

A Review on Real Time IOT Based advanced E-attendance System

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Abstract: If we talk about the current scenario of our education system then we found that we have a lot of technologies to use but still we are following the traditional system. If we talk about the attendance system in universities and schools, lecturers did that work manually. Lecturers take the attendance and update it manually in the database. If we combine the fingerprint sensor and RFID sensor with IOT (Internet of Things) than we can do it automatically and there is no need to do it by lecturers. We can use IOT and finger print sensor for better performance. IOT data is directly store on server in real time so we can access it from anywhere and anytime which will provide us with better proficiency and flexibility.

Keywords: Hybrid attendance system, Bio metric solution, Cloud access, restricted access levels, Wireless connectivity

I. INTRODUCTION

An advance e-attendance system means a system which has an advanced technology and it is electronically designed to take attendance where Internet of things (IOT) is used for real time tracking and data storing of attendance. This is a Hybrid system where we are using RFID and Finger Print sensor together which will help us to record attendance individually with better proficiency. Cloud access is a very useful technology in today's era that we can store our data securely in a place and by using IOT real time monitoring can also be provided. So we can say that a real time advance e- attendance system is a complete system to provide record of attendance of a person in an effective manner.

II. RELATED WORKS

Study of previous working paper helps to find-out the various application of an attendance system and description of various works done by the different authors which is given below:

Unnati and Swaminarayan Priya in 2014 has proposed a student attendance management system where they are using two technologies together so the chance of proxy attendance will not take place and the accuracy of system will increase. There are many technologies available for attendance taking like manual, Bluetooth, Infrared, Wi-Fi, NFC and computerized then also they select RFID and also for biometric verification they have chosen face recognition instead of iris and fingerprint detection technique. The main reason they are using these two technologies that other technologies have many loop halls which will be cover by these technologies. In this proposed system RFID is for taking attendance and face recognition for verification. The proposed system is a generic application design to automate and enhance the manual work of recording and reporting in real-time, the Time and Attendance System in universities. A Log is maintained in the Database. Log contains RFID Tag Id and Captured Image by Camera. If both Student Id fetched from RFID Tag and Captured Image is matched, presence is marked as "Present" else it is marked as "Absent". This system has a good approach but the problem is in face recognition as it is short distance and takes time to compare the captured image with all other images of students.

Piyush Devikar et.al in 2016 has proposed an IOT based biometric attendance system where they used finger print scanner for taking attendance. The proposed system involves a biometric attendance system that integrates an ESP8266 NodeMCU breakout board and a fingerprint scanner. The fingerprint scanner processes the user's fingerprint to verify the student's attendance. NodeMCU uploads the attendance data to Google Spreadsheet using a service called PushingBox API. NodeMCU an open source development board has used to upload the attendance data to Google spreadsheet using a service called Pushing Box API. Pushing Box is a cloud service that provides cloud notifications based on API (Application Programming interface) calls. Using Pushing Box API, it is easy to launch the scenario of notifications by simply attaching device ID as the only argument.. The use of cloud computing to store the attendance records makes all the data easy to access and retrieve as end when required by the teachers. The use of fingerprint

scanner ensures the reliability of the attendance record. The system, due to its lack of complexity, proves to be easy to use and user friendly but the problem is power backup i.e. if power failure occurs the data will be lost and the whole process need to be repeated after power turns ON.

M. Ehikhamenle et.al in Feb, 2017 has proposed a system i.e. An RFID based e-attendance system. This research concept is based on a microcontroller approach that digitalizes analogue signals obtained from sensors used to monitor the receipt of signals from radio frequency chips implanted in tags and cards. It monitors persons and keeps record on a register of their attendance automatically through the aid of a timing mechanism, and stores the register information on an SD card through the SD Card Module incorporated into the project. The register information that is stored in the SD card can then be easily obtained by removing the SD card from the module and copying out the data for further manipulation through the various software are available such as SPSS, Microsoft Access, and Excel. This device is cheaper and small but there is limitation of memory for storage of data and misplacing of RFID card can make false attendance.

M. Pandiselvi et.al in March, 2017 in his work on “RFID based smart class attendance system with absentees using face verification” used the component of Arduino, GSM for short message, keypad, LCD display, and RFID reader for reading purpose. Arduino is an open source protocol. GSM used for variation of time division multiple accesses. A basic 12 button keypad can be used for giving input. This allows a microcontroller to scan the 7 output pins to see which of the 12 keys are being pressed. LCD is a technology used for displays in notebook and other smaller computers. Radio frequency identification uses Electromagnetic fields to automatically identify and track tags attached to objects. The RFID tags having stored electronically stored. Passive tags collect energy from RFID reader interrupting radio waves. In the face verification system, MATLAB algorithms are used for Face verification. The system waits for images, if the input image enters then search done in the document. Once the input image is obtained & identified then attendance is marked. If the system does not identify input image then move is made to next step of the system and marked as absentees for the unauthorized students. This system designs a complete model of advance attendance taking method but the process of face recognition is time taking and use of high resolution camera is costly due to which it is not user friendly system.

Dipali Patil et.al in 2017 has introduced an IOT based smart attendance system using GSM. As we know in IOT, physical and virtual “things” have identities, physical attributes and virtual personalities and use intelligent interfaces. The physical and virtual things are seamlessly integrated into the information network GSM which shapes an important building block for the IOT. The roll calls have been done by the kit itself and the teacher just have to press keys accordingly. After finishing that process the whole data will get saved in PIC microcontroller and will be send to main server i.e. administrator officer by GSM with the help of IOT. The other GSM based system have faced academic attendance monitoring problem hence they made this system fully automated and it does not require any human intervention except setting the initial time. LCD and PC interface both are provided with GSM based attendance on the spot on LCD or remotely from computer. Again as discussed in previous paper GSM has some limitation which raise problem of interference.

Mr. Vijay Jadhav & Mr. Lakshman K. in 2017 have published a paper based on “Office automation and attendance system using IOT”. There are basically two parts of their project. One is office load control using IOT and another is to take attendance of employee by RFID and store it on the cloud using IOT. This system allows owner to control his/her office appliances through the internet using an easy to use android app and for this system uses a NodeMCU microcontroller for the purpose. Inbuilt Wi-Fi modem is used for receiving commands over the internet. This information is then passed on to the microcontroller. The microcontroller now processes this data and switches the loads through relays. Thus office automation system allows user to control his office remotely using IOT technology. Here they have used Atmega328 microcontroller to process all the operation. To transmit the data over internet they have used ESP8266 Wi-Fi module. They have used Think speak website to upload the data over cloud. Also they were displaying who has scanned RFID card with the help of LCD display. This work can be considered a complete setup but using only RFID approach is easy to cheat so this side needs solution on which we are working.

III. MY APPROACH

After studying previous works I found where all those system are lacking and what their limitations are. In previous works either they are using individual method or complex dual method which needs alternative in case of failure. Even some systems has data storage which can be easily modified hence we are introducing a hybrid system that reduces the proxy attendance as well as presence of alternative in case of one fails. IOT makes the system real time approaching that data directly upload to server and can be checked instantly after marking present. One thing that is not used in any of the previous work is power backup and data stacking which helps to overcome the loss of data due sudden power off.

IV. VALIDATION OF MY APPROACH

RFID is most widely used hence its cost is less and easy to implement and the fingerprint taken is less complex biometrics as it takes less time and less management. Hence both the systems are user friendly. As we are introducing data stacking and power backup so the system will work after the power failure and the data can be stored temporarily so when power comes back the whole process need not be repeated again.

CONCLUSION

We are living in a generation where science and technologies are now a part of our lives. As today's era is era of technology and new inventions then why do we use the time taking old methods for taking attendance. We need a system which demands less maintenance and having a user friendly method so this proposed device is not only useful but also helpful to maintain a record of students and employees in very easy way. Its cost is less so can be implemented widely in school, colleges or any kind organization.

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