Fingerprint Based Attendance System by IOT

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Abstract - *Identification and Authorization of a person is determined using his personal metrics. For this specified work various types of authentication systems are used in the market, to point out the identity of a human being. Therefore, biometrics or biometric authentication serves as a type of gadget that employs the measurement of fingerprint biometrics of a human body, transforming the security industry. Manually attendance procedure usually takes lot of time and also consumes more energy & effort for validating the attendance data because a large amount of attendance data will be generated. Therefore, in this paper, a system is proposed to reduce these problems & level of it & produce effectiveness of processing student's data using a system with the help of a concept & methods of IOT i.e (Internet of Things) with the fingerprint (biometric) method. Here the student's data are uploaded safely onto the cloud server & can also be easily collected as per need. This research paper draws a picture of how a simpler, easier system can be made to use student attendance system using Internet of Things (IoT) Technologies.*

Key Words: **Biometric, Efficient, Integrate, Authorization, Authentication.**

1. INTRODUCTION

Basic attendance method which is followed in our school system, where the teacher calls our Roll No or name of the student & marks his/her attendance respectively. This usually consumes a lot time & energy. This method becomes more hectic when there are large number of students are present in a class Managing this all type of data is very hectic and restless thing, One more extra disadvantage is that there is also a chance of marking a fake or proxy attendance of students Hence this study/model presents a system that can record the fingerprint of students & use them wisely to check their attendance for lectures and other types of activities. Also Biometrics assures the physical presence unlike RFID card or password security systems which are precarious. The design of this system proposed in this paper is a collaboration of NodeMCU ESP8266 (microcontroller), R307 Fingerprint Sensor module, and an online Google sheets display. This system requires a connection to a website that can be gained through Wi-Fi. This R305 fingerprint sensor is capable of clarifying the finger images within seconds and also provides the storage capacity of 127 fingerprints.

Here each student will be assigned to a distinct ID number which is activated during the fingerprint enrollment process.

The built-in Wi-Fi module present in ESP8266 is used for creating a connection so that the end-user can make a connection with the device. Under this type of process & working conditions, the device is now efficient of validating a person by his fingerprint & uploading the respective data with time in time out to respective, webserver Now below a brief literature survey narrates the recent studies and implementation of this similar concept.

1.1 Objective

The main motive of this model is to avoid fake attendance, thus increasing the authenticity of attendance data records, to reduce the process of manually taking and maintaining the attendance records becomes highly cumbersome.

A system that track records of the attendance making use of biometric scanners and feeds them securely over cloud.

This Biometric attendance system is based on fingerprint and wireless techniques which decodes the issue of proxy attendance and the inconvenience of handling the manual data of each student.

1.2 Problem Statement

This system prevents from false attendance, much of our time will be saved & therefore honestly of student attendance data is also optimized. Spoof is another problem with the old system. There are several the students who make fake signs or responds where in some cases where the students are not present and this method won't make the attendance of students reliable.

1.3 Literature Survey

For research by Dhanalakshmi et al. [6] IT Offers research using fingerprint and Wi-Fi module. Biometric attendance system is designed and implemented for effective real-time monitoring and Transparency in managing the physical presence. Wi-Fi- Wireless Fingerprint Terminal (WFT). this is the system who is appropriate when implemented in educational institutions. Everyone has a unique fingerprint pattern and is used to find the record of a particular individuals. Student attendance tracking is verified by Institute.

There are two ways to authenticate fingerprints taken in the verification process. In first method the organization Creates

database itself and uses a different approach. second method is CIDR, student's attendance can be monitored, recorded and sustained without any interference from humans. Attendance can be automatically sent directly to students and Parents' mobile numbers via SMS. It provides transparency as well as enhanced efficiency. This can help in Managing and improving in attendance system.

2. PROPOSED WORK PLAN

2.1. The main aim of the project is to automatize the procedure of attendance

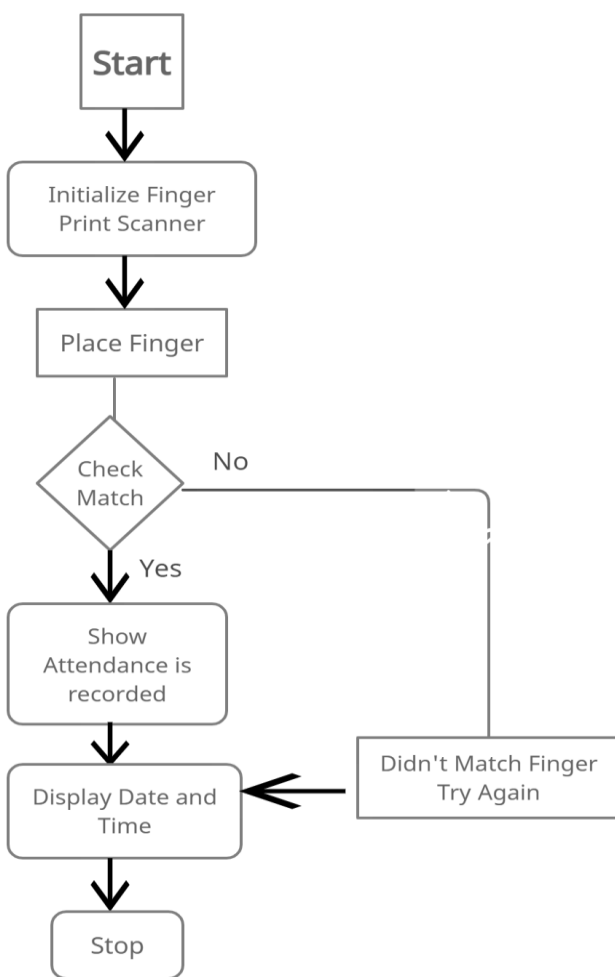**The flow chart will be as follows: -**

Chart -1: **Flow Chart**

2.2 Algorithm

1. System begins.

2. Scans for the Wi-Fi network (if nothing is selected).

3. Connection is established successfully.

4. It starts scanning for the fingerprints when the connection is established successfully.

5. Students can scan their fingerprints now.

6. Selection of choice of enrolling a new fingerprint or deleting the previous ones.

7. When it evaluates and matches any student's fingerprint image, it uploads their fingerprint ID to the google spreadsheet.

8. As and when the server receives the finger print data from its system, it upgrades the presence/attendance of the student.

3. System Design & Components

a) **NodeMCU ESP8266 -** NodeMCU Microcontroller Unit is an IOT platform that runs on ESP8266. It has one analog pin (a0) and nine digital pins (D0-D8). The input voltage is between 7-12V and a operating voltage is 3.3V. It has flash memory of 4MB and clock speed is of 80 MHz It has also two control pins i.e., EN, RST which resets the microcontroller. It has also 16 GPIO i.e., general-purpose i/p, o/p pins on the board.

b) **R307 Fingerprint Sensor -** R307 a fingerprint sensor who has TTL UART for the direct connections. It has a storage capacity of 1000 fingerprints. Its operating voltage is between 4.2 - 6v Dc. R307 has 0.3sec scanning speed. It follows one-to-one approach (1:1) and one-to-many (1: n) approach. The specialty of this module is it consumes low power, it costs also low as compared to others.

c) **Breadboard -** Breadboard is type of tool or we can say a regular rectangular type board with large number of holes knows as strips present on it. These strips let us to insert any type of components into it to check or analyze an early version of any electronic circuit. There also latest types of breadboards available in the market of different shapes, sizes, and color. There are also numbers, letters written in the top if each row strip just for reference.

3.1 Software

Google Spreadsheets - Google Sheets are a kind of spreadsheet programs which are incorporated as part of open source, web-based document editors which are being offered by Google. Google Sheets is type of a application which is totally online web-based that gives access to users to build, upgrade and reform the spreadsheets and update the information simultaneously.

This google online spreadsheet application enables users to build, upgrade and reform the spreadsheets. These types of Sheets are often compared to Microsoft Excel, as both of the applications are used for homogeneous purposes.
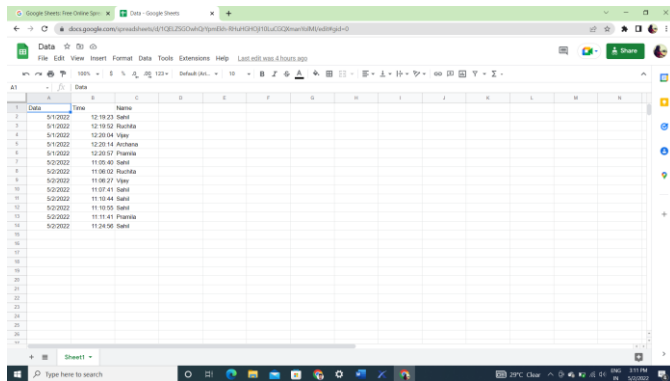
### How to use Google sheets? (Steps)

The Users have an access and can create on their own and also can modify the spreadsheets via the Google Sheets also they can access it through mobile devices-based applications or running on iOS devices. To get access to the Google Sheets, one should have valid email ID is required. Sheets also has the following functions: -

- The data here is available in the form of tables where we can construct and handle data.

- Examine - They can conceptualize the given spreadsheet data into various forms like pie charts, bar graphs and various forms of tables.

- Share – Users can easily share their sheets or their documents with anyone or can enable privacy in it for security purpose.

- Printing – There are also other options available to import the Sheets files into other document formats like Microsoft Excel, Microsoft Word, Microsoft PowerPoint, PDF reader and etc.

- It is also a kind of similar to Microsoft excel, because most of the spreadsheet's functions are same.

3.2 System Implementation

The proposed method in this paper is a design of portable Biometric system which enables a server to accept the fingerprint ID. The data is directly logged to a computer in excel file which is running the client application. This completely eliminates the need of storage device in the design. The other improvement is and time and date is added to the logged data. This also eliminates the RTC hardware. Battery power is the most important resource for a handheld device. These two improvements help to reduce the power consumption which is provided by a battery.

The design methodology is easy to understand with a block diagram representation as in Fig. The design is mainly separated into four parts, i.e., the power supply section, control(microcontroller) and display section, biometric scanner section, and IoT communication section. The control and display section is formed by NodeMCU microcontroller and Google sheet The biometric scanner section is an optical fingerprint scanning module R305, and Wi-Fi ESP8266 module is the IoT communication section. The power source is a 9 V Li-ion battery with 3.3 and 5 V regulators, is the hardware prototype setup of device which shows each section mentioned above.
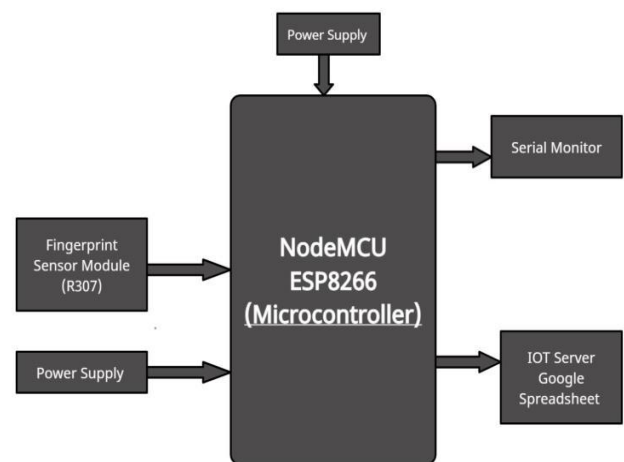
4. Applications –

The system will also be used as biometric attendance of students. This types of techniques are often used for real time monitoring of presence of students and helps in maintaining the attendance records in real time. It can be used for safety purposes where high-level of security is desired. The system can be improved by enclosing it in a plastic covering. This would make it more compact & reliable to use in a classroom setting.

It can be further improved in domestic as well as industrial application too. It can also be improved to fit the corporate environment. Usually, biometrics are also used in the legal process or related to some government work also. It is a basically efficient and low-cost embedded platform with easy report generation facility available.

5. Conclusion

The procedure of manually taking attendance is very difficult and very time consuming. To avoid this, Biometric Attendance based on IoT comes in the picture. This IoT based system supports biometric identification and has a capability of recognizing features automatically. It is an open-source system and user friendly because of lack of complexity.

The system can be used almost at each place such as classroom for student's attendance, In MNC companies to keep the record of employees/workers, etc. The IOT system can further help in calculation of attendance percentage and can help admins to keep record.

6. References –

[1] Dow C., "IOT Programming Projects: Build modern IOT with the Raspberry Pi 3 and Python", Paperback, October 31,2018, Packt Publishing.

[2] Seviratne Pradeeka, "Internet of Things with Blynk: Build with the power of Blynk configuring smart devices and build exciting IOT projects", Paperback, May 28,2018, Packt Publishing

[3] Shinde Snheal. R, A. Karod and Dr. R. Suralkar, IOT Based Environment Monitoring System, International Journal of Electronics and Communication Engineering and Technology, 8(2), 2017.

[4] Leo Louis. "Working Principle of Arduino and using it as a tool for study and research", IJCACS, April, 2016.

[5] Viswanath Naik. S, S. Pushpa Bai, Rajesh. P and Mallikarjuna Naik. B,Iot Based Green House Monitoring System, International Journal of Electronics and Communication Engineering & Technology (IJECET), Volume 6, Issue 6, June (2015), pp. 45-47.

[6] Pradip Patil,Sumit Sharma,R. B. Gajbhiye, "A Study- Imp act of Internet of Things (IOT) For Providing Services for Smart City Development", June 2015.

[7] Trideep Roy, Somalya Ghosh, Arpeta Santra, Home Automation Using Raspberry PI Based on IOT, International Journal of Computer Engineering and Technology 10(3), 2019.

[8] Pranava Madan, Lakshay Dhama , Rajiv Dahiya , Ruchika Doda, "Paper on Arduino Research Papers", International Journal for Research in Applied Science & Engineering Technology (IJRASET), March,2019.

[9] Rajaprabha, Jayalakshmi, Anand and Asha, Smart Garbage Collector for Smart Cities, International Journal of Civil Engineering and Technology, 9(12), 2018, pp. 435–439

[10] Dr. Samir Mohammed Chasib, Dr. Sad Fahad Resan, Mohammad Salah, Jabar Salih, Ali Mohsen Hasan, Developing Sustainable Lightweight Bubbled Ferrocement Slab Using Enhancing Cementitious Agents. International Journal Civil Engineering and Technology (IJCIET) 8(12), 2018, pp. 749–765.