

IOT BASED SMART ATTENDANCE SYSTEM

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ABSTRACT: *Internet of things (IOT) based smart attendance system is more useful, due to manually taking attendance is a lot of time wasted. To overcome this issue, an automated smart attendance management system has proposed in different places like regular classes, conferences and training institutions etc. This design depends upon the application of RFID technology, Wi-Fi communication and IOT technology. So it is possible to collect, record and process the data on the authenticity of the student attending classes or different sessions etc. The RFID reader can also generate real-time combined detail reports on attendance, present and absent of the student during the classes. Finally we can see an attendance report on the website from anywhere and anytime.*

Keywords: *RFID reader, passive tags, buzzer, LCD, server, database and IOT technology.*

INTRODUCTION:

Now a day's many students have their own assumptions about attendance percentage in their classes. As the students should have some attendance criteria to attend for external exams, they are very curious to know about their attendance percentage.

In the manual method of taking attendance, students are required to write down their names and put the tick mark to particular students who attend the class in the attendance record book. The problems associated with this method vary from unnecessary waste of time and also improper documentation.

To overcome these problems an automated technique is implemented through Radio frequency identification (RFID) technology, Wi-Fi communication and the Internet of Things (IoT) technology. This paper also helps us to keep the attendance record without the human involvement.

The fundamental of the system work:

Each student has to use RFID tag while entering the classroom, RFID reader will recognize the RFID tags and then the RFID tags will be displayed on LCD. At the same time, the reader sends the data to the server. The data management system will search the database to get the information of student.

In this project mainly two technologies are used. They are Internet of Things (IoT) technology and Radio frequency identification (RFID) technology. This RFID technology requires some hardware components like RFID reader, RFID tags. So, this RFID technology is used for automated identification of users.

Based on RFID reader power output and the radio frequency, the RFID reader can emit radio waves in the range of 10 meters to 15 meters or more. When an RFID tag passes through the electromagnetic field range, it identifies the RFID reader's activation signal. The RFID reader decodes the data encoded in the tag's IC (silicon chip). The decoded data is passed to the host pc for processing.

An RFID device often called an RFID tag is a tiny microchip designed for wireless data transmission. It is generally connected to an antenna in a package that looks like a normal adhesive sticker. An RFID tag sends data over the air in response to RFID reader. The data transmitted by the tag provides user identification.

The remaining of the paper is discussed as mentioned below: Section II addresses about the related work, Section III addresses about the proposed system and block diagram,

Section IV addresses about the system structure, Section V addresses about the system hardware, Section VI addresses about the system software, Section VII addresses about the implementation and results whereas Section VII addresses about the conclusion.

II. RELATED WORKS:

Biometric technique:

The biometric is also a fingerprint verification technique has been used automatic attendance management system. It is the high cost effective, more power consumption and complexity of the performance.

Face Recognitions technique:

The face recognition technique developed by automated attendance management system. It is based on image processing technique. This technique main use high cost HD camera capture each students face recognition and store to the database. But unauthorized persons are coming to the class. But sometimes not accuracy results because of environments effects compare to the each students face and also slow performance and more time consuming.

Barcoding Technique:

The barcoding technology and RFID technology both same. It is a straight line technique. It stores less data compare to RFID. It's far scratched or crumpled bar codes may reason trouble while scanning. It is limited secure analyze to RFID.

III. PROPOSED PROJECT:

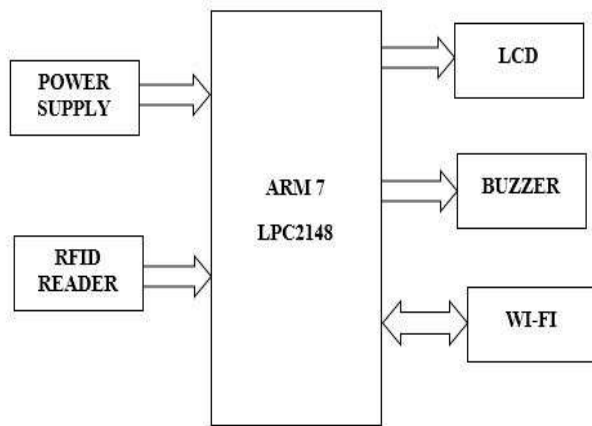
In the proposed system authenticity of the person can be identified with RFID and IOT technologies. It uses some hardware components, which includes ARM7LPM2148, RFID reader, Tags, 16x2 LCD, and Buzzer. It uses both RFID technology and IOT technology, which makes it more secured than any other systems. Initially, the authorized user's data are stored in the server or data base. An authenticate person have an own RFID tag or ID card, shows his ID card to RFID reader system before entering the classroom.

The RFID system send that ID card information to server. When a person shows the correct ID card to system, it displays attendance is successful and buzzer sound will be generated. Whenever the same ID card again shows to the system, then it displays already used and buzzer sound will be generated. Whenever the wrong ID card shows

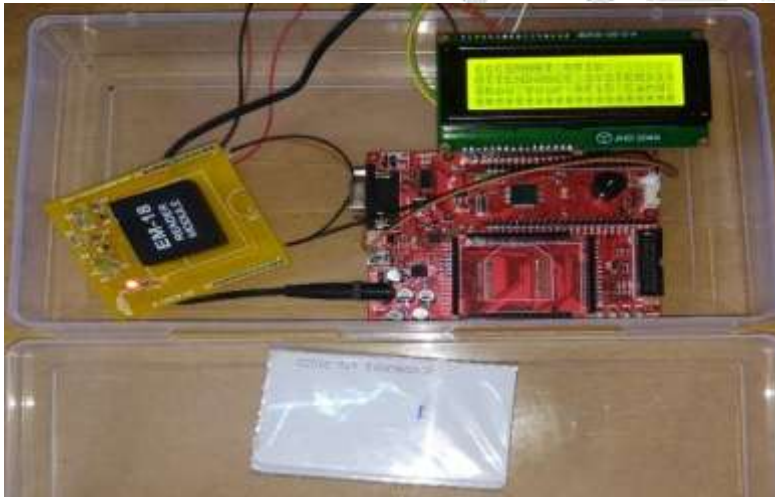
to the RFID reader system, it displays invalid data and also buzzer sound will be generated loudly.

Finally system send to the information to the server. The admin person can observe the attendance performance anywhere from the website easily.

The block diagram representation for our proposed system is as below:



IV. SYSTEM STRUCTURE:



V. SYSTEM HARDWARE REQUIREMENTS:

In this project hardware components are requires RFID Reader, RFID Tag, Microcontroller ARM7LPC2148, LCD, and Buzzer, WIFI router.

RFID READER:

RFID reader reads the data from RFID tags. An RFID reader module acts as both transmitter and receiver of continuous radio frequency signals with a particular frequency. RFID reader and tag are very close to each other, and so this working principle is based on the inductive coupling. There is no need for straight line between the reader and tags.



RFID TAG:

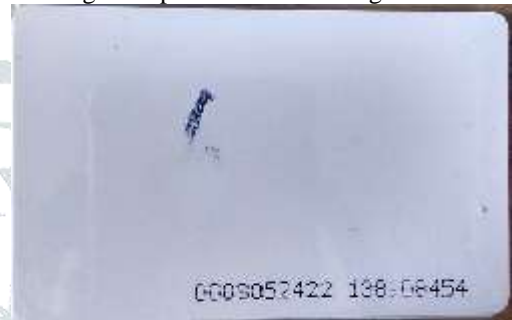
Basically RFID tag looks like small credit card size and inbuilt small microchip designed for wireless data transmission. This RFID system contains two components. They are RFID reader and RFID tag. Now this RFID tags are also coming in two ways:

I. Active tag:

Active tag have their own power supply and transmitter that sends data to the reader. It is dual antenna, data transmitting and receiving signal. So the range of active tag is more compared to passive tag.

II. Passive tag:

Passive tag do not have their individual power supply. So this passive tag relies on the radio waves which is coming from the RFID reader for the source of energy. It has single antenna and only receives the signal from reader. Less range compare to the active tag.



ARM7LPC2148:

ARM is based on RISC processors. It is 32 bit RISC processor. ARM processors made them proper for lowest power applications. It is some specific feature of LPC2148 processor. It has 40 kB of on-chip S-RAM and 512 kB of on-chip flash memory. It enables high speed 60 MHz operation and USB 2.0 flexible device full speed controller with two kB of endpoint RAM. It also has ADC converters and DAC converters. 2 10-bit Analog to Digital converters provide 14 analog inputs. DAC converter is 1 10-bit D/A converter provides variables analog output.

LCD:

LCD full name is Liquid Crystal Display. It is used as a flat display in digital watches, cameras and interfacing into the portable computers. In this project and 16x2 LCD display is used. An LCD of 16x2 can display 2 line with 16 characters on each line. It is used to display the received data from ARM7. LCD can perform the some functions such as display characters, numbers, special characters and ASCII characters etc.

BUZZER:

A beeper or buzzer is a sound signaling device. It may be piezoelectric, mechanical or electromechanical device. Typical uses of beepers or buzzers include alarm gadget, timers and confirmation of user input such as a keystroke or mouse click.

VI. SYSTEM SOFTWARE:

This project uses software tools and languages. Software tools are Kiel UV Compiler, ORCAD, and Flash Magic. Keil UV compiler is used for ARM code development, converts the embedded C code into assembly code and then as HEX file. ORCAD for using schematic development and Flash Magic tool for using Firmware uploading or dumping (.hex file) into the ARM7 microcontroller.

Languages:

The Embedded C is a set of language used for kit development and ARM processor coding. PHP and HTML language for creating internet websites.

VII. IMPLEMENTATION AND RESULTS:

All the authorized user's information store in the data base or server. Once if we give the information then it is stored with an address ID card in the server. During ID card matching, the user ID card is compared with all the address IDs. By this, we can store numerous user information in different address IDs.

This developed program is successfully burnt into the arm7 board using USB programmer.

Step1: After provide the power supply the RFID reader system initialization happens and then it displays as shown your ID card on the reader.

For every user registration process, enter every student own information details and create the website.



Step2: Read the RFID tag or ID card and compare with the address IDs stored in the server.

Add Student

Id	<input type="text"/>
Name	<input type="text"/>
Registration No	<input type="text"/>
Department	<input type="text"/>
Semester	<input type="text"/>

Step3: If the ID card matches with the details in the database then displays as attendance is successful and buzzer sound will be generated slowly.

Step4: If wrong card shows to the reader then immediately displays as invalid data and also alarm the buzzer two times.

Step5: If the same ID card shows again to the system, then it displays as already used and buzzer sound will be generated loudly.

Step6: Finally system sends the information to the server. The admin person can observe the attendance performance anywhere from the website easily.

The attendance report representation for our proposed system is as below:

ATTENDANCE REPORT FOR 2018-08-08

ID	NAME	REG No	DEPARTMENT	SEMESTER	IN-TIME
210088C74E20	M RAJESH	16001D4406	ECE	1	2018-08-08 22:08:20
21008836D847	P Harish	16001D4405	ECE	1	2018-08-08 22:08:55
21008A04C56A	G Sagar	16001D4410	ECE	1	2018-08-08 22:09:06
2100884EEB0C	Ch.Arusha	16001D4417	ECE	1	2018-08-08 22:09:15
210089595A4B	M Mahesh	16001D4409	ECE	1	2018-08-08 22:09:21

VIII. CONCLUSION:

This paper describes the successful development and prototyping of a low-cost event attendance management system. It depends upon the use of RFID technology combined with the use of Wi-Fi communication, IoT technology and data analytics delivered by the system server. It is fast, cost effective and low power consumption better than biometric and face recognition techniques.

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