Student Attendance Management System

Article *in* International Journal of Engineering and Technology · February 2018

DOI: 10.21276/sjet.2018.6.2.1

3 authors, including:

Karwan Jacksi
University of Zakho
73 PUBLICATIONS **2,995** CITATIONS

SEE PROFILE

Falah Hasan Mohammed
Duhok Polytechnic University - Zakho Technical Institute
4 PUBLICATIONS **70** CITATIONS

SEE PROFILE

Scholars Journal of Engineering and Technology (SJET) **ISSN 2347-9523 (Print)**
Abbreviated Key Title: Sch. J. Eng. Tech. **ISSN 2321-435X (Online)**

A Unit of Scholars Academic and Scientific Society, India
www.saspublisher.com

Student Attendance Management System

Karwan Jacksi[1*], Falah Ibrahim[2], Shahab Ali[3]
University of Zakho, Iraq Duhok Polytechnic University, Iraq University of Zakho, Iraq

Review Article

***Corresponding author**
Karwan Jacksi

Article History
Received: 24.01.2018
Accepted: 05.02.2018
Published: 15.02.2018

DOI:
10.21276/sjet.2018.6.2.1

Abstract: Attendance management is important to every single organization; it can decide whether or not an organization such as educational institutions, public or private sectors will be successful in the future. Organizations will have to keep a track of people within the organization such as employees and students to maximize their performance. Managing student attendance during lecture periods has become a difficult challenge. The ability to compute the attendance percentage becomes a major task as manual computation produces errors, and wastes a lot of time. For the stated reason, an efficient Web-based application for attendance management system is designed to track student's activity in the class. This application takes attendance electronically and the records of the attendance are storing in a database. The system design using the Model, View, and Controller (MVC) architecture, and implemented using the power of Laravel Framework. JavaScript is adding to the application to improve the use of the system. MySQL used for the Application Database. The system designed in a way that can differentiate the hours of theoretical and practical lessons since the rate of them is different for calculating the percentages of the students' absence. Insertions, deletions, and changes of data in the system can do straightforward via the designed GUI without interacting with the tables. Different presentation of information is obtainable from the system. The test case of the system exposed that the system is working enormously and is ready to use to manage to attend students for any department of the University.
Keywords: Attendance Management Systems, Web Application, Absence Management System.

INTRODUCTION

Due to student's interest in classrooms, and whose is the largest union in the study environment of university or institution, so recording absence at a department having a large number of students in a classroom is a difficult task and time-consuming. Moreover, the process takes much time, and many efforts are spent by the staff of the department to complete the attendance rates for each student. So in many institutions and academic organizations, attendance is a very important criterion which is used for various purposes. These purposes include record keeping, assessment of students, and promotion of optimal and consistent attendance in class. As long as in many developing countries, a minimum percentage of class attendance is required in most institutions and this policy has not been adhered to, because of the various challenges the present method of taking attendance presents. The process of recording attendances for students was in the form of hardcopy papers and the system was manually done. Besides wasting time and taking efforts for preparing sheets and documents, other disadvantages may be visible to the traditional one due to loss or damage to the sheets-sheet could be stolen.

The developed system considers as an alternative to the traditional one, it is easy, fast and reliable than the traditional one, especially after the development of information technology and its usage by educational institutions. Therefore, the design of student attendance system has a significant reality meaning.

The system is a Web-based application developed for daily student attendance in departments within the university. It facilitates access to the attendance of a particular student in a particular class. This system will also help in generating reports and evaluating the attendance eligibility of a student. The system is not only improving the work efficiency, students' study and development, but also can save human and material resources.

Related Work

Recently, there has been so much research in the development students absence and attendance system, some of which include Internet systems like web-based system, mobile-based attendance system, some of the others computerized attendance system with hardware technology like fingerprint based attendance system, iris-based attendance system, face recognition based attendance system, RFID (Radio Frequency Identification) based attendance system, and others need communication technology like Bluetooth

based attendance system, NFC (Near Field Communication) based attendance system [1] and other systems such as using technologies utilized in [2–4].

According to [5] Web application attendance management system used SMS software technology to send SMS easily to student parent. The system can store in details all data about the students and those cares absent. The advantage of it using efficient techniques to store and update the student attendance and report in the Web Site rather than wasting the paper as well as decreasing the faculty's time also.

The system has other technique to register the attendance according to [6] Web service for student attendance management system is used a QR Code technology to register the student presence by scanning the QR Code using a QR Code scanner. Then this information delivered to the server, where the server makes the call to the API.

There is multitude developed Web-Based Student Attendance System using Radio Frequency Identification technology will significantly improve the current manual process of student attendance recording and tracking system, especially in a university or school environment because it is easy to connect data of internet. The system promotes a semi-automated approach in capturing the student attendance, i.e. by having the students to flash their student cards to the RFID reader [7-10].

In most institutions attendance part of student's continuous valuation or there have conditions that student must be met before they allowed to sit for examinations so very important to use attendance management in educational institutions. The system required minimal hardware, NFC tag, and NFC-enabled mobile device. The benefits of like these systems eliminate many paper works involved in it, removing the opportunity of losing attendance data, can generate different presence reports easily by a click of a mouse, etc [11,12].

The proposed system i.e. web-based system the most common attendance system that available because it is friendly and easy to use, less cost, no need extra hardware, and more than this a student cannot intentionally register fake attendance record in the daily presence sheet. So the next section will explain in details.

Design and Implementation

The Student Attendance Management System (SAMS) has designed with the MVC architecture and implemented with the powerful Laravel Framework. In order to increase use of the application and make it easy to use and attractive, JavaScript and its jQuery libraries, and AJAX use. In this section, explain the system contents will be presenting.

Database

The system uses MySQL as a language for the database, and the migration techniques for selecting a different type of databases for the system such as SQL Server, SQLite, etc.

Tables

Eight tables have used for the system to has been implementing. The tables are Object, Staff, Department, Course, Staff Course, Student, Record and Absence tables. The tables have normalized prior the implementation phase so as not to get redundancy in the facts to been a store. Later, relationships among them have created. Figure 1 shows the details of the tables and their relationships.

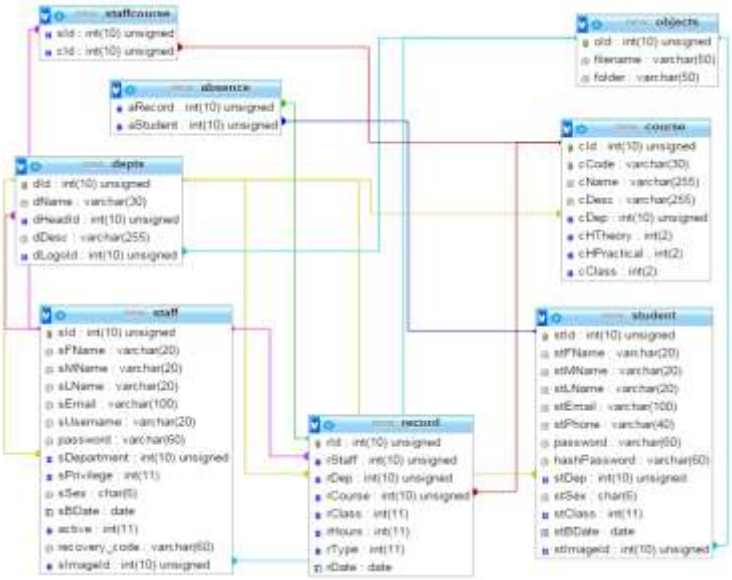

Fig-1: System Tables and their Relationships

Interface

The application is design with the latest technology of user interface designs by means of its simplicity, lightweight weighted pages, and responsive to all device screens. The system uses Bootstrap framework within it to increase the intuitive perceptions to the user.

System diagram

The system's diagram can illustrate in figure 2, starts from the simple page which works like the main gate to the system. There are two types of pages, staff and student pages. Each of the pages asks about the login details which is an email and password, after entering the correct credentials, the users will go to their entrance. For students, a simple page that built containing student name, department, class, picture and all the involved courses with their attendance proportions. For the staff login, the entrance console is different depending on the role of the staff, which has described in the following section.

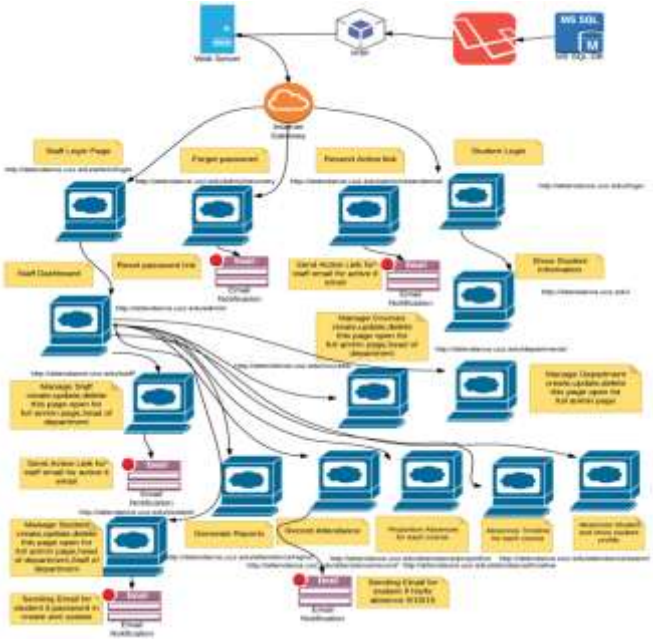

Fig-2: System Diagram

Core of the system

The system consists of two main parts, public, and private site. The public site is where everybody can visit it, while the private section is limit to authorized people. The public part consists of a simple page asking for the log in details. So, anyone with the credentials can log in and check his/her attendance details. The private part has designed for staff of the system. There are 5 types of users for this part similar to the staff of University, and they are lists below from the highest level of privileges to the least level of privileges:

Full Admin User (FAU),

This type of user is normally used by the university registration directory to register all the details of students at the University. This user has all the privileges over the system to control everything within the system. Through this user, HDUs are creating.

Head of Department User (HDU),

The head of the department at the university uses this user type to manage the department students. This user can create courses, credits of the courses, theoretical and practical hours for each course, create, department staff, lecturers, and assistant lecturers. This function used to assign the teachers to their courses. With the privileges of this user, editing the attendance details is possible to including the removal of a student attendance.

Since the students at each department are categorizing according to their classes (stages), therefore, the first thing this user has to do is to create the department classes. Normally there are 4 classes/stages in each department to assign students to their classes.

Afterwards, the courses are creating for each class, and students having these courses was inserting into them. Later, the lecturers will assign to each course.

Staff of Department User (SDU)

This type of user works like a secretary of the department. Within this role, can show all the department's specifics, such as general information, staff details, course details, and classes. The attendance information of involved students can also be

discovered, and they can generate reports. Reports can customize as follows: 1) all department students report, 2) a specific class report, 3) a specific course report, or 4) a specific student report. Reports can generate and downloaded as PDF or Spreadsheets formats.

Theoretical Lecturer User (TLU)

This type of user is using by lecturers to manage their course students. Using this role, attendance of theoretical hours and practical hours can record. However, they cannot remove or edit attendance details.

Practical Lecturer User (PLU)

This user assigning to a practical part of courses, so they only can record practical hours of a course.

System features

There are several features available within the approach such as statistics, search function, report generation, recording login details and much more. When a staff enters its console, a dashboard is designing for them. The features of this dashboard depend on the privileges of the logged user. Statistical materials are available for the user which provides up-to-date information for the user. The search function can use for a specific student. The function uses Ajax to connect to the database and retrieves relevant information while typing in the search entry box. Auto-complete widgets offer suggestions while typing into the field showing suggestions for the selected entry.

While generating reports, there is a wide flexibility inside the proposed system. Besides customizing the type of report producing as stated in SDU section above. Two main categories can select. The first one, using the date of the report, for instance, creates a report for a specific class and specific date, or for a specific course from a first date to an end date. The second group is by using the proportions of the attendance, such as producing attendance reports that have 5% absence rate, this will generate a report containing all students that have only 5% absence rate. Furthermore, the reports are creat using two thresholds such as from 2% to 10%, and then this time it will take only students within this range.

Another feature of the system is to record the logged information for the staff attendance who made. This is a very important feature to increase the reliability and truthiness of the system. This information includes the name of the staff, date, and the hours of absent the course that has been taken such as practical or theoretical part of the course.

A complete history for each student is kept in the system from the student time assigning to the course until he/she passes the course. This is also useful for the department to check the student attendance activities. When students absence arrive their 5% rate for a specific course, a notification email send to them with intend informing them about the risks to been fail in that specific course.

Conclusion and Future Work

Attendance management is significant to all organizations such as educational institutions. It can manage and control the success of any organization by keeping track of people within the organization such as students to maximize their performance. The proposed system offers the process of monitoring attend students, it aims to help the teacher in the classroom or laboratories to manage and record students' presence electronically and directly without the need to list on paper so it will save time and effort. The system can analyze the data and displays statistics about the student‘s absences, printing report about absence percentages and students warnings for the specified period. The developed system easy to use and friendly that has an attractive and simple GUI is design so that insertions, deletions, and changes of data can do easily without interacting with the tables, so it was designed with the MVC architecture and implemented with the powerful Laravel Framework. In order to increase use the application and make it easy to use and attractive, JavaScript, jQuery and AJAX have used. MySQL use for the application Database which stores the data for long period.

The application’s test case revealed that the system is working exciting and is ready to use to manage students attend for any department of the University, College or Institute.

Since our system is modular and can extend effortlessly, the future work ambitions are to make the system takes attendance by other methods such as face recognition and using Biometrics (fingerprint) techniques, NFC mobile devices, or RFID Systems. Furthermore, we would like to make the system to manage and record the attendance for the staff of the university.

REFERENCES

1. Patel UA, Swaminarayan Priya R. Development of a student attendance management system using RFID and face recognition: a review. Int J Adv Res Comput Sci Manag Stud. 2014;2(8):109–19.
2. Jacksi K. Design and Implementation of Online Submission And Peer Review System: A Case Study Of E-Journal Of University Of Zakho. Int J Sci Technol Res. 2015;4(8):83–5.
3. Jacksi K, Badiozamany S. General method for data indexing using clustering methods. Int J Sci Eng. 2015 Mar;6(3):641–4.
4. Jacksi K, Dimililer N, and Zeebaree SR. State of the Art Exploration Systems for Linked Data: A

Review. Int J Adv Comput Sci Appl IJACSA. 2016;7(11):155–64.
5. Gangagowri G, Muthuselvi J, Sujitha S. Attendance Management System.
6. Anitha V Pai, Krishna A, Kshama PM, Correa M. Web service for student attendance management system. www.ijarse.com. 2016 Mar;5(3).
7. Arbain N, Nordin NF, Isa NM, Saaidin S. LAS: Web-based laboratory attendance system by integrating RFID-ARDUINO technology. In IEEE; 2014. p. 89–94.
8. Srinidhi M, Roy R. A web enabled secured system for attendance monitoring and real time location tracking using Biometric and Radio Frequency Identification (RFID) technology. In IEEE; 2015. p. 1–5.
9. Arulogun O, Olatunbosun A, Fakolujo O, Olaniyi O. RFID-based student's attendance management system. Int J Sci Eng Res. 2013;4(2):1–9.
10. Kassim M, Mazlan H, Zaini N, Salleh MK. Web-based student attendance system using RFID technology. In IEEE; 2012. p. 213–8.
11. Ahmad BI. TouchIn: an NFC supported attendance system in a university environment. Int J Inf Educ Technol. 2014;4(5):448.
12. Benyo B, Sodor B, Doktor T, Fördős G. Student attendance monitoring at the university using NFC. In IEEE; 2012. p. 1–5.