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RFID-BASED ATTENDANCE SYSTEM

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Abstract
Manual attendance systems in schools, colleges, and offices are time-consuming and prone to errors such as proxy attendance and inaccurate record keeping. The RFID Based Attendance System is designed to automate the attendance process using Radio Frequency Identification (RFID) technology. In this system, each user is provided with a unique RFID card that contains identification data. When the card is scanned near the RFID reader, the system automatically reads the card information and records the attendance in the database through a microcontroller. The recorded data can then be stored, displayed, or processed for further use such as report generation. The system uses an RFID reader to detect the card, a microcontroller to process the information, and a display or computer interface to show attendance status. This automated approach reduces manual effort, minimizes errors, and prevents proxy attendance. The proposed system is efficient, reliable, and cost-effective, making it suitable for use in educational institutions and workplaces for accurate and convenient attendance management.

Keywords: RFID Reader , Arduino Uno, RTC Module , LCD Display, Buzzer.

INTRODUCTION

An RFID-Based Attendance System is an automated solution designed to replace manual record-keeping with a fast, accurate, and contact-free digital alternative. The system utilizes Radio Frequency Identification technology to identify individuals through unique tags or ID cards. When a tag is scanned by the RFID reader, the Arduino Uno processes the signal and instantly logs the entry.

To provide a user-friendly interface, an LCD display shows real-time status updates, while a buzzer provides an audible confirmation for each successful scan. A key feature of this design is the use of the EEPROM, which stores authorized IDs and attendance logs permanently, ensuring data is preserved even during power failures.

1. DEFINITION

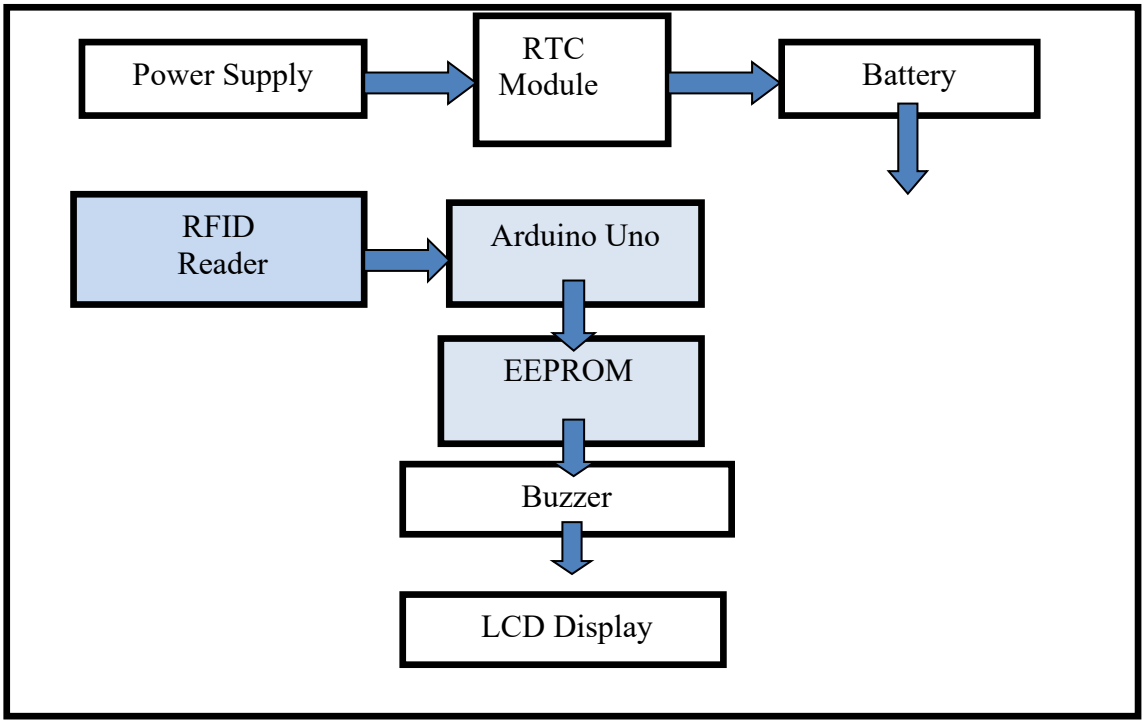
When a user brings their unique tag within range, the reader captures the digital data and sends it to a microcontroller like the Arduino Uno. The system then validates the ID against stored records, provides real-time feedback via an LCD and buzzer, and archives the entry time into the EEPROM memory. This

process eliminates manual paperwork, prevents human error, and ensures a secure, tamper-proof method for monitoring attendance in real-time.

2. PURPOSE

The primary purpose of an RFID-based attendance system is to automate the process of recording presence, replacing slow and error-prone manual methods with a high-speed digital solution.

3. METHODOLOGY



The Methodology of an RFID-based attendance system is grounded in the principles of Electromagnetic Induction and Sequential Logic Processing. System is operated manually using Bluetooth module. A battery or adapter powers the Arduino Uno, which turns on the RFID reader, LCD, and buzzer. You place an RFID tag near the reader. The reader uses radio waves to "read" the tag's unique ID number. The Arduino receives this ID and compares it to a list of allowed users saved in its memory. If the ID is correct, the LCD shows "Present," and the buzzer makes a short "beep". If the ID is wrong, the LCD shows "Invalid," and the buzzer makes a long sound.

4. NEED OF STUDY

1. To reduce the time and efforts spent on manual paper based attendance .
2. To provide instant visibility in to the presence or absence of Individuals .
3. To minimize the recurring costs of stationery and dedicated manual labor for recording maintenance .

4. To ensures that attendance logs are securely stored in EEPROM.

5. OBJECTIVES

1.To reduce the time and effort spent on manual paper-based attendance marking.
2 .To use an LCD display and buzzer to give users immediate visual and audible confirmation of their status.
3.To utilize the EEPROM for storing logs permanently, ensuring data is not lost during power outages.
4.To build an efficient, scalable attendance tool using affordable, off-the-shelf electronic components.

SCOPE OF STUDY

1.The Scope of Study in theory explores the technical and operational boundaries of the system, focusing on the following conceptual areas:
2.Electromagnetic Interaction: To examine the efficiency of Inductive Coupling between the 13.56MHz reader and passive tags for proximity-based data transfer.
3.Embedded System Logic: To study the implementation of Control Theory using the Arduino Uno to manage multiple asynchronous inputs and outputs (RFID, LCD, and Buzzer).
4.Data Volatility and Persistence: To analyze the reliability of Non-Volatile Memory (EEPROM) in preserving digital records against system resets or power fluctuations.
5.Signal Processing: To investigate the conversion of raw radio frequency signals into Digital UID strings and their subsequent validation through string-matching algorithms.

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