NEW EMPLOYEE ATTENDANCE MANAGEMENT SYSTEM FOR SCHOOLS AND UNIVERSITIES USING IOT

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Abstract: RFID based employee attendance management system proposes a non-contact temperature measurement and attendance monitoring system for the COVID 19 pandemic. This design was developed using an ESP8266, infrared thermometer and RFID reader. It uses an infrared temperature sensor to measure body temperature in a non-contact manner. An RFID card reader is used to scan the ID card. The employee ID number and temperature will be uploaded to the website. This website can be monitored via the internet. Details such as entry time, ID number, and temperature readings are stored on the server and displayed on the website. The temperature sensor can measure the temperature when the distance between the sensor and the person is about 10 cm, which improves the accuracy. This system is essential in this pandemic situation to prevent infection.

Keywords: RFID, Cloud Computing, COVID, IOT.

I. INTRODUCTION

The global pandemic COVID 19 has had a dramatic impact on the health and economy of people around the world. Schools, universities, small to large manufacturing and businesses have been closed to prevent the spread of the disease. The effects of coronavirus are extremely devastating in terms of both economic growth and human survival. The economic slowdown before the pandemic hit India was already worse than what the Indian economy experienced in 201112. India's GDP is estimated to have shrunk by 23.9% from April to June. This was the first example of negative growth in which India had not experienced an economic slowdown for at least 40 years. To revitalize the economy, both governments and individuals need to take appropriate security measures to return. By developing a non-contact occupied temperature monitoring system, we decided to play our role in improving safety measures. Attendance is mandatory to ensure the presence of people at already planned events, schools and workplaces. The system uses an infrared temperature sensor to measure temperature contactless and uses an RFID card reader to confirm everyone's attendance. Staff details and a person's temperature are sent to the website over time and stored in the cloud for later reference. The COVID 19 pandemic also showed what the obsolete traditional method of compulsory attendance has become-the traditional method of compulsory attendance using pen and paper is a particle of possible illness. Endangers the transmission of. With the paper sharing and stationery sharing features, it is difficult to protect others from viruses. As companies prepare to conduct more face-to-face workspaces, there is a growing need for safer and more hygienic ways to mandate attendance. This can be achieved using technology already available in most modern classrooms and schools.
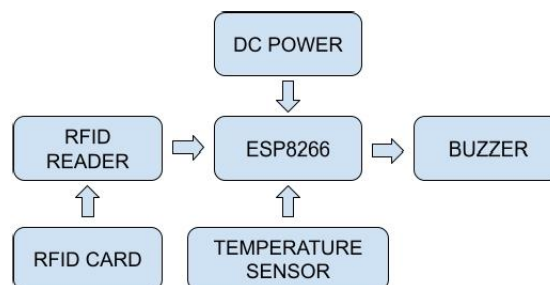

Fig.1. Block Diagram of RFID Based Employee Attendance Management System using IOT

The block diagram describes the functioning of the system. When a RFID card is placed near the RFID tag reader, provided, the tag or the card used is of the same frequency in which the RFID reader is operating. Thus, the communication is established between the reader and the card or tag. The card reader is connected to ESP8266, through SPI Protocol. SPI is abbreviated as Serial Peripheral Interface Protocol. The data is further processed in ESP8266, it checks whether the RFID tag scanned, is an authorized card or not. Temperature sensor is wired with esp8266. It measures the temperature of the person without contact. Thus, when the card is read, and the temperature of the person is determined, if the temperature is normal and the employee is authorized, then the doors will be unlocked else the buzzer will be turned on.

II.   CONVENTIONAL SYSTEM

Attendance management is one of the most crucial tasks in an educational institution- school, college, or university. Daily student attendance allows teachers to keep a tab on students' activities. It also enables parents to understand whether their children are attentive towards studies & attend their class regularly. However, managing the daily attendance of thousands of students is quite a challenging task for teachers. Traditional means of registering daily students' attendance may result in errors & tremendous manual work. An RFID based attendance system can be a great solution to overcome such challenges as it automates the students' attendance process & enables teachers and parents to track & monitor students' activities effortlessly. Besides student attendance management, the RFID attendance system can also be used to track the attendance of faculty or staff to simplify the payroll management procedure. Fingerprint Sensor Based Biometric Attendance System using Arduino. In this project, the fingerprint Module and Arduino is used to take and keep attendance data and records. Biometric Attendance systems are commonly used systems to mark the presence in offices and schools. This project has a wide application in school, college, business organization, offices where marking of attendance is required accurately with time. By using the fingerprint sensor, the system will become more secure for the users. RFID based attendance system using aurdino RFID based attendance system is an advanced attendance management system that has an RFID reader, RFID Tag, LCD display & a arduino unit that allows the wireless communications to establish the identity of students, faculty, or any other staff. RFID attendance system is used to take attendance for student in school, college, and university. By placing their ID cards on the reader, students or workers can immediately verify their attendance. RFID attendance system provides wireless identification of stakeholders when they fall in the radiofrequency range of the RFID attendance reader. To mark the attendance automatically, the students or staff need to carry the RFID tag that contains unique information about them such as name/ID number/class/section. The receiver/reader of the RFID attendance system automatically registers the attendance & saves the attendance data in the Arduino. The administrator can anytime extract the data to get a summary of student attendance history & keep a tab on them as well as faculty attendance for salary & payroll management. In this COVID situation, social distances are required and need to reduce contact with others. Here we use RFID tags associated with specific people related to specific persons that are replaced by fingerprint systems used by institutions. You can mark your presence by using RFID tags, which are held with you to reduce coronavirus contact and transfer. Thus, this system in COVID status is not inactive and effective and everytime the staff cannot engaged in the extracting data from the arduino.

III.   PROPOSED SYSTEM

An Arduino Uno (Atmega328p) is connected with MFRC522 Reader, a Wi-Fi module Node MCU ESP8266 and a GSM module. By enabling GPS module connection with the controller, the location of the RFID card which gets read by the reader and send location to the database. A Passive RFID card is read by the RFID reader and the data is sent to the database and software application for further data processing. The Wi-Fi module Node MCU ESP8266 is selected as a primary data transmission method. The data is transferred to the Google Server Cloud. Database of students is designed using MySQL and the details are stored by class, section and department wise. The student database is designed in such a way that the parallel attendance reader system can be used for attendance monitoring at the different entrance of an institution and never produce any redundant data in the cloud storage. The Software Implementation is done using Python. The frontend is done using Tintern and the Backend is done using MySQL. This enables data collection, aggregation and processing faster. The system can send a notification to the professor with just a click of a button.
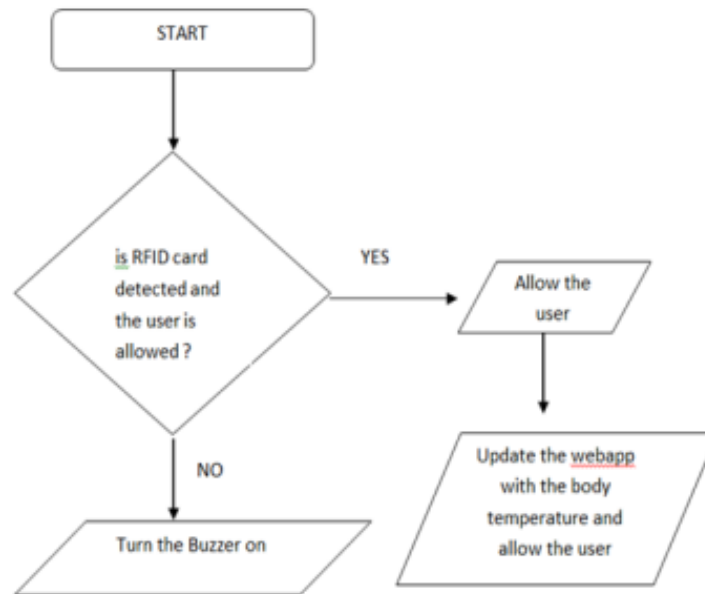
Fig. 2. Flow Chart of RFID Based Employee Attendance Management System using IOT

RFID based employee attendance management aims to design, develop and implement attendance systems using radio frequency identification technology. This technology can be divided into two types: system passive and system active. The system uses a passive system to record staff attendance. Frequency identification technology reads staff tags, attendance is automatically recorded and stored in the database. The system has several security features that can prevent security breaches: capture and audit trails. The advantage of the system is that it distinguishes between human and robotic inputs and can record all user activity when accessing the system. A tag that is used in place of an ID card and a reader that reads information related to employee attendance.

The RFID attendance system software that integrates with a database and has the ability to store individual employee data or information. The system has a maximum read range of 2 cm, a probability of success of one, and a minimum read distance of two seconds for optimal functionality. By using the system, the two disciplined attitude of employees and the efficiency of staff are immediately improved. RFID-based attendance tracking system that uniquely identifies each staff / student based on the RFID tag attached to the ID card. This makes the attendance detection mechanism easier, faster, and safer than traditional methods. The software component consists of a web-based GUI for displaying staff or student attendance, hosted on a web server, and stores data on a database server. Staff or students simply place an RFID card or tag on the reader and the tag records their presence. This presents an IOT-based RFID card reading system that provides classroom teachers and their parents with detailed information on getting on and off each student. A separate RFID card will be assigned to each student. Once the student enters the promotion reading area, authorized students can take their seats. Student entry / exit dates will be updated on the school server and parents will be notified. A software counter with LCD tells the bus driver how many children are on the bus, solving the problem of students unknowingly staying on the school bus.

The system has great advantage as it is an immediate and economical solution during and after the pandemic situation. In workplaces and institutions demanding human interaction our model can help in abiding to the safety norms of the government. As it is completely automated human interface can be reduced. The system contains an infrared temperature sensor that can measure the temperature of an individual. This simple yet efficient model can be improved with the help of recent technologies to implement it in all organizations which involve the human workforce. The current system is designed in such a way that the power management is done such that all the components which are existing in this implementation, the power is supplied efficiently.
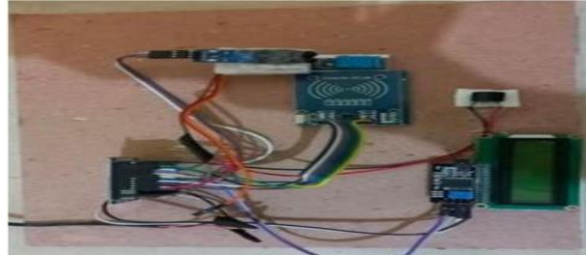
Fig 3: Implemented circuit
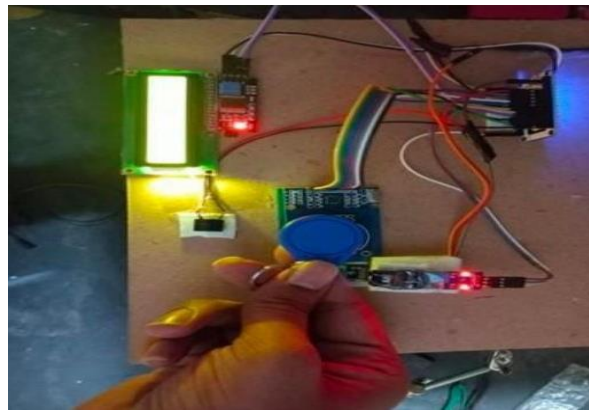
Fig 4: Output when the card is placed

CASE 1 - WHEN RFID TAG IS PLACED

When the card is placed, near the proximity of the RFID Module, it reads the value from the card and communicates it with the ESP8266. It produces the result on the LCD Panel. If the card is authorized, then it will represent as authorized, or the buzzer will turn on and it will show the same.

CASE 2 - WHEN RFID TAG IS NOT PLACED

When the card is not placed, the system waits for the event to happen. An instruction to scan the card will be mentioned on the LCD Panel.

IV. CONCLUSION

The system has significant advantages over existing systems as it represents an immediate and economical solution during and after a pandemic situation. In workplaces and institutions that require human interaction, this model helps meet government safety standards. Because it is a fully automated human interface, it can be reduced. The system includes an infrared temperature sensor that can measure a person's body temperature. This simple and efficient model can be improved with the help of new technologies for implementation in all organizations, including the human workforce.

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