

# International Journal of Innovative Research in Science, Engineering and Technology

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## RFID based Attendance Monitoring System

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**ABSTRACT:** Attendances of every student are being maintained by every school, college and university. Faculty has to maintain proper record for the attendance. The manual attendance record system is not efficient and requires more time to arrange record and to calculate the average attendance of each student. Hence there is a requirement of a system that will solve the problem of student record arrangement and student average attendance calculation. The proposed system should store the absent and present student's attendance details in electronic format so that management of attendance becomes easy.

An RFID-based Attendance Monitoring System is a solution that automates attendance tracking using Radio Frequency Identification (RFID) technology. It eliminates the need for manual sign-ins and helps in efficient time management for schools, offices, and organizations.

**KEYWORDS:** XBee/Zigbee is a wireless communication module, AT89S52 is an 8-bit microcontroller

### I. INTRODUCTION

The maintenance and management of student information is almost a tiring process in the educational institutions nowadays. Therefore, an effective system for the management of student academic information such as their Attendance, Curriculum performance is required. Moreover, the students also need to be updated of their performance periodically for their improvement in the Academics. In the traditional way, first the attendance of all the students is recorded manually in a log book and then entered again in a desktop application.

Technological improvements can be useful tools to help in the development of new systems to eliminate the disadvantages of the classical methods while enhancing its advantages. All of this review has shown that in most of the higher academic institutions attendance records have primarily become the proxy to determine the student's success. In this paper for student attendance, we present a unified management system using information technology RFID for different purpose in an organization.

RFID is short for Radio Frequency Identification. Generally, a RFID system consists of 2 parts. A Reader, and one or more Transponders, also known as Tags. RFID systems evolved from barcode labels as a means to automatically identify and track products and people.

### II. METHODOLOGY

To overcome the existing method of the recording the data in the attendance we followed the computerized method by interfacing the RFID with the microcontroller. The primary purpose of an RFID system in this application area is to

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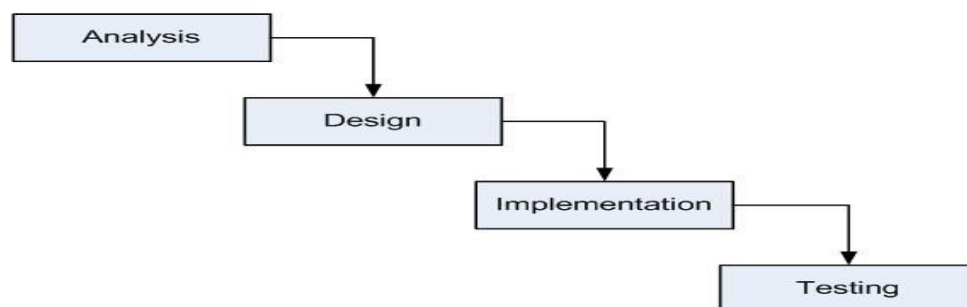
detect the presence and absence of the student data to be transmitted wirelessly by Xbee device, which is read by an RFID reader and processed according to the programmed instructions.

The ease with which RFID can be integrated into current operations depends on the openness and flexibility of the technology infrastructure especially the system that will be used to collect RFID data. The proposed system provides solution to lecture attendance problem through coordinated hardware and software design handshaking data communications between RFID tag and RFID reader serially interfaced between the microcontroller and system.

The RFID based the following steps are followed to develop.

1. Microcontroller system is developed with the RFID reader.
2. Xbee module is interfaced with microcontroller.
3. RFID application is developed for attendance system.
4. Microcontroller system is paired with RFID.
5. Paired system is used to store attendance.

This model is easy to understand by system developers as well as users and this model is more visible, as it produces deliverables at the end of each phase. Visibility is one of the processes characteristics that are looked while selecting a Software Life Cycle model for a project.



### III. WORKING

In every RFID system the transponder Tags contain information. This information can be as little as a single binary bit, or be a large array of bits representing such things as an identity code, personal medical information, or literally any type of information that can be stored in digital binary format. Fig Shown is a RFID transceiver that communicates with a passive Tag.

Passive tags have no power source of their own and instead derive power from the incident electromagnetic field. Commonly the heart of each tag is a microchip. When the Tag enters the generated RF field it is able to draw enough power from the field to access its internal memory and transmit its stored information.

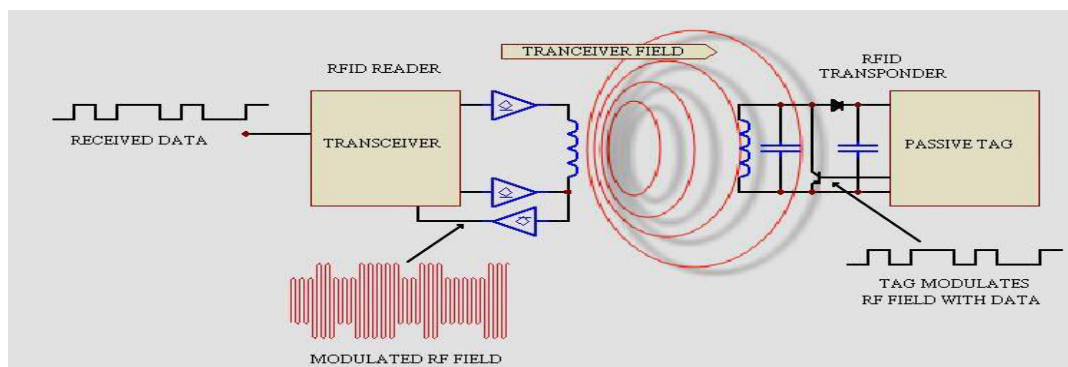
When the transponder Tag draws power in this way the resultant interaction of the RF fields causes the voltage at the transceiver antenna to drop in value. This effect is utilized by the Tag to communicate its information to the reader. The Tag is able to control the amount of power drawn from the field and by doing so it can modulate.

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## IV. HARDWARE AND SOFTWARE REQUIREMENTS

The hardware components used in our project is listed below.

1. Atmel89s52 microcontroller
2. Power Supply
3. Zigbee transceiver
4. RFID system

The software components used includes.

1. CVAVR cross compiler
2. AVR studio programmer
3. Embedded C

### Code Vision AVR Cross Compiler

CodeVisionAVR is a C cross-compiler, Integrated Development Environment and Automatic Program Generator designed for the Atmel AVR family of microcontrollers.

The program is designed to run under the Windows 95, 98, Me, NT 4, 2000 and XP operating systems.

The C cross-compiler implements nearly all the elements of the ANSI C language, as allowed by the AVR architecture, with some features added to take advantage of specificity of the AVR architecture and the embedded system needs.

### AVR Studio Programmer

AVR Studio is an Integrated Development Environment (IDE) for writing and debugging AVR applications in Windows 9x/ME/NT/2000/XP/VISTA environments. AVR Studio provides a project management tool, source file editor, simulator, assembler and front-end for C/C++, programming, emulation and on-chip debugging.

AVR Studio supports the complete range of ATMEL AVR tools and each release will always contain the latest updates for both the tools and support of new AVR devices. AVR Studio 4 has a modular architecture which allows even more interaction with 3rd party software vendors. GUI plug-ins and other modules can be written and hooked to the system.

### Embedded C

Embedded C is extensive and contains many advanced concepts. The range of modules covers a full introduction to C, real-time and embedded systems concepts through to the design and implementation of real time embedded or standalone systems based on real-time operating systems and their device drivers. Real time Linux (RTLinux) is used as an example of such a system. The modules include an introduction to the development of Linux device drivers. Embedded C covers all of the important features of the C language as well as a good grounding in the principles and practices of real-time systems development including the POSIX threads (pthreads) specification.

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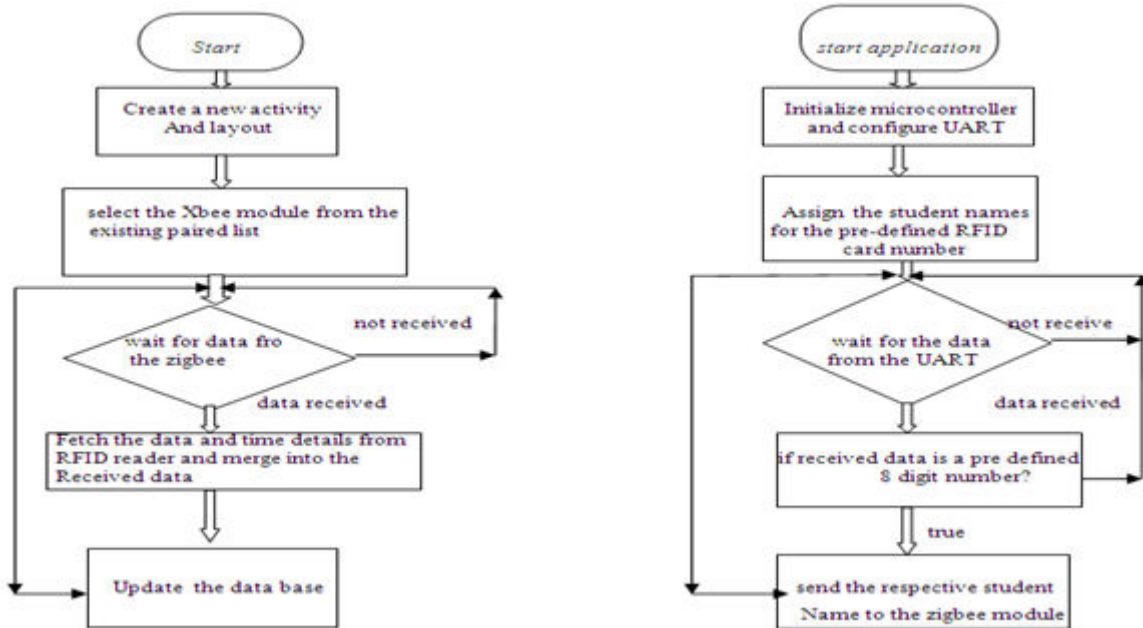
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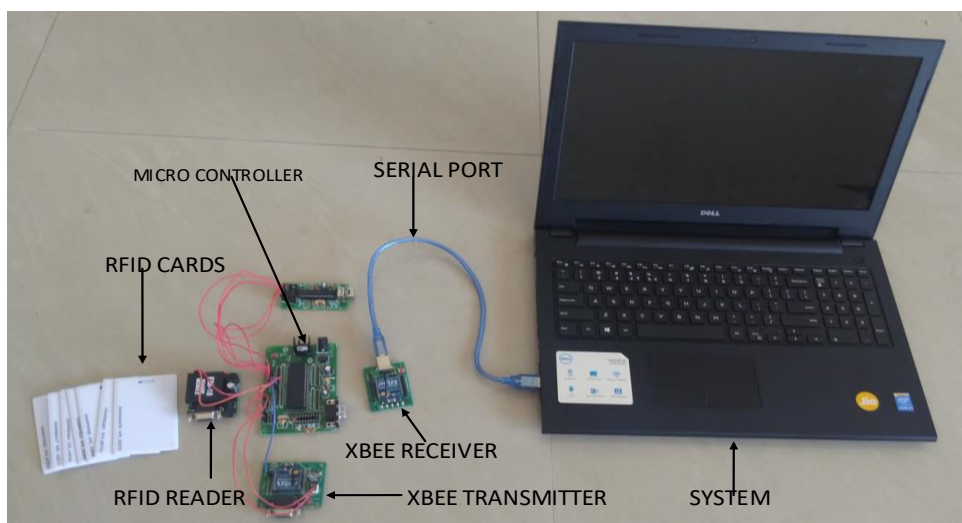
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## V. FLOWCHART

Flowchart of proposed model



## VI. RESULTS



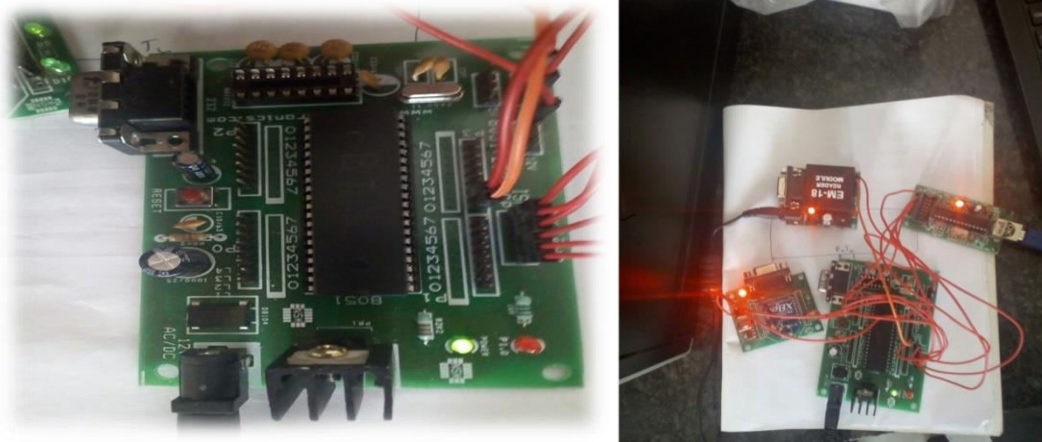
Proposed model of the project

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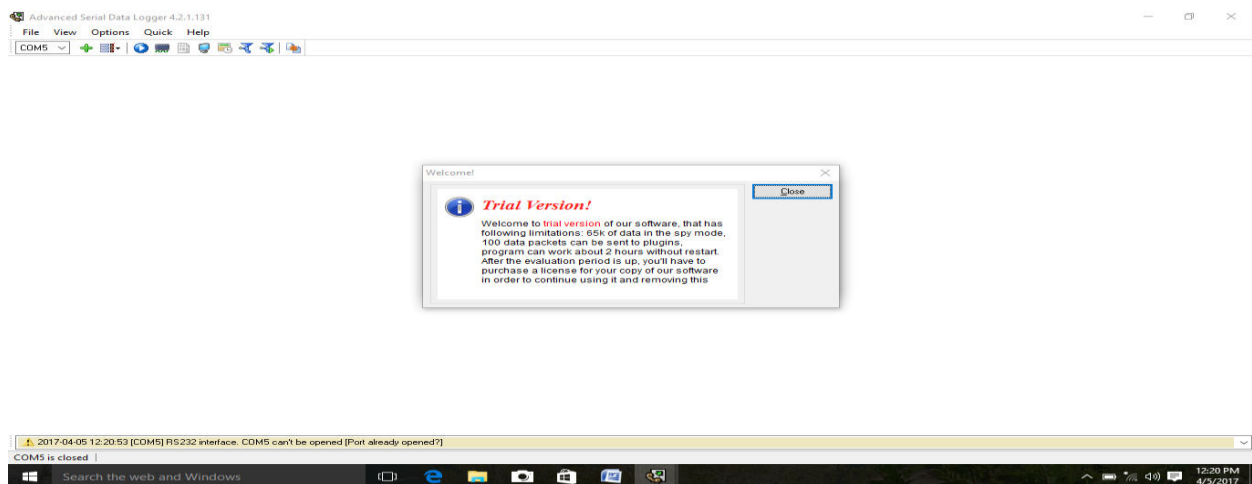
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Transmitter section

Install the app in mobile, pair the zigbee with device called the “HC-05”.After paired the with device zigbee“HC-05”, open the “attendance system” application.

Step 1: Once the pairing is done the android application is opened and the Bluetooth module is detected as connected with name “Hc-05” as shown in the figure 5.3Initially it is disconnected after some seconds it will connected.



Pairing snap

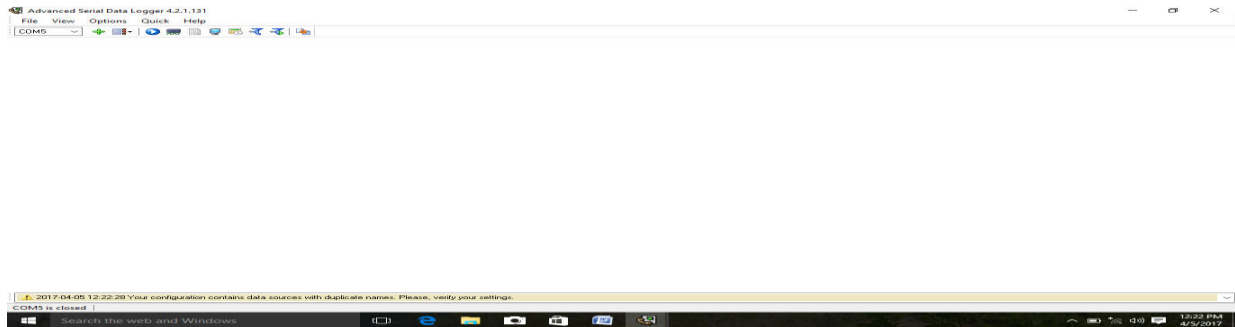
Step 2:- When we swipe the card on RFID transceiver the names are displayed on the application along with the voice. It automatically stored in database along with the date and time.

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4 devices paired snap

Step 3:- :- read database, it is used to read the data enter when the card swiped, it shows the date & time of card swiped. The date& time of card swiped which is synchronized system or computer with mobile date &time.

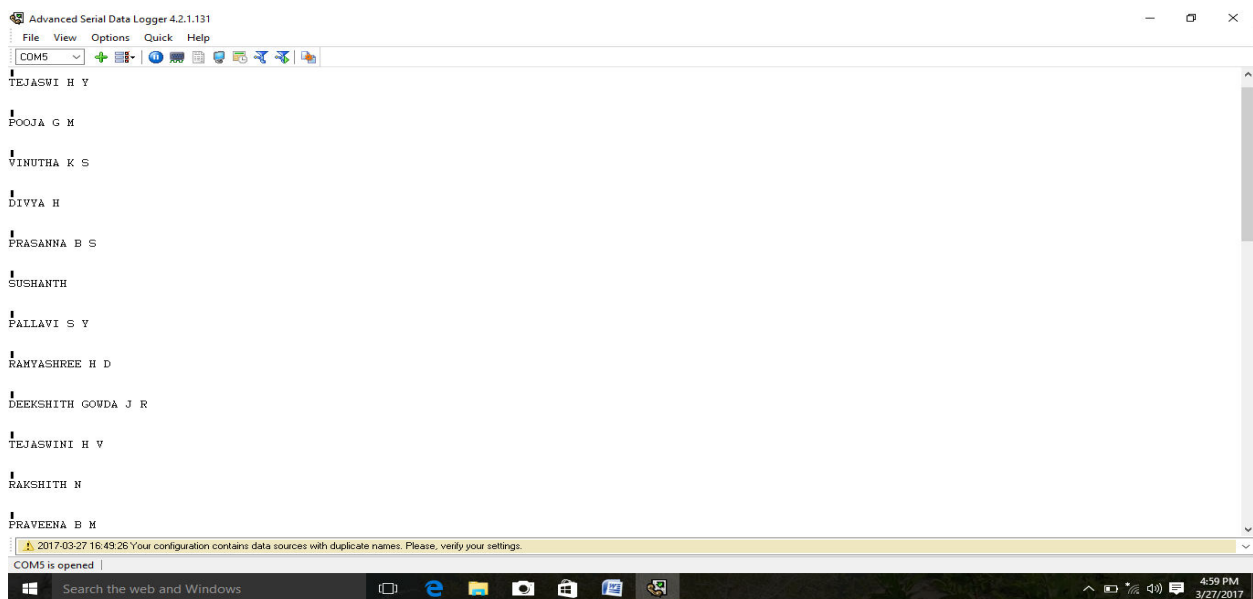


Image after card swipe

## VII. CONCLUSION

The RFID-Based Attendance Monitoring System is an efficient, automated, and reliable method for tracking attendance in various sectors such as education, corporate offices, and industries. By utilizing RFID technology, this system minimizes human error, prevents proxy attendance, and enhances overall security.

With the ability to store attendance records in a database, the system enables real-time monitoring, remote access, and integration with payroll or academic management systems. Additionally, it reduces administrative workload and ensures a seamless experience for both users and administrators.

In conclusion, an RFID-based attendance system provides a cost-effective, time-saving, and scalable solution for attendance tracking, improving operational efficiency and record management in any organization.



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