A NOVEL INTEROPERABLE IOT BASED PROXY DIGGING OUT ATTENDANCE IDENTIFICATION SYSTEM IN CONTEXT TO SMART EDUCATION

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Abstract

The Internet of Things (IoT) explosive rise in recent years has made it feasible to engage and communicate with a variety of devices. The interoperability and heterogeneity in terms of devices and data formats make it impossible for traditional approach to be fully compatible with IoT applications. The information and communication technologies (ICT) and the ongoing integration of new technologies into formal education, smart education has become a common aspect. With the use of sensors, actuators, and processors, the internet of things (IoT) enables objects to interact with one another and carry out useful tasks to make education smarter. In this context an Novel interoperable IoT based proxy digging out cost effective system is designed which will be installed on the main gates, outside the classrooms and seminar halls, during marking attendance a student will be fetch by timestamps hence the duplication will be resolved. A unique schema is incorporated to make it more efficient and reliable.

Keywords: IoT, Smart Education, Proxy Detection, Interoperability, RFID, Heterogeneous Sources

INTRODUCTION

Due to fast development in to smart education field is altering educational systems by empowering teachers, administrators, and students to work together more successfully. Although new technologies have been adopted for decades to improve educational institutions, methods are usually criticised for missing adequate theoretical and technological foundations. Internet of Things (IoT) is a new technology which is a mixture of embedded hardware, sensors, processors and actuators which can easily communicate for a purpose. IoT is ubiquitous here it favors to make education smarter. The designing of IoT applications is a challenging issue due to interoperability. The major issue is heterogeneity in terms for data formats and different devices currently available for data capturing. The existing activities in college and universities create redundancy to the IoT development for any application. Hence unique schema is required for identification of students whenever at the same time classes are running at different blocks in different rooms. The major challenge here involve with the duplicate punches or multiple entries. Every time it would be difficult to maintain attendance on pen paper and in case of subject specializations this would be again a big obstacle.

That why unique proxy attendance identification for a student is designed. In case of duplicate punch it gives alert. The design consists of five major parts RFID tags, AVR microcontroller, LCD display, automatic door close and alerts. In the education scenario manual attendance data is really complicated to record, there would be redundancy, wastage of time, resources and efforts. Here in this paper IoT based unique proxy attendance identification system is implemented and tested in JCBUST, YMCA campus which consist of radio frequency identification RFID tags, This system can be placed outside each and every classroom and university main gate too to identify the genuine student as well. This system is basically designed to anticipate with problems of existing systems in current education scenario.

RELATED WORK

The education sector is one of the most adaptable and effective areas in deploying IoT devices to use them to make education more collaborative, interactive and accessible to all. Interoperability is the biggest challenge while it comes to practical implementation in education domain. The RFID based attendance system is proposed along with web interface which enabling parents and teachers to take appropriate decisions [1]. RFID technology is the most emerging technologies in the world which has a potential to save lot of time and manpower in any institute. RFID based automate attendance system is very efficient at affordable price; the system is portable and easily deployed in commercial and academic institutions [2]. An automatic attendance system using RFID and webcam is proposed to reduce an error which occurs while taking manual attendance. The suggested method would address the majority of the issues with the current attendance systems by utilizing contemporary technology and providing assistance to institutions and parents [5]. The goal of the proposed research is to use RFID technology in the educational sector to address issues with the manual attendance system. The necessity for instructors to record each student attendance in every lecture at the same time, would be difficult to manage [6]. In the classroom or workplace, the camera module is positioned. To record the images of the classroom, a camera module is employed. These samples are utilized for attendance tracking and facial recognition [7]. Many academic institutions still record students' attendance using the old-fashioned pen and paper method, according to research [8].

OBJECTIVES

> To design IoT based interoperable, cost effective system for keeping attendance.

> To align the heterogeneous data which are coming from the different format and resources.

> To remove the data duplicity while punch-in and punch-out.

> To detect proxy attendance inside the campus that can be taken from any place without need any other resources to maintain it.

> To design a unique schema for identification based on RFID tags.

PROPOSED SYSTEM

The suggested system includes an LCD screen, an AVR board controller, a card reader, a programmable unit, and an RFID card.
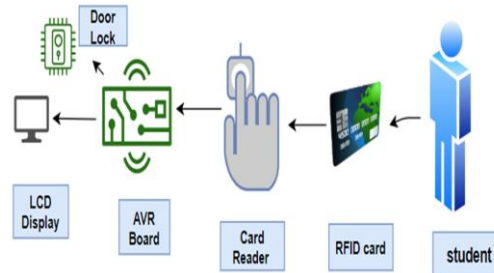
Proposed System

Each student will receive an RFID card or tag that will include their specific identity information.

RFID Reader: Each classroom's entry will have an RFID reader installed. The reader will recognize an RFID card or tag when a student swipes it, and it will track their attendance.

Door Sensors: To determine whether students are present in the classroom, door sensors will be set at each entry.

Automatic Door Closing: Once attendance is taken, the door sensors will detect the presence of students in the classroom, and the doors will be automatically closed.

Database: The attendance information will be kept in a database that only authorized staff can access for record-keeping and oversight.

Alerts & Notifications: In the event of any discrepancies or anomalies in attendance, the system may be configured to send alerts or notifications.

Attendance Reports: Generate attendance reports for each student, which will show their attendance for each class.

Integration with other systems: To offer a more complete solution, the system can be integrated with other systems like the student information system or the campus security system.
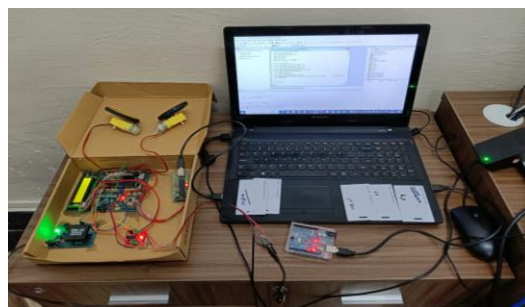
Hardware Setup
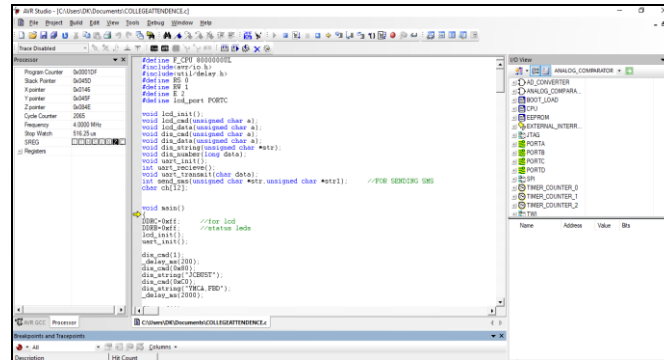
Implementation using AVR Studio

The implementation is carried out using AVR Studio, a strong and flexible tool for creating programmes and programming microcontrollers built on the AVR architecture. It offers a strong code editor with syntax highlighting, code completion, and code folding features.
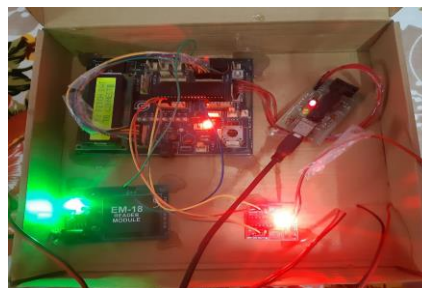
Unique schema

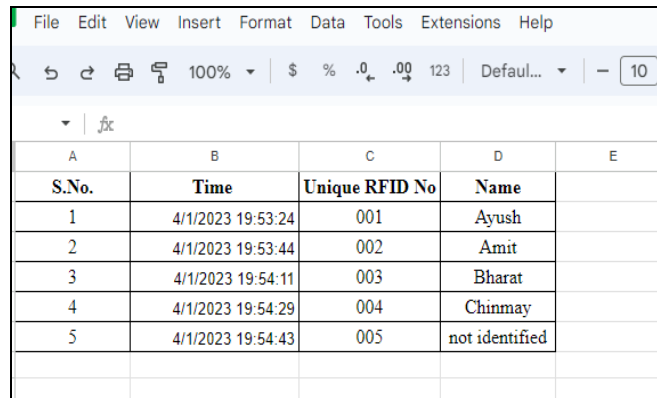| S.No.	Unique RFID No	Name
1	user==001	Ayush
2	user==002	Amit
3	user==003	Bharat
4	user==004	Chinmay
5	user==005	not identified

A unique schema often contains tables, columns, and relationships that are not available in conventional schemas. Custom business rules, validation rules, and other logic particular to the organization or application may also be included in the schema.

A unique schema is designed in this system based on RFID tag for Proxy detection, it has the advantage of providing a more efficient and effective means of managing data because it is specially developed to match the demands of the University. It can also improve data quality because it is tailored to the specific needs of the any organization or application.

RESULTS AND DISCUSSIONS

Output on LCD screen

Google sheet

The system can ensure more accurate attendance records because it relies on individual identification via RFID cards or tags. When a student enters the University Campus with a valid RFID tag, tag information along with the student's name is displayed on the LCD screen, while Google Sheets displays values along with timestamps. The LEDs on the AVR controller board light up and the LCD displays "not indentified" if there is duplicate or proxy attendance. It will not be recorded in the database. This helps to reduce the possibility of human errors or proxy attendance. The system's automatic door functionality adds an added degree of security by allowing only authorized personnel with valid RFID cards or tags access. This aids in managing access to classrooms or specific regions of the campus.

CONCLUSION

Universities and educational institutions can ensure correct attendance tracking, prevent proxy attendance, increase campus security, and improve overall operational efficiency by deploying an IoT based proxy attendance system with an automatic door. Finally, an RFID-based proxy attendance system with an automatic door is a great solution for universities and educational institutions seeking to improve attendance tracking, prevent proxy attendance, and increase campus security. This system can monitor attendance efficiently and correctly while preventing unauthorized entry by employing RFID technology to track attendance and automatic doors to limit access. Furthermore, the system can be integrated with other campus systems to provide a more comprehensive solution, and it can be customized to meet the institution's specific needs. While installing this system may necessitate significant resources and preparation, the benefits of greater attendance accuracy, security, and efficiency make it a valuable investment for educational institutions looking to improve their operations and student outcomes.

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