Attendance Monitoring System based on RFID

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TOPICS

- 1. Objective
- 2. Introduction
- 3. Theory
- 4. Working
- 5. Conclusion

PREVIOUS WORK

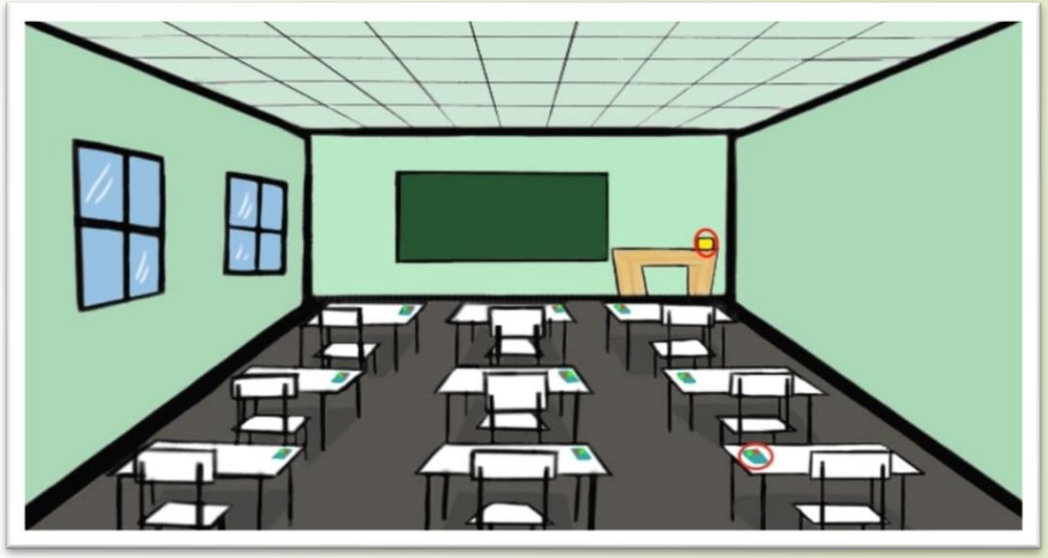
- **Study & Findings:** It was found that most of the organizations uses manual attendance monitoring and many models exists which aim to monitor attendance using RFID technology. The various models are:
  - Simple attendance logging after verification using only RFID cards.
  - Logging and monitoring attendance after connecting the RFID reader directly into a server.
  - Use of GSM to inform parents about the student's attendance.
  - Cloud storage and SD card options for backup.
- **Inference:**
  - No methods were used to provide data security.
  - Logging multiple attendances simultaneously was not possible.
  - Uses limited infrastructure for covering a very large area.

1. OBJECTIVE

- Our aim is to provide a system that:
  - is completely automatic,
  - Is able to log multiple attendance simultaneously,
  - does not require any manual effort.
  - helps in monitoring attendance seamlessly.
  - is not limited by infrastructure.

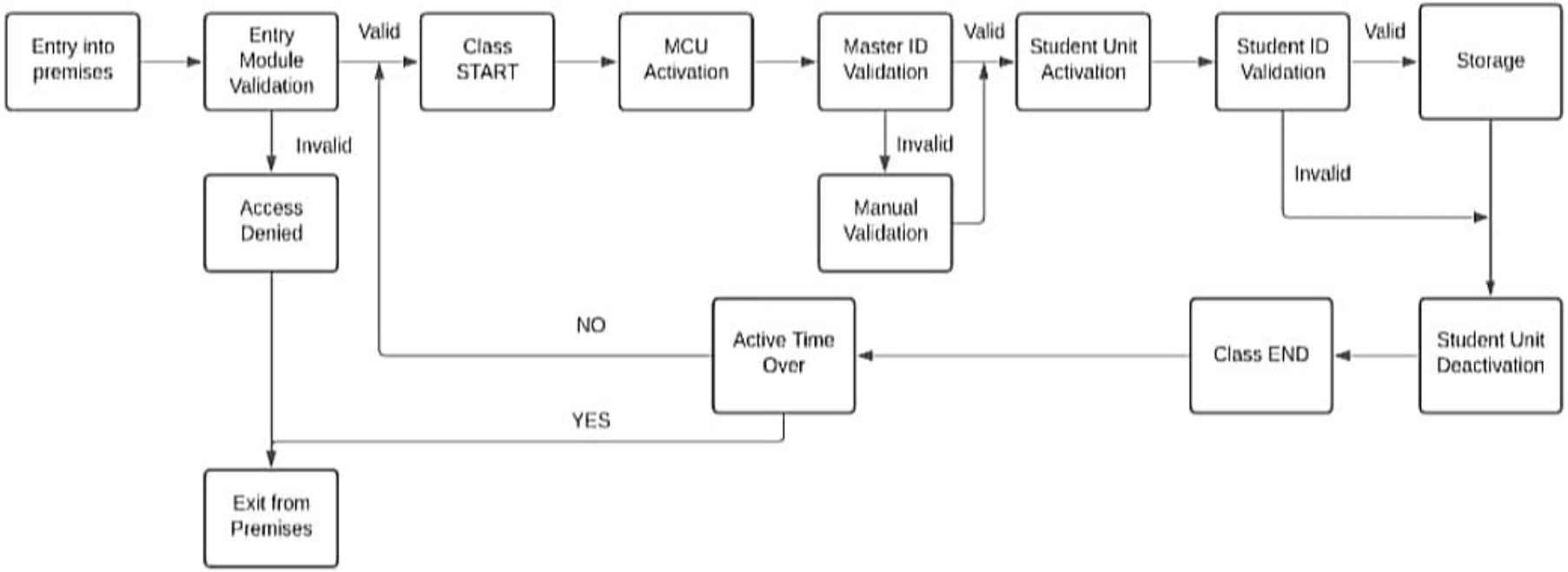
2. INTRODUCTION

PROPOSED SYSTEM & IMPORTANCE



- Automates the attendance taking process.
- Reduces time and increases efficiency.
- Enforces Security.
- Scalable, easy to manage and easy to monitor
- Methods will be implemented to tackle proxy/ false attendance.
- (LoRa is used to connect multiple SUS to a single MCU, irrespective of the number of SUS), Greater area of connectivity.
- (Due to the implementation of multiple SUS, the model is able to handle greater volume of data in less time.) Handles greater volume of data. Enhanced efficiency.
- Easily detects failure, at any level and in any case.

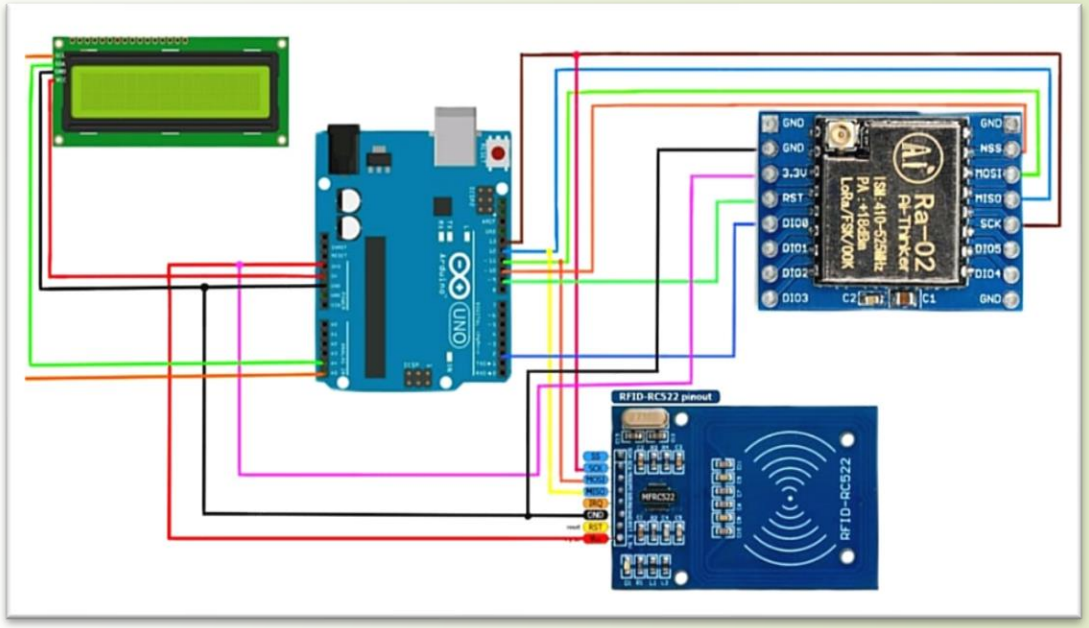
3. THEORY



Block diagram of the proposed system

TECHNOLOGY USED

- RC522 RFID reader is used for reading information from the RFID tags/cards.
- Arduino Uno or Nano is used as the microcontroller.
- LoRa is used as the communication layer and protocol.
- LCD is used to display the necessary information for visual aid.



RFID

- Provides a Unique ID
- Line of Sight not required.
- Contactless information sharing.
- Battery-less operation.
- Can detect through obstacles.

ARDUINO

- Open-source in hardware and software and Inexpensive.
- Does not require an external programmer.
- Arduino IDE is supported in almost every OS.
- Ease of Programming.
- A very large and growing community.

LoRa

- Operates on 433MHz band.
- Provides deep indoor coverage.
- Low-power.
- Low-cost. A single unit costs around Rs.450.

LCD

- It is a 16x2 LCD.
- Provides visual info.
- Uses 12C protocol.
- Depicts status of the process.

4. WORKING

- **Reading info from RFID Card:**

  The RFID Reader reads and prints the tag values.

- **Communicating using LoRa**:

  The LoRa module is used to send and receive data packets to and from end nodes

- **Customising the LCD Screen:**

  We are able to customise the LCD based on our needs like:

  - Displaying a Welcome message.
  - Status of the process.
  - Necessary numbers and values.

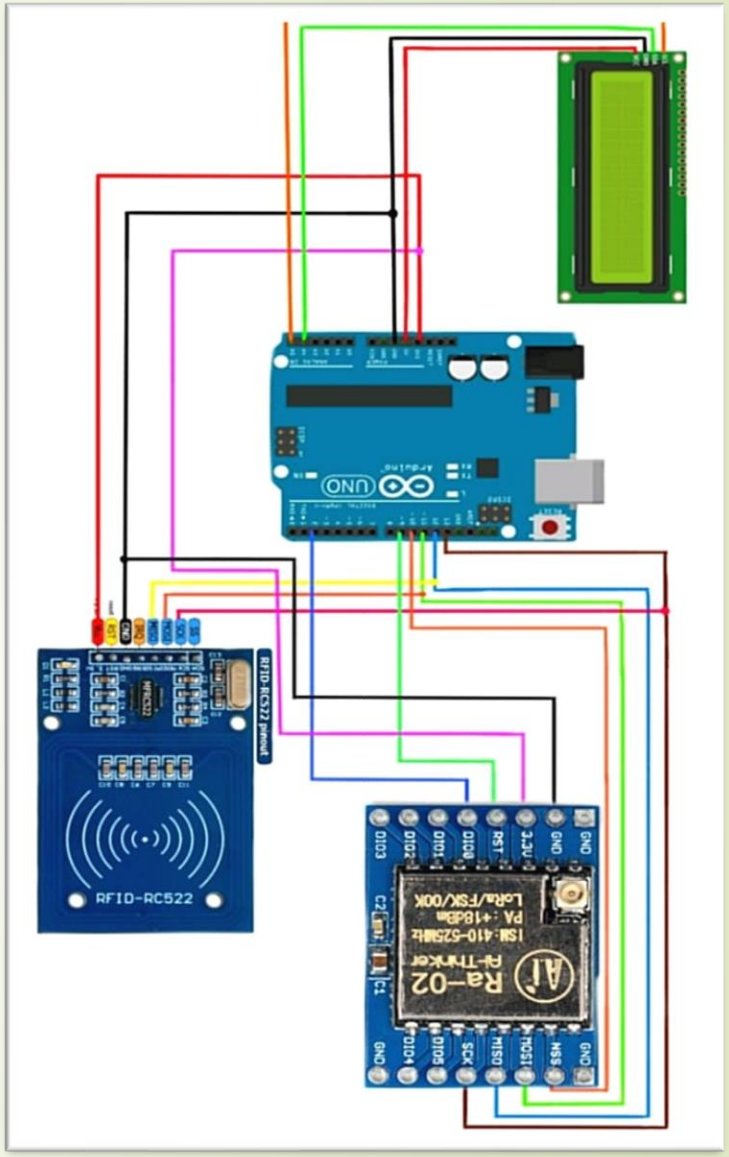
MASTER CONTROL UNIT

The Master Control Unit will have an Arduino Uno, RC522 reader module, LoRa Ra-02 module and 12C LCD module.

The Master Control unit is responsible for the whole process.

The Master Control Unit is capable of showing the vital Information at that time.

The task performed by MCU is explained in the next slide.



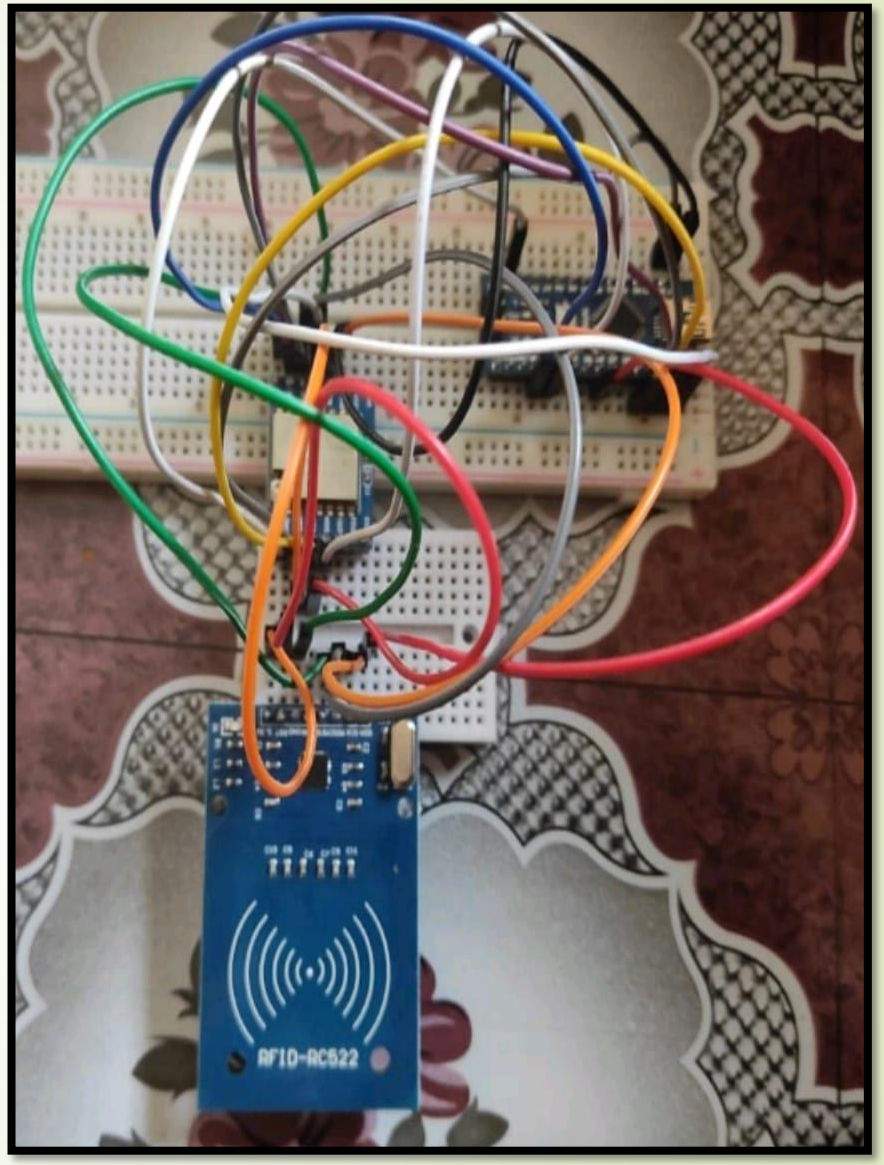
Process :

- The teacher starts the MCU.
- The teacher is greeted.
- All the SUS will be activated.
- All the student's data is collected and stored in the respective database.
- The attendance is confirmed, and the process ends.

STUDENT CONTROL UNIT

A The Student Unit mainly comprises the Arduino Nano, RC522 RFID reader module and Ra-02 LoRa module.

This is done to collect the Information from the student's ID card when taking the attendance and to transmit that information to the Master Control Unit for further processing

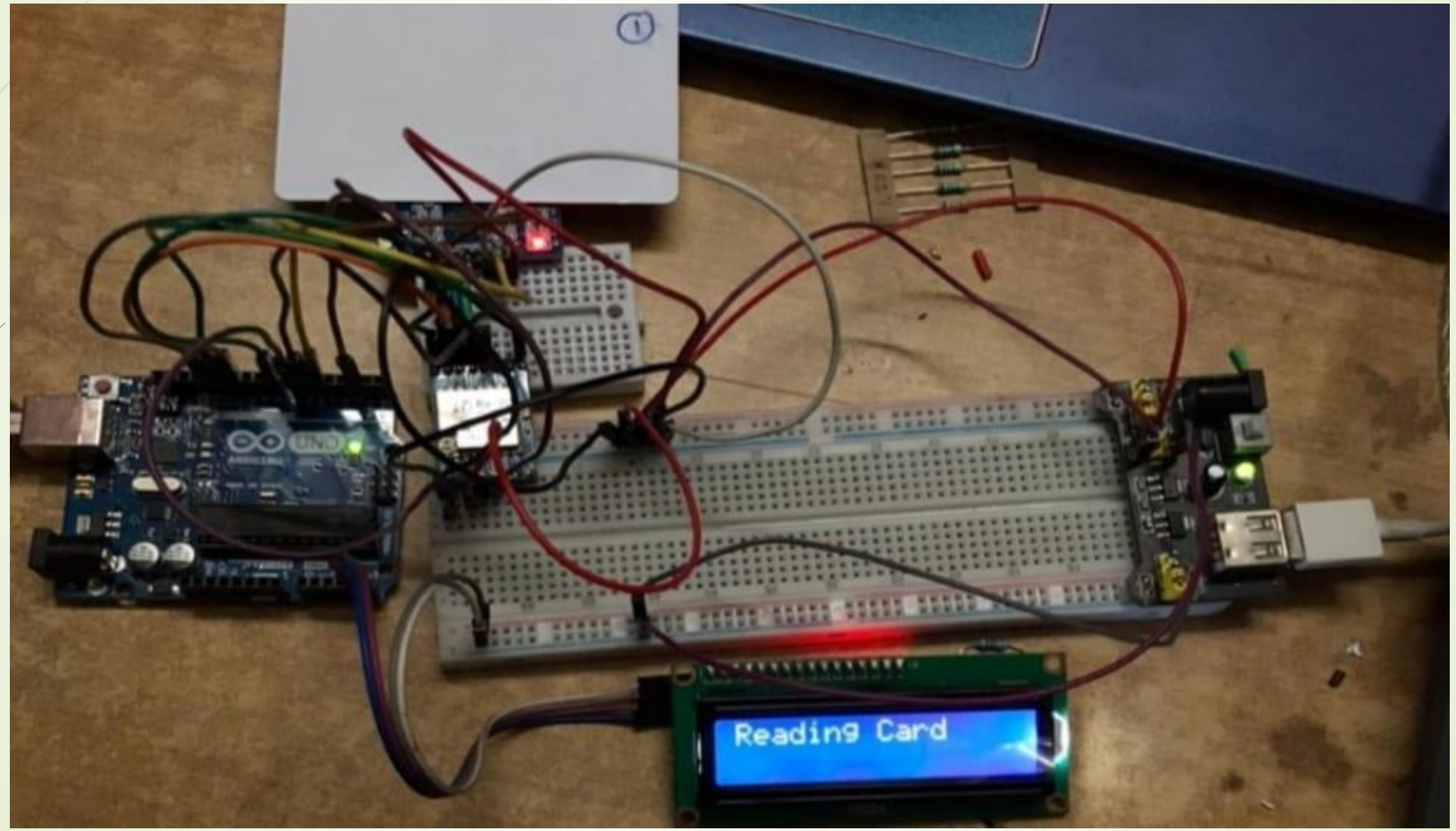


Process :

- Student places the ID card.
- Transmits the data to the MCU.
- MCU sends back the confirmation.
- Attendance process ends

The **MCU** and **SCU** are working simultaneously.

PICTORIAL REPRESENTATION



5. CONCLUSION

Automation :

- Saves time.
- Reduces errors.
- Less human effort.

Low Cost :

- Most of the components and software are open-source.
- Relatively cheaper than

Better operability :

- Simple Interface.
- Easy to use & operate.
- Abstract design.

Advantageous :

- Digitalization of data Low response time.
- Simultaneous registering of attendance.

Low Maintenance :

- Battery operated
- Very low power consuming components and techniques.

Future Scope :

- Adopt in other organisation to cater their needs.
- Include parts to enhance or change certain requirements.

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THANK YOU