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Mobile Learning and Attendance Management System on Android Platform

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ABSTRACT: Education system has become so smart due to the development of the technologies such as VLC, video conferencing and e-Learning. General e-learning is available in the form of web based application, but does not exist [in] the form of mobile application yet. These applications help the institute to move forward quickly, fulfil their vision and accomplish their goals, E-way. This research project assists teaching-learning process by implementing an Android based application for mobile learning and attendance management 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, broadcasting of notes to students using Android applications. This system helps teacher to take attendance through smartphone and keep records of students for their progressive assessment. This system gives a prior intimation with SMS to the student as soon as their attendance goes below the specified attendance threshold.

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 a 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 the 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, a student might miss the exam and important notice displayed due to unawareness, chances of false marking of attendance is more due to more paperwork and manual attendance entry, evaluation and report generation is tedious and time consuming job. Timely updates to the parent are not possible. With this system teacher can upload notes, timetables, assignment to 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 the smart attendance,evaluation and report generation.

Smartphones arebased on operating systems like blackberry,iOS and Android. To design proposed project,smartphones with the Androidoperating system are chosenbecause the penetration rate of the Android OS is 70 percent.It is open source and freeware.

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 andinstitutes located inremote,rural area can also take the advantage of thisapplication.

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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 the 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 for the instructor's mobile phone and presence of the student can be confirmed. The problem of this proposed system is a student's phone is required for attendance. In case of the absent student if his mobile is given to his friend and if kept it in coverage area then also his presence would be marked[8].

All the above systems are time consuming and unsafe. In the proposed project Android based attendance system is designed which is less time consuming, safe and easy to implement.

III. BLOCK DIAGRAM OF PROPOSED SYSTEM

With the proposed system shown in Figure 1 teacher can take attendance of student with own mobile and upload that record on the 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, timetables can also be uploaded on server and broadcast to the students.

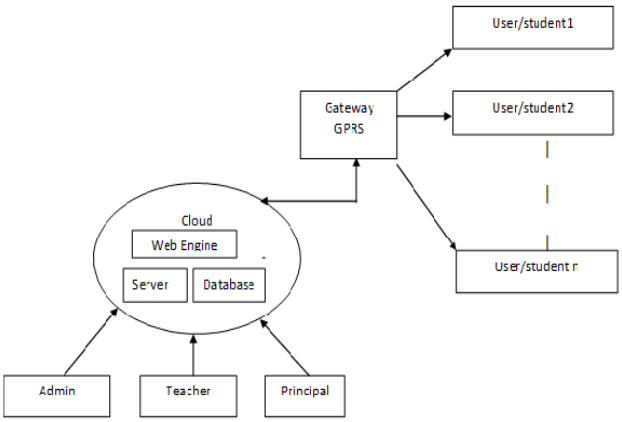

Fig.1. Block diagram

IV. SYSTEM DESIGN

A teacher or operator with valid usename and password can upload the data on the web server. The data such as notes, time tables, important notices which are uploaded is broadcasted to student's smartphone through GPRS. Sudents can read the data as per their convenience. System design is shown in Figure 2.

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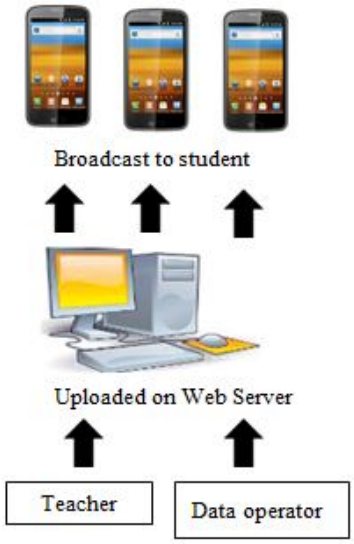

Fig.2. System Design and Development [1]

The entire system consists of

A. Authentication module

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

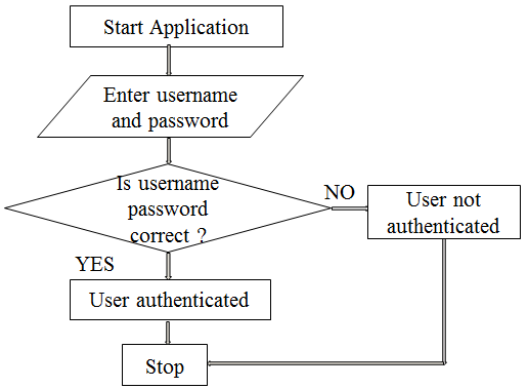

Fig.3. Flow diagram of Authentication Module

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 the server. The overall attendance is calculated automatically and message will be sent to the parents whose ward has less than 75% attendance. This flow is as shown in Figure 4.

C. Database module

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

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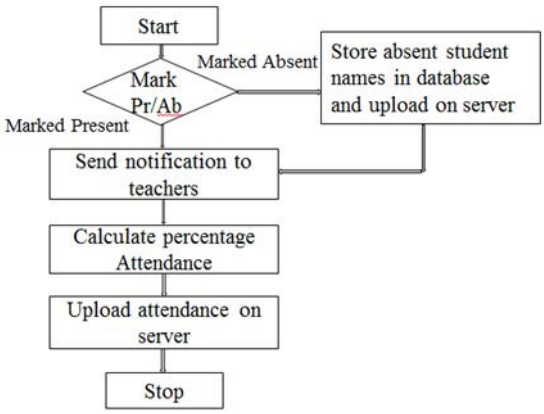

Fig.4. Flow diagram of Student attendance module

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 a 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.

V. TECHNICAL STEPS

A. Setting up environment on own machine. This phase involves installation of the Java JDK, JRE, Android SDK, and Eclipse.
B. Creation of GUI / Main Forms/ Sub Forms and create activities linked with each other
C. Create error log module which keeps trackof non-authenticated transactions such as enter wrong password, server network up-downs. Keeps record of network connectivity.
D. A service Call logs module which keepstrack of all user activities like log in time, logout time, upload and download time, File size.
E. Designing Web APIs for communication between server and Android smartphone.
F. Android App Test setup process-Run .apk fileon Android smartphone and test the application.

VI. METHODOLOGY

A. 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

B. *Software Requirements*

The 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

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VII. 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. In the module shown in Figure 5, user gets authenticated and able to open department selection option form. Using department registration screen shown in Figure 6 users can select department, year, semester and subject and enter into an application option form.

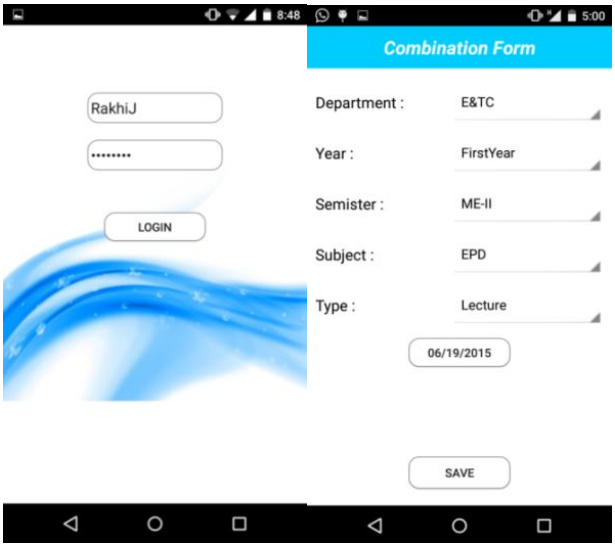

Fig.5. Authentication screen Fig.6. Department registration screen

ELearning Menu- User can select one option out of three as shown in Figure 7. As per selection, the next screen will appear.Using the notification module, users can send notification to student or teacher. Shown in Figure 8.

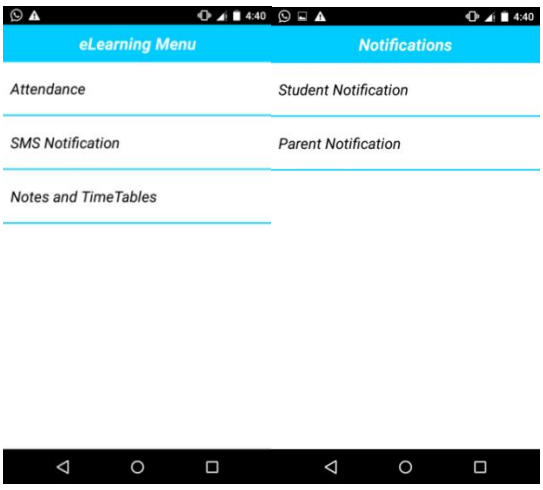

Fig.7. E-learning menusFig.8. Notification screen

If parent notification is selected, notice will be sent to a single number or comma separated unlimited numbers. If Student option is selected, bulk SMS will be sent as per class selected. Shown in Figure 9(a)and Figure 9(b).

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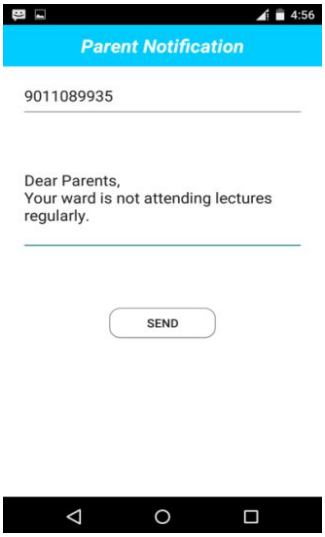


Fig.9(a). SMS screen

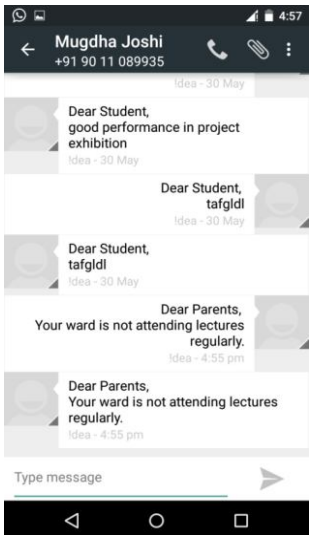


Fig.9 (b). SMS screen

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

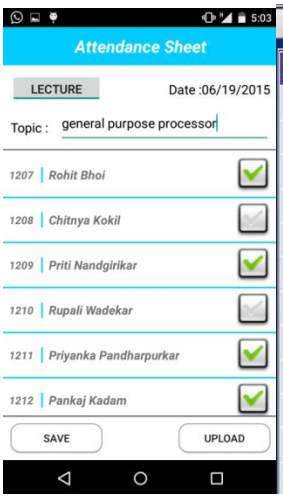
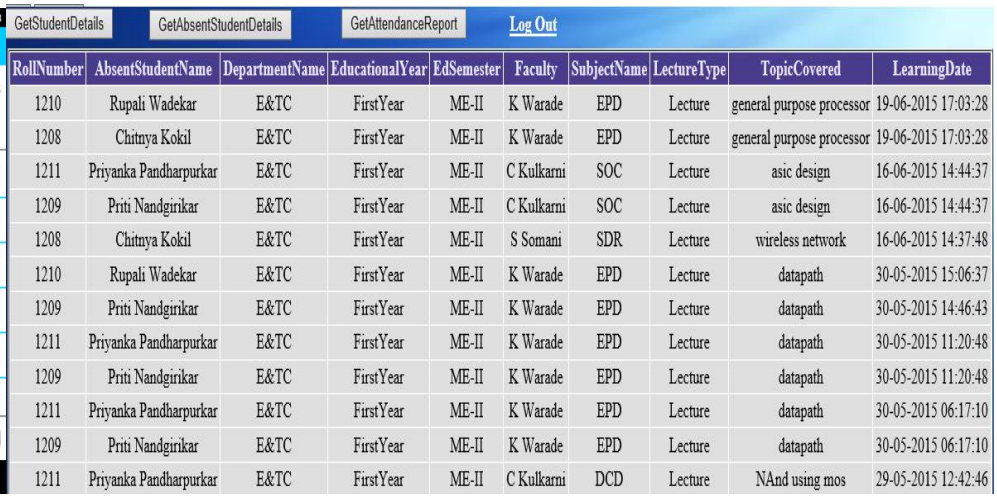


Fig. 10(a).Attendance sheet



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

The percentage attendance will be calculated and report is generated on server accordingly. Shown in Figure 10(c). The teacher can broadcast notes to students by the web service. Shown in Figure 11.

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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

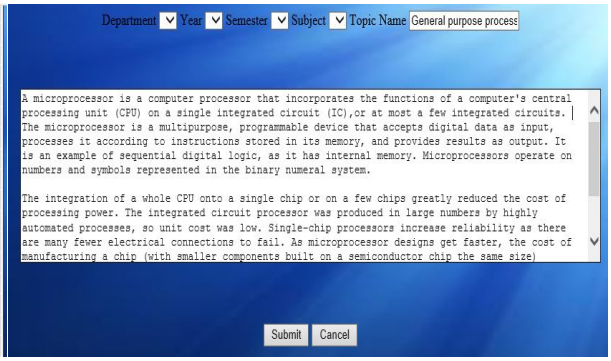

Fig.11 Notes broadcast

VIII. 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.The system is easy to implement Inthe future this system can be implemented to automate most of the educational systems and it can be designed for cross platform.In attendance module percentage attendance per subject can be calculated, it reduces the efforts required for report generation.

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BIOGRAPHY

Rakhi Joshi has completed her B.E. in E&TC Engineering from DKTE College of Engineering, Ichalkaranji and currently pursuing M.E in VLSI & Embedded System from MIT College of Engineering, Pune. Her research interests include embedded systems.

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Sunil B. Somanisecured 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.