

Attendance and Assessment System

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ABSTRACT: Recently, student attendance has been seen as one of the key elements or issues that reflect the academic achievements and performance of any university in comparison with traditional methods that impose time consuming and inefficient. Diverse automatic identification technologies, such as Radio Frequency Identification (RFID), were more in vogue. Great developments were made in the modern era; which are based on Radio Frequency Identification Techniques. The applications are applied effectively to various sectors such as transportation, agriculture, hospital / healthcare and other industries. RFID technique enables the use of wireless automatic recognition by means of passive and active electronic tags with correct readers. This paper illustrates a physical system that incorporates RFID and wireless database record entries for application. Our proposed system not only reduces the time spent in manual attendance but also maintains records of entries that can be used for statistical purposes such as allocating correct attendance score and additional administrative tasks.

KEYWORDS: RFID, wireless data base record, readers, active and passive tags.

INTRODUCTION

IT has played an significant role in the growth of many areas of academic sectors and fields, such as student tracking and management systems. Hence, monitoring and managing student attendance in the school, college, and university setting is a critical issue. As it can be helpful to encourage students to attend on time, change the learning performance, increasing the degree of learning and eventually raise and enhance the quality of education. Calling the name of the student or taking the signature of the student are two traditional methods of tracking students attendance in the classroom and they have been more time-consuming. The academic output affected therefore by the presentation of the student. There is also a need to maintain the attendance records of the students automatically by using a faculty's information technology management system to assist the attendance retention. The attendance systems can therefore be useful in reducing administrative sophistication and expense rather than improving instructional performance. Technologies have recently been established and appeared in the digital age, and this could transform the future of science to impact people in daily life, such as Wireless Sensor Networks (WSNs)[1].

Biometrics technologies are used to validate identity through their characteristics such as facial recognition, fingerprints, fingerprint, voice recognition, irises, barcode, Bluetooth, Near-Field Communication (NFC)[2], RFID[3] etc. Specific applications for the attendance systems based on these technologies are recognition, monitoring and counting. RFID is an automation technology which is used to identify and position an object. The healthcare industry, financial institutions, cars, books, mobile phones, computer equipment, are a number of applications using RFID technology to position and manage people , assets and inventories.

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Trend program for organizing, capturing, and monitoring student presentations in the academic field. Such systems employed many technologies ranging from Fast Response (QR) code, Ethernet and Wi-Fi interfaces to Liquid Crystal Display (LCD) RFID, or General Packet Radio Service (GPRS). Related works proposed

and developed system attendance for students, such as the RFID-based attendance system in 2012 compact, lightweight and inexpensive, used for student recording displayed on the computer and incorporated strong attendance unit. Similarly, an author presented an integrated student attendance system based on RFID technology and the system's hardware node, and comprehensive explanation of the implementation processes for specific use. In addition, the student attendance program with RFID that collected RFID readings on the web and the key results of the proposed program were to minimize or remove the requirements for manual labour. The system also provided faster procedures, less inventory, less effort and higher efficiency through direct cost savings while causing some technical difficulties and slow implementation of the system.

In addition, Patel and Priya have proposed development of a student attendance management system using RFID and face recognition. The device log established contained an RFID tag ID, and a camera captured the image. On the other hand, QR code technology is designed to develop and check the attendance system of the student at Sulaimaniyah University. The benefit of the conducted program is to periodically assess the rate of absentee students, but it allows each student to have a mobile capable of capturing images that is considered a slow method as the instructor reads the names over the phone and then sends them to the database. Although NFC technology with the camera embedded on a mobile device which proposed the creation of the attendance system. The program conducted documented attendance of students using Bluetooth, but the drawback of the proposed program is that the telephones must have Bluetooth technology inside the operating system[4].

Several traditional methods for student attendance management imposed time consumption, increased requirements for the workforce, and duplication of effort. On the other hand, these mechanisms were boosted and the educational level improved and the learning efficiency in the academic sector, such as college or university, was modified. In this article, we propose a system for student attendance management and information service. The program prevents student records from being handled and offers the opportunity to monitor student attendance, support an information service on student grading points, regular schedule, lecture time and classroom numbers, and other guidance given by faculty department staff using web-based application hybrid scheme RFID technology. Students attending RFID-based systems that have been developed are often evaluated and criticized with respect to system functionalities and key results to identify and concentrate on essential and important systems or technologies that need more efforts from potential researchers from which the advantages of high performance and reliability can be obtained[5].

SYSTEM DISCRIPTION

The project is an architecture of multiple control method based assessment and monitoring design, which offers both wired and wireless control medium for automation. The wireless control is separated and controlled by the GUI[6] of an Android mobile phone, providing not only remote functionality for a wider coverage, but also control and authentication system in-house. For the device, wireless controls on android operating system (OS) are performed at the Interface. The mobile phone is equipped with remote control by cell phone as well as physical control. The design of the system is given in Figure 1.

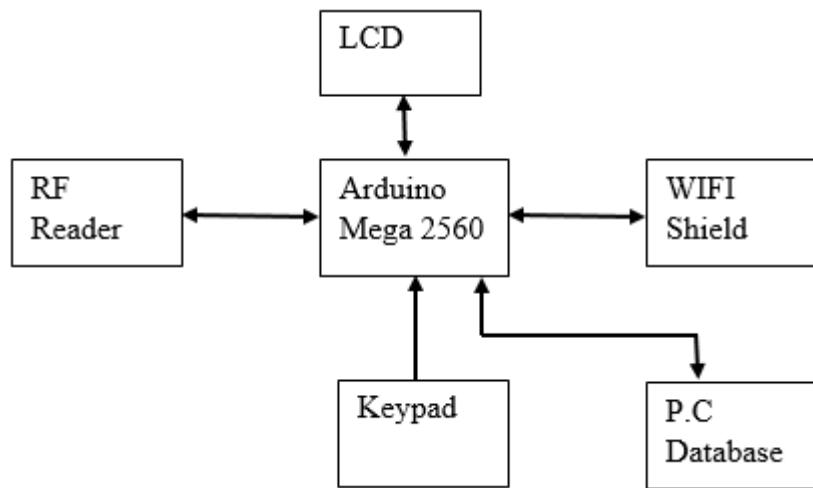


Figure 1: Block Diagram of the System

A cell phone with an android-based operating system is proposed to wirelessly track the database using TCP / IP, which offers easy access to indoor proximity communication, while we use GSM module for wireless remote control over a wider area for outdoor proximity. Over serial communication (RS232), the modules are further interfaced with the programmable controller. By making the actuators perform their desired function, the programmable controller performs the actuation on signal obtained from either communication source. The controller is configured as per user's requirement to perform the actuation. In order to have duplex communication with the actuators, the controller is programmed to receive feedback if any error occurs in operation. The system errors are monitored continuously so that system efficiency can be increased with a minimum error / loss rate.

RF Reader

A RFID reader (Radio Frequency Identification Reader) is a tool used to gather information from an RFID tag, used to identify individual items. Radio waves are used to relay tag data to a reader.

RFID is in principle a system close to bar codes. The RFID tag does not need to be scanned directly, however, nor does it allow a scanner to display line-of - sight. To be understood, the RFID tag must be within the range of an RFID reader that is between 3 and 300 feet. RFID technology allows for quick scanning of several items and allows for rapid identification of a particular product, even if it is surrounded by several other items. Because of its expense and the need to mark each object individually, RFID tags have not replaced bar codes.

WIFI Shield

The Arduino WiFi Shield can wirelessly connect your Arduino to the internet. Link it to your wireless network by following a few basic instructions for starting controlling your environment over the Internet. Each aspect of the platform – hardware, software , and documentation – is publicly accessible and open source, as always with Arduino. It means that you can know precisely how it is designed and use it as the starting point for your own circuits.

- Requires an Arduino board (not included)
- Operating voltage 5V (Board supplied by Arduino)
- Arduino Compatible with the
- Connection via networks: 802.11b / g
- Styles of Encryption: WEP and Personal WPA2
- Arduino interface on SPI port
- Nano SD Card aboard
- Headers at ICSP

- FTDI link for serial WiFi Shield debugging
- Mini-USB to upgrade firmware on WiFi shield

HARDWARE DESIGN

This section discusses mainly the hardware implemented within the project. The project works when the Android cell phone application sends the character to the Bluetooth and GSM module which forward the character to the microcontroller Arduino. The Arduino microcontroller gets the character as a numerical value and then sends pulse on the desired port to match the condition. The Pulse will continue to transmit until contact is made with the button on android application. Arduino microcontroller, Bluetooth module, GSM module, and biometric scanner are key components of this project.

In the project, which is an open-source single-board microcontroller, Arduino microcontroller is successor to the open-source Wiring platform and is designed to make the process of using electronics more accessible in other fields of engineering projects. Aurdino's hardware consists of a simple open hardware design, an Atmel AVR processor[7], and support for onboard input / output. The software consists mainly of a standard language compiler for the program and the boot loader running on board. The proposed command flow for the system decision is further listed in Figure 2.

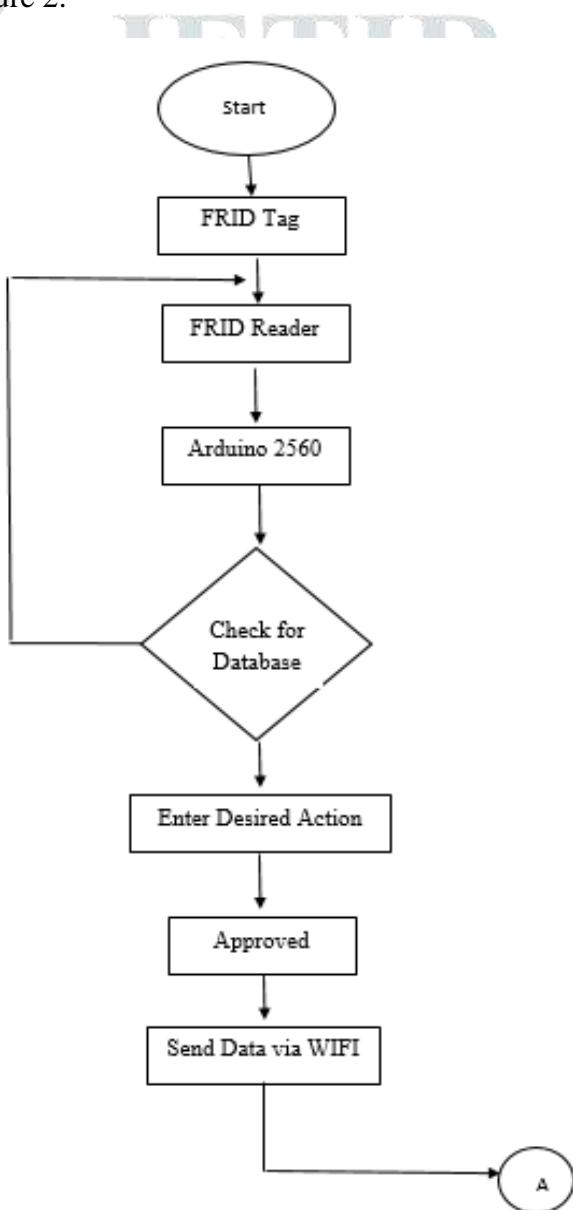


Figure 2: Algorithmic Decision

The Wifi Sheild module is the most convenient and reasonable way to go wireless within a limited range. This module helps us to expand our serial interface via wireless communication, so any program running on our hand-held computer feels like it is controlling a serial local port. The four pins include Tx, RX, GND, and +5V. The input supply voltage should be 3.3V-6 V, while the GSM module used in this work provides a convenient way to communicate wirelessly within a large region.

Via wireless communication, this module features include serial interface, so any program running on our handheld computer feels like it controls a serial local port via four pins i.e. Respectively Tx, RX, GND and +5V. The voltage range applied to the module is to be 3.3V-6 V.

SOFTWARE DESIGN

The project's software design mainly confers on the system's main function designed for programmable microcontroller. The Arduino microcontroller is a single-board open-source microcontroller which is programmed in either C or C++. The microcontroller performs the function of Command Detection. RFID identification is carried out via RFID readers via RFID tags . Figure 3 illustrate the Android mobile phone application sends the character to the Wifi module which forward the character via TCP / IP to the Arduinio microcontroller. The Arduino microcontroller gets that character as a numerical value and then sends pulse on the desired port to match the condition.

The pulse will continue to transmit until contact is made with the button on android device. The activating actuators are designed on send via android phone buttons with a single shot pulse. Any input switch is released; this interrupts the microcontroller's main function loop. The microcontroller then turns the relay off and stops the ongoing process.

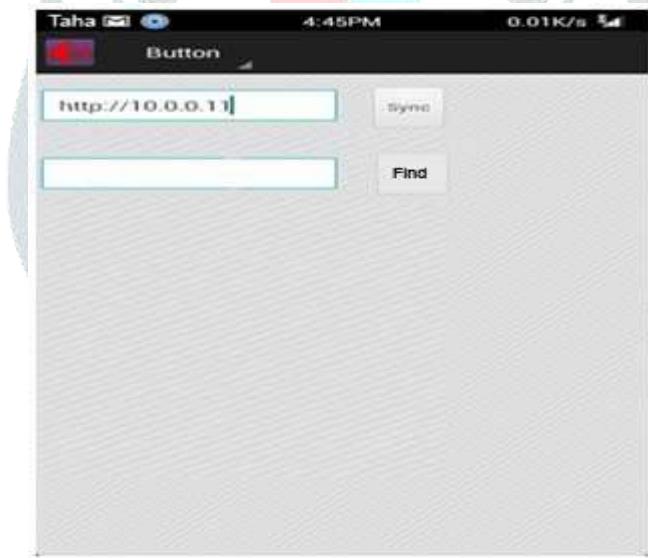


Figure 3: Layout of the System

Upon establishing the connection, Android GUI acts as the control panel between the main board and the phone. All data that the main board receives will be sent to the computer. Also, the data received from phone will be sent to main Board of Directors. The application is designed at low API level so that it is compatible with the devices with higher versions. The Android GUI with version 4.0.4 (Ice Cream Sandwich) tested on a smart phone. The interface is very simple to use, after connecting to the Android GUI, user can simply click the icon to perform the function.

CONCLUSION

A student attendance and information system is designed and implemented for managing student data and providing capabilities for monitoring student attendance, grading student points, giving timetable information,

lecture time, room number, and other information relevant to students. The proposed program also makes it simple for workers who do not need extra paperwork and extra lockers to save data. In conclusion, the system is a low-cost system designed to withstand any terrain and surroundings, offering tactical and supervisory efficiency and greater comfort. In addition, the Wireless & GSM link is implemented in Control board allows installation of the system in a simpler way. Positively, RFID technology promises increased productivity and enhanced business and administrative process performance.

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