Application of RFID based Student Attendance System using Cloud Storage and IOT

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Abstract

In current years, there have been development of the number of intelligent tools based Radio Frequency Identification (RFID). RFID systems have been used successfully working to many areas such as transport, health protection, farming and inventory tracking to tag a few [4]. RFID tag is a small radio frequency identification device which includes the chip, read-write device, manager application, processing, and transmission. The proposed system aims to collect University attendance system by using RFID. Many Universities s' attendance system is done through the roll to call which is waste time and power. It points to misuse time and ability of teachers to teach. Thus, it is crucial to use capable and effective modern systems, because RFID attendance system and replacing the tradition system, time and power waste could be avoided.

1. Introduction

Attendance system needs to implement at many places, university for students and in the other areas such as industries for login – logout times for employees. RFID based attendance system used in school, college, university and company. Main use of RFID project is to take automatically attendance of school students or employees. New technologies supported to have good technique and minimize human errors. This proposed system is aim to discover automatic universities student attendance system. Student's roll call system is completed through the class list and inspecting student attendance need to drop time and power so this proposed system points to expensive time and teacher power to teach. Therefore, it is specially to use efficient and modern systems, waste of time and energy could be averted. Thus, attendance system could be supported to an automated and unified one. The proposed system includes automatic student roll call system use of cloud storage and radio frequency identification devices. An automatic system can give better routine and efficiency than the traditional method of look at student. RFID devices are tagging objects use of wireless microchips automated identification system and it consists of RFID card reader [4]. The reader is a powerful device. RFID reader can read RFID tags and can identify objects wirelessly without line-of- sight. In this proposed system describe the RFID system for identifying and monitoring attendance. RFID readers are equipped in read range zone when RFID cards pass through it. RFID technology is equipped at every classroom in the university to encourage that every student presence is collected by chip classroom roll call system.

2. Related Works

Farzana Akter 's and their group proposed student attendance into Internet of Things (IoT) using finger print and central database [2]. Ching Hisang Chang present Smart Classroom Roll Caller System (SCRCS) that can view student attendance on the display local area[1]. Majid Meghdadi and Ahad Abbaszadeh Azar proposed RFID to professors and students attendance in University[3]. Normally, RFID consists of three basic tasks. They are RFID tags, RFID readers and the application management system. It has two categories such active and passive. As well as RFID tag and reader must have the same frequency when installed the system. High frequency RFID reader can read High frequency RFID tag which cannot read other tag's frequency. Most university used high frequency and ultrahigh frequency RFID cards for students. RFID card can used many functions such as security card, library door entrance card, car and motorcycle parking card, payment car etc [1]. In this work is conceptual model of roll call system using RFID and IoT technology to verify all students' ID attendance on cloud storage. Conceptual design model is to confirm student attendance and total attendance number in the university classroom. All students must register their student card. They use their card and to sign or leave RFID sensor board [1].

3. Methods

The proposed system is modeled to automated student roll call system using RFID. This system included system overview design, system flow chat, architecture design, cloud storage, local area network server.

3.1. Overview of the System

Proposed system illustrates an automated roll call for catching present or absent students. This data send to cloud storage to store the student attendance, attendance status to the individual student. Figure 1 illustrates the proposed system overview. Figure 2 shows proposed system flowchart. This system contains three modules. Three modules of work flow is user node, management and cloud storage.

User module contain sensor and management module (classroom) detects user sensor data, and another module is cloud. The management module checks the tag whether the student is registered or not and also sent tag data to cloud storage for registered student. Valid students facts are stored to cloud storage through the network and an interface of internet application to show the status of the student in real time when they need. The management module ran in a local area. It receives data from user node and sent them to cloud storage via Wi-Fi module.
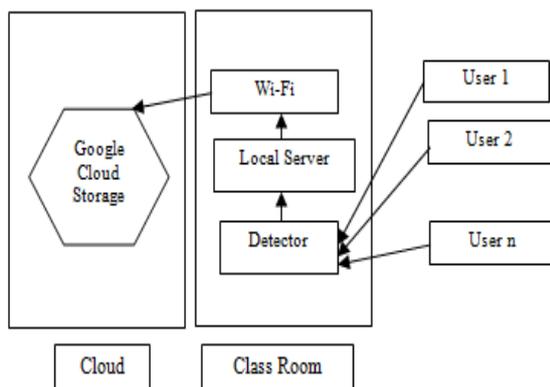

Figure 1. Overview of the proposed system

The sensor node and the management system are used local network connection. This network is configured by proxy server and local area network topology. Additionally, management system and cloud system also broadcast to request or response data by local area network of the internet communication.

In sensor module, user holds RFID to their labeling card (ID) or every node conduct sensor module. It contains all information about that the specific student. RFID reader is used to read the tag and gather information about students. It is used for authenticating specific user.
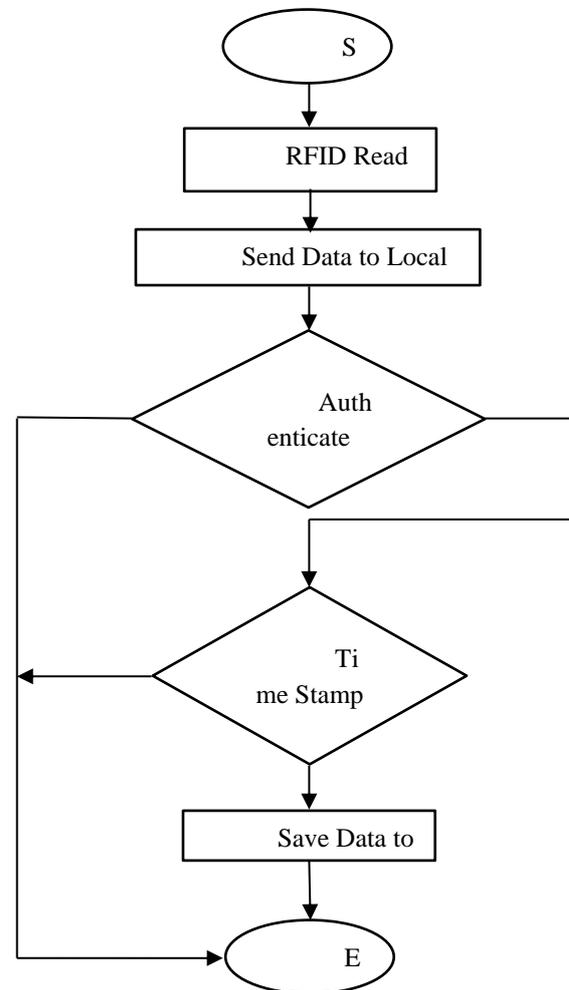

Figure 2. Flowchat of proposed system

Management application, in this unit, data is collected from sensor node and the management system authenticates the system user after collecting data. If user ID is valid then it will be sent to the storage. If the user is invalid in this case the user ID will not send to the cloud storage. Management application is the authenticating part process of the system. The management system process is body of the proposed system.

Cloud storage, this proposed framework has a cloud storage system which has the storage space and an application. It is used to get data and save to cloud storage. Cloud storage helps to save all the presence data about individual attendance status.

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4. Proposed System Architecture Design
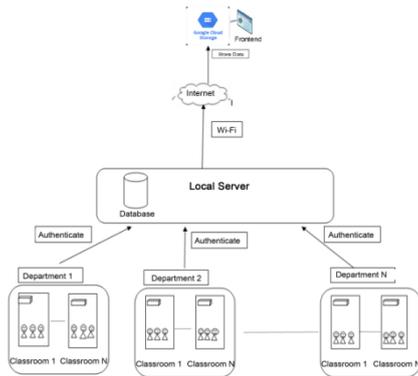
Figure 3. Proposed system Architecture framework

Figure 3 illustrates proposed system architecture framework. It contains hardware parts such as RFID which joined into identity card used by each student, RFID reader device mounted on each classroom door, cloud storage system and internet to build an IoT infrastructure. All RFID sensors and devices are connected with arduino.

5. Laboratory Test

This proposed system includes arduino board, RFID module to implement IoT environment for automatic student attendance. The local area network is configured proxy server which can run Apache Web Server, PHP language and MySql server 5.1. The network connected sensor read information about the RFID through arduino board using arduino code. Application of IoT and automatic student attendance is shown in this paper. In Laboratory test described connection between sensor and arduino board and the system gets attendance from RFID tag which is shown in Figure 4.

6. Results Discussion

The proposed system to operate a selected class room is tested for 35 students of University of Computer Studies, Hinthada to get their automated attendance. This proposed framework can make the attendance. It also can send the data to the cloud storage.

RFID reader can read the RFID for the particular time stamp. Thus, everybody can give the proxy for the definite ID.

Figure 4 shown lab test for student attendance system. Hardware includes UNO R3 MEGA328PCH340G which is implemented in entrance of classrooms to read the students ID card. Each student ID card read process on RFID reader is about 10-15 second. Reader is connected with local server database to verify authorize person or student when enter class room and moreover to communicate internet access.
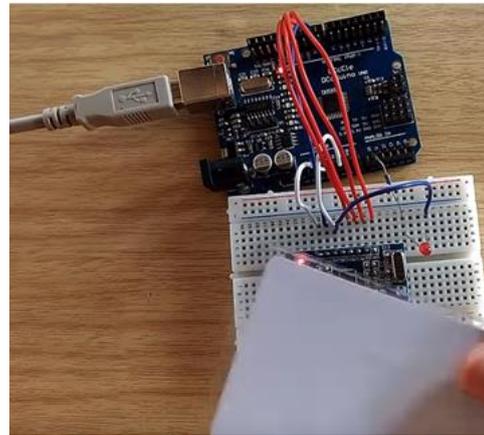
Figure 4. Lab Test with UNO R3 MEGA328PCH340G

Figure 5.MFRC522 RFIDReader

Figure 5. shown MFRC522 RFIDReader, RFID card and tag for student ID card. Each student already register in RFID and local database. Each student enter classroom roll call must register with their student card ID. Their present roll call data are stored through the local sever to cloud. Figure 6 shown cloud database for student.

Figure 6. Student Attendance Store Cloud Storage

7. Conclusion

The proposed automated attendance system has been developed to reduce the manual process of difficulty. RFID based automated student attendance system has been designed to improve manual process of difficulty. Manual attendance system caused delay process on the entire educational field [5]. When manual roll call registration replaced by automatic attendance system the teachers will be free from roll call registration every student's attendance. It has a great profit on the entire traditional educational process. All teachers will be free from registration every separate student's attendance information that will save their costly time and force. Attendance information is accessible through the graphically user interface for admin when necessity. Student information can access through the user form for admin when they necessity. The system will explore the information of student to the respective teachers, student and parents after the each class completion more over they can see every day, every week and every month from internet front end application.

At the times the proposed method will minimize the student absent amount from 40% to 5% that will become better student's work. Therefore, this proposed system will guidance in increase of quality education.

References

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