

Smart Attendance System

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Abstract—In today's academic operation process, maintaining the attendance of students plays a major role in the status of daily performance in their activities. The important task of the operating system is the process of pacing the attendance by using the Wi-Fi module (ESP8266). The smart way of taking attendance for multiple numbers of scholars is carried out in a one-point process of time. The Wi-Fi module takes the attendance in a thrusting order within a bit seconds and the scholar's records are readily available and are maintained by the garçon database, according to the colorful departments. Multiple lines like documents, images, vids, and zip lines, etc., can be uploaded and circulated to the scholars, those lines canbe recaptured by the scholars with respect to their unique IP addresses. It helps the scholars to view their attendance as well as lines anywhere, anytime. This system provides an electronic attendance system for ease and security. Thus, the Proposed system is more efficient at the time of recovering data compared to another attendance system.

Keywords—Academic management process, ESP8266, private cloud, Wi-Fi Router, zip files.

I.INTRODUCTION

The combination of Networking and Automation technology is improving with time, internet and smart devices have become more popular and reasonably priced, so this automation system intends to develop a smart and secured way of automatic attendance management system. People's expectations about a smart system that has modernized productively. A contemporary intelligent attendance system is a blend of different widely used controlling apparatus and wireless networks. The new complicated products in the electronics world brought a new model of changes to automating the attendance system. The intensive progress of the attendance system has enhanced with a period, wireless sensors, and required electronics for creating the same frequency by on another name. The attendance tracking systems currently in place in numerous organizations/institutions are often considered to be inadequate. They are suggesting the utilization of traditional methods, where students are required to record their attendance on paper to mark their presence in the classroom. This type of attendance may lead to some cons. Another disadvantage is that the data must be entered manually and considered by the staff. This system is tedious, may have errors and it requires manpower. According to the manual system, data must not be obtained fast, accurately, and precisely within the exact time.

Features of the smart way of recording attendance are as follows:

1. First, need to scan the RFID tags to the RFID card reader
2. It reviews the data and sends it to the database.
3. Confirmation data will be displayed on the LED display
4. The attendance is marked and stored in Google Sheets. The Proposed system of Smart attendance system using the ESP8266 Wi-Fi module is illustrated. The architecture is centered on an RFID computer which acts as the main controller of the system. Initially, an RFID tag is provided to each student, it acts like a smart card that is already connected to the Wi-Fi router, and it is provided with a unique IP address. It will initialize a connection and transfer the information between the RFID card reader module as the host computer and the ESP8266 module this process, the required information of the student, the student's unique IP address, and the Register number will be recorded in the local host of the main server. The same information is fed into the ESP8266 module for the smart attendance system. This collected information will be used to identify students and delivered to the local host server for validating attendance. The host computer, RFID card reader the next step is RFID will transmit data consisting of the student's IP address and which indicates the attendance time to the server. The attendancedata will be stored in the database of the local host [1].

Thehardware elements show the process for the flow of recording and marking :

Hardware Components: ESP8266Node MCU esp8266 Wi-Fi module is an open-source, low-cost, low-power MCU (microcontroller unit) developmentboard. It consists of 17 General-purpose I/O pins (11 areDigital I/O pins), out of which one pin is an analog pin, 4 pinsupport PWM, 2 pairs of pins are for UART (UART0 andUART1) and support 1x SPI, and 1x I2C protocol [2].

An RFID, short for a radio frequency identification system, comprises two key parts: a tag affixed to the object to be recognized and a reader that scans the tag. The RC522 module is equipped with eight pins, each serving a distinct function for various communication protocols supported by this module. Additionally, the RC522 reader module is capable of both reading and writing data to these memory components. After the attendance data is validated. This response status will be displayed on the PC screen. By displaying this response status, the staff knows whether their attendance is submitted successfully to the server or not Finally the entire student data for individual student data can be displayed and also staff can take copies by taking printouts. The additional application is that multiple files like

documents, images, videos Zip files, etc[3].

HARDWARE SETUP

The hardware elements show the process for the flowof recording and marking.

A. Hardware Components:

The ESP8266 or NodeMCU Wi-Fi module is a low-cost, open-source microcontroller unit development board that consumes low power. It boasts 17 general-purpose input/output (GPIO) pins, 11 of which are digital I/O pins, with one of them serving as an analog pin. Additionally, it features 4 pins that support pulse-width modulation (PWM), and two pairs of UART (UART0 and UART1), and can accommodate 1x SPI and 1x I2C communication protocol[4].

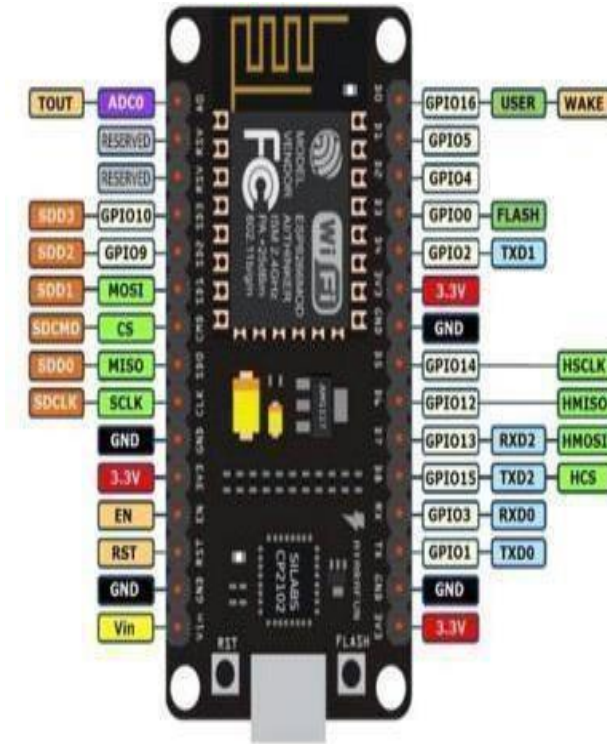


Fig.2.1 NodeMCU

A radio frequency identification (RFID) system comprises two primary components: a tag that is affixed to the object to be identified and a reader that reads the tag. The RC522 module has a total of 8 pins and supports multiple communication protocols, with each pin serving a unique function for each protocol. The RC522 reader module is capable of both reading and writing data into the memory elements of the tag [5].

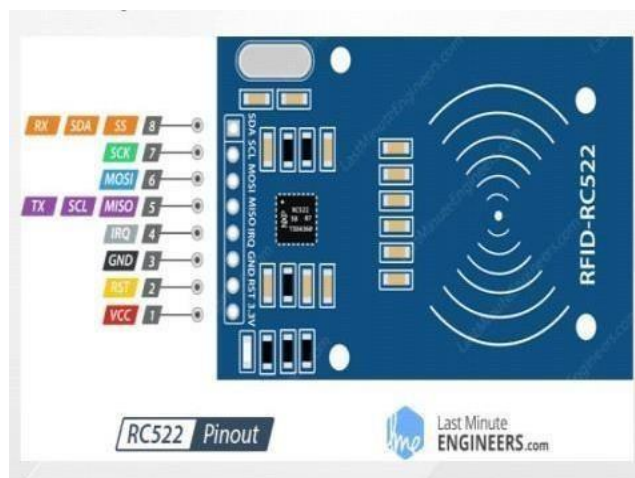


Fig.2.2. RFID-RC522

RFID Tags are of two types:

Active Tags: It contains a power supply fixed internally. It consists of three components one is an Antenna coil, the second is a Microchip, and the third is a power source. It is used for high ranges.

Passive Tags: It doesn't contain an internal power supply. It consists of two main components. Antenna coil and another is a Microchip. It is used for low range [6].

We are using passive tags for this project.



Fig.2.3. RFID Tags

LCD

The 16x2 LCD is an electronic device utilized for exhibiting messages and data. LCD stands for Liquid Crystal Display, and the 16x2 designation signifies that it comprises 16 columns and 2 rows. This display screen is capable of showing up to 32 characters in total (16x2=32) [7].

II. WORKING

The block architecture demonstrates how all of the hardware elements work together to operate a smart attendance system. By scanning and data storage in a database.

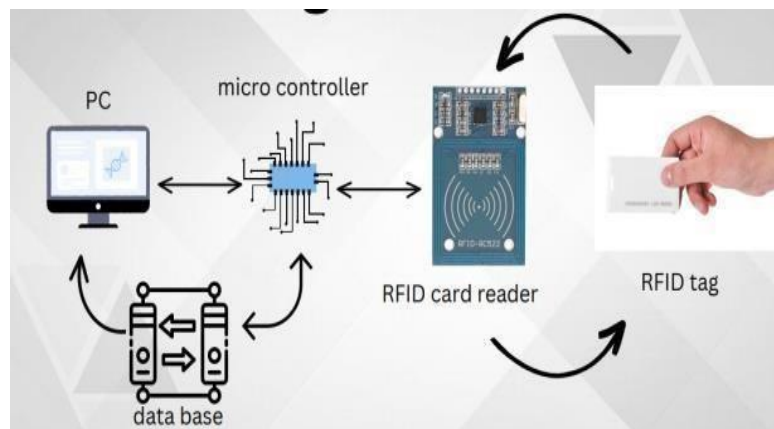


Fig.3.1. Block Diagram

This project will teach you how to create an Internet of Things (IoT) enabled attendance system using an Arduino NodeMCU ESP8266 microcontroller, as well as an RFID card reader platform, which operates with RFID tags. So, we will use an RFID card reader, tags, and Node MCU ESP8266 Board[9]. After the RFID scanner reads the RFID cards, the

collected data is transmitted to the Google Sheets cloud platform utilizing the ESP8266 Wi-Fi module. This information is viewable on an begin to format your paper, first write and save the content as a separate text file. LCD screens and can be accessed from anywhere on the internet by authorized personnel, allowing them to monitor and analyze attendance records [9].

III. EXPERIMENTAL RESULTS

In this section, the experimental approaches made and the corresponding results obtained are presented



Fig.4.1. Module for scanning RFID tags and displaying response

Date	Time	Roll Number	First name	Second name	Phone number
3/1/2023	10:14:47	123456	Gout	polytechnic	1234567890
3/1/2023	10:13:43	123456	Gout	polytechnic	1234567890
3/1/2023	10:11:25	123456	Gout	polytechnic	1234567890
3/1/2023	10:10:37	123456	Gout	polytechnic	1234567890
9/1/2023	9:53:53	2	Sahin	Rahesh	2
12/23/2022	15:30:36	2	Sahin	Rahesh	2
12/23/2022	15:30:19	1	Rahesh	Kumar	1234
12/23/2022	15:54:35	1	Rahesh	Kumar	1234
12/23/2022	15:51:37	1	Rahesh	Kumar	1234
12/23/2022	15:03:24	2	Sahin	Rahesh	2
12/23/2022	15:00:11	1	Rahesh	Kumar	1234
12/23/2022	14:59:56	1	Rahesh	Kumar	1234
12/23/2022	14:59:06	1	Rahesh	Kumar	1234
12/23/2022	14:58:23	1	Rahesh	Kumar	1234
12/23/2022	14:57:00	1	Rahesh	Kumar	1234
12/23/2022	14:54:05	1	Rahesh	Kumar	1234
12/23/2022	14:51:18	1	Rahesh	Kumar	1234
12/14/2022	15:42:55	1	Rahesh	Kumar	1234
12/14/2022	15:42:37	1	Rahesh	Kumar	1234
12/14/2022	15:42:19	2	Sahin	Rahesh	2
12/14/2022	14:55:48	1	Rahesh	Kumar	1234
12/14/2022	14:55:26	2	Sahin	Rahesh	2
12/14/2022	14:55:21	2	Sahin	Rahesh	2
12/14/2022	14:40:09	1	Rahesh	Kumar	1234
12/14/2022	14:10:34	1	Rahesh	Kumar	1234

Fig.4.2. RFID tags displaying response

CONCLUSION

The objective of an automatic attendance management system is to overcome the drawbacks of conventional manual methods. We have developed a prototype of a Smart Attendance System that utilizes an ESP8266 smart card and an RFID card reader. The Smart Attendance System is designed to record attendance within a specific time frame, and it is portable to enable easy usage without interrupting classroom sessions. With the integration of IoT, enhancing the device's ergonomics to make it even more user-friendly, with the ultimate goal of contributing to the creation of a healthier academic environment.

REFERENCES

- [1] "IOT-based smart attendance using RFID" by S.S. Saini, S. Yadav, and S. Kumar in International Journal of Engineering Science and Technology, Vol 8, No. 6, pp 141-145,2016.
- [2] "RFID-based smart attendance using IOT" by N.Bhosale and S.S. Sane, in International Journal of Computer Science and Mobile Computing, Vol 6, No. 2, pp.130- 135,2017.
- [3] "Smart Attendance using IOT and RFID foreducational institutes" by V. H. Mhetre and R. B. Patil, in International Journal of Advanced Research in Computer Science and Software Engineering, Vol 7, No. 2, pp. 445-448,2017.
- [4] "IOT-based smart attendance using RFID and face recognition" by S. Singh and A. Singh, in International Journal of Advanced Computer Science and Applications, Vol 9, No. 8, pp. 476-480,2018.
- [5] B. J. Mendonca, G. D'mello, R. D'Souza, and J.More, "Automated attendance using Android devices," Int. J. Appl. Inf. Syst., vol. 8, no. 6, pp.21-26, 2015.
- [6] F. Susanto, F. Fauziah, and A. Andrianingsih, "Lecturer Attendance System using Face Recognition Application an Attendance System using Face Recognition Application an Computer., vol. 3, no. 2, pp. 167-173, 2021, Doi: 10.47709/cnahpc.v3i2.981.
- [7] V. Hava, S. Kale, A. Bairagi, C. Prasad, S. Chatterjee, and A. Varghese, "Free & Generic Facial Attendance System using Android," Int. Res. J. Eng. Technol., vol. 06, no. 09, p. 6, 2019.
- [8] D. M. V. Salac, "PRESENT: An Android-BasedClass Attendance Monitoring System Using Face Recognition Technology," Int. J. Computer. Sci. Res., vol. 2, no. 3, pp.102- 115, 2018, Doi: 10.25147/ijcsr.2017.001.1.28.
- [9] M. M. Islam, M. K. Hasan, M. M. Billah, and M. M. Uddin, "Development of Smartphone-Based Student Attendance System," in 5th IEEE Region 10 HumanitarianTechnology Conference 2017.