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Design and Development of Android based Attendance Management System

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Abstract

Now a days, it is highly possible to adapt mobile computing in various applications. The portability, open source nature of smart phones and android development platform has made the development of application software for various environments as handy. Smartphone applications are resulted in paper less work, easy to use and time saving in nature. The wireless communication technology of smart phone enables the information transfer from the current client to remote database server, where ever the network range is available. The Attendance Management System is a mobile computing software application, which focusses on an activity or function, which is based on management information system of academic institutions. In this work, the systems functionalities are categorized as a group and the similarities in grouped functionalities are designed and developed with reuse of software components.

Keywords: ANDROID Apps, Management Information System, Software Engineering, Paperless Office, Attendance Management System.

1. Introduction

The mobile computing and mobile based application processing are being popular in all environments and it is not exceptional to academic institution too [1]. The conventional and traditional mode of attendance management system (AMS) leads lot of paper work and it is hard to maintain for a long period of time. Due to the nature of manual work, it is hard to perform the activities related to the management of attendance, when there is a need in taking reports of specific interest and there is a chance of committing error in recording the data and information on the records.

The computerized automation of academic attendance management system is available in the form of personal computer based application and available in various computing platforms [2][3]. The various topology equipped, PC based management applications are running efficient and effective manner in many institutions and are being in the category of either internet based applications or intranet based applications [4]. The first category of internet based management applications, the system at backend is in need of live server deployment of its database server. The second category of intranet based management applications, the system at backend is implemented within the local network as local database server. This computerization of management systems provides the organization or institution to manage their academic/administrative activities in effective manner and is accessed by their all types of system users along with the support of 24/7. The system with mobility in the form of portability provides much accessibility. The mobile application based academic management system provides paper less activities, comparing with traditional and personal computer based computations. In this proposed, "design and development of Android based Academic Management System" (AAMS), the properties based on software engineering like ease of use, effective GUI, flexible in accessibility, and employing MIS principles are considered.

2. Conventional Automation of AAMS

The conventional automation is very essential, when the existing system is analyzed and designed toward complete automation. The conventional mode of development provides the users, to experience the previous mode of operations, even it is now available with complete automation. The heterogeneous computing deals with this project in the manner of combining the computing's of mobile and PC based together to provide basis of computing for this application [5]. In this project, the traditional mode of manual attendance management, is replaced with PC application based and mobile app based activities. As for PC and mobile the platform of operating system is planned as Android OS.

The mobile based platform of android OS is available on the market for smart phones. The application for the smartphone development is supported by google with various range of API's in the name of Android Development Tool (ADT). The various API's of google android platform provides a developer to design and develop his interested application for mobile with ease of use. The Android development tool includes Java, Eclipse for Android Development as IDE, Android

SDK (API's are included) and Emulator. These development software tools are available for free of cost as open source products. The developer will have full privilege over the developed application and can be distributed as open source product to the market for further development [6]. The android applications are termed as simply "Android Apps". Android OS is available in the name of "Android-x86 - Porting Android to x86", which can be installed (ported) in a PC (x86 alone and not for 64 bit processor) [7]. This gives the advantage of working with Android OS even from PC.

3. Design of AAMS

The design of AAMS is having two categories of plan in it. The first plan is based on technical aspects and includes client / server computing architecture, medium of communication

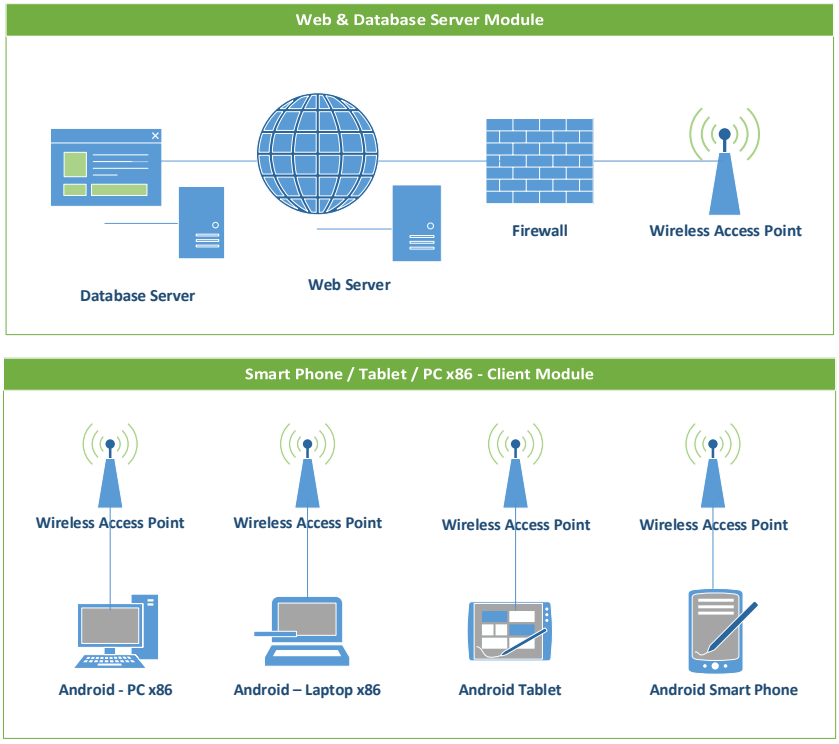


Figure 1. Design of AAMS based on Technological Plan.

devices [Client (PC/Laptop/Tablet/Smart Phone), Server (Web/Database), Wireless Access Points] involved, application security details, and maintenance details of the entire system. The second plan is rest with implementing the principles of management information system to make the entire system effective by which the management users can access the system according

to their need and produce sufficient soft reports for analysis and take decision. The decision making effectiveness using the AAMS is proposed in the second category of plan.

A. Technological Design Plan

The requirement analysis is the main step in any design process. The client/server architecture based base design is the first step in technological design. The devices based on android platform like smart phones, tablet pc, laptops, and PCs are taken as client in this system. The client acts as a front end part and server acts like back end part of the system. At the server end a web server with database server / application server stores the data / information, collected from clients (front end part) and fed into databases (back end part). As a communication medium, the wireless internet is used; the smart phone and tablet pc can be connected and communicated with servers using mobile internet access / WiFi access points of the organization. A PC or Laptop or both are communicated with the internet infrastructure available on the organization/institution. The server mentioned is an online live server.

B. MIS based Design Plan

The AAMS is mainly designed, developed and implemented in any institution, for needful effective decision making by the management users. As the parts of management function, the existing manual mode of planning, controlling and decision making activities are taken into account and focused on computer based manipulation during design. The academic activities plans like time table schedule, faculty subject allotment and alternate faculty etc. are computerized with activity specific management rules and regulation. Then the management specific information system (IS) and its database schema is developed. At final with the academic management specific rules and regulations, the MIS is structured and ready at design phase. At the next stage, decision making concepts of MIS and its relevant details are listed and verified with the specific management needs correspond to strategic, tactical and technical decision making with optimized decision model. The users of the system is defined, and their role on the system access and the restrictions on the user accesses are defined. The exceptional management details of the institution for academic management is structured and focused at the time of development [8].

4. Development and Implementation of AAMS

This new automation system is embedded into android application which runs in mobile phone. In proposed system the faculty will mark the attendance using their respective android OS based device. On real time, the attendance is made available in the database server (on live server) by the faculty during the class conduction duration.

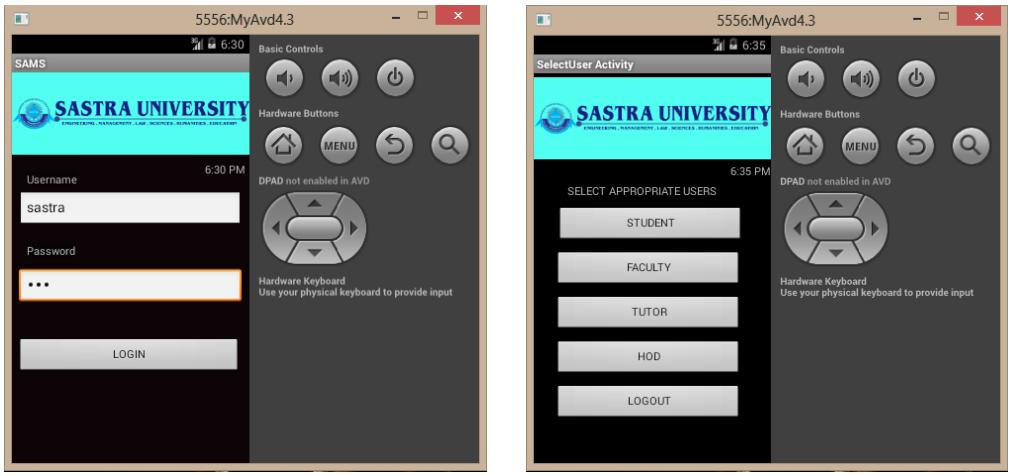
A. Characteristics of the AAMS

1. Fasts up the process of attendance marking in the centralized database.
2. User friendly and enhanced GUI
3. Easy analysis of data.
4. Better user interface and transparency of data.
5. Reduced dependency on data.

B. Modules

1. User Module – Student, Faculty, HOD, Top Management

The main purpose of the user module is to provide accessibility of users. In this module, the various users of the institution are provided with their authentication to access the database for their operations.

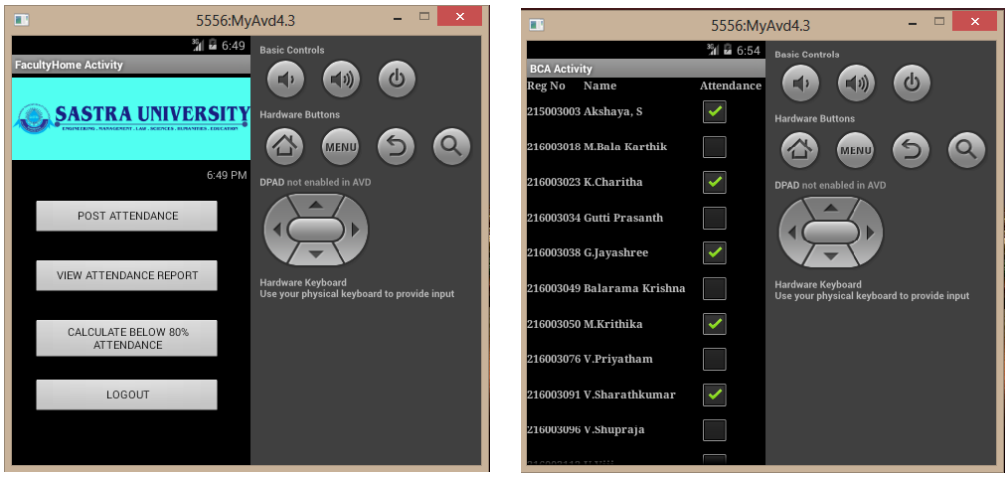


(a) (b)

Figure 2. (a) General login of AAMS (b) Various users login

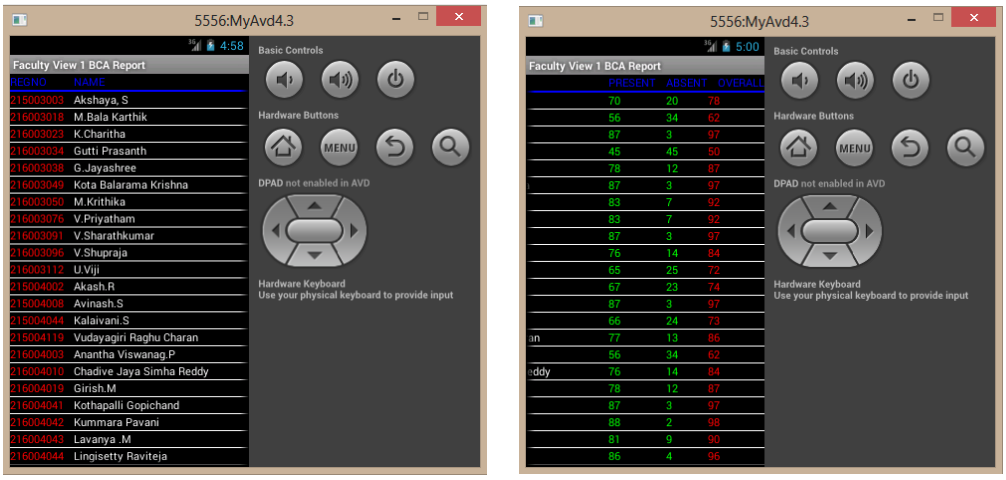
2. Attendance Entry Module - Faculty

The purpose of Attendance Entry Module is to enter the attendance using Android device. In this module faculties mark the attendance using the android app. Faculty selects the branch, semester and year.



(a) (b)

Figure 3. (a) Faulty login of AAMS (b) Attendance marking by faculty



(a) (b)

Figure 4. (a) AAMS Subject wise semester Report (b) Attendance marking by faculty

3. Update Database Module

The first function of this module is to update the attendance list from the android phone. When the attendance data list from the android phone receives, server automatically updates its database. The server updating the database whether any change from android phone occurred.

4. Internet Connectivity Module – Android Client to Web Server based Online

As for the live web server, www.uhostfull.com based free hosting server account is used to deploy the database and PHP scripts [9].

5. Discussion

In present system, faculties are marking the attendance directly in the paper and post them as data entry in server manually. The whole activities are stored in the database; at the end of the semester or session report will be generated by needful manner. The existing system is not user-friendly because the retrieval of data is very slow. The current system consumes more time. For computer system, it is hard for the faculty to carry along with them. All problems of existing system is taken into account; the new optimized system with automation is used in this project.

6. Conclusion

This app helps the faculties to reduce their work stress by reducing the time and calculations required to update the attendance manually. The various levels of management personals are utilizing the app in variety of ways like, viewing the attendance, performance details of students. By using this optimized mobile app, 24/7 the management personals are accessing the information for various decision making analysis.

7. References

1) Shibata, H., "An attendance management system using mobile phones", Communications, Computers and signal Processing, 2005. PACRIM. 2005 IEEE Pacific Rim Conference on, vol., no., pp.590, 592, 24-26 Aug. 2005.
2) Zengguang Zhang; Peng Gong; Lijun Cao; Yunlei Chen, "Design and Implementation of Educational Administration Attendance Management System Based on B/S and C/S," Information Technologies and Applications in Education, 2007. ISITAE '07. First IEEE International Symposium on, vol., no., pp.606, 609, 23-25 Nov. 2007.
3) He Zonggang; Zheng Junsheng, "Design and Implementation of Student Attendance Management System Based on MVC," Management and Service Science, 2009. MASS '09. International Conference on, vol., no., pp.1, 4, 20-22 Sept. 2009.
4) Kassim, M.; Mazlan, H.; Zaini, N.; Salleh, M.K., "Web-based student attendance system using RFID technology," Control and System Graduate Research Colloquium (ICSGRC), 2012 IEEE , vol., no., pp.213,218, 16-17 July 2012.
5) Lee, V.W.; Grochowski, E.; Geva, R., "Performance Benefits of Heterogeneous Computing in HPC Workloads," Parallel and Distributed Processing Symposium Workshops & PhD Forum (IPDPSW), 2012 IEEE 26th International , vol., no., pp.16,26, 21-25 May 2012.
6) http://developer.android.com/develop/index.html
7) http://www.android-x86.org/releases/releasenote-4-4-r1
8) http://www.fao.org/docrep/w7506e/w7506e03.htm
9) http://www.uhostfull.com/index.php