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Mobile Application for Student Attendance and Mark Management System

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Abstract

Marking attendance in the class meeting session and recording the marks of the students are the prime tasks of the subject handlers, since marking the attendance can regulate the students to attend the classes. Moreover, it verifies number of students present in the conducted classes. The purpose of recording the marks is to analyse the performance of the students in terms of curricular activities. Earlier, the tasks of marking attendance and recording the marks are handled manually by pen and paper method. This method consumes more time and adds more workload to the subject handlers and sometimes the data may prone to error. To avoid these problems, this paper presents a mobile application for student attendance and mark management system. This application is mainly designed for the faculties and other staff members of the organization who maintain attendance and marks regularly. Using this system, the subject handlers, staffs or the authorities can verify the number of students present or absent in the class meeting sessions. This application allows the users to mark attendance through mobile devices and to keep in touch with students. Furthermore, this application allows the teachers to mark and edit the attendance and also to add the marks in the system database for further retrieval. It gives a prior intimation to students as soon as their attendance goes below the specified percentage through an alert message.

Keywords: Mobile application, Student attendance and mark management system, Java mobile application

1. INTRODUCTION

In current scenario, marking attendance in the class session and entering the marks of the students are the essential tasks of the subject handlers, since marking the attendance can regulate the students to attend the sessions and verify the number of students in the class. Record of marks is inevitable to analyse the performance of the students in their exams. The management and maintenance of student information is a key task for any institution. The task of marking attendance and making entry of the exam makes are traditionally carried out manually with a log book. Later, this task is carried out by the desktop applications. The desktop application is a standalone application installed in the particular desktop or laptop and the tasks can be performed only with that particular desktop system.

The main drawback of this system is that the computer systems are not portable hence it cannot be kept anywhere to perform the task such as mark and attendance entry. The entered marks can be viewed only on the particular system if the desktop is not connected with network. Another method for mark and attendance entry is web-based application. In this method, the attendance and the marks details are uploaded in a server through internet and the users such as students, parents, and teachers can view the marks and attendance through browsers with internet using any one of the devices such as desktop, laptop, and hand held mobile devices. This system is active only when the internet is on since the data are not been updated with the local database.

These limitations of the traditional systems are overcome by the mobile applications. The mobile application allows the users to install this application in their mobile devices. The user can update the student attendance and mark details in the local mobile database by connecting their mobile devices with the server which keep the attendance and mark details through internet. Hence, the updated marks and attendance details can be viewed even offline. In order to reduce the manual work and to achieve more efficiency in managing the student information, this paper presents a java-based mobile application to manage the student attendance and makes more easily and effectively. The proposed application can store student information to the server database and it can be retrieved by the mobile phone and save that information in their local mobile database. Through this system, teachers can easily record the student attendance and can generate the reports.
The rest of this paper is organized as follows: Section 2 reviews the literature. Section 3 explores the implementation of the application. Section 4 discusses the outputs and Section 5 concludes this paper.

2. LITERATURE REVIEW

This section reviews the research works carried out by different researchers that are related to the proposed work. In general, the mobile application is developed using any one of the languages such as Java using software development kit (SDK). The data used for the application or processed by the application are stored in the data bases. The following mobile application developers succeed in developing the student attendance management system with the structured query language (SQL) data bases.

V. Somasundaram et al presented a mobile-based attendance system using visual basic .Net (VB.NET) and SQL server. This system is used to store, organize, find and manage the information of the students and helps to generate the reports of the student information [1].

K. Akhila et al proposed an android-based mobile application for student attendance tracking system. It offers reliability, time saving, and it is easy to control and to take the attendance using android mobile phones. It can reduce the efforts of the staff members towards attendance maintenance. It is an efficient and user friendly android mobile application for attendance monitoring [3]. Rakhi Joshi et al developed an android-based attendance management with smart learning system. The web-based mobile application is developed with a SQL server. This system is used to mark attendance through smart phone and gives a prior intimation to student as soon as their attendance goes below the specified level through SMS [2]. Moreover, Amita Dhale et al. presented a survey on "smart connect", android and web based application for college management system. It is developed using SQL server. It is mainly used to store the details required for the institutions [8].

The mobile operating system (MOS) place a key role in the development of mobile application since the application for one MOS is not compatible with other MOS. Therefore, before developing the mobile application for a particular application the MOS must be considered and the application must be developed for the same. Thus, the student attendance management and monitoring systems are developed for the Android MOS. Akshay A. Kumbhar et al presented an automated attendance monitoring system using android platform. It is then used to maintain the attendance of the student regularly [9]. Jessenth Ebenezer et al presented an android-based student activity register system. It is used to mark the attendance and to store the details of the students so that the professors or higher officials can view the attendance of the students and regulate them if they are not regular to the classes [7].

The mobile application-based attendance management system is also employed in the organisations to mark the attendance of the employees. S.P. Avinaash Ram and J. Albert Mayan presented a mobile application for employee registration and mobile attendance. It is used to update the employee attendance regularly and track their attendance. Moreover, it is helpful to the staff and the authorities to take the attendance. This system is also used to know the number of employees easily and to monitor whether they are regular to the organisation. This system also provides the details of every employee [4].

In addition to providing the authentication in organizations, the location-based attendance management system is also practiced. Mohammad Salah et al presented a mobile application for time and attendance system based on the location. This application is used to take the attendance of the employees based on whether they are in the same location of an organisation or not. This application is developed using android [5]. The wireless technologies such as Bluetooth and Wi-Fi are used with

mobile application for attendance management system. Riya Lodha et al developed an application for attendance management system using Bluetooth enabled devices. This application functions with the wireless technology using Bluetooth to mark the attendance. Hence, it reduces the time taken for the attendance marking [6]. Freya. J. Vora proposed a framework of android-based mobile attendance system. It uses Wi-Fi technology to mark the attendance in android based phones. It is allows to store and edit the attendance [10].

From the literature review, it is observed that the mobile application-based attendance management system plays a central role in the educational institution and the commercial sectors to regulate the attendance of the students and the employees. Moreover, the mobile application-based mark management system enhances the quality of education through easy access and analysis of marks. However, this mobile application is developed based on the MOS. This paper presents a Java-based mobile application for attendance and mark management system for educational institution.

3. MOBILE APPLICATION FOR STUDENT ATTENDANCE AND MARK MANAGEMENT

This section explains the mobile application environment and the mobile application of student attendance and mark management system. Figure 1 shows the architecture of mobile application environment. The mobile application for the student attendance and mark management system is developed and deployed in the cloud server. This application is also installed in the mobile devices of the users such as student, staff and parents, faculty members for accessing the student marks and attendance details. The users are divided into two groups namely student and staff. The student user can be either students or parents. The staff user can be the staff members, faculty member, principal, dean, etc. of the educational institution. The student users can view the attendance and marks that are uploaded in the database or cloud server. The staff users can enter, edit, modify and update the marks and attendance of the student through any mobile device.

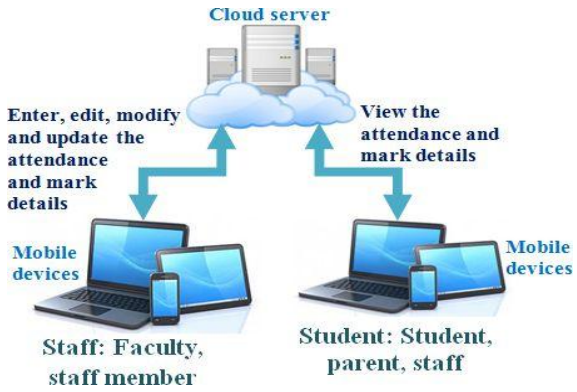


Figure 1. Architecture of mobile application for student mark and attendance management environment.

Figure 2 shows the schematic diagram of mobile application for mark and attendance management system. This mobile application consist of two login modules namely staff login and student login. The student login enables the student users such as students and parents to view the class attendance details and marks that obtained by the students in the internal and external assessments. The staff login enables the staff users such as staff members, faculty member, principal, dean, etc. of the educational institution to enter, edit, and update, and view the student marks and their attendances. The mark and the attendance details are stored in the databases.

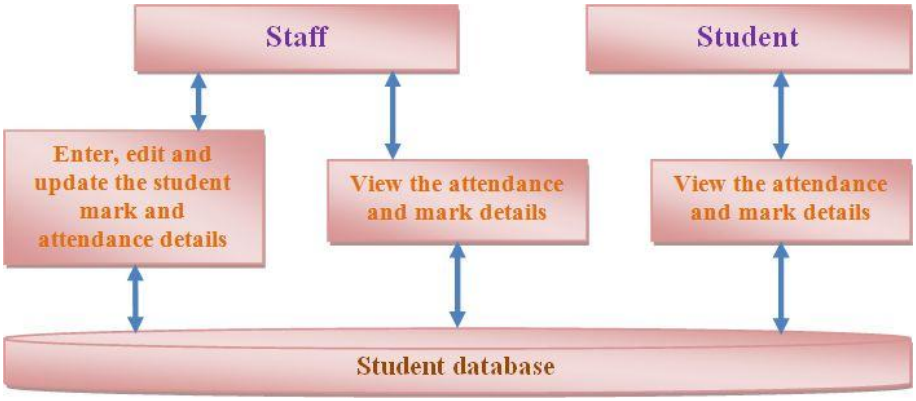


Figure 2. Schematic diagram of mobile application for mark and attendance management system.

4. IMPLEMENTATION DETAILS

This mobile application is developed using Sun Java Wireless Toolkit 2.5.2_01 with Java Platform, Micro Edition (J2ME). The application is implemented with the computer system specification of Windows10 operating system, 4GB RAM and 500GB Hard disk with CPU: Intel(R) Core (TM) i5 – 3470 CPU@ 3.20GHz. The following steps cared out to develop the Java-based mobile application.

4.1Implementation Procedure

Step 1: Launch the Sun Java wireless toolkit 2.5.2

Step 2: Select the new project option and enter the project name and the MIDlet name as public class name and select the create project option

Step 3: Write the program in notepad++

Step 4: Save the program in j2mewtk\\..\\ application\\ src folder with file extension of .java

Step 5: Open the Sun Java Wireless toolkit window

Step 6: Select the open project option and choose the project

Step 7: Build the project and run the project

Step 8: The output is displayed.

Initially the Sun Java wireless toolkit 2.5.2 is launched and the option new project is selected. The project name and the MIDlet name are entered as public class name. Then create project option is selected. The program is written in notepad++. The program is saved in the directory of \\..\\ j2mewtk\\..\\ application\\ src folder with file extension as .java. Then, Sun Java wireless toolkit window is opened. Open project option is selected and the project is chosen. The project is built and run. Then, the output is displayed.

6. OUTPUT AND DISCUSSIONS

This section presents the sample code and output of the developed application. Figure 3 shows the sample code of mobile application for student attendance and mark management system. Figure 4 (a) shows the mark and attendance entry form. Figure 4 (b) shows the mark and attendance submission acknowledgement form.

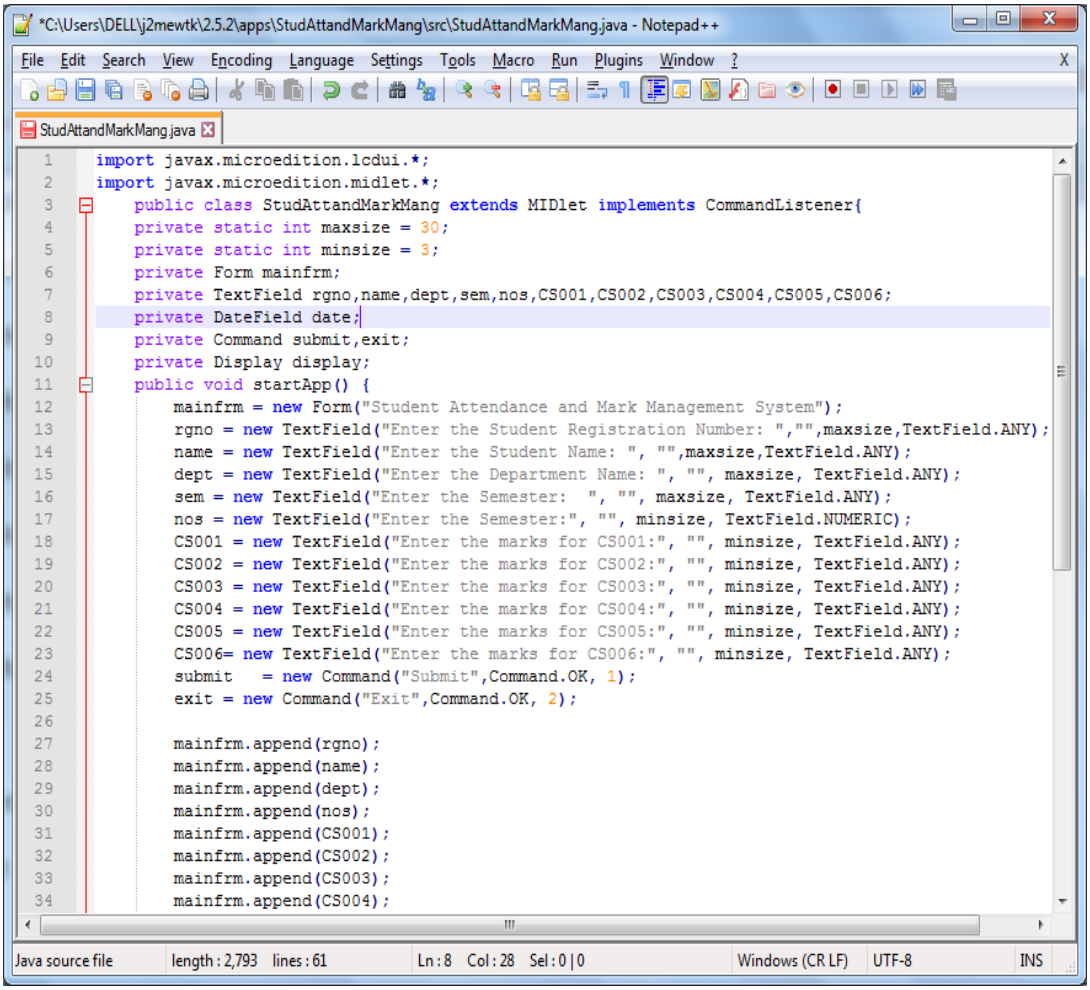
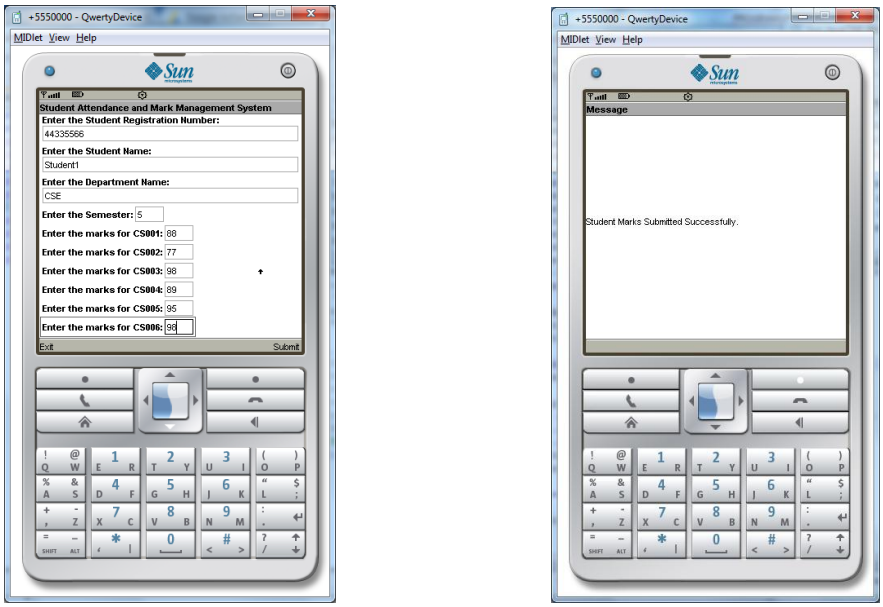


Figure 3 Sample code of mobile application for student attendance and mark management system



(a) (b)

Figure 4 (a) Mark and attendance entry form (b) Mark and attendance submission acknowledgement form

5. CONCLUSION

This paper presented a mobile application for the student attendance and mark management system. This system is enabled with two login modes namely student and staff. The student login allows the students or parents to view the student mark and attendance. The staff login allows the staff and faculty member to edit, modify, and update. This application is implemented using Sun Java wireless toolkit with J2ME.

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