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IOT ENABLED SMART STUDENT ATTENDANCE SYSTEM USING RFID

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Abstract

The application of RFID to student attendance monitoring as developed and deployed in this study is capable of eliminating time wasted during manual collection of attendance and an opportunity for the educational administrators to capture face-to-face classroom statistics for allocation of appropriate attendance scores and for further managerial decisions. The smart and automated attendance system for managing the attendance can be implemented using the various ways of bio-metrics. Finger print sensor is one of them by using this system the issue of fake attendance and proxies can be solved. This smart system will be an effective way to maintain the attendance and records of students. The students IN time and EXIT time is informed with the text Message to the corresponding educational administrator. And the presence of the student in the classroom is monitored with the help of the RFID tracking system.

Keywords: RFID, Bio Metrics and Finger Print Sensor.

1. INTRODUCTION

The attendance maintaining system is difficult process if it is done manually. The smart and automated attendance system for managing the attendance can be implemented using the various ways of bio-metrics. Finger print sensor is one of them by using this system the issue of fake attendance and proxies can be solved. The major steps in this system are detecting the finger print and sensing them. After these, the comparison of detected finger print can be done by cross checking with database of students finger prints. This smart system will be an effective way to maintain the attendance and records of students.

1.1 RFID

An RFID system consists of three components: A scanning antenna and Transceiver (often combined into one reader, also known as an interrogator) and a transponder, the RFID tag. An RFID tag consists of micro chip,

memory and antenna. The RFID reader is a network-connected device that can be permanently attached or portable. It uses Radio frequency waves to transmit signals that activate the tag. Once activated, the tag sends wave back to the antenna, where it is translated into data. There are two main types of RFID tags: Active RFID and Passive RFID.

1.2 IOT

The Internet of things (IOT) refers to the concept of extending Internet connectivity beyond conventional computing platforms such as personal computers and mobile devices, and into any range of traditionally "dumb" or non-internet-enabled physical devices and everyday objects. Embedded with electronics, Internet connectivity, and other forms of hardware (such as sensors), these devices can communicate and interact with others over the Internet, and they can be remotely monitored and controlled. ` The definition of the Internet of things has evolved due to convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems. Fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), and others all contribute to enabling the Internet of things. In the consumer market, IOT technology is most synonymous with products pertaining to the concept of the "smart home", covering devices and appliances (such as lighting fixtures, thermostats, home security systems and cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smart phones and smart speakers.

1.3 CRYPTOGRAPHY

Cryptography also allows senders and receivers to authenticate each other through the use of key pairs. There are various types of algorithms for encryption, some common algorithms include Secret Key Cryptography (SKC) and Public Key Cryptography (PKC). In SKC only one key is used for both encryption and decryption. This type of encryption is also referred to as symmetric encryption. In PKC two keys are used. This type of encryption is also called asymmetric encryption. One key is the public key that anyone can access. The other key is the private key, and only the owner can access it. The sender encrypts the information using the receiver's public key. The receiver decrypts the message using his/her private key. For non-repudiation, the sender encrypts plain text using a private key, while the receiver uses the sender's public key to decrypt it. Thus, the receiver knows who sent it. Hash Functions: These are different from SKC and PKC. They use no key and are also called one-way encryption. Hash functions are mainly used to ensure that a file has remained unchanged.

2. EXISTING SYSTEM

Remote monitoring system is a real-time monitoring system that monitors the system from a remote/mobile location. The conventional method of taking attendance by calling names or signing on paper is very time

consuming and insecure, hence inefficient. Radio Frequency Identification (RFID) based attendance system is one of the solutions to address this problem. This system can be used to take attendance for student in school, college, and university. It can also be used to take attendance for workers in working places. Its ability to uniquely identify each person based on their RFID tag type of ID card make the process of taking the attendance easier, faster and secure as compared to conventional method. Students or workers only need to place their ID card on the reader and their attendance will be taken immediately. With real time clock capability of the system, attendance taken will be more accurate since the time for the attendance taken will be recorded. The system is connected to the computer through RS232 and store the attendance taken inside database. The proposed system utilized GSM short message service to perform remote data monitoring. The communication software written in VB language achieved efficient control of serial interface port and real-time synchronization of remote data into system database. Limitations are No proof of the concerned person belongs to that RFID tag and Low level of security.

3. PROPOSED SYSTEM

IOT Enabled Smart Attendance System Using RFID. The advantages are High security level, Cheating or fraud of attendance can be identified, Data are encrypted and Student presence is monitored for every two hours.

4. LITERATURE SURVEY

4.1 Attendance and Information System using RFID and Web-based Application for Academic sector

AUTHOR: Hasanein D.Rjeib, Nabeel slih Ali

CONTEXT: Recently, students attendance have been considered as one of the crucial elements or issues that reflects the academic achievements and the performance contributed to any university compared to the traditional methods that impose time-consuming and inefficiency. Diverse automatic identification technologies have been more in vogue such as Radio Frequency Identification (RFID). An extensive research and several applications are produced to take maximum advantage of this technology and bring about some concerns. RFID is a wireless technology which uses to a purpose of identifying and tracking an object via radio waves to transfer data from an electronic tag, called RFID tag or label to send data to RFID reader. The current study focuses on proposing an RFID based Attendance Management System (AMS) and also information service system for an academic domain by using RFID technology in addition to the programmable Logic Circuit (such as Arduino), and web-based application. The proposed system aims to manage student's attendance recording and provides the capabilities of tracking student absentee as well, supporting information services include

students grading marks, daily timetable, lectures time and classroom numbers, and other student-related instructions provided by faculty department staff.

4.2 Review of RFID based Attendance System

AUTHOR: Snehal V.Baviskar, D.D.Dighe

CONTEXT: RFID means Radio Frequency Identification. It is a wireless identification technique which has become very popular these days. It is used for smart system that can be used to identify, monitor secure and do object inventory by the use of radio frequency. This technology is also used in Bank locker security system, Library Management System etc. This technique is safe, secure, faster and easy to use with lower overheads in contrast with the other conventional techniques such as bar code, biometrics etc. It has two components i.e. RFID tag and RFID reader. RFID reader is the device capable of reading and recalling information stored inside the RFID tags. This paper presents a design of an Automatic Attendance System for both students and professor with parent notification sent via GSM and it also gives report about their test marks through SMS process. This project is to simplify attendance recorder system by using RFID. This paper reviews some of these monitoring systems and proposes an RFID based student attendance system.

4.3 IOT based Smart Attendance System using GSM

AUTHOR: Dipali patil , Pradanya Gavhane , Priyesh Gharat , Urvashi Bhat

CONTEXT: In recent years there have been rise in the number of application based on Radio Frequency Identification system and have been successfully functional to different areas such as transportation, health care, agriculture and hospitality industry.IOT technology facilities automatic wireless identification using electronic passive and active tags with suitable readers. In this paper an effort is made to solve regular lecture attendance monitoring problem in developing countries using direct GSM/GPRS with IOT technology. The application of IOT to student attendance monitoring as developed and deployed in this paper is capable of eliminating time wastage during manual collection of attendance and an opportunity for the educational administrators to compile the attendance effectively.

5. SYSTEM ARCHITECTURE

An Architectural diagram is a representation of concepts, their principal elements and components that are part of architecture.

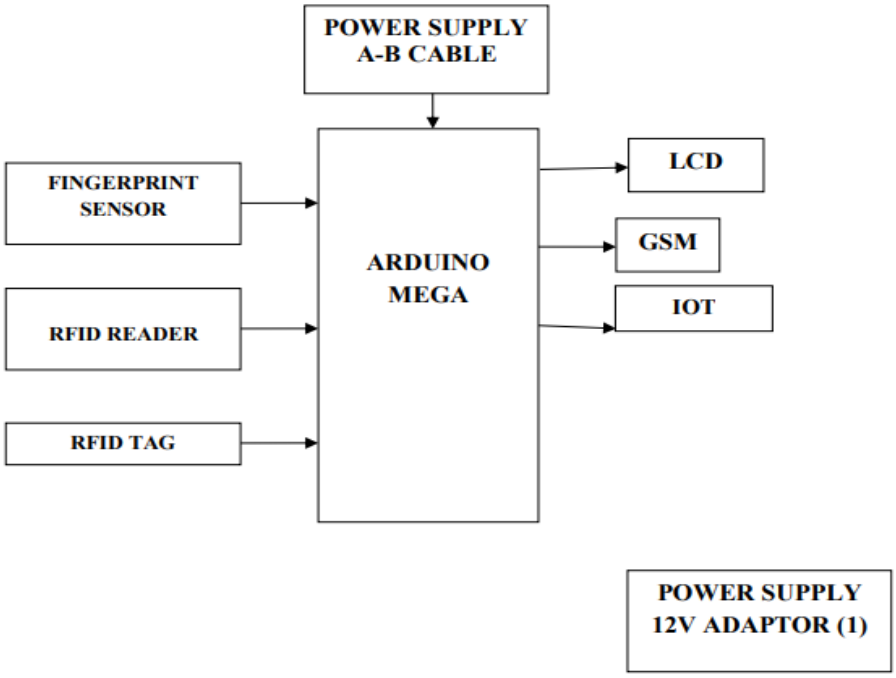

Fig: System Architecture

6. LIST OF MODULES

6.2.1 Student Registration

The details of each student are entered as per the ID card with RFID number and the Finger print. The Tag consists of the RFID number that corresponds with the Student in the Database. When the student shows the RFID tag to the reader. The reader sense by the Radio frequency wave and send the signal to the GSM to send the Alert message.

6.2.2 Alert Message

The Alert Message that consist of the Student IN time which has been sent to the corresponding parent and the staff regarding his presence or the absence to the college. For every two hours the Message will be sent to the staff to make sure his presence in the class room.

6.2.3 Database Management

The Database consists of the student attendance percentage. The percentage is calculated based on his presence and absence. In case of any special occasion (OD) the student presence is manually changed by the staff. The

staff can view an individual student attendance percentage of one particular subject for a day, week, month and for the whole academic semester.

6.2.4 Data Encryption

The data updated in the database are encrypted securely so by that only the authorized person can be able to make the changes in the database. Other than the Authorized person they can be able to view the result only. Because of this, the boosting up of the attendance in the end of the semester can be avoided because of the data that are stored in the cloud at the end of each day.

7. EXPERIMENT RESULTS

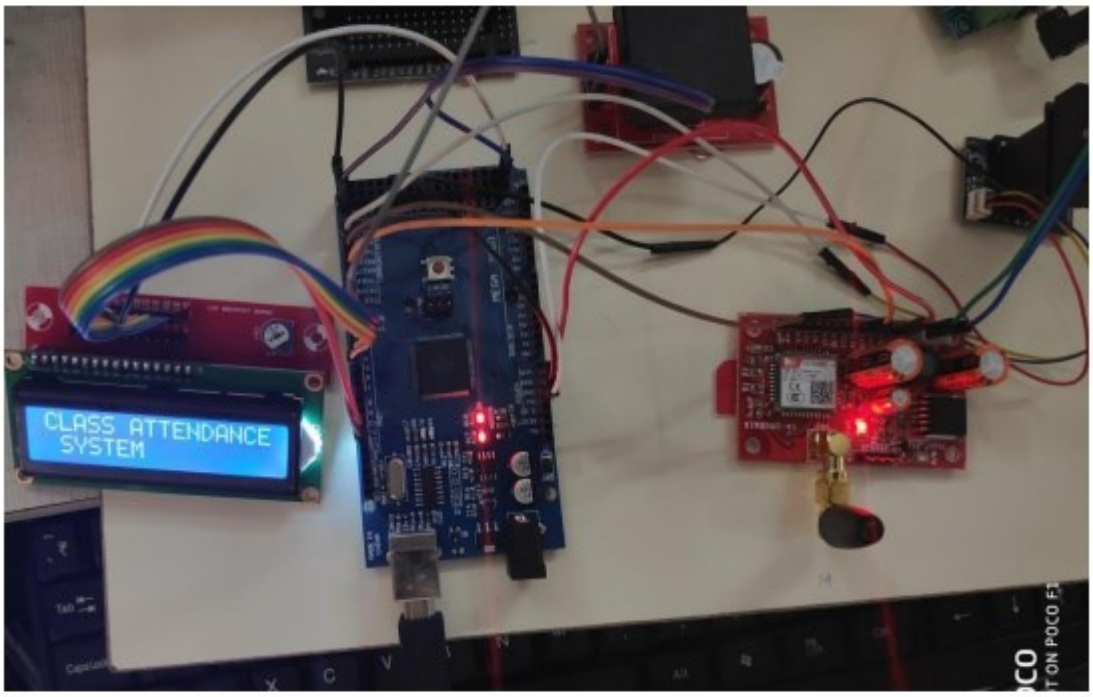

Fig: Hardware Components

Fig: LCD display

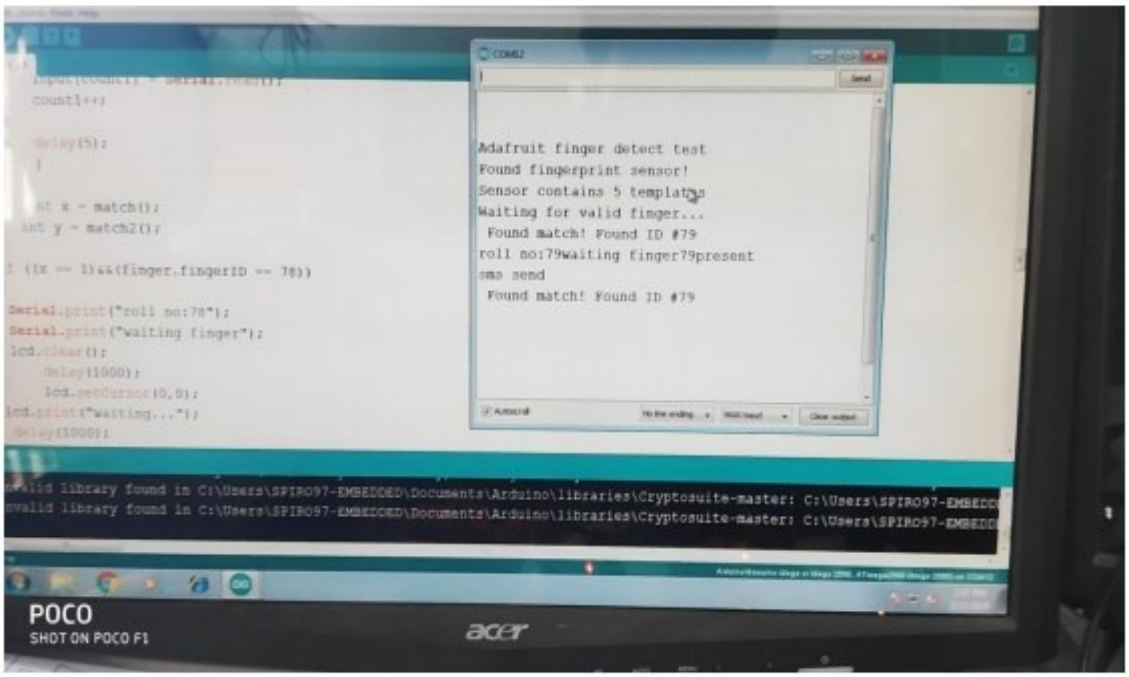

Fig: Source Code

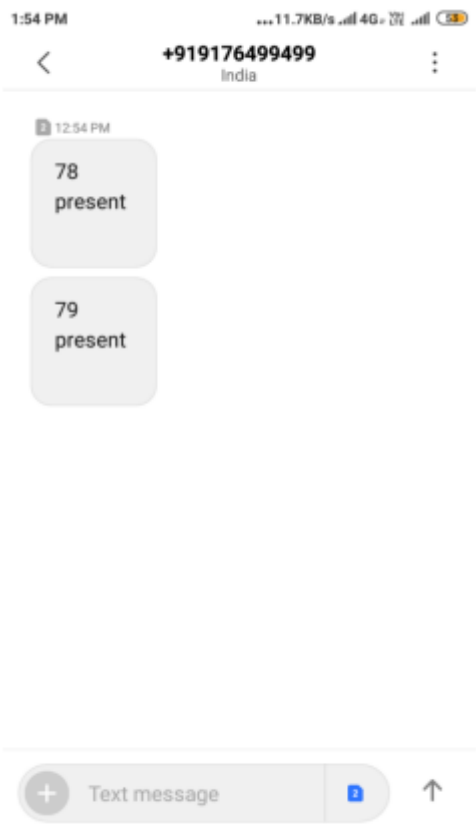

Fig: Alert Message

8. CONCLUSION

The Smart Attendance System takes less time for the students and to the staff. No more manual Attendance and cheating or disguise of another person with his tag is not possible because of the fingerprint technology. If the Student attended the class he will be marked present else he is absent for that hour. The consolidated report of the individual student and also for the whole student can be viewed by as per separate subjects and also for whole day. The report can be viewed for the days, weeks, months and also for the whole academic semester.

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