International Journal of Enhanced Research in Science, Technology & Engineering
ISSN: 2319-7463, Vol. 12 Issue 3, March-2023, Impact Factor: 7.957

Iot Enabled Attendance Monitoring System for Gardeners Using RFID

Mr. Arun.S[1], Dr. Arul. P[2], Suganeshwari. K[3], Myuri. V[4], Meera. P[5], Gunavarshini. R[6]

[1]Assistant Professor, Department of Electrical and Electronics Engineering, Kongunadu College of Engineering and Technology (Autonomous), Thottiam, Tiruchirappalli (D.T)-621 215, Tamilnadu, India
[2]Professor, Department of Electrical and Electronics Engineering, Kongunadu College of Engineering and Technology (Autonomous), Thottiam, Tiruchirappalli (D.T)-621 215, Tamilnadu, India
[3,4,5,6]U.G. Scholar , Department of Electrical and Electronics Engineering, Kongunadu College of Engineering and Technology (Autonomous), Thottiam, Tiruchirappalli (D.T)-621 215, Tamilnadu, India

ABSTRACT:

RFID technology has been widely used in various fields. Various automatic identification technologies, such as radio frequency identification (RFID), have been more popular. RFID is a wireless device that uses data transmission from an electronic tag, identified as an RFID tag or label, to send information to an RFID reader to justify the classification and routing of objects by radio waves. In addition to a programmable logic circuit like Arduino, the current research aims to suggest an RFID-based attendance management system and information services system. The gardeners are not educated people and does not aware about their time and all. Our proposed system aims to create and make aware to the gardener to know about their times and their details. The proposed system is designed to manage the gardener attendance system using RFID cards to communicate with an RFID reader/writer module connecting to an Arduino UNO. The Arduino UNO receives the authentication data, which is then sent via the Wi-Fi module to store real-time data through the IoT (Internet of Things). The RFID card is given to each and every gardener. The in and out time of each worker is monitored. Finally, at the mentioned time the information about the workers is send as a document through the email to the higher authority of our college.

Keywords: RFID, Arduino UNO, IoT, Wi-Fi Module, Email.

INTRODUCTION

Using an RFID device is a quick and easy way to identify someone. Barcodes, optical character recognition, biometrics, smart cards, and other identification methods exist, but RFID devices have a far greater variety of uses. such as time and attendance, transportation and logistics, security and animal tagging, postal monitoring, and road toll administration. RFID labels function as tiny transponders that respond to user inquiries remotely and transmit a persistent number or comparative identification. Security and policing individuals in specific locations are currently the biggest issues. Physical security is not the greatest option. We concur that security includes more than just technology; it also involves helping people make the most of their time and lives. The main goal of installing an access control system is to limit physical entry to your sites or buildings. In order to increase protection, entry is restricted electronically. It will keep note of who goes where and when. People can liberate their minds from security and realize their full potential with the proper access control system. Automatic access control systems are required because many Nigerian organizations experience security threats. The system will be put in place at the entrance, and the company will only allow authorized employees to enter. To track employee movement and keep them from entering restricted areas, the device can be installed at any entrance within the company. Not just the primary entrance is being installed. With the features we stated above, it makes a great security and attendance system because of its distinctive feature of calling the person by name to welcome them.

RELATED WORKS

A. Barcode: The barcode is one of the most well-known and widely used modern methods. The way that provisions for an article are organized is by using lines of identical width but opposite length [4]. It is an automatic scanning device. The object is tracked and identified using electronic data that is stored in a corresponding line.

B. Bio-metric systems

The design of a person's physiological features, such as a fingerprint or facial pattern, or a behavior characteristic, such as handwriting or patterns, can be used to automatically verify or recognize a person's identity using biometric systems. A number of the most important biometric features used are depicted in the image below. Even though behavioral features can be more easily integrated into certain applications, a physiological system supported by a biometric system has greater reliability than a behavioral system. Umar et al. [3] proposed an RFID-based security and access control system. It is the design of an RFID-based security and access control system for Punjab University hostels. Biometrics and RFID technology are combined in the system to complete the required task. The system takes a picture of the user and looks through the database for a match when the RFID reader installed at the hostel's entrance detects the tag UID. Access is granted if the captured image and the card UID match a registered user; If not, the system shuts off the alarm to notify the security personnel and denies access.

The system's advantage is that it successfully completed the control and security tasks by processing data from sub-controllers like; installed at the entrance gate, exit gate, and mess gate, respectively, are entrance monitoring controllers, exit monitoring controllers, and mess monitoring controllers. The developed system is useful for reducing security threats to the hostels, but the system's response time could be faster. Rather than using computer systems that are able to process the images in real time, dedicated processors can be used to speed up the response time. Peter et al. [4] proposed an RFID-based access control security system with GSM technology. An RFID system with a 125 KHz frequency, a microcontroller that was programmed to send control signals, a liquid crystal display (LCD), a GSM/GPRS modem, and a DC motor were used to archive the work. The microcontroller is instructed to turn on the DC motor, display the user number and card number on the LCD, and activate the GSM/GPRS modem in order to send an SMS alert to the security personnel regarding the authorized user card after the RFID tag containing the unique information of the user has been scanned by the RFID reader and confirmed to match the information stored in the microcontroller. Otherwise, the DC motor remained off, the LCD displayed an invalid card, the buzzer remained on for about five seconds, and the GSM/GPRS modem was activated to send the security personnel an unauthorized user card.

EXISTING SYSTEM

1. Automatic attendance monitoring using RFID

Due to the emergence of an electronic learning paradigm that differs from the traditional one and the accessibility of virtually all information online, students are now more motivated than ever to attend lectures. The apprentice may be unable to attend classes due to a variety of factors, including student laziness, an uneven playing field, extracurricular activities that are counterproductive to the institution's objectives, and many others. It is essential to find a more efficient and effective solution to this issue. RFID is a technology that has more problems it can address. Data entry is more precise and time thanks to the automated ID and data gathering technology known as RFID.

Although RFID is not a new technology, it has only lately become more popular due to its low cost at the moment and developments in other computer-related fields that expand its potential application areas. RFID systems use tiny chips called tags to transmit data identifying objects to an RFID reader, which in turn can interact with computers. The primary objective is to design a system where authorized individuals will be present, evidence the information with their time, date, file, store it, and regularly download it from Google Sheets online. To achieve our objectives, we used technology and software. In order to serve users, we used RFID hardware. For each person, a unique RFID tag will be made available.

2. Smart attendance monitoring system using GSM and RFID

The significance of attendance cannot be overstated in any group. Many businesses, colleges, and institutions use paper to track attendance. The likelihood of error is significant when paper-based attendance is taken into account. This problem can be resolved using technology, and in the process, the use of paper can be prevented. There are many technologies that help to solve this issue. The best of them, however, is RFID (Radio Frequency Identification), which uses radio waves to identify and monitor people or objects. When it comes to RFID, contact is done wirelessly using electromagnetic and electrostatic coupling and radio frequency spectrum. The system is constructed using an RFID card reader module from the model RC522 RFID card reader and is used to demonstrate the findings. The user is first given access to the tag's (or card's) unique ID, which is originally stored in the database. To record attendance, the user must position the tag a specified distance from the RFID reader. A microchip that aids in storing a special sequence number that is helpful in identifying things makes up the tag. Micro circuitry and an integrated silicon chip are both parts of the microchip. The tag has a permanent memory that can be written more than once and is rewritable. The most essential component of the RFID device is the RFID reader. The RFID reader used for detection works at a frequency of 125 kHz

and a 12V power supply, with a maximum range of about 5 cm above the reader. Data is exchanged between an RFID tag (or card) and an RFID scanner using radio waves. The GSM Module is used to interact with the internet.

PROPOSED METHODOLOGY

The proposed system's block diagram can be seen in Figure 1. The reader reads the first RFID tag code, decrypts it, and sends the information to the controller. Only the gate will open with an audio greeting and display the gardener worker data in the serial monitor.

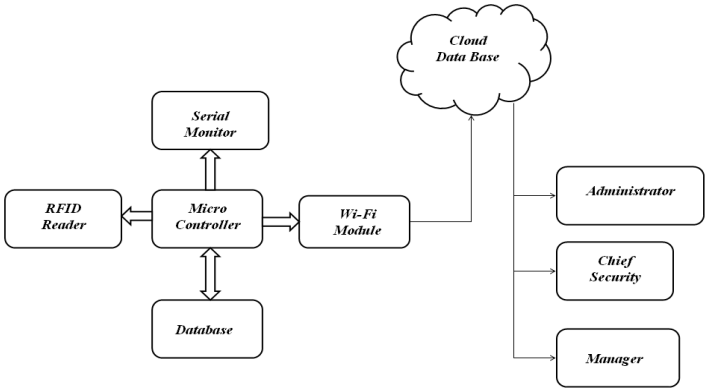

Figure. 1 Proposed Block Diagram

The RFID card is look like an ordinary card which has a particular number on it. For the appearance of the id card user will attach their photos and id numbers, other details also. In this system Arduino used for the code inlet to operate the device. When the card is scanned by the reader the time is noted for the calculation of in and out time the gardener details also displayed in serial monitor. After the working time or mentioned time the attendance list is e-mailed to the mentioned authorities by using Adafruit website. For the access of ad fruit website user have to sign up for create an account. There is also downloading option is available to save for other needs.

Arduinouno

It's an 8-bit Atmel Pico power microcontroller with high speed RISC architecture. It is a high-performance, 8-bitAtmel Pico power AVR RISC microprocessor. In addition to having a 6-channel 10 bit A/D converter, three flexibletimer/counters with compare modes, a serial programmable USART, an SPI serial interface, 32KB of ISflash memory with read-while-write support, 1KB of EEPROM, 2KB of RAM, and 23 general purpose input-output lineit also has a 1-KB EEPROM, a 2-KB EEPROM, and 1KB of EEPROM. This device can work with voltages between 1.8 and 5.5 volts. This controller linked to the buzzer, micro SD card, and LCD using a number of ports.

Figure 2

2. Radio Frequency Identification Tags

The proximity integrated circuit card, also referred to as an RFID device [3], can be powered either actively or passively. An antenna, microchip, and battery are the only components of one transponder, or RFID device. (only for active tags). Usually, the amount of the chip is determined by the size of the antenna. The height and shape of the antenna depend on how frequently the tag is used. While active tags have an on-board power source, passive tags are inductively powered by the radio signal produced by an RFID scanner. An active tag can continue to work and capture sensor readings or carry out their calculation even in the absence of a reader. Passive tags can only be used in the presence of a viewer.

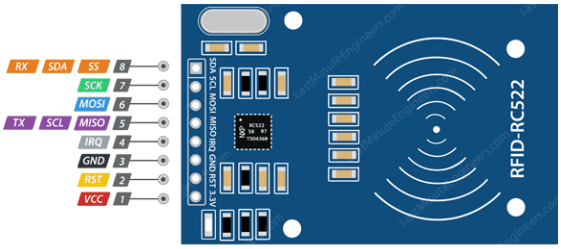

Figure 3

In addition to the microchip, some tags have rewritable memory, which can range in size based on the application. Microchips hold the Unique Identification (ID) of each item. The serial identifier for the RFID memory is this ID. RFID bands' range is determined by their frequency. These frequency bands are Low Frequency (between 30 and 500 KHz), High Frequency (10 to 15 MHz), and Ultra High Frequency (between 2.4 and 2.5 GHz). The interference resistance and extra performance quality are assessed using this frequency range.

3. RFID Card Reader

The suggested design made use of a RFID reader and an interface made of the controller. This RFID reader's main purpose is to keep track of employee data like name, employee code, and welcome note. When an employee presents the RFID tag to the RFID reader, the code is read, and if it matches the base code that has been previously saved, the gate opens and all relevant information is shown on the serial monitor.

4. Serial Monitor In Arduino

The serial monitor is the 'tether' between the computer and your Arduino - it lets you send and receive text messages, handy for debugging and also controlling the Arduino from a keyboard! For example, you will be able to send commands from your computer to turn on LEDs.

5. Ada Fruit

Adafruit.io is a cloud service - that just means we run it for you and you don't have to manage it. You can connect to it over the Internet. It's meant primarily for storing and then retrieving data but it can do a lot more than just that. Display your data in real-time, online. Make our project internet-connected: Control motors, read sensor data, and more! Connect projects to web services like Twitter, RSS feeds, weather services, etc. Connect our project to other internet-enabled devices.

V. EXPERIMENTAL RESULTS

Once user scan the RFID card, the information about the gardeners are shown in the serial monitor of the Arduino IDE. The RFID-based gate security system can record the authorized entry, identify it, and permit them to pass through the gate. It also displays all information associated with that code and plays an audio greeting. The information such as name, RFID number, blood group, and age are displayed in the serial monitor. The accepted card information that was read by the reader. The RFID code and the greeting message are depicted in the Figure 4

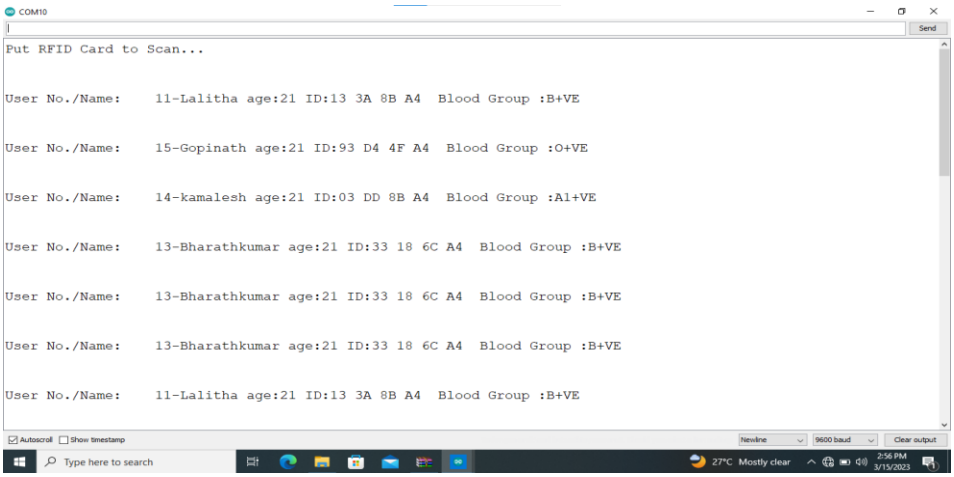

Figure 4

This table below shows the in time and out time of the gardener is shown and the values of the security worker is also provided. It will be available in the ExcelSheet

Table I:

S.NO	ID	VALUE	FEED ID	TIME
1	0F8MH490YSJ03FZMGSCF3H6PC2	8	2477067	2023-03-16 09:50:07 UTC
2	0F8MH4GFZ65VNMMF84AR3VES47	8	2477067	2023-03-16 09:50:32 UTC
3	0F8MH4T30P50MHPFXNJV16F4R9	1	2477067	2023-03-16 09:51:03 UTC
4	0F8MH4XRC37RK0ZMV998DBST9H	8	2477067	2023-03-16 09:51:15 UTC
5	0F8MH4ZAZW906EGQ48280BEVSA	8	2477067	2023-03-16 09:51:20 UTC
6	0F8MH5T2QB8TDRN24M3G8DEC01	6	2477067	2023-03-16 09:52:48 UTC
7	0F8MH5VGHM9VD4FPX4EWERZ0FJ	5	2477067	2023-03-16 09:52:52 UTC

CONCLUSION

This project provides an illustration of an environment-specific automatic access control system. The system differentiates between authorized and unauthorized users using radio frequency identification (RFID) and Arduino technology. The microcontroller's stored UID is used by the RFID reader to compare the RFID tag that the user has been provided. If the match is good, the microcontroller allows access; if not, it denies it. An Arduino-built automatic access control system prototype that uses RFID has been tested and found to function as designed. The system can be put in place at the entrance to stop someone from accessing a secure area without authorization.

REFERENCES

[1]. B. Nandhakumar , K. Naveen Kumar , M. Vijay , A.Sriram -RFID based Attendance System using IoT, International Journal of Modern Science and Technology (IJMST),2020
[2]. KhushBakht , AmadUd Din, AimanShehzadi , MaryumAftab -Design of an Efficient Authentication and Access Control System using RFID , International Conference on energy Conservation and Efficiency (ICECE),2019.
[3]. Nishitha.R , Sandeep Seetharam , Raksha.V, UmmeKulsum - IoT Based Automatic Billing System by RFID, 4th International Conference on Recent Trends on Electronics ,Communication and Technology (RTEICT),2019.
[4]. Xiaoxu Wang , Yuesheng Wang – An office intelligent access control system based on RFID, IEEE,2018.
[5]. Mohammed A.H.Ali ,Nortasha A. Yusoff - Development of Tele-Monitoring Attendance System Using RFID,IEEE International Conference on Automatic Control and Intelligent Systems(I2CACIS),2018.
[6]. K. Balamurugan, Dr.S.Elangovan, Dr.R.Mahalakshmi, R.Pavithra - Automatic Check-Post and Fast Track Toll System Using RFID , IEEE International Conference on Advances in Electrical Technology for Green Energy (ICAETGT),2017.
[7]. Sandeep Singh Rawat , ShaikSaidulu ,RasmiRanjan- Secure ATM Door Locking System Using RFID, Springer ,2016.
[8]. Yashi Mishra, Gaganpreet Kaur Marwah , SekharVerma -Arduino Based Smart RFID Security and Attendance System with Audio Acknowledgement, International Journal of Engineering Research and Technology (IJERT),2015,Vol.4.
[9]. Wisdom Gen P. Dumpayan, Matthew Lawrence M. De Mesa, Nathalie Danielle F. Yucor, Eden T.Gabion , K Pooventhan, R Achuthaperumal, C Manoj Balajee, Surveillance Robot Using Multi Sensor Network International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control, Volume 3 Issue 2 (2015) pp. 113-115.
[10]. K.Aravindhan, B.Evangeline Prasanna, “A Cluster Approach in VANET Using Collaborative Learning Automata - Based Routing” in Asian Journal of Information Technology, Volume 15, No.21.