance record, performance record, and parent intimation system using Android applications. This system helps teacher to take attendance through smartphone and keep record of students for their progressive assessment. This system gives a prior intimation to student as soon as their attendance goes below the specified attendance threshold in the form of an SMS.

Keywords: Android, Attendance management, E-learning, GPRS, smart phone, etc.

I. INTRODUCTION

Nowadays, mobile devices have become a way of life for students especially in higher education. Computers are now replaced by compact smart phones that can be fit into pocket and can be carried anywhere. The rapid progress in mobile technology has created a new area which is known as mobile learning. Mobile learning is the next generation of e-learning that leads attractive way of knowledge delivery especially used in teaching and learning process. With development of this Android application the student preferred to use mobile devices as technology supported educational tool. This system is designed because notes dictation in the class is difficult considering semester duration, student might miss the exam and important notice displayed due to unawareness, chances of false marking of attendance is more due to more paper work and manual attendance entry, evaluation and report generation is tedious and time consuming job. Timely updates to parent are not possible. With this system teacher can upload notes, time tables, assignment on server and broadcast it to the registered mobile numbers so that it is easily accessible to student by their own smart phone. This system enables student to learn anywhere, anytime and at their own convenience. This system makes students to be active, responsive while learning their academic. Another application that is provided by this system is smart attendance evaluation and report generation.

Smart phones are based on operating systems like blackberry, I OS and Android. To design proposed project, smart phones with Android operating system are chosen because penetration rate of Android OS is 70 percent. It is open source and free ware.

The application is compatible with all Android versions ranging from Gingerbread2.3 to Lollipop 5.0.1 so that students who cannot afford to buy high end mobiles and institutes located in remote, rural area can also take the advantage of this application.

II. SURVEY OF DIFFERENT ATTENDANCE TRACKING SYSTEMS

Following traditional systems are used to mark attendance in the teaching process.

A. Manual attendance system

It is the conventionalmethod of taking attendance by calling names or signing on paper but it is inefficient due to more chances of malfunctioning and more paper work as well.

B. RFID with Object Counter

Radio Frequency Identification (RFID) based attendance system is one of the solutionsto address this problem, but that is time consuming and unsafe. Anyone can carry others card to mark proxy attendance [7].

C. Bluetooth Based Attendance System

In this, attendance is being taken using instructor's mobile phone. Application software is installed in instructor's mobile telephone, enables it to query student's mobile via Bluetooth. It transfers student's mobile Media Access Control (MAC) addresses to the instructor's mobile phone and presence of the student can be confirmed. The problem of this proposed system is student's phone is required for attendance. In case of absent student if his mobile is given to his friend and if kept it in coverage area then also his presence would be marked [9].

All the above systems are time consuming and unsafe. In the proposed project Android based attendance system is

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designed which is less time consuming, safe and easy to implement.

III. BLOCK DIAGRAM OF PROPOSED SYSTEM

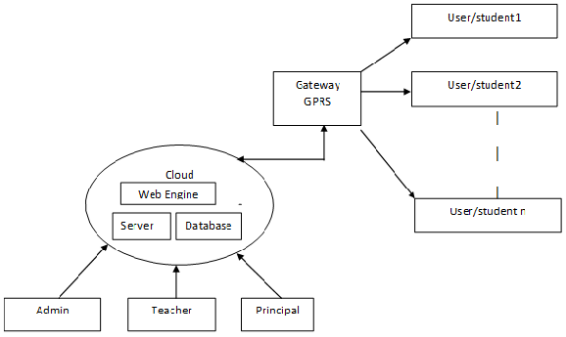

Fig.1. Block diagram

With the proposed system shown in Figure 1 teacher can take attendance of student with own mobile and upload that record on web server. On the server side, percentage attendance will be automatically calculated and report will be generated accordingly. In the SMS notification module, SMS will be sent to parents or students. In E-learning module notes, time tables can also be broadcast to the student.

IV. RESEARCH ELABORATIONS

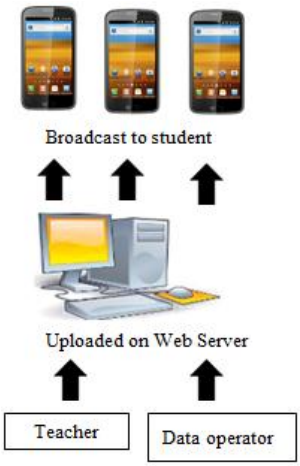

Fig.2. System Design and Development [1]

Teacher or operator can upload the data on the web server. The data which is uploaded is broadcasted to student's smartphone through GPRS.

V. SYSTEM DESIGN

The entire system consists of

A. Authentication module

The purpose of Authentication module shown in Figure 3 is to provide security. It is the entry module of application.Each user enters his/her username and password to enter into application. If username and password is matched, application gets started.

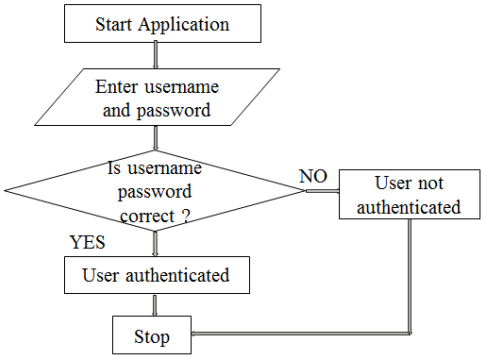

Fig.3. Flow diagram of Authentication Module

B. Student attendance module

This module is specially designed for faculty. After the lecture is done, staff can upload student attendance record in the database created on server. The overall attendance iscalculated automatically and message will be sent to the parents whose ward has less than75% attendance. This flow is as shown in Figure 4.

C. Database module

The learning material to be shared is stored on server. By means of internet it will be broadcasted to all the registered students.

D. SMS notification module

In SMS notification module SMS will be sent to Parents or students. If parent notification option is chosen, then SMS will be sent to entered mobile nos. If student notification option is selected bulk SMS will be sent to group of students which belongs to that particular class. With this module examination reminder, student progress, less attendance intimation and any important notice can be sent. This module can be useful for parents as well as students.

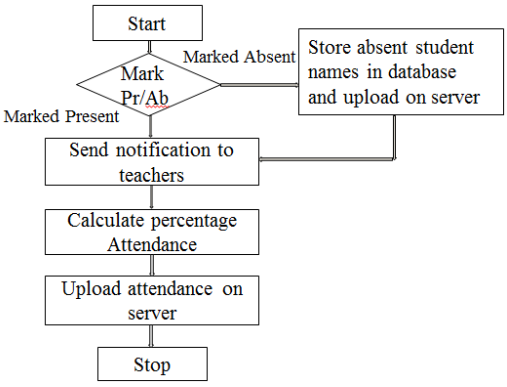

Fig.4. Flow diagram of Student attendance module

VI. TECHNICAL STEPS

Setting up environment on own machine. This phase involves installation of Java JDK, JRE, Android SDK, and Eclipse.

Creation of GUI / Main Forms/ Sub Forms and create activities linked with each other

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- Create error logs module which keeps trackof non-authenticated transactions such as enter wrong password, server network up-downs. Keeps record of network connectivity.
- Service Call logs module which keepstrack of all user activities like log in time, logout time, upload and download time, File size.
- Design Web APIs for communication between server and Android smartphone.
- Android App Test setup process-Run .apkfileon android smartphone and test the application.

VII. HARDWARE REQUIREMENTS

- Personal desktop/Laptop -Central server with processing engine.
- The minimum memory size required is 1GB.
- Smartphone-Offers more advanced computing ability and connectivity

VIII. SOFTWARE REQUIREMENTS

Solution is developed using Below Technologies and platforms

- Application Development- Android
- Web Application Development- C# and ASP.Net
- Database management- SQL Server 2012
- Android Application Development- Eclipse-Luna 4.4
- Web Application Development- Microsoft Visual Studio 2005 Express Edition

IX. RESULTS

This implementation is done on the server and smartphone. Implementation on the server is done using .Net and visual studio, while the implementation of smartphone is using Java script.The application is tested on Android smartphone version Lollipop 5.0.1.

Fig.5. Authentication screen

In the module shown in Figure 5, user gets authenticated and able to open department selection option form.

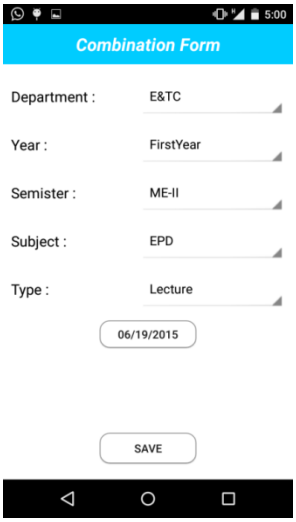

Fig.6. Department registration screen

Using department registration screen shown in Figure 6 user can select department, year, semester and subject and enter into application option form.

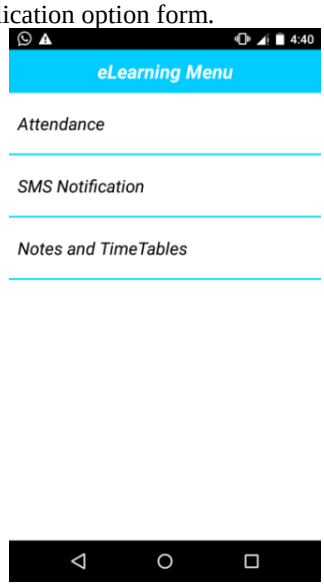

Fig.7. E-learning menus

ELearning Menu- User can select one option out of three as shown in Figure 7. As per selection, next screen will appear.

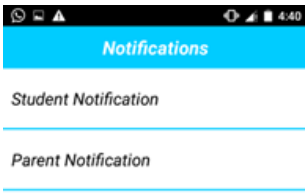

Fig.8. Notification screen

Using notification module, user can send notification to student or teacher.Shown in Figure 8

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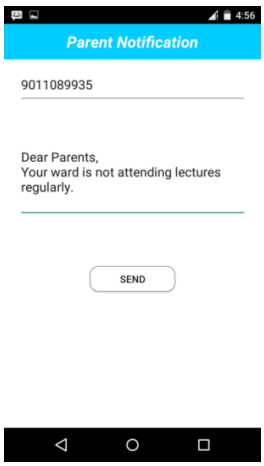


Fig.9(a). SMS screen

If parents notification is selected, notice will be sent to single number or comma seperated unlimited numbers. If Student option is selected, bulk sms will be sent as per class selected.

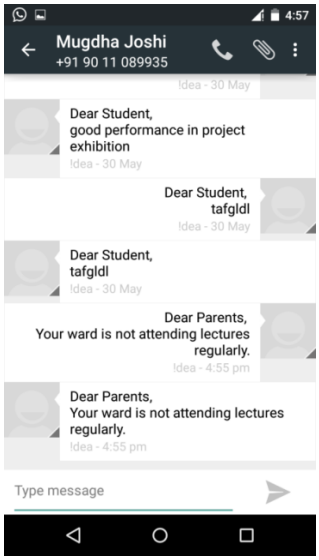
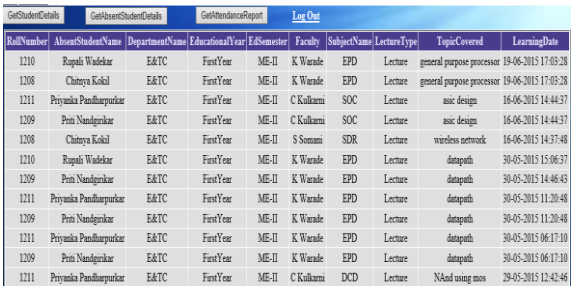


Fig.9 (b). SMS screen

Fig. 10(a). Attendance sheet



GetStudentDetails | GetAbsentStudentDetails | GetAttendanceReport | Log Out

RollNumber	AbsentStudentName	DepartmentName	EducationalYear	EdSemester	Faculty	SubjectName	LectureType	TopicCovered	LearningDate
1210	Rupali Wadekar	E&TC	FirstYear	ME-II	K Warade	EPD	Lecture	general purpose processor	19-06-2015 17:03:28
1208	Chitnya Kokil	E&TC	FirstYear	ME-II	K Warade	EPD	Lecture	general purpose processor	19-06-2015 17:03:28
1211	Priyanka Pandharpurkar	E&TC	FirstYear	ME-II	C Kulkarni	SOC	Lecture	asic design	16-06-2015 14:44:37
1209	Priti Nandgirikar	E&TC	FirstYear	ME-II	C Kulkarni	SOC	Lecture	asic design	16-06-2015 14:44:37
1208	Chitnya Kokil	E&TC	FirstYear	ME-II	S Somani	SDR	Lecture	wireless network	16-06-2015 14:37:48
1210	Rupali Wadekar	E&TC	FirstYear	ME-II	K Warade	EPD	Lecture	datapath	30-05-2015 15:06:37
1209	Priti Nandgirikar	E&TC	FirstYear	ME-II	K Warade	EPD	Lecture	datapath	30-05-2015 14:46:43
1211	Priyanka Pandharpurkar	E&TC	FirstYear	ME-II	K Warade	EPD	Lecture	datapath	30-05-2015 11:20:48
1209	Priti Nandgirikar	E&TC	FirstYear	ME-II	K Warade	EPD	Lecture	datapath	30-05-2015 11:20:48
1211	Priyanka Pandharpurkar	E&TC	FirstYear	ME-II	K Warade	EPD	Lecture	datapath	30-05-2015 06:17:10
1209	Priti Nandgirikar	E&TC	FirstYear	ME-II	K Warade	EPD	Lecture	datapath	30-05-2015 06:17:10
1211	Priyanka Pandharpurkar	E&TC	FirstYear	ME-II	C Kulkarni	DCD	Lecture	NAnd using mos	29-05-2015 12:42:46

Fig.10(b) Attendance report

After selecting attendance module, sheet will appear on teachers mobile (Figure 10a). Teacher will mark attendance and report of absent students will be generated on webserver as displayed in figure 10(b).

The percentage attendance will be calculated and report is generated on server accordingly. Refer Figure 10(c) for that.

0		EPD	24	1	95%
1207	Rohit Bhoi	ANN	1	0	100%
1207	Rohit Bhoi	DCD	1	0	100%
1207	Rohit Bhoi	ACD	1	0	100%
1207	Rohit Bhoi	SOC	1	0	100%
1207	Rohit Bhoi	EPD	24	13	45%
1207	Rohit Bhoi	SDR	2	0	100%
1208	Chitnya Kokil	ANN	1	0	100%
1208	Chitnya Kokil	DCD	1	1	0%
1208	Chitnya Kokil	ACD	1	0	100%
1208	Chitnya Kokil	SOC	1	0	100%
1208	Chitnya Kokil	EPD	24	11	54%
1208	Chitnya Kokil	SDR	2	1	50%
1209	Priti Nandgirikar	ANN	1	0	100%
1209	Priti Nandgirikar	DCD	1	0	100%
1209	Priti Nandgirikar	ACD	1	1	0%
1209	Priti Nandgirikar	SOC	1	1	0%

Fig.10(c)Attendance report

X. CONCLUSION AND FUTURE SCOPE

By this system students can learn anywhere anytime as per their own convenience. Timely updates of student can be sent to students as well as their parents.Attendance marking and report generation becomes easy. Less chances of malfunctioning. In future this system can be implemented to automate most of the educational systems and it can be designed for cross platform.

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BIOGRAPHIES

Rakhi Joshi has completed her B.E. in Electronics from DKTE, Ichalkaranji, Maharashtra, India and currently pursuing M.E in VLSI & Embedded System from MIT College of Engineering, Pune. Her research interests include Embedded system, Digital techniques.

Dr. V.V Shete, Head, Department of E&TC, MITCOE Pune, affiliated to Savitribai Phule Pune University. He has published numerous scientific papers. His area of interest is soft computing, Signal Processing.

Sunil B. Somani secured M.E. Degree in E&TC. Engineering. He is in the teaching profession since last 20 years and specialized in areas such as Advance communication, Microwave engineering and Mobile communication. He is currently working as PG coordinator at the MIT College of Engineering, Pune, India.