Paperless System for Attendance Management

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Abstract - In today’s digital world, numerous teachers from various schools, colleges and educational institutes are still stuck with traditional system of recording attendance using big registers and maintaining papers. They have to do very tedious task of compiling attendance of numerous students. This paper establishes a paperless solution for recording daily attendance of students making use of devices and technologies which is already present in schools or colleges. This solution not only reduces time but also makes it easier to process the recorded attendance. This solution can be a replacement for existing system providing benefits like low cost, easy to upgrade and efficient.

Keywords – attendance management system, paperless system.

1. Introduction

Attendance in simple words is keeping record of all the people who are present and absent. We are familiar with attendance from childhood because attendance is recorded at places like school, college, educational institute, offices etc. It is also used as a proof for a person’s presence or absence for particular activity. It is also used to take disciplinary actions. Conventional way of recording attendance is using registers or papers in which attendance is recorded in tabulated form. An observer is a human being who takes a roll call or calls out name and marks presence or absence using letters ‘P’ or ‘A’. Biometric identifiers like fingerprint recognition, face recognition, palm recognition, use of RFID cards are some of the recent ways of recording attendance. But conventional method is easy to use and implement than all these methods. Though it is easy to use, it has some disadvantages as well, like tedious work of processing the recorded attendance and wastage of papers as these records are usually not used unless needed. It becomes more complex if we are dealing with huge number of people.

Coming up with solution for above conventional system, this paper gives a prototype which makes the process of recording attendance paperless and easy to record and manage using the devices and technologies which are easily available nowadays.

The proposed system contain two parts, first an android application to record and export the attendance which will be installed in every teacher’s android device. Second, a website, which will be used to compile and process all the records collected by every teacher using an android application. An app will be developed using Android SDK, SQLite Database and Web Site which will be developed using ASP.NET and which will run on MySQL database. This paper will be categorized in 3 more sections. Section 2 will give description of Android Application. Section 3 will explain about the Web Site and Section 4 will give concluding remarks.

2. Android

Android app plays a significant role in system as it is used to record the attendance and export it to the Remote MySQL database. A device which runs on android is needed to run this application.
2.1 Android Device

Android is an open source operating system, based on UNIX. First commercial version of Android i.e. Android 1.0 was released in September 2008 [1]. As years progressed, various version of android operating system were released. In last 7 years, android has become very popular. On September 3, 2013, Google announced that one billion activated Android devices were in use worldwide. Because of this, it’s very easy to get an android device. In India, 6 out of 10 smartphone users use android device. [2]

Android application developed in the system will be installed in each faculty’s android device which will be used to record the attendance. The app needs to be very light weight, so it can be also run on an android device having processor as low as 1GHz. The app is developed using Android API 19 so it can be run on android version ranging from 2.3 Gingerbread to 4.4 KitKat. Making the app easy to run on many versions of android. Storing of attendance record is also an important feature of this application. SQLite database is used to store the attendance record in android device as it is lightweight having maximum page size of 65536 bytes. [3]

2.1.1 Attendance Management App.

The main purpose of this device is to record and export attendance records on a daily basis to the remote server. Firstly the Teachers will be provided the Android App along with a unique username and password through the admin. For every lecture the teacher logs into the app using the credentials and records attendance of the following class. The recorded attendance is firstly stored into the phone’s database i.e. SQLite. This app also has features such as exporting and importing data from the database and for this an internet connection is required so that the data from the phone’s database is transferred onto remote server using JSON (Java Script Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write. It has a data format that is inter-changeable with a programming languages built-in data structures that eliminates translation time and reduces complexity and processing time.). Basically this android app will only be provided to the teachers or the teaching staff of the department and not for the students or the non-teaching staff.

Functions of this application

1) Record attendance
2) Edit attendance
3) Export attendance

For overall development of this android application, the following tools are required:

- **Eclipse IDE**
  
  Eclipse is an integrated development environment (IDE). It contains a base workspace and an extensible plug-in environment for customizing the environment. Eclipse is written mostly in Java and its primary use is for developing Java applications, but it may also be used to develop applications in other programming languages.

- **Android SDK**
  
  The Android software development kit (SDK) includes a comprehensive set of development tools. These include a debugger, libraries, a handset emulator based on QEMU, documentation, sample code, and tutorials.

3. Website

Website also plays a significant role in this system as it is used for various functions in the database such as storing attendance, generating defaulters etc. and export it to the Remote MySQL database. The website is hosted on one web server accessible via a network such as the Internet. All publicly accessible websites collectively constitute the World Wide Web.

3.1 ASP.NET

We have used ASP.NET framework to build this website. ASP.NET is an open-source server-side Web application framework designed for Web development to produce dynamic Web pages. It was developed by Microsoft to allow programmers to build dynamic web sites, Web applications and web services. It was first released in January 2002 with version 1.0 of
the .NET Framework, and is the successor to Microsoft's Active Server Pages (ASP) technology. ASP.NET is built on the Common Language Runtime (CLR), allowing programmers to write ASP.NET code using any supported .NET language. After four years of development, and a series of beta releases in 2000 and 2001, ASP.NET 1.0 was released on January 5, 2002 as part of version 1.0 of the .NET Framework. ASP.Net is very convenient as well as user friendly framework to build webpages as it provides a pluggable Web API as it helps you to build and consume HTTP services easily.

3.1.1. Attendance Management Website

The proposed solution also contain a website hosted on a remote MySQL database which is world’s most widely used relational database model (RDBMS) , in which data exported from Attendance Management App is getting stored. Every Student and teacher is provided a username and password. Restricted access is given to students and teachers. Apart from student and teacher, there is also an admin login. Admin has access to all the operations. This website is developed using ASP.NET. MySQL database is used for back end data storage. Along with this, CSS is used with markup languages to change the appearance of website. All the records entered using Attendance Management App are stored in this MySQL Database.

Tools used to develop website are:
   i) Visual Studio 2010
   ii) Xampp
   iii) MySQL Workbench

The Website is divided into three segments;

1) Student Login
   • Student can view his/her attendance.
   • Student can view his/her profile.
   • Student can view timetable.

2) Teacher Login
   • Teacher can view his/her own profile.
   • Teacher can view class wise attendance.
   • Teacher can generate defaulters in his/her own classes.
   • Teacher can view timetable

3) Admin Login
   • Admin can add and edit new student.
   • Admin can add and edit new teachers.
   • Admin can add new timetable.
   • Admin can view attendance of each and every student in institution.

4. Conclusion

So the proposed system gives a feasible solution for current system in school and colleges. The new system is paperless, easy to use, and easy to manage. The new system gives framework for recording and compiling attendance and thereby making tedious work in current system simple and efficient. So this prototype is not only cheaper but easy to install unlike other systems like biometric and RFID devices which includes stretching of long wires and wall mounting. [4]

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