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Cloud-based RFID Attendance System

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Abstract

Many organizations nowadays believe that employee work ethics plays an important role in order to enhance the productivity, develop teamwork and gain respect. One aspect that affect to the workplace and the business includes attendance. Poor attendance in an organization could disrupt production schedules which also reflect badly towards the organization. Today, along with the rapid development technology, many problems faced by many organizations could be solve by implementing the appliance of science and technology. In the past, the previous generation implement a conventional method in order to take the attendance such as signing on paper or using punch card. This inefficient method is very time consuming and put much effort to analyse the track record of attendance. Cloud-based Radio Frequency Identification RFID attendance system is one of the solutions to address this problem. This system can be used to improve the old method by taking attendance record of employee and generate the record that operates on a cloud. Hence, attendance system could be monitored in real time.

Keywords: RFID, Cloud-based, Attendance System, Record

1.0 Introduction

Most organization that operates based on contribution of staff either from executive level or operational level required full attendance before they are able to start the operation. Therefore, the attendance system provides the information that will help them to plan if any absent. Attendance can be defined as the action of being present at one place or event, for example present to somebody party or present to work in office. Staff attendance tracking is a common practice in almost all organizations.

There are various types of attendance systems that have been developed in the previous implementation such as attendance systems by using punch card or using web-based. These implementations still can cause lots of problems such difficulty to keep track of the staff attendance and may provide incorrect information to the users.

The purpose of this cloud-based RFID system is to improve the traditional way of record attendance. Besides that, it is used to generate a record in real time. It is crucial for

one organization in order to maintain their performance standards. For example, once the user scans the RFID card to the RFID sensor device, data will be recorded and store in the sensor device which also contain storage and cloud through synchronization. Thus, if internet connection is loss, data still can be store on the device.

There are several objectives to be achieved in this project. First, to develop RFID-based attendance system for administrator. Secondly, to enable connection between sensor and raspberry pi to successfully transfer the data retrieve from RFID sensor. For the last objective is to allow the administrator to access the system online.

1.1 Background Problems

Organizations of all sizes use time and attendance systems to record when employees start and stop work, and the department where the work is performed. Punch Card Machine was commonly used to store data of staff attendance in many organizations. But it would be hard to manage and keep track staff's attendance as it would be prone to damage, lack of storage space and supply costs.

By implementing the Radio frequency identification (RFID) which is a form of wireless communication that uses radio waves to identify and track objects, it will be useful to become a replacement of punch card machine. RFID can be used to record time attendance for staffs'.

The system provides ease of management for the administrator to view and track staff attendance performance which is also stored in the cloud storage. The system also comes with recording data and enables the administrator to grouping staffs. In overall, this system able to manage daily attendance data through comprehensive reports at cloud storage.

2.0 Methodology

In this project, the methodology that have implemented is Rapid Application Development (RAD). It is planned to assist developers to grow their project or software in the shortest time while preserving the character of software. There are four main phases involved in the lifecycle of Rapid Application Development, which are namely as planning phase, user design phase, construction phase and implementation.

3.0 Result

In overall, looking at the results in the testing phase, the Cloud-based RFID Attendance System can be considered a success although there is some weakness in this system. Figure 1 shows a simple a list of record attendance for CheckIn which is successfully sent to the cloud storage and is being displayed in the web system. The production system has taken into account the existing systems in the local and global market. The shortcomings in the existing system are taken for further improvement in this prototype system. Table 1 shows a comparison of the systems developed with existing systems on the market.

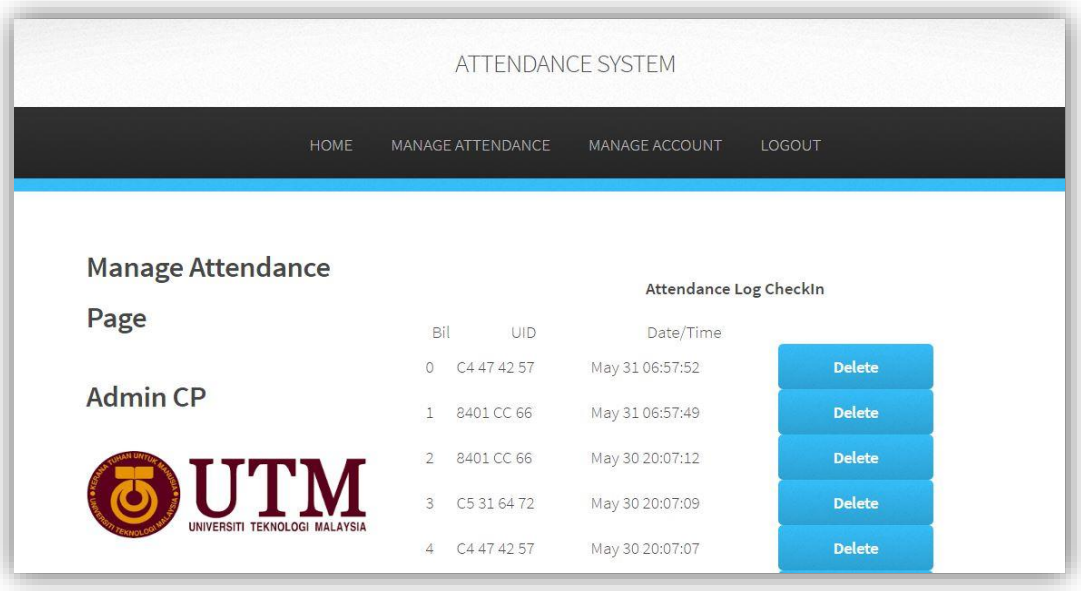

Figure 1 Administrator View Attendance Log CheckIn

Table 1 : Comparison among Existing System and Developed System

System / Features	**Traditional Punch Card System**	**Fingerprint Attendance System**	**Develop System**
Save Time		√	√
Real time monitoring		√	√
Using card	√		√
Using fingerprint		√	
Store in cloud			√
Portability	√		√
Generate Report		√	√
Low Cost	√		√

Figure 2 below shows the connection diagram between Arduino Uno and RC522 Sensor. The microcontroller on the board is programmed using the Arduino programming language. It can receive input from variety of sensors and can affect the surrounding by controlling lights, motors, and other actuators.

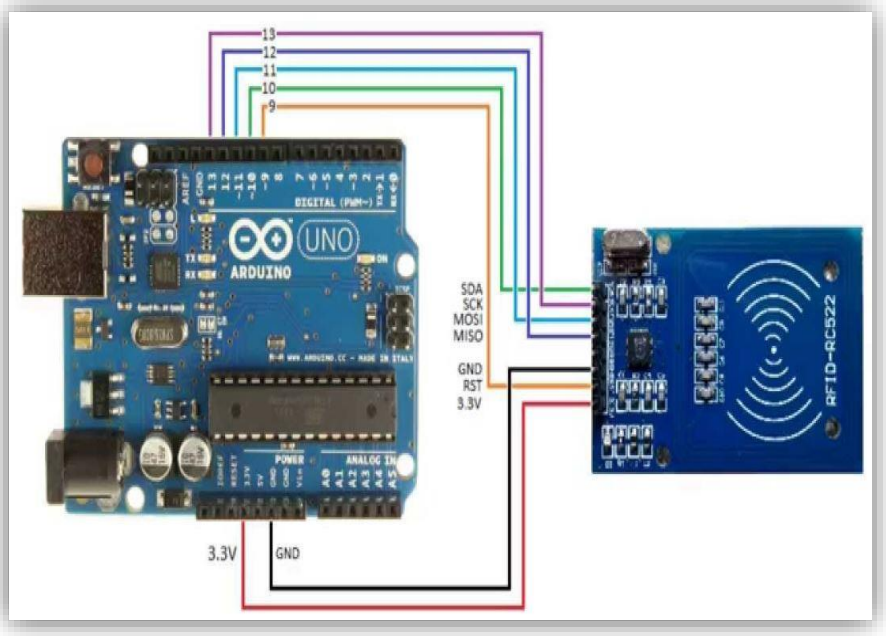

Figure 2 Connection Diagram Between Arduino Uno and RC522 Sensor

4.0 Discussion

Cloud-based RFID Attendance System is basically a management attendance system that assist the administrator in an organization to reduce time of tracking and monitoring the attendance record. It provides services for user to track the record of attendance and real-time monitoring by referring from different devices. Besides, all the record could be stored in cloud.

At the end of this project, the Cloud-based RFID Attendance System is successfully build to meet the objectives, specification and requirements that has been identified in the early stage of this project. The Attendance System module is a web application hosted on a web server from the Raspberry Pi device to provide services through web browser. On the other hand, a similar module web application but hosted with different hosting is connected to the web server.

5.0 Conclusion

In overall, Cloud-based RFID Attendance System is a system that consist of web application module with two different hosting. The web application allow user to manage the attendance record with certain level of privilege given. In summation, this system merely beneficial to any organization for managing attendance record easier. In conclusion, this project is successfully completed as all the identified objectives has been achieved and full filled. Further enhancement and future works will be continued to improve the Cloud-based RFID Attendance System in multiple aspects.

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