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# Authenticating the RFID Attendance System using OTP

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***Abstract:*** ***Attendance is the most important log maintained in each and every place. Because attendance will speak how we are regular to our work place or even to our schools and colleges. RFID means Radio Frequency Identification is a wireless identification technique which becomes very popular these days and is used for the identification of physical objects like products, human, etcetera by the use of radio frequency. This technique is much more advantageous, safe, secure and easy with cost efficient in contrast with the other conventional technique used. It is much faster and it has two components i.e. RFID tag and RFID reader. In this paper we have proposed IOT based attendance management system, which updates the student's attendance in the server, and the authentication of the particular person will be detected using the OTP sent to the particular person's mobile number.***

***Keywords: IOT (Internet of Things), Arduino UNO atmega328, RFID tags (Radio Frequency Identification), RFID Reader, OTP (One Time Password).***

## I. INTRODUCTION

In olden days the attendance was taken using the tally marks and finally the marks are added to find the total attendance of the person. After the evaluation of notebooks, the attendance was taken manually by the attendance in charge by calling the names and marking the present and absent status. We are in the world which is saving each and every second. To avoid the manual attendance marking to save the timing and to mark exact attendance we are upgrading our self here we are using RFID attendance system. RFID is based on the radio frequency tags which can be detect the human beings, animals and even objects. The corresponding tag name will be available on the tags and the numbers are used to identify the particular person's attendance. The program has been embedded in Arduino-uno which is a microcontroller. Then the tag will be identified and the attendance will be recorded. Anyone can mark the attendance for other person using his rfid tag. To avoid the fraud here we are making and idea to generate an OTP and the OTP was sent to the corresponding person's mobile number. Only if the correct OTP was entered to the attendance page, the attendance will be recorded.

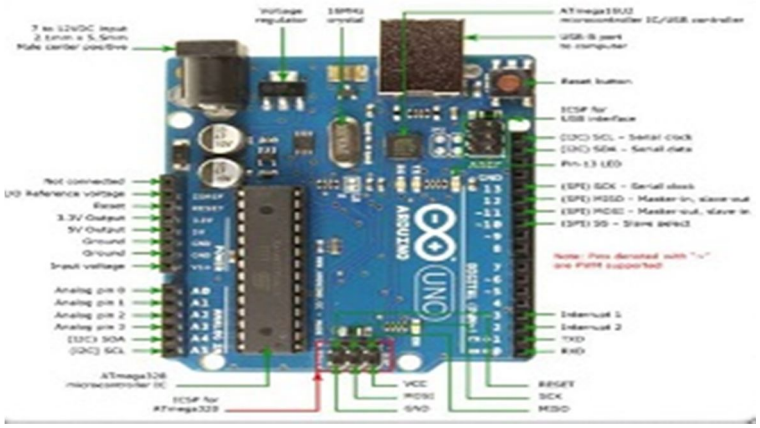
## II. LITERATURE SURVEY

An rfid based automatic attendance system in educational institutions of nigeria by a.a. olanipekun and o.k. boyinbode has discussed about the result of the challenges of the manual method of taking attendance in schools and colleges in nigeria, an automated attendance system needs to be adopted. the challenges include difficulty in keeping the attendance list over a long period of time, unnecessary time wastage during writing or signing, improper documentation, students forgetting to write or sign the attendance paper, lecturers forgetting the attendance list in the classroom, students writing or signing illegally for an absentee among others. This paper implements radio frequency identification (rfid) automatic attendance system in nigeria educational institutions which provides the functionalities of registering students, recording attendance, making decision on the eligibility of a student to sit for an examination in a course and other functions. This work eradicates the deficiencies associated with the manual attendance system with an automated approach implemented through radio frequency identification (rfid) technology. The case study is federal university of technology, Akure, Nigeria. Design and construction of an rfid based e-attendance register m.ehikhamenle, r.o.okeke explains about the design and construction of an rfid based electronic attendance register. it takes advantage of the wireless and cheap rfid technology in combination with a real time clock module and an SD card module to take automated attendance and log the data for further analysis if desired. It is microcontroller based and the Arduino micro-controller was used as well as the mfrc522 rfid module. Each subject of the register would be represented by a tag whose identity is already stored, which when placed close to the reader would cause the micro-controller to log the subject's information in an SD card. The stages involved in this research are

the design stage where the whole system was designed, the coding stage where the code for the microcontroller was written and debugged and the final build stage where everything was put together. Implementation of student safety system using rfid by (aye su mon kyaw, chaw myat nwe, hla myo tun) department of electronic engineering, Mandalay technological university taken a new step against crime against children is increasing at higher rate and it is high time to offer safety system for the children going to school. This paper presents a system to inform parents about the status of their children such as absence. The system checks and detects which child enter the wrong bus and issues an alert to this effect. Rfid-based detection unit located inside the bus detects the rfid tags worn by the children in addition, the system checks the children absence and updates the database. The parents can log into the system website and monitor the details of their children. Rfid-based students attendance management system arulogun o. t., olatunbosun, a., fakolujo o. a., and olaniyi, o. m. finds the application of rfid to student attendance monitoring as developed and deployed in this study is capable of eliminating time wasted during manual collection of attendance and an opportunity for the educational administrators to capture face-to-face classroom statistics for allocation of appropriate attendance scores and for further managerial decisions. From all the surveys we have pointed out that the RFID tags are the best way to take attendance, but here we found the problem, that anyone can mark attendance with others tag. So here we found a solution to avoid the fraud with generating OTP and sent to the mobile number belongs to the tag holder.

### *A. Arduino UNO*

Arduino Uno is a microcontroller board based on the ATmega328P processor. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter. Arduino Uno has a number of facilities for communicating with a computer, another Arduino board, or other microcontrollers.



1.1 Arduino UNO Configuration Diagram

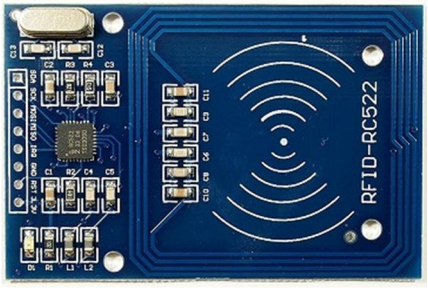
### *B. Arduino UNO Specifications*

Microcontroller: ATmega328P
Operating voltage: 5V
Input voltage: 7-12V
Flash memory: 32KB
SRAM: 2KB
EEPROM: 1KB
Digital I/O Pins: 14 (of which 6 are PWM)
Analog Input Pins: 6
Clock Speed: 16 MHz

### *C. RFID – Radio Frequency Identification*

It is based on electromagnetic fields to automatically identify and track tags attached to objects. A Radio Frequency Identification Reader (RFID reader) is a device used to gather information from an RFID tag, which is used to track individual objects. Radio Frequency waves are used to transfer data from the tag to a reader. The RFID tag it must be within the range of an RFID reader, in

order to be read. RFID technology allows several items to be quickly scanned and enables fast identification of a particular product, even when it is surrounded by several other items.

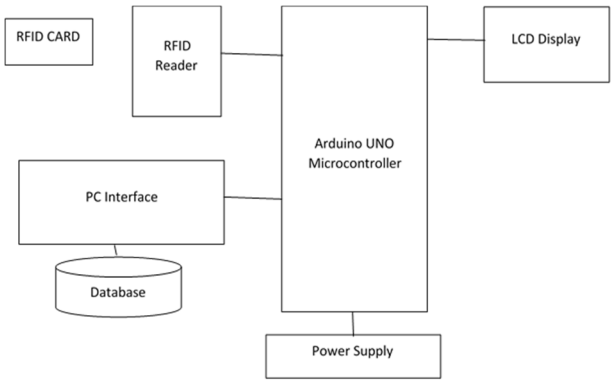



1.2 RFID Reader Kit

Rfid Tags are classifies as two types as Active tags and Passive tags. Passive RFID systems use tags with no internal power source and instead are powered by the electromagnetic energy transmitted from an RFID reader. The lower price point per tag makes employing passive RFID systems economical for many industries. Active RFID systems use battery-powered RFID tags that continuously broadcast their own signal. Active RFID tags are commonly used as "beacons" to accurately track the real-time location of assets or in high-speed environments such as tolling. Active tags provide a much longer read range than passive tags, but they are also much more expensive.

1.3 RFID Tags (passive tags)

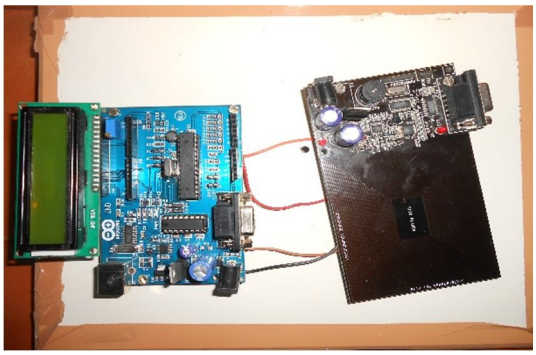
*D. Block Diagram*




1.4 Block Diagram of RFID Attendance System

*E. Working Process*

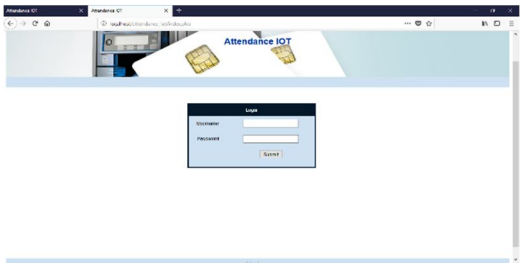
The Arduino sketch software has to be installed according to the OS bit. The sketch has to be verified using the examples available in the software. The Arduino uno board has to be connected with system using USB 2.0, then the port has to be enabled by selecting the COMP Port COM3/COMP4. Then the program for the RFID tag identification has to be embedded into the Arduino UNO board. The UNO board and the RFID Reader has to be connected with the Ground and 5$^{th}$ analog pin of the Arduino board. Then the program has to be verified and uploaded to the Arduino UNO kit.



1.4 (a) RFID Reader and Arduino Kit

We have to create the database to store the data collected from the Arduino UNO board, the attendance of the persons will be collected as A, B, C and so on. Database has to be updates each and every time the tag has been noted with the RFID reader. We have to create an interface between the Arduino UNO data and the Database in MySQL using JAVA. The interface has to be run using the Net beans IDE.

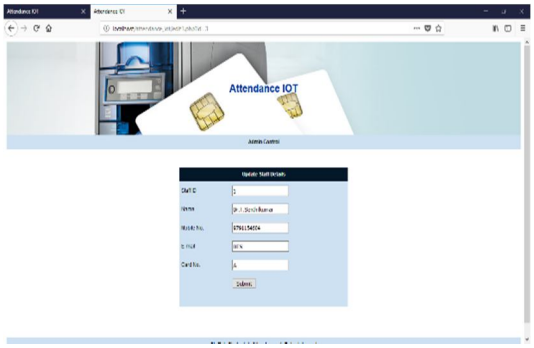
The php pages for the attendance and the admin who manages the attendance has to be created using the html and php pages. The pages should be user friendly.




1.5 Admin Page

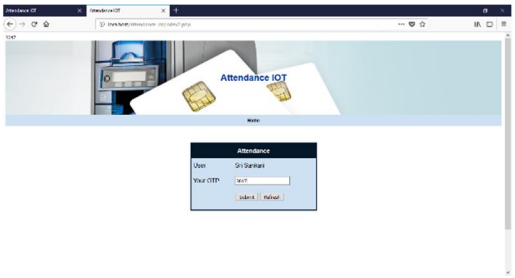
Three kinds of database has to be created to store the attendance data, like attendance_iot, and we have to generate multiple tables for staff, student and non-teaching staffs like admin, ai_attendance, ai_staf, ai_students. The data has to be in editable forms.

1.6 Staff Attendance Data




1.7 Editable Form

While the card is swiped with the RFID reader, then the card will be identified by the interface and the card will be determined as A or B or else. Simultaneously the One Time Password will be generated using the rand() function. The OTP will be sent to the persons whose tag was swiped through the rfid reader.




1.8 OTP and Attendance

Once if the correct otp is entered the attendance will be recorded and a notification will pop up like attendance stored successfully. We can even retrieve the attendance data from the database with the date and time.


1.9 Attendance Data

Successfully we have recorded the attendance for each and every person belongs to University College of Engineering, Bharathidasan Institute of technology (BIT) Campus, Anna University, Tiruchirappalli. And successfully we rectified the problem of using others tag for attendance purpose also solved with the OTP generated and sent to the mobile number belongs to the person.

## III. CONCLUSION

The attendance of the University College of Engineering, Anna University, BIT campus's students has been recorded with the RFID reader and tags. And the problem has been rectified by generating the one time password and sent to the corresponding mobile number and the otp has been entered in the attendance page and the attendance has been recorded with the date and particular time.

## IV. ACKNOWLEDGEMENT

I render my sincere and whole hearted thanks to Dr T. Senthilkumar The Dean, Dr.A. Valarmathi Head/AP , Mrs. S. Nalini AP, Anna University BIT campus for their guidance and the support throughout the tenure of this work.

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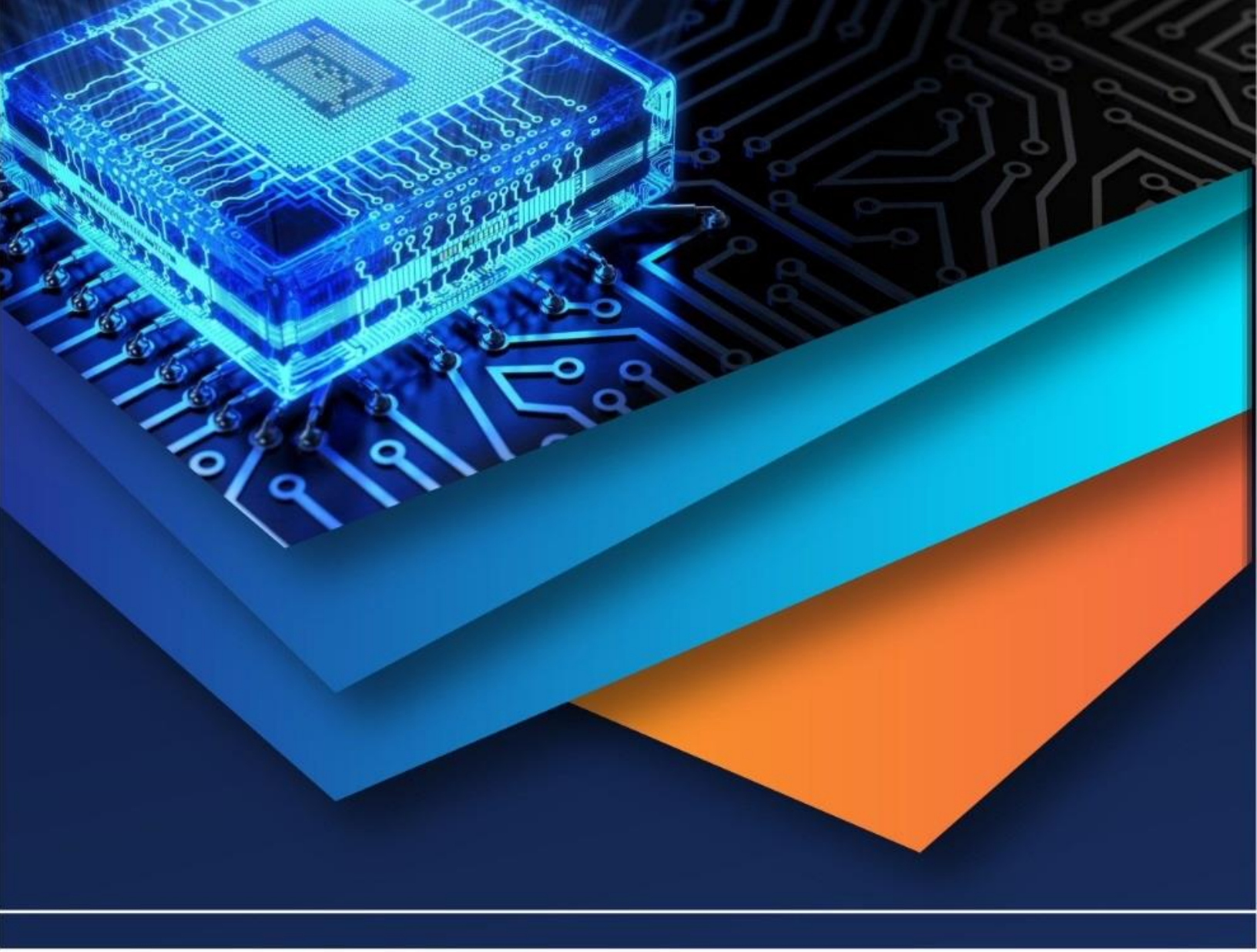

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