IoT BASED ATTENDANCE MONITORING SYSTEM

Dr.S.Brindha[1], Ms.K.Sudha[2], Mr.A.Bala Ganesh[3], Mr.S.Nishanth[4], Mr.N.Vishnu Prasad[5]

[1,2,3,4,5]Department of Computer Networking, PSG Polytechnic College
Coimbatore, Tamil Nadu, India

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Abstract - *Most agencies combat the delicate device of retaining their guide attendance scholars. The manual approach of subscribing to the paper is long-lasting and unsafe. A high-quality attendance monitoring gadget ought to be done in "analogous places". An RFID (Radio Frequency Identification) predicated go-to gadget the usage of the IoT system is one of the consequences on deal with this issue. This paper is about the origins of the IoT- predicated Attendance Monitoring System, which identifies each persona. The pupil as having supported the RFID marker tied to their identification card. This makes the attendance recording medium royal, quick, and impenetrable compared to the ordinary system. The device is deliberate to be used in several instructional establishments, marketable services, government services, etc. The proposed technique consists of assault elements that assist IoT technology. "The attack issue includes the EM-18 RFID card florilegium and RFID labels/cards". Scholars ought to place their RFID card or marker on the florilegium and their presence will be documented the everyday. Also, the recorded visit is extra specific due to the fact the technique syncs with the real-time timer the usage of the RTC (Remote Time Clock) module.*

Key Words: IoT, RFID, Attendance Monitoring system

1. INTRODUCTION

Attendance plays a necessary role in numerous institutions, colleges and colleges are made of paper. Taking Attendance on paper into account, the probability of an error is high. This trouble can be fixed using technology, and documentation is frequently avoided at some stage in this process. Many applied sciences can assist clear up this problem. But the first class of them is RFID (Radio Frequency Identification) because names use waves of radio to discover and track objects or individuals. Communication with the excellent RFID is wireless the use of an "electromagnetic and electronic connection, where the spectrum is often used for communication". To illustrate the results, the machine is configured with the usage of the RFID card reader module and RFID playing cards/tags of the EM-18 RFID card reader mannequin. The RFID machine consists of a tag or card and a reader [1].

The Radio Frequency Identification (RFID) tag or card incorporates a unique ID, which is at the start of database information earlier than being assigned to the user. To report attendance the user must area the tag at a sure distance from the RFID reader. The tag includes the microchip, which helps to keep the special serial number useful for identifying objects. The microchip includes the microcircuit and the embedded microchip. The tag includes rewritable and everlasting memory that can be programmed several times instances over and over again.

The most common Radio Frequency Identification (RFID) reader is the primary phase of the RFID system. The RFID reader used in the detection covers a most vary of 5 cm over a hundred twenty-five (125) kHz and 12V special strength supply frequency working reader. The RFID card is used to trade facts with the RFID reader the usage of radio waves, where the tag is generated from the antenna that receives the radio waves, so the other issue is the built-in circuit, which is especially for processing and storing data. It reads records from the tag and sends them to the middle object for processing [8]. The tags are examined way of the reader at special frequencies. The reader is similarly connected to the computer to manner information made by way of using an any "wireless fidelity (WI-FI) connection or Universal Serial Bus (USB) connector". Scanning the tag toward the reader creates this kind of workload less complicated and improves the speed of the error with this type of simple system. Also, the lengthy process of attendance is prohibited for a pass/step.

The clever attendance monitoring device eliminates the usual method of registering attendance. It presents a secure, error-free attendance administration system [15]. Administrators are blissful using such a prudent attendance system. The gadget is well-suited to manipulate the body of workers' attendance. It is usual to file attendance in their lecture room for college.

2. LITERATURE SURVEY

A.A. Olanipegun and O.K. PointeBoot have carried out an RFID-based automation machine [3]. This visit computing device software program has developed the use of VB.net and also the database (Microsoft Access). Each student has the RFID tag attached to their pupil ID card. There is a series connection between the PC (Personal Computer) and additionally the RFID reader and is maintained for the connection between the RFID and also the computer. The RFID Reader is placed at the doorway of the lecture hall. The RFID reader reads the RFID tag or card on every occasion students enter the lecture hall, and it keeps the machine through the capability of storing all the scholar's data (entry time, name, etc.) within the database with the aid of the

potential of a series link. Here, the administrator of this approach can view all the archives through the use of the software program interface by retrieving facts from the database with no problem like ordinary setup [3].

Moth Myint Thein and Chaw Myat Nweand Hla Myo Tun have developed a student attendance management system that supports RFID and also the fingerprint reader. This method also works as two-factor verification. During this setup, the RFID reader is connected to the pc and therefore the system has specific software for the direct visits of students created by Microsoft Visual Studio and SQL Database. Initially, each student must record his or her RFID tag and fingerprint, which can be stored within the database. When college students enter the classroom, they want to use the RFID tag, which might also be examined by using an RFID reader, which checks the Infobase to verify the data, and also the next verification will begin if it's correct. within the second step, the fingerprint of the code is checked. If I fit, the visit is going to be saved on the server. The administrator can view, edit and delete the system. Furthermore, teachers are authorized to use this system, and they can even act as administrators. it's in no time (from RFID) and a secure system (fingerprint). Perhaps, whether or not the tag is employed more by others, the 2 factors are mitigation issues and fraudulent actions that automatically save the visit properly [6].

H. K. Nguyen and M. T. Chew created a prototype for the attendance administration machine with the surroundings of an outsized wide variety of RFID readers within the room and consequently the server software maintained by way of the laptop. Reader and laptop or PC related with the help of a wireless router or LAN connection. When someone enters the globe, he/she ought to use the RFID tag, which is examined through the RFID reader and sends the go to the server by using a wireless or LAN connection. Because multiple RFID readers are placed, one man or woman can visit immediately and discover extra performance than the general technique [11].

Hassanin d. Rajeev & al implemented the attendance system with a mixture of RFID and a web-based organization. this system uses the RFID tag and browser to receive student attendance and skim to specific students. The reader then connects to the Arduino microcontroller, which sends the RFID reader response to the online services via the Arduino shield, and eventually the scholar's visit is stored on the net server using PHP and MySQL. The supervisor can view all student documents by logging into this particular web-based application and viewing student details using an LCD [13].

Srinidhi MB and Rom il Roy proposed a machine that net-based attendance the use of a four-tier structure by the use of RFID and Biometrics. During this approach students' and teachers' RFID special codes will save into the database. An RFID reader and fingerprint device are positioned at the door of the classroom. When students enter the classroom, they

want to use the RFID tag which is read by using the reader and verifies identification by using evaluating with the database whether the tag matches or not. Second-degree verification is allowed if supplying the first level is succeeded. Verification with a fingerprint is the 2nd step of the machine and if the student's fingerprint suits the database, then the attendance is traveling be marked and stored in the database if no longer there isn't any attendance for faculty kids. The fingerprint verification is solely lively in ten minutes which includes five minutes before the schedule and after the schedule of sophistication offset. If each person is late then it denies presenting attendance to particular, however dent, students can occupy the lectures and learn. Finally, SMS will ship to the student's dad and mom about inform unique students' presence. This approach is time-oriented [14].

3. PROPOSED SYSTEM

Students are given a unique RFID card, which, when students enter the classroom and swipe the RFID card, scans the RFID sensor and sends the data to the database, and displays it on the LCD (Liquid Crystal Display). Management can monitor students' attendance from time to time or when needed by management and determine the outcome. The results are displayed on the monitor screen and stored in the database. Attendance will be monitored and if students do not show up on the day, a notice will be sent to the HOD (Head of the Department) or parents.

Figure 3.1 illustrates the flow of records in an attendance system built entirely using RFID technology.
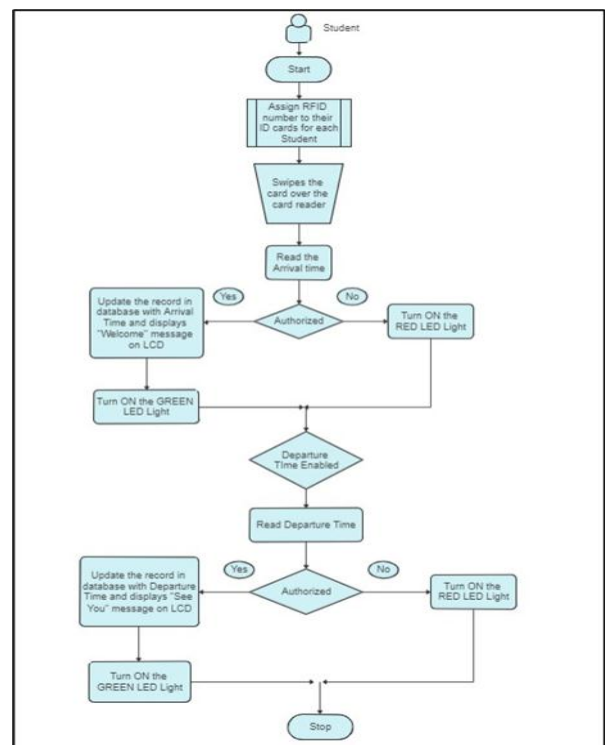

Fig.1.The proposed circuit model

First, students' information is stored in RFID tags.

When the scholar with the right RFID card swipes his RFID card against the RFID reader, a "Welcome" message appears on the LCD and a green LED light flash. System. When the same student swipes his RFID card a second time, the computer will set it as the time he exits, displaying the "See You" message on the LCD. The interval between the first card swap and the second card swap is the total working time stored as data. When a student swipes the wrong card, the code number is not recognized, that is, the student's information is not stored in the program, and therefore the code is not recognized by the computer, so it is not recognized. A red LED light illuminate.

4. IMPLEMENTATION

4.1. Block Design

This is a map of our project IoT based attendance monitoring system, RTC & LCD. Here the Arduino UNO acts as an electronic device that controls all other components as an input/output unit.
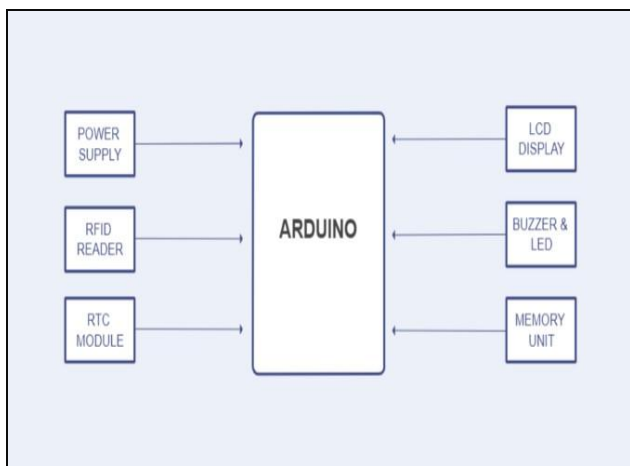

Fig.2.System Block

We used a 5-volt power supply to power all the components used in this project. The RFID Reader module is integrated with the Arduino to read information from the RFID card/tag. The remote time clock (RTC) is used to display the current time and date on the LCD. Each release of the LCD, such as current date & time, current or non-existent scholar information, and menu options from 1 to 4.

The red and green LEDs are used as a signal to come and go. Similarly, the buzzer makes a sound whenever an interruption is detected. The most important part of this map is the EEPROM part. EEPROM stands for Electrically Erasable Programmable ROM. It stores information in RFID Reader whenever users change their card.

4.2. Circuit Diagram

To get started, the Arduino is equipped with the UNO EM-18, RTC module, LCD, Buzzer, LED Lite, and push-buttons. When the connection is ready. Configure the RFID library in the Arduino IDE.
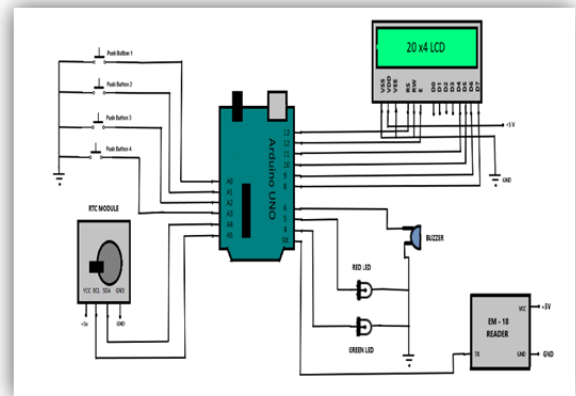
The activation system can be found in the backend.

Fig.3.Schematic Diagram

4.3. Working mechanism of RFID system

RFID (Radio Frequency Identification) can be a technique used to identify any product or object without the need for any line of sight between the transponder and the reader.

The RFID system consists of two main hardware components in a row. Depending on the computer design, technology used, and demand, the transponder can be found on the goods to be scanned. An RFID reader consists of a frequency module, a control unit for configurations, a monitor, and an antenna for exploring RFID tags. Additionally, various RFID readers are configured with an additional interface that allows the received information to be sent to another computer (control system or PC).

RFID Tag - A specific data-carrying device of an RFID architecture, usually consisting of an antenna (connection element) and an electronic microchip.

5. EXPERIMENTAL RESULT

The proposed system for managing attendance has yielded RFID has produced brilliant effects in managing attendance technology, and test results recommend that the proposed system is high quality has been tested with special RFID playing cards and RFID tags and has been high quality in identifying RFID cards. That has been recorded. And "three RFID cards" are used to test the gadget in all scenarios.
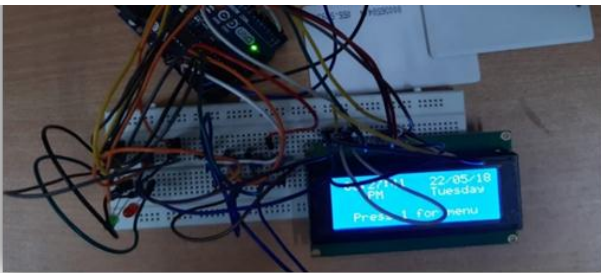
Fig.4.Interfacing Arduino with RFID

Step 1: To manage the student's data in the system

Fig.5.Managing database options

Step 2: To view the current attendance detail, status of each student, and total working hours for all students that are registered in the system.

Fig.6.Previous datasets

Fig.7.Logged attendance lists

Step 3: If an unauthorized student tries to delete the attendance details it won't delete them. Only authorized admin card can delete the attendance details.

Fig.8.Unauthorized users

Step 4: When a student swaps a card for the first time over the RFID reader it will display a "WELCOME" message means that you're present.

Fig.9. Arrival Message

Step 5: When a student swaps a card for the second time over the RFID reader it will display a "SEE YOU" message that means that you've completed one day.

Figure 10. Departure Message

Figure 11. RFID graph

Step 6: This graph represents the following data of the student's RFID card ID.

CONCLUSION

The modern-day guide gadget of registering attendance via IoT primarily based attendance machine the use of RFID will be modified into an environmentally friendly and free of mistakes attendance administration system. By using this technique, data can be pronounced barring any hindrance. An organization that monitors their college students or team of workers in schools, colleges, and any institutions. Although there is a range of methods for managing scholar attendance, the proposed machine is immediately manageable and extremely beneficial to any firm. The system saves time, is friendly to users, and is dependable to use. In the future, we will add face recognition, a web page, and an SMS (Short Message Service) module to send messages to parents, instructors, and non-students to view student attendance records.

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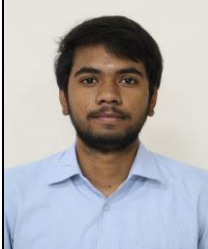
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BIOGRAPHIES

Dr. S.Brindha
Head of Department
Department of Computer Networking
PSG Polytechnic College
Coimbatore, India.

Ms. K.Sudha,
Lecturer
Department of Computer Networking
PSG Polytechnic College
Coimbatore, India.

A.Bala Ganesh
Final Year Student
Department of Computer Networking
PSG Polytechnic College
Coimbatore, India

S.Nishanth
Final Year Student
Department of Computer Networking
PSG Polytechnic College
Coimbatore, India

N.Vishnu Prasad
Final Year Student
Department of Computer Networking
PSG Polytechnic College
Coimbatore, India