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RFID Based Smart Attendance Monitoring System Using IoT

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Abstract:- In classrooms, time is wasted on roll calls as it's done manually. In this proposed system, an authorized pupil is given an RFID label. therefore, the data stored in the card is appertained to as identification/ attendance of a person. Once the pupil places the card in front of the RFID card anthology, it reads data and verifies it with the data stored microcontroller ESP32. However, also it displays a communication on the TV attesting to the entry of that pupil; additionally displays a communication denying the attendance, If the data matches. The status of a pupil's attendance recaptured system by pressing the status button connived to the microcontroller. Hence, a lot of time is saved as all the scholar's attendance is directly stored in the database.

Keywords:- *Internet of Things; Radio Frequency Identification; Microcontroller ESP32; Attendance System*

I. INTRODUCTION

The project's purpose is to reduce the workload. To continuously monitor the employee in their working and also to monitor their health condition using the temperature sensor. A ESP32, RFID, temperature sensor, and LCD display., When a specific RFID is scanned the Athas scanned that specific person is recorded and it is displayed with a "Welcome" message. Then it is displayed to check the temperature.So when we check our temperature using the temperature sensor on this system temperature is displayed. All this data is stored in the form of a graph using ThingSpeak.

II. LITERATURE

The technology rightfully favors our conditions RFID Technology. It's automatic data identification and collection technology. Indeed, though it's not a new bone, it has recently become interested in the fields of computing. RFID incorporates radio frequency and microchip technologies to develop a system that can be used to identify, cover, secure and act on an object. It consists of a chip that contains unique details that can be used as identification when detected by an RFID reader. In classrooms, time is wasted on revision because it is done manually. In this proposed system, the eligible learner is assigned an RFID tag. However, the problem of tag collision affects the performance and finesse of the identification process. In this paper, we propose a novel anti-collision protocol to reduce marker collisions that occur in a grounded RFID student attendance system. The Global Forest Resource Assessment reports that nearly 80,000 to 160,000 trees are encyclopedically cut down daily for paper product, leading to deforestation, which in turn contributes to climate change. likewise, in any public transport system, once the passenger reaches their destination, the ticket is no longer useful and is eventually thrown away. To overcome these issues, smart ticketing systems support the concept of digitalization.

III. DESIGN

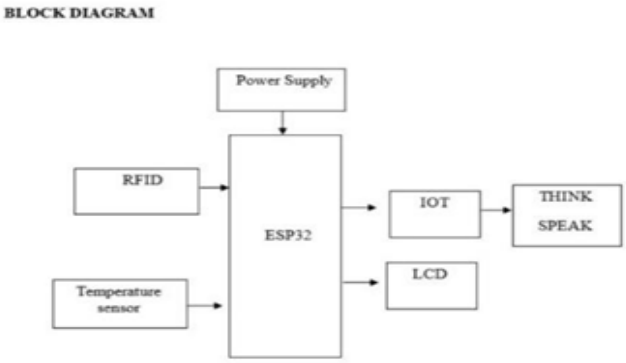

Fig 1 Block Diagram of the Proposed Method

The diagram above shows that the current process is done using RFID technology, in this program, each student has an RFID tag for attendance, the student places the RFID tag next to the RFID reader and the ID result from the RFID reader will be sent to the microcontroller and compare with the student's data stored in the memory, the memory stores the student name data, if the student ID, student name is displayed on the LCD, and if the unlisted student data is notified on the LCD, the unregistered student using the Wi-Fi module microcontroller can send the student attendance data to the cloud via the Internet, the data already installed in the cloud can be viewed in real-time by a teacher, student, and even a parent, so student attendance is monitored anywhere in real-time using the Internet of Things (IoT).

MICROCONTROLLER ESP32

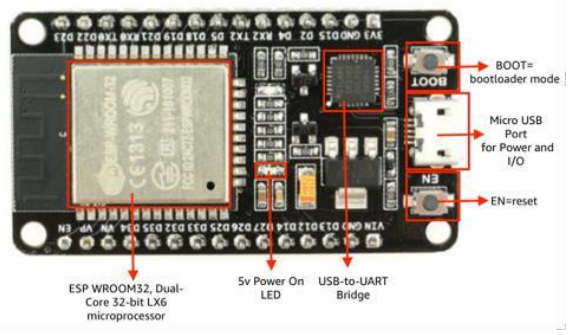

Fig 2 Esp32 Microcontroller

The Raspberry Pi is a small computer that can be used for many different purposes, including military and

surveillance applications. The Raspberry Pi 4 Model B is the latest addition to the Foundation line. The total number of universal input and output pins on the Raspberry Pi is 40. There are seven zero pins, two 5V pins, two 3V3 pins, and 26 universal input output pins (0V) on the board. The processor present in the Pi 4 Model B uses 20-25 percent less power and works more than 90 percent more efficiently than older versions. It includes two small "High-Definition Multimedia Interface (HDMI)" ports with a resolution of 4Kp60. The Raspberry Pi4 consists of a 4-pin stereo and an audio port. It consists of an SD card slot, which is useful for loading the operating system, files, and necessary images. It has a "Universal Serial Bus (USB)"-C connector. Since the pi-4 has a 64-bit architecture, the operation should also be 64-bit, which the foundation released recently. "Graphics processing unit GPU (GPU)" PI-4 B supports Blue Ray video playback and Graphics 3.0. It has four "USB" 3.0 and 2.0 connectors. They can be connected to external devices such as a mouse, keyboard, and other peripherals. True gigabit Ethernet is included with the Pi-4-B, allowing it to send Ethernet frames at 1 billion bits per second.

IV. RFID

Fig 3 RFID Tag

Radiofrequency identification (RFID) refers wireless system consisting of two corridor tags and a compendium. An Anthology is a device with one or more notes that emit radio waves and receive signals from an RFID marker. The tags, which use radio waves to transmit their identity and other information to nearby compendia, cannot do anything or function. Passive RFID markers are powered by anthology and do not have a battery. Active RFID markers are powered by batteries. RFID markers can store various information from a single periodic number to several data channels. Guides can be carried in the hand or attached to or over a pole. Learning systems can also be set up in a press, room, or building. RFID markers also known as transponders (transmitter/pollee) are attached to objects to be counted or linked. Tags can be active or inactive. Active markers are those that are partially or fully powered by a battery, suitable for communication with other tags, and can initiate their discussion with the marker anthology. On the other hand, idle markers do not carry any internal power source but are supported by the marker anthology. The tags contain a composite antenna and a microchip, the main purpose of which is to store data. The reader is also known as a transceiver (transmitter/receiver) located in the radio frequency interface (RFI) module and control unit. Its main functions are tag sparking, tag contact sequence setup, and data transfer between operating software and tags.

V. HUMAN TEMPERATURE SENSOR

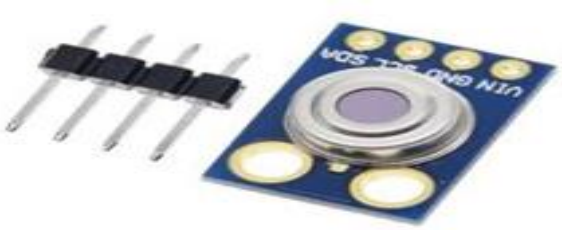

Fig 4 Human Temperature Sensor

The MLX90614 is a non-contact infrared (IR) digital temperature sensor that can be used to measure an object's temperature from -70°C to 382.2°C. The MLX90614 is an infrared thermometer for non-contact temperature measurement. Both the sensitive IR thermocouple detection chip and the signal conditioning ASIC are integrated into the same TO-39 can. The MLX90614 includes a low-volume amplifier, a 17-bit ADC, and a powerful DSP unit, which achieves high accuracy and thermometer adjustment. The thermometer is factory measured with a digital SMBus output that provides full access to a moderate temperature range with a total temperature range of 0.02°C. The user can set the digital output to a pulse frequency (PWM) range. The 10-bit PWM is designed as standard for continuous average temperature transfer of 20 to 120°C with an output of 0.14°C.

VI. LCD

Fig 5 LCD Display

The word LCD stands for liquid crystal display. It is a single type of electronic display module used in a wide range of applications such as various circuits and devices such as mobile phones, calculators, computers, televisions, etc.

These indicators are preferred for multi-segment diodes that emit light and seven segments. The main advantages of using this module are cheap; easy setup, animations, and no restrictions on displaying custom characters, specials, and even animations, etc.

VII. TRANSFORMER

Fig 6 Transformer

The transformer is utilized in RFID-based attendance systems to scale down the ac voltage. Essentially, this system is connected

directly to the housing authority power supply, which provides 220 V ac, but it does not operate at that voltage.

With the help of this step-down transformer, which has two main and secondary windings, these voltages are reduced to 12 V ac. Bridge Rectifier: This RFID-based attendance system is made up of devices that are not powered by electricity. As a result, using this bridge rectifier, which comprises four diodes, these voltages are inverted into dc. All electronic components in this RFID-based attendance system are powered by a 5V dc voltage regulator. As a result, the output of the bridge rectifier is controlled from 12V dc to 12V dc.

VIII. IMPLEMENTATION

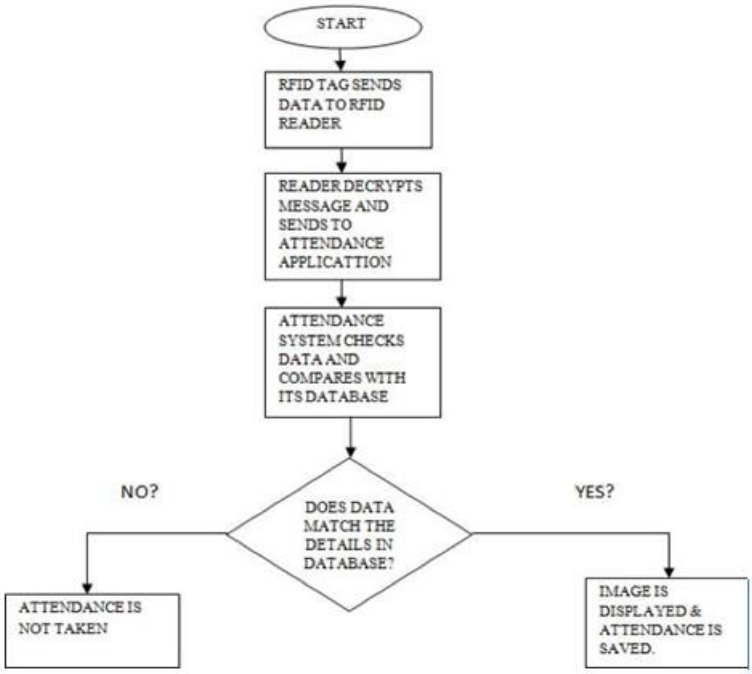

Fig 7: Flowchart of the Proposed Mode

The ESP32 Wi-Fi module collects the RFID CARD/keychain UIDs for multiple users and sends them online to the website. RFID CARD registration is done on the server using any RFID module MF-RC522 available on the market. Authentication of the card/keychain will be done on the web server while the UID of the card is transmitted via WiFi. A smart RFID system was successfully designed, developed, and tested in this study. The innovative results of the development of the new system have proven to be reliable for supporting the management system in the field of education in the use of RFID technology and microcontroller boards. It can be considered a successful implementation.

Fig 8 Result of Prototype Model

Finally, we completed an IoT-based RFID attendance system using ESP32 with the web and database. Then system development results have proven to be reliable in supporting an attendance operating system for the academic sector using RFID technology and a microcontroller board. It qualifies as a successful commitment.

IX. RESULTS AND DISCUSSION

X. DISCUSSION

The main objective is to reduce the paperwork and workload. We are getting the attendance of students or employees and we are having systemized data using RFID based System. Now we are even able to note the temperature of the students or employees. With the help of this project, we will be able to get the accurate attendance of the employee or student with timings. We will even get the temperature of the person who is entering the office. In this way, we can decide the salary of the person depending on the working hours of that respective person. So, this will be more advantageous than the existing systems.

XI. CONCLUSION AND FUTURE SCOPE

Through proposed IoT-based smart attendance system using RFID, the existing manual attendance record system can be transformed into an effective and error-free attendance management system. By using this system, information can be transmitted without any problems. The proposed system will be of great help to schools, colleges, and any organization in tracking their students or employees. Although there are different methods of managing student or staff attendance, the proposed system is easy to use and very convenient for any organization. The proposed system is time-saving and user-friendly. Participation can be easily saved and restored. The advantage of the system is also the high speed of identification and verification. This system can be applied to future work not only in small industries but also in large industries. This study is considered as a basic stage for several future types of research, and the following operations can be performed to improve the performance of this algorithm.

A. *Establish a Wireless Connection Between the ESP and the PC.*
B. *Design an Online Attendance System Database.*
C. *Add Additional Input Such as Fingerprint and Face Detection.*

REFERENCES

[1]. B.M Sri Madhu, Kavya Kanagotagi, and Devansh. “IoT-based Automatic Attendance Management System”. In: 2017 International Conference on Current Trends in Computer, Electrical, Electronics and Communication (CTCEEC). 2017, pp. 83–86. Doi: 10.1109/CTCEEC.2017.8455099.
[2]. Hasan U. Zaman, Jannatul Siffat Hossain, Tasnim Tamanna Anika, and Deboshree Choudhury. “RFID-based attendance system”. In: 2017 8th International Conference on Computing, Communication and Networking Technologies (ICCCNT). 2017, pp. 1–5. Doi:10.1109/ICCCNT.2017. 8204180.
[3]. Unnati Koppikar, Shobha Hiremath, Akshata Shiralkar, Akshata Rajoor, and Vishwanath P. Baligar. “IoT based Smart Attendance Monitoring System using RFID”. In: 2019 1st International Conference on Advances in Information Technology (ICAIT) (2019), pp. 193–197.
[4]. Kamran Ahsan. “RFID Components, Applications and System Integration with Healthcare Perspective”. In: Deploying RFID. Ed. By Cristina Turcu. Rijeka: IntechOpen, 2011. Chap. 2. Doi: 10.5772/16968. URL: HTTPS://doi.org/10.5772/16968.
[5]. Hassan Sharabaty, Ertan Zencir, and Ghassan Hameed. “New anti-collision protocol for RFID-based student attendance system”. In:Oct. 2018, pp. 17. Doi: 10.1109/ISMSIT.2018.8567278.