

# IOT BASED BIOMETRIC AND RFID ATTENDANCE SYSTEM

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## ABSTRACT

*In our project, we proposed a portable system which maintains the attendance record of students automatically. Our system, takes the attendance list over a significant piece of time, fair amount of time wastage, composing and marking. Students are neglecting as well as ignoring to sign the attendance paper and lecture attendance. It is necessary to move away from this conventional system and need to provide better solution for the problem which is being faced. IOT is the key medium to solve the said problem. This system uses a biometric and RFID concept to facilitate the attendance system in educational institutes. A biometric device is used to mark the attendance without the intervention of the teacher. This project enables the easy way of maintaining class attendance with fewer efforts, this will save time wasting on calling out names and it gives a full-proof method of attendance marking.*

**Keyword:** - fingerprint detection, attendance, sms notifications of check in and checkout, check in and checkout time, web portal support.

## 1. INTRODUCTION

*Our project presents a simple and portable approach to student attendance in the form of an Internet of Things (IOT) based system that records the attendance using fingerprint based biometric scanner and stores them securely over cloud. The idea of this project was taken to overcome all the issues in all previous technologies and make data in digitized way. Attendance is a concept that exists in different places like institutions, organizations, hospitals, etc. during the start and end of the day to mark a person's presence. Since the past, the traditional way of taking attendance in a class includes a pen, attendance book or registers and a person. Thus the drawbacks arise as it consumes time, needs manual work and the most important, information or the attendance can be manipulated. Also, there are chances of students not responding to their attendance and later claiming for the attendance. The new procedure of taking attendance using fingerprint is easier and therefore overcomes all the above mentioned drawbacks. Apart from this, forging a signature in an attendance sheet may also happen. The work in-creases much more if the class strength is more. Hence, a lot of work force has to be put into attendance verification and analysis. In any IOT based system, the hardware consists of a combination of sensors, microcontroller, display, and the most important, hardware providing access to the internet. The Fingerprint technology serves as an identity proof to take the attendance of students. This project uses the concept of Internet of Things to set up a smart attendance tracking system.*

## 2. METHODOLOGY

*A Biometric Attendance System is a highly specialized system that records students attendance by comparing a single fingerprint image with the fingerprint images previously stored in a database. The Biometric Identification system uses the principle behind the AFAS. This proposed attendance management system uses biometric identification. This system compares an individual's biometrics with every record present in the database. In general, biometric recognition consist of two stages:*

*i. Enrollment and*

ii. Authentication

During enrollment process the fingerprint of the user is captured with unique features and stored in a database with the student ID. During checking, the fingerprint of the user is sensed again and the stored data are compared with the records present in database.

All data and information required for the proper recording of attendance are stored in database. The lecturer selects the course code and the attendance type, then the student places his/her fingerprint on the fingerprint reader; the finger with those stored in the database. The system successfully takes the attendance both at lectures as well as examinations. The prototype captures new fingerprint to be stored in the record; scanned fingerprint placed on the device sensor and compared them against those stored in the database successfully.

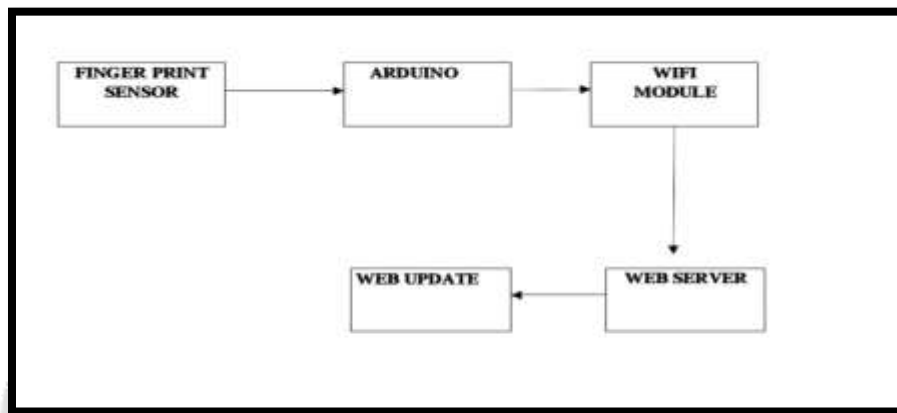


Fig1.1 Process

3.1 Proposed System:

1. Proposed System Reduce paper work and save time and money
2. Eliminating Duplicate data entry and error in time and attendance entries
3. We will improve visibility to track and manage student attendance
4. Easy attendance Recording using RFID and biometric base attendance system
5. Keep the parents inform about the student attendance Email and SMS Alert increased security and confidentiality with roll based permissions to users.

3. BLOCK DIAGRAM

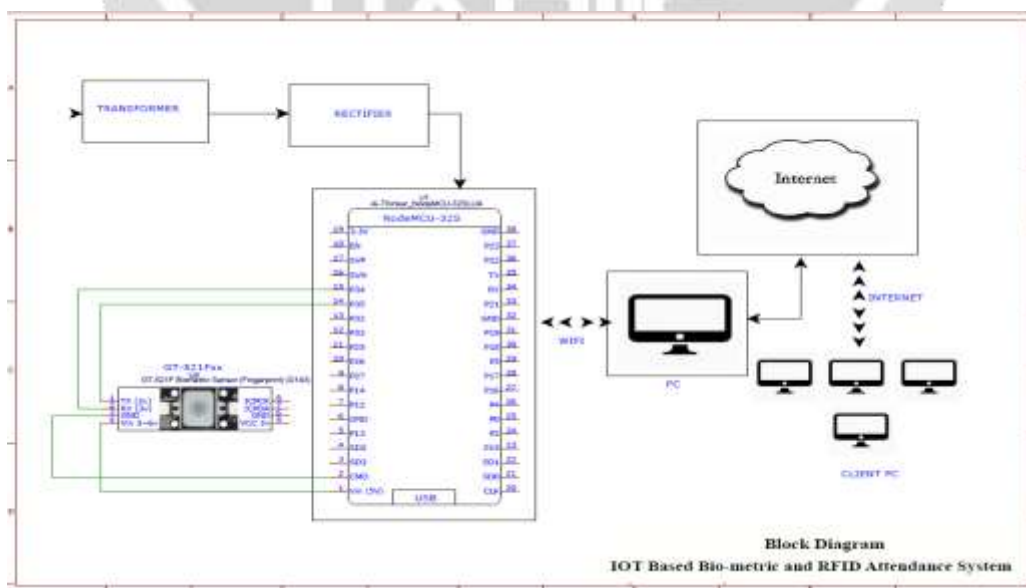


Fig1.2 Block Diagram

**Block Diagram Explanation:**

1. First Block in a dig Represent Power Supply Unit Containing Step Down Transformer in Rectifier Which will give +5V as Output Voltage Generated Voltage are used for biasing different modules like Wi-Fi modules, Bio-metric sensor, RFID Reader ,etc.
2. Bio-Metric Scanner used for unique identification on humans mainly for verification and identification
3. Once Person Scanner finger that data process in a inbuilt micro-controller of Wi-Fi module
4. Wi-Fi module in connected to any router for access of internet programming a microcontroller includes database connectivity (Xampp) where data will stored
5. We are accessing database in a our webpage through PHP multiple Pages of website are interconnected for a two way communication from Scanner to website and from website to Scanner by operating a website in a LAN network with ngrack will give access to multiple clients connected in a Same network by the help of 000webHost we will run a website globally or Online  
Over a period of data stored in database are extracted in a Excel Format for report generation and tracking attendance
6. Admin Can add a user or edit
7. Message of Monthly attendance will be send to the person on registered mobile number

**3.1 Modules:****1. WI-Fi Module esp8266-12E:**

In any IoT based system, the hardware consists of a combination of sensors, microcontroller, display, and the most important, hardware providing access to the internet. This hardware should be capable of uploading the data from the sensors or microcontroller to the internet. Example of one such hardware is esp8266-12E. These modules have extremely small form factor, and are the most commonly used Wi-Fi module.

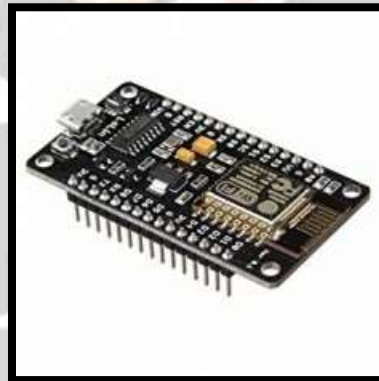


Fig 1.3 Wi-Fi Modules

**2. Fingerprint Module:**

Fingerprint recognition is known to be the best and fastest method for biometric identification. It is secure to use, unique for every person as fingerprint does not change in one's lifetime. Besides these, implementation of fingerprint system is cheap, easy and accurate up to satiability. This system has been widely used in both forensic and civilian applications. Compared with other biometrics characteristics, fingerprint-based biometrics is the most proven technique and has the largest market shares. Not only is it faster than other techniques but also the energy consumption by such systems is too less.



Fig 1.4 Finger Print Sensor

### 3. RFID:

*RFID stands for Radio Frequency Identification. It used to transfer data through radio frequency waves. Scanning items with RFID card allows users to automatically and uniquely identify and track inventory and assets. It has a reading range between a few centimeters. RFID's first application was of identifying airplanes as friend or foe in World War II. The cost of implementation of RFID and using an RFID system continues to decrease, making RFID more cheap and efficient and users.*

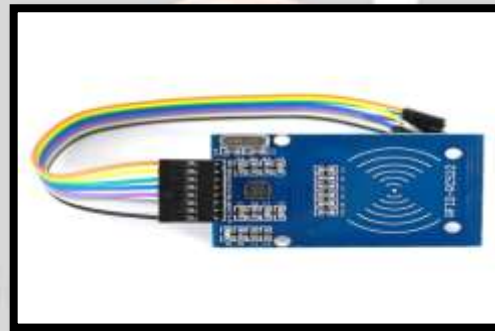


Fig 1.5 RFID Reader

### 4. OLED Display Module:

*OLEDs structure consists of organic materials positioned between the cathode and the anode. It is composed of electric conductive transparent Indium Tin Oxide (ITO). The organic materials compose of a multi-layered thin film, which also includes the Hole Transporting Layer (HTL), Emission Layer (EML) and the Electron Transporting Layer (ETL). By allowing the appropriate electric voltage, Holes and electrons are injected into the EML from the anode and the cathode. The holes and electrons are combine inside the EML to form excitons, after these electro luminescence occurs. The transfer material, emission layer material and choice of electrode are the key factors which determine the quality of OLED components.*



Fig 1.6 OLED

#### 4. FUTURE SCOPE

*The system can be improved by encasing it in a plastic covering. This would make it more compact and easier to use in a classroom setting. The system can be configured to enable lecture-wise attendance taking. It can further be updated by automatically calculating attendance percentage of students and inform the staff if a student's attendance is weak.*

#### 5. CONCLUSION

*The Paper has successfully presented a reliable, secured, fast and efficient system replacing a manual and unrealizable system. This system can be implemented many institutions especially in the academic institution for better result regarding the management of attendance. This system will save time to reduce the amount of work and the administrator has to do and will replace the stationary material with and electronic device. Hence, a system with expected results has been developed but there is still for improvement.*

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