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Classroom Attendance System by Using IOT with Fingerprint.

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Abstract: *According to the previous attendance management system, the accuracy of the data collected is the biggest issue. This is because the attendance of a particular person can be taken by a third party without the realization of the institution which violates the accuracy of the data. The main objective of this paper is to calculate the attendance of students in an easy way. a proposed system that uses a fingerprint to secure data accuracy of the attendance to the faculty thereby reducing the burden in taking attendance. The project is developed based on the IoT (Internet of Things) concept where a smart device is used to manage systems. The proposed system requires ESP32 wifi module, fingerprint sensor.*

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I. INTRODUCTION

Fingerprint based technique use computer to store and verify fingerprints. The system will also reduce the total time needed to do attendance recording. Using such technique inclusion of fake attendance can be prevented. We have chosen fingerprint sensor for thumb recognition.16x2 display connected for displaying the data read from finger print sensor which helps to detection of which roll no present at instant and this data forward to ESP32 wifi module. so its connected to the web hooks trigger by IFTTT platform which stored all data in google sheet.

II. PROPOSED MODEL

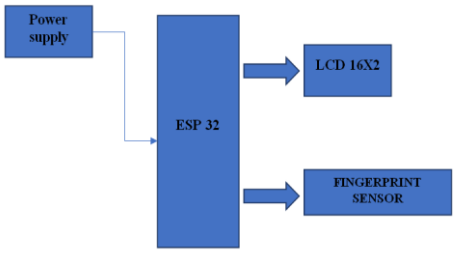

Fig.(1) block diagram

The proposed system involves a fingerprint attendance system that integrates an ESP32 NodeMCU board and a fingerprint sensor. The fingerprint sensor processes the user's fingerprint to verify the student's attendance. NodeMCU uploads the attendance data to Google Spreadsheet using a service called web hooks trigger by IFTTT platform. 16x2 display connected for displaying the data read from finger print sensor which helps to detection of which roll no present at instant and this data forward to ESP32 wifi module, so its connected to the web hooks trigger by IFTTT platform which stored all data in google sheet. In Proposed system, there are three main parts: enrolling, searching and displaying the attendance. This simple device starts with the connection of esp32 wifi module and fingerprint sensor to the computer for enrolling. Enrolment plays an important role. It involves capturing an image of the user's fingerprint. Searching involves shifting through a set of stored fingerprints and comparing them with the input fingerprint. At the output window scanning time, date, user name and ID number are displayed. Google spreadsheet is used in this system to show the information.

III. SYSTEM REQUIREMENTS

(i)ESP32 wifi module
(ii)Fingerprint sensor
(iii)Arduino Software (IDE)
(iv) IFTTT platform

(3.1) ESP32 wifi module: ESP32 connected with 5v power supply. Data from fingerprint sensor forward to ESP32 wifi module, so its connected to the web hooks trigger by IFTTT platform which stored all data in google sheet.

(3.2) Fingerprint sensor: There are many kinds of fingerprint module. They are optical, capacitive, piezoresistive, ultrasonic, piezoelectric, RF, thermal, etc. An optical fingerprint sensor is used in this system. This sensor read the fingerprint pattern. The scan image is converted as template and saved in memory.

(3.3)Arduino Software (IDE): The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards.

(3.4) IFTTT platform: IFTTT derives its name from the programming conditional statement "if this, then that."IFTTT is a web service that lets you create applets that act in response to another action. You can use the IFTTT Web hooks service to create web requests to trigger an action. The incoming action is an HTTP request to the web server, and the outgoing action is an email message.

IV. EXPERIMENT SETUP

(4.1)Enrolling: Firstly, fingerprint module is connected with Esp32 nodeMCU. ID number is enrolled using the serial monitor. If this step is ok, the fingerprint is scanned with sensor. And then, the fingerprint is converted as templates and stored in EEPROM. After that, another fingerprint is taken and saved as another ID number.

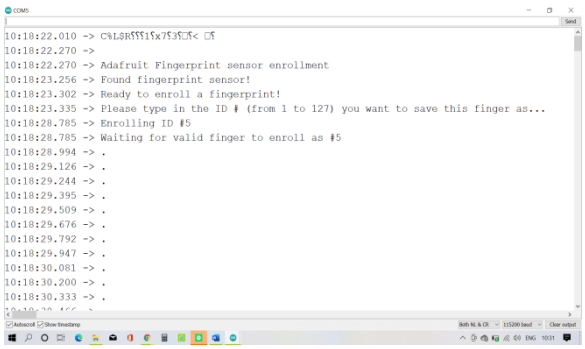

Fig. (2) Enrolling ID Number

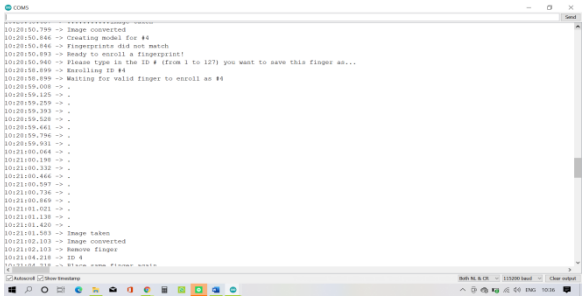

Fig. (3)Saving fingerprint

(4.2)Searching and Displaying Fingerprint: Firstly, the controller checks whether the fingerprint is present or not. When the fingerprint is detected and compared this template with the stored value in EEPROM. If this is matched, ID number and name is displayed into Excel including the scanning time and date.

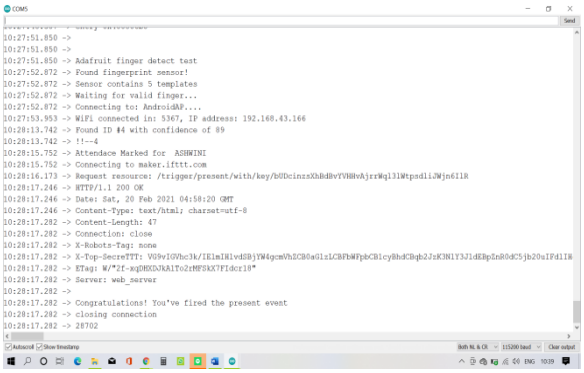

Fig.(4) Waiting valid finger

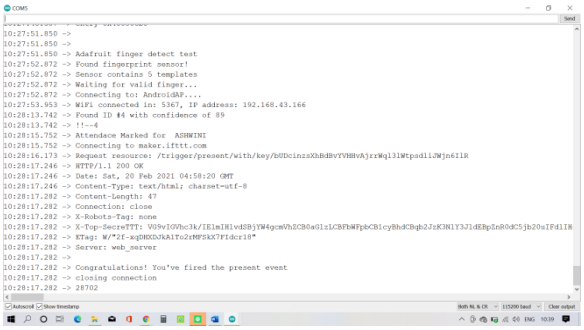

Fig.(5)Arduino serial monitor

Test and result for fingerprint attendance system are shown in Figure (6) and (7).

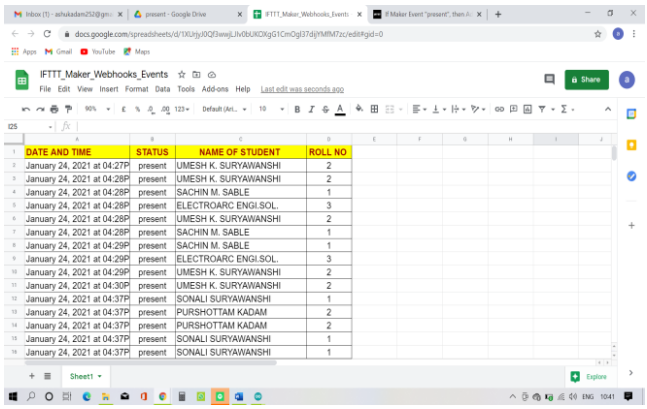

Fig.(6)Test and result for fingerprint attendance

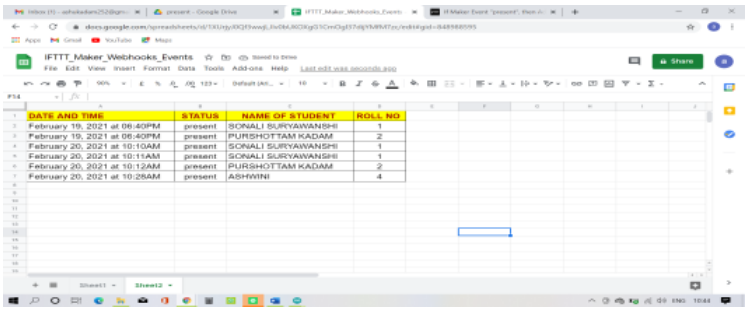

Fig.(7)Test and result for fingerprint attendance system

Fig.(8) Photo of fingerprint attendance system

V. CONCLUSION

This system is user-friendly and reliable because this system displays name, the ID numbers, date and time on excel sheet. This excel sheet can also be saved and attendance can be calculated with Microsoft Excel technique. Otherwise, this attendance system can be implemented to check which person reached the work in time or on time or late time. So, this developed system is very also useful in saving valuable time of students and lectures, paper, generating report at required time.

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