

## Automated Attendance System Using IOT

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### Abstract

*In this modern era with Internet and Web, everything is possible, which made the entire world as a small global village. With the help of Internet and web, people can access required valuable information and communicate with others through verbal chat, instant messaging, email etc... This paper proposes an approach which can be applied in Universities, schools, colleges and various Organizations. With the aid of Proposed work employees can be monitored automatically without any conventional methods and with a reasonable price compared to already existing programs. The proposed work depends on smart devices which are inclined to members of schools, organizations, where each smart device has a special MAC (physical) address. Students can be connected to the application through MAC address and results can be saved finally, we can generate the report on daily or weekly or Monthly basis. The proposed system consists of two parts; the first one is a website, which can be accessed through the main screen of the system management like registration of student data, adding the admin to the system and so on. The second part is a system work environment which is a controller (Raspberry Pi) and running the main script of the system. Finally results can be obtained automatically based on students MAC address. For some exceptional cases, an Android application has been developed for admin to update all future plans. At present the system can be operated by itself and also can be a part of other integrated systems.*

**Keywords:** IOT, Raspberry Pi, MAC address, Android Application.

### Introduction

Nowadays with the concept of the Internet of Things, it is possible to connect millions of devices and let them to communicate with each other. As almost all organizations have the IoT infrastructure they can make use of this facility to monitor the attendance of employees automatically. Some of the benefits of automatic attendance over manual and semi

automated attendance are: saves manpower, time, easier reporting, and lower margins of error. This paper proposes a system known as Automated Attendance System using IoT which can record the attendance of students automatically with less human interaction. The Automated Attendance System works on the basis of Machine to Machine (M2M) interactions. By using the unique MAC (Media Access Control) address of Wi-Fi devices, such as a laptop network card, phone, media player etc. the proposed system automatically records the user. When this is done, manual verification of the user can be easily performed by the administrator. This system will use the MAC address of each student which will be stored in the beginning. The Proposed System also allows a teacher to add attendance manually for the student who doesn't have a smart phone. The Automated Attendance System includes some other features like print the final attendance report directly from the website, monthly notification about the attendance for each student and the ability to remark the student as present in case of any emergency.

### **Literature Review**

Studies so far show that automated attendance system without human intervention is important and gaining more attention. **Mahesh Sutar et. al [1]** proposed Smart Attendance System Using RFID in IOT. In This system, an effort is made to solve regular lecture attendance monitoring problem in developing countries using RFID technology. This system will ease is school/collage to monitor the student as it reduces manpower, gives time saving, easy control and reliability.

**Chethana Gosal S et. al [2]** proposed a method of taking attendance using Bluetooth and Wi-Fi in Specific Region has been presented here which is automatic, paperless, quick, and accurate. A Bluetooth receiver along with a camera for face detection is used to overcome the disadvantage of proxy and biometric.

**Mahesh P et. al [3]** presented an automated attendance management system using Raspberry Pi and NFC which is a smarter and more efficient way .with the help of such system the attendance management system in school/colleges/universities and hence reducing the time required for attendance in class. This system is applicable to not only students but also teachers, employees, workers.

**Rajat Chaudhary et. al [4]** developed a wireless automatic attendance system using fingerprint identification technique which automates the whole process of taking attendance and maintaining it. The fingerprint identification technique was used for maintaining the attendance record.

**K.Lakshmi et. al [5]** Authors proposed system is to help the teachers in college to avoid maintaining the registry book. This project uses a barcode scanner. B.B.S.A.S uses Barcode scanner to take the attendance of students entering the lab. Each student's ID card will have a barcode at the back side of it which contains unique data of the student such as roll number, branch and year. Etc. It will reduce the teacher's efforts to manually mark attendance and their headache of maintaining the register since everything would be stored in the database. It will also help in generating the defaulters list on its own and send email to those students whose attendance is below the required amount.

### Methodology

The system architecture shown in Figure consists of the students (MAC addresses), wireless router (gateway), Raspberry pi3 (system), Internet (web server), and administrator for the web application

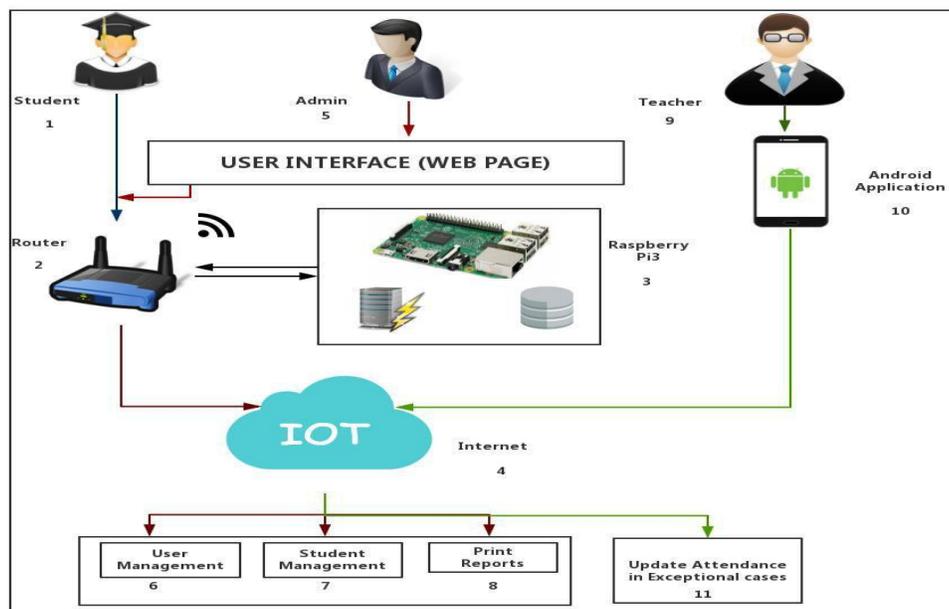


Figure1 : System Architecture.

**Students (MAC addresses):** Each student must open his/her WIFI network when he reaches the college morning and he must be pre-registered in the college network by Admission and Registration Department.

**Wireless router (getaway):** A wireless router is an electronic device that works as a router meaning it sends data from the internet cable to a device and as a wireless access point. The students devices will connect with this device via WiFi service, the wireless router is responsible to identify the MAC addresses of all phones which is connected and sent it to the system.

**Raspberry pi3 (System):** The Pi is a tiny computer about the size of a credit-card, the board features a processor, RAM and typical hardware ports you find with most computers. This means you're able to do most things a desktop computer can do such as document editing, playing HD video, and playing games, coding and much more. In this part we have installed the system, which is responsible to make most of tasks in project, such as sending a request to the router to ask about connected devices and bring them MAC addresses, store those MACs in a database to do some of the processes in case of future ,this card can be a web server , getaway also.

**Internet (web server) :** The Internet is a worldwide system of computer networks - a network of networks in which users at any one computer can, if they have permission, get information from any other computer, to achieve the principle of Internet of things (IOT). We have built our server in the network and will make a simple website on it to do some tasks on our system such as generate reports and add student's details to the system including the MAC addresses.

**Administrator (admin):** is a person who is responsible for the systems which are behind our Web sites. Admin will be responsible of add student details and generate the reports any time through internet from anywhere.

The Proposed system will start every day morning at 9:00AM to scan college network. When a Student enters into the college campus, he must connect with college network; in turn Router is connected to Raspberry Pi which has system. When a student enters into a college campus, system checks database to ensure whether the student's MAC address is stored or

not. If a Particular student has been registered with his MAC address, then the system is going to monitor the student by his MAC address for a particular period of time (9:00 AM to 1:00 PM).

System can automatically record all traffic for each MAC address i.e. how many classes a student has attend and store this information into a database.

System Administrator can access the interface from anywhere, at anytime via website and he can generate daily report, monthly report. He can also add new students, admin, teachers into the system. An Admin can also add new Admin, teachers, students and delete & update existing users in the system.

There may be some exceptional cases like if a student does not have Smartphone, if a student loss his/her phone, if a student has to leave the class in middle in some emergency situation. To handle these issues an Android Application has been developed, with the help this Android Application teachers can mark the student's attendance manually.

### **Module Description**

Proposed system consists of two modules

- [1] Administrator Module
- [2] Confirmation Module

### **Administrator Module**

In this module Admin is responsible for adding a new Admin, Teachers, and Students; remove and display information about the people who are included into the system. Also it is the responsibility of the Admin to maintain Attendance report and if necessary, print the reports monthly.

### **Confirmation Module**

This module is designed for teacher to update the student's attendance in exceptional cases. If any student does not have Smartphone like a phone without WiFi facility, if a student loss his phone then their attendance can be updated manually by the teacher.

## **Conclusion and Future Work**

Traditionally student attendance has to taken by professor and it is wastage of time and much proxy attendance can be recorded in manual system. This can be replaced with computerized system. Most of the existing system needs some techniques or some applications have to be installed in student's phone.

In proposed system application just needs personal phone MAC address of each student and that make the system cost is low. In this work , the web based Automated attendance system is developed using python object oriented programming language , PHP server-side scripting language and CSS,HTML ,JavaScript for designing which is fully meet the system's goals.

This system represents the machine to machine interaction (M2M), which is the basic concept of internet of things (IOT) and take the advances of this new techniques to simplify management works in organizations. The system has overcome many limitations incorporated in attendance, and saves a great amount of time and reduces errors which may occur during attendance calculation.

The proposed system is fully responsive which can be used flexibly in mobile, tablets and different operating systems.

As a future work Evasion of the attendance in organizations and colleges can be implemented. For this seek it is better to use IP camera to recognize the student face and connect it with collage database to improve the system's accuracy.

As we get huge amount of data from IoT platform, so with the concept Big data we can Analyze the collected data, Predict the future based on historical data and ease the organizations management work.

In some organizations manager need to track the employees. For this purpose we have to develop model which uses GPRS module to track the location of employee within organization only.

## References

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