A Review on Webbased Classroom Surveillance and Attendance Monitoring System Using Biometric

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Abstract - Attendance has become more important part for any organizations/institutions. Recording and monitoring of class attendance is an area of administration that can require significant amounts of time and effort in a school/university environment, largely due to the amount the time required in conferences to obtain the long-term maintenance requirement increases the difficulty of this task and is very time consuming. For this reason, an efficient system is designed. This using a fingerprint sensor and all recordings are stored on a computer server. Fingerprint sensors and OLED screens are placed at the entrance of each class room. In order to mark the presence, the student must place their finger on the fingerprint sensor. On identification student's attendance record is updated in the database and he/she is notified through OLED screen. For the administration you need all fixed equipment and special staff. Furthermore, an automated system replaces the manual system.

Keywords: OLED Screen, Fingerprint Sensor, Attendance Monitoring System.

I. INTRODUCTION

The presence system is updated with a fingerprint technology and embedded systems. The device reads the finger patterns from the fingerprint technology and verify this data with the already saved model in our database. [7] If the database information matches the system recognizes with the stored fingerprint trend. If the finger details do not match the data stored in the database. The system is designed so that it can be used and can also connect to a PC to print presence or for whose presence is occupied.[8] This paper discusses the problem described above such as time wastage, inconsistent data entry, duplicate data entry and

enter false information using fingerprints the students. Biometric attendance management will automate and replace system, register, track, monitor, calculate 75% attendance and generates a report.[11]

A presence management system is a biometric system used to register and manage attendance. First, several attendance management methods have been developed by single factor. This article will introduce a presence management system that uses fingerprints and technique to record, monitor and manage student attendance.[23] The system consists of a user interface, database, fingerprint scanner and installed at the entrance. If the student close, present your fingerprint or look directly into the iris scanner.[15] The scanner reads the fingerprint / iris to obtain the pattern and compare it with the functionalities stored in the presence management system database and shows success when fingerprint / iris is verified; otherwise, it shows the error "insert fingerprint again for verification". The system records, monitors and reports student

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attendance on a daily, weekly and monthly. It also allows to calculate 75% of student attendance [1].

Support for attending students at higher education institutions using. The paper method is a difficult task, especially if the number many students. In view of this, an integrated fingerprint is based the attendance system has become redundant to facilitate work and effective [10]. The presence management system has been developed with the help of Arduino 1.8.7 IDE, C # programming language, PHP script, MySQL database and SFGDemo software, and has been tested with fingerprint reader connected to a computer student identity verification system [2].

The system consists of five different modules including the fingerprint capture, fingerprint processing (registration or authentication), pattern matching, microcontroller, GSM modem and database[21]. The fingerprint method uses a separate finger function to identify individuals. When this system was compared to manual method, the result shows the average time student using fingerprint-based integrated attendance management system using a microcontroller and manual attendance registration 6.57 and 19.17 seconds respectively. Integrated fingerprint based [5].

The system has proven to be more efficient, safer and more sustainable when Compared to the manual method on paper [19].

With this software you can manage workforce and track the time and attendance of employees in one easier way. This software application can manage registration, control and monitoring of staff absences and delay [22]. The importance of this application is to take care of it that the employee is punctual and does his or her work on time. There is currently no adequate system for monitoring personnel visits from certain companies [3].

II. PROPOSED MODEL

A. NODEMCU ESP8266

NodeMCU is an open-source Lua-based firmware and development board dedicated to IoT-based applications. Contains firmware and hardware for the ESP12 module-based system. Figure 1 & 2 shows the physical structure of NodeMCU microcontroller.[18]

Fig. 1. Physical overview of NodeMCU microcontroller

We have used this microcontroller to send all the information of the students wirelessly to the database. It also enables the fingerprint sensor to communicate with the server making the whole system usable portably and its smaller size makes the system lighter.[6]

It contains many scopes in the coming future. This is very easy to use. The programming of this hardly takes 5-10 minutes. The design is very simple and it is very light weighted as well. For charging this there is a slot in the front side of this as we charge our mobile with the datacable.

B. R305/R307 Fingerprint Scanner Sensor Module

This is a fingerprint sensor module digital with TTL UART interface for direct connections to the UART microcontroller or to the PC via MAX232 / USBS on the module and then configure it in mode 1:1 or 1: N for identification person.[9]

Fig. 2 Finger Sensor

The fingerprint module can be directly connected to any microcontroller and to the arduino board. This biometric optical fingerprint reader of finished products such as access control system, attendance system, safe box, car door with locking system [20].

The fingerprint sensor is very fast it reads the thumb in short span of time. And as the thumb is accessed the attendance is marked in the dashboard. In this the faculty

has to scan his finger twice for marking his or her attendance at the same time.

C. 0.96" I2C OLED Display

This is a 0.96-inch blue OLED display module. The display module can be connected to any microcontroller that uses SPI/IIC protocols. It is a display panel, screen, 4 pin male headers soldered to the board before.[26]

Fig. 3 OLED Display

OLED (Organic Light Emitting Diode) is an autoluminescent technology composed of a thin organic film of several layers placed between them and which does not require a backlight [4]. OLED has a high application potential for practically all types of displays and is considered to be the latest technology. Online DDL, Nested SELECTs, Cursor etc. We used MySQL DBMS to store the information of the student's attendance. We have designed a relational database to maintain the data. There are three primary tables [16]. This is the registration process, student information and course information. There are reference tables for maintaining the Attendance and Results. The database is connected to Web Application and Web application query into the database table according to the client request [12].

The OLED display gives the clear view to the checker. As the display is very high quality so it provides a great view to the viewers. OLED display is the latest technology in the market. And OLED has so much demand in the market [28].

III. BIOMETRIC SENSORS

A biometric sensor is a device (or transducer, to be precise) that converts an individual's biometric trait into electrical signals. Biometric sensors are typically semiconductor devices that process images of an

individual's physical characteristics using complex algorithms [24].

Many physical characteristics of a person, such as face, iris, fingerprints, etc., are scanned with a biometric sensor and converted into a digital image by an analog-to-digital converter [30].

This digital information of the person is stored in a memory and is used to verify or authenticate his identity.

We have seen about the sensors and the different types of sensors in the previous tutorials. Biometric sensors are becoming more and more important and useful because they are more efficient, accurate and offer more security [29].

Most modern smart phones (at the time of writing this tutorial) include at least one fingerprint sensor to authenticate the user, while some high-end phones provide additional biometric sensors such as iris scanners and facial recognition technology [14].

IV. Data Collection Process

As soon as the student or the faculty scan the finger the data is collected of a particular person. This data is shown on the screen of desktop or a laptop to the Head of the department and as well as the Principal [13].

The data is collected every lecture wise of student and the faculty. This data is shown in the format of number of students present in the particular lecture. The exact time at which the faculty has started the lecture [25].

As well as the at what time the student is entering the classroom is he on time or he is late. By this the principal will not have to wait for checking the attendance of every department. He can directly check it on the screen. The fingerprint sensor saves the data in the system [17]. The data stored in the system is permanent type and it is accessible to higher authorities. Whenever they want to check it [27].

The advantages of the system are as follows.

- 1) The main advantage is that the principal will not wonder for the attendance. As he can check it by its own his screen of desktop or laptop.
- 2) The main desire of this project is time saving of both student as well as the faculty.

- 3) By this system the principal and the faculty will have the keen focus on the attendance.
- 4) And if the student is not attending the lectures regularly this will be directly shown to the faculty and to the principal. And they can call the student immediately.
- 5) By this the results of the students will definitely improve. As the student will be more attentive in the lectures.
- 6) As the student will definitely fear for bunking off the lectures.
- 7) And this will definitely lead to 100% attendance in the classroom.

V. CONCLUSION

After going through the basics of the manual and system based on automated biometrics; can conclude that the need for an automated attendance monitoring system cannot be overemphasized. The manual system has many drawbacks and can be easily run by staff. Hence, it is concluded that the system is more effective and efficient in controlling the presence of the staff. The future scope of this study can be implemented using presence system for facial recognition. Because of the advantages of the automated control system the presence of the personnel developed in this study is the system. It is hereby recommended to all private and government sectors organizations in Nigeria to make appropriate records and management of personnel activities in your organization.

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