Examination Room Guidance System

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Abstract- *The project's objective is to assist students in exam centers. Today, a jumbling technique is used for 99 percent of exams. Numerous students are having difficulty finding lodgings during this process. The majority of students experience anxiety both before and during the exam when they are trying to find their exam spot. In these situations, our project is useful. An RFID card will be provided to every student as their hall pass. When students arrive at the college and present their hall pass to the RFID reader. This will automatically show the individual's room number and send a message via the GSM module to the registered student's phone number. The time spent looking for a room in testing facilities will be largely reduced by our project.*

Keywords- Arduino, RFID,GSM.

I. INTRODUCTION

Exam administration and conduct at educational institutions depend heavily on the effective management of examination rooms. Accuracy, security, and real-time monitoring are frequently difficult to maintain with traditional approaches. A contemporary Examination Room Guidance System (ERGS) is developed that integrates LCD, GSM, and Radio-Frequency Identification (RFID) technologies to overcome these problems. Exam room management may be made more transparent and efficient with the help of the ERGS, which promises to offer a complete solution. Compared to traditional techniques, this system offers various advantages by using RFID tags for student identification, GSM for remote monitoring and alerts, and LCD for real-time information presentation.An developing technology is radio frequency identification, or RFID.belongs to the family of Automatic Identification and Data Capture (AIDC) technologies, which are a quick and dependable way to identify objects in a variety of applications. There are two primary parts that make up the RFID. The transponder, or tag, and the interrogator, or RFID reader, which sends and receives the signal linked to the thing. RFID tags are "interrogated" by RFID readers in an RFID system. The radio frequency "interrogation" that the tag reader creates is used to communicate with the tags. Additionally, the reader has a receiver that decodes a reply signal that it receives from the tags. The data payload of the tags is reflected in the reply signal.

II. RELATED RESEARCH

In order to comprehend current solutions, spot possible advancements or innovations, and make sure your system successfully satisfies the necessary criteria, it's crucial to study comparable work when creating an examination room guiding system with Arduino, GSM, and RFID. The following are some areas you may look atforrelevantwork.

1. Systems Utilizing RFID: Investigate current RFID-based systems that are employed for inventory monitoring, attendance management, and access control. Recognize the advantages, disadvantages, and possibleimprovements of RFID technology.

2. **Integration with GSM:** Examine devices or projects that use Arduino and GSM modules to communicate data or provide remote monitoring and alerting. Examine several communication protocols to determine whether they are appropriate for your system, such as GPRS, SMS, or IoT platforms.

3. Systems of Guidance: Seek out guiding systems utilized in a variety of contexts, including industrial, healthcare, and transportation. Recognize how these systems guide, instruct, or enlighten users, and modify pertinent ideas to fit the setting of your exam room.

4. Arduino-Powered Initiatives: Examine Arduino projects that have comparable parts or features, such data recording apps, RFID attendance systems, or Internet of Things-based monitoring systems. Look for ideas and best practices by examining their designs, coding structures, and user interfaces.

5. Designing User Interfaces: Examine the guidelines and illustrations for interactive system user interface design. Pay close attention to user-friendly interactions, clear feedback systems, and intuitive interfaces that are customized for the users of your exam room, such as students, professors, and administrators.

6.GuidanceMechanisms: Look for guiding systems that are employed in a variety of industries, including manufacturing, transportation, and healthcare. Recognize the ways in which these technologies assist users with navigation, directions, or information, and modify pertinent ideas to fit the setting ofyourexamroom.

7. Security Considerations: To safeguard data, stop illegal access, and maintain system integrity, investigate security mechanisms put in place in comparable systems. For your application, take into account secure communication protocols, authentication strategies, and encryptionmechanisms.

When developing your examination room guiding system with Arduino and related components, you can learn a lot, steer clear of typical mistakes, and make well-informed judgements by reading through comparable work in these areas.

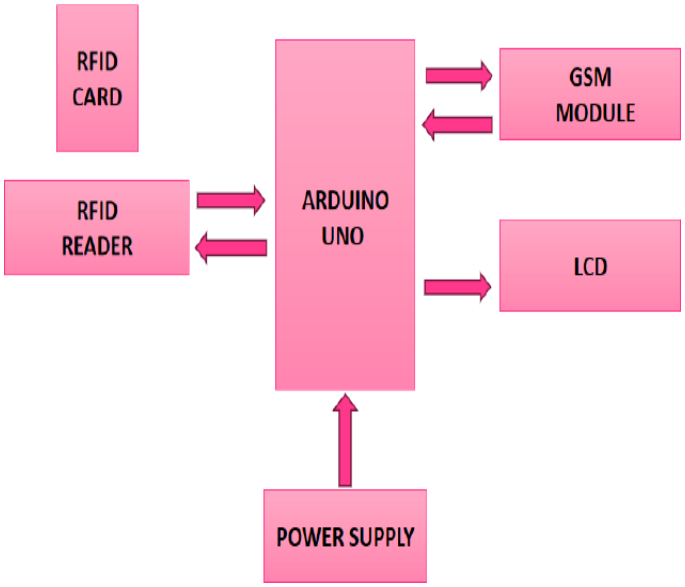


Figure1:Blockdiagram

- **RC522, the RFID module:**reads RFID tags to determine a person's identity. transmits tag information to the Arduino Uno.
- **The Arduino Uno:**handles the RFID information that the RC522 module sends. Utilising RFID data, communicates with other components. regulates the information-displaying LCD display. controls the GSM module's communication.
- **LCD Screen (16 x 2):**shows data, including exam directions and student names. operated by an Arduino Uno.

The GSM Module (SIM800L): Notifies users by SMS when certain events happen, such entry, exit, or completion. SMS commands are received for system control.

III. DEVELOPMENT BOARD FOR THE ARDUINO UNO

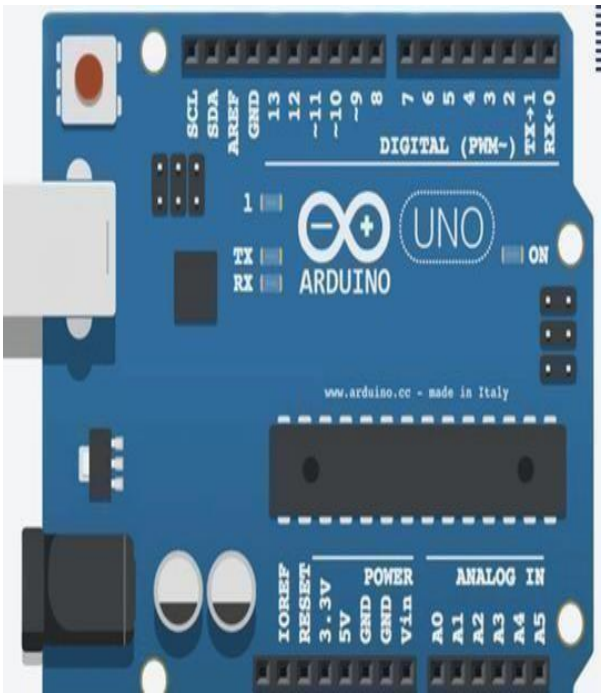


Figure2:ArduinoUNO

An open-source microcontroller board that has gained popularity, the Arduino Uno, is built around the Atmel AVR microcontroller. It is simple and easy to use, making it perfect for novices and hobbyists. It may be used in a wide range of electronic projects. A 16 MHz quartz crystal, six analogue inputs, a USB port, a power jack, 14 digital input/output pins, and an ICSP header for programming are all included on the board. It has two ways to get electricity: external power sources or USB connections. The Integrated Development Environment (IDE) for Arduino is a user-friendly software application that makes it simple to code and upload programmers to the Arduino Uno. It also boasts a sizable development and enthusiast community that communicates online, exchanging code and project ideas. The Arduino Uno is an all-around strong and adaptable programming board that can be used for a variety of tasks, from simple LED blinking to complex robotics and automation systems.

LCD Panel:

An electronic display module known as an LCD (Liquid Crystal Display) screen has several uses. One of the most fundamental modules seen in many different devices and circuits is the 16x2 LCD display. For the following reasons, liquid crystal displays are increasingly being used in place of LEDs, including multi-segment LEDs and seven-segment LEDs.

Figure 3: LCD

LCD costs have been falling. the capacity to display text, numbers, and pictures. compared to LEDs, which are often limited to a few characters and digits. replacement of the LCD's dirty controller, which frees up the CPU to focus on other tasks like updating the LCD. By contrast, in order to keep the records shown, the CPU should be used to refresh the LED. Character and snapshot programming made simple. The additives are designed to be utilised exclusively with microcontrollers; hence, they cannot be turned on by conventional integrated circuit circuits. A tiny liquid crystal display could be utilised to write particular messages using them. LCD communication with controller. LCD interface with controller: According to the LCD standard, the data bus needs eight I/O lines and three control lines. 8 bidirectional data/command pins (D7-D0) for data. ASCII format is used when sending alphanumericcharacters.

• Register Select (RS)
•RS=0 -> The Command Register is chosen
• Data Register is selected with RS = 1.
• Read or Write, or R/W
• Write 0 and read 1
•E: Turn on (Latch data).
•Applied to latch data that is present on data pins. To latch the data, there must be a high-to-low edge.

I2C MODULE:

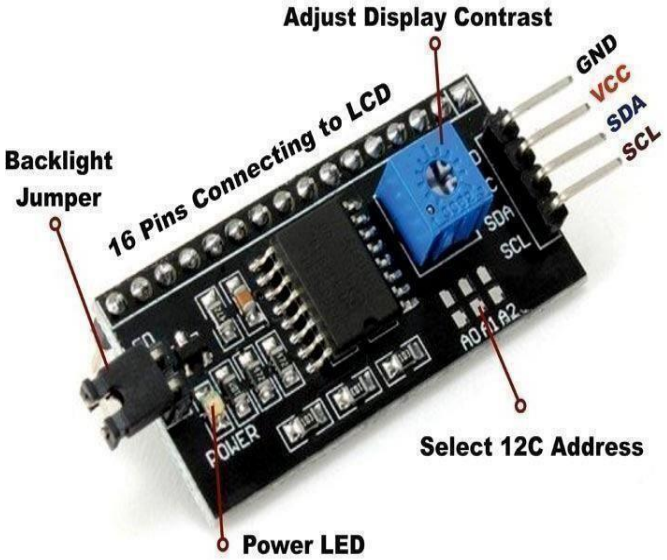


Figure4:I2CMODULE

Inter-integrated controller is what I2C stands for. Low-speed devices can be connected using this serial communication protocol.I2C serial data is converted to parallel data for the LCD display via the built-in PCF8574 I2C chip in the I2C module. The default I2C address that I2C modules come with is either 0x27 or 0x3F; you can determine which version it is by looking at the underside of the module. A contrast adjustment pot is located on the display's underside of the module. This might need to be adjusted so that the text appears on the screen correctly. Applied to latch data that is present on data pins. To latch the data, there must be a high-to-low edge.

RFID:

One of the newest technologies in the Automatic Identification and Data Capture (AIDC) family of technologies, Radio Frequency Identification (RFID) is utilized in many different applications and provides a quick and accurate way to identify items. Two primary parts make up the RFID. The tag that is affixed to the object and the interrogator, or RFID reader, which sends and receives signals. RFID tags are "interrogated" in an RFID system by an RFID reader. A radio frequency known as "interrogation" is generated by the tag reader in order to interact with the tags. Furthermore, a receiver attached to the reader decodes a reply signal that it receives from the tags. The data content of the tags is reflected in the reply signal from those tags. RFID tags are "interrogated" by an RFID reader in an RFID system. A radio frequency known as "interrogation" is generated by the tag reader in order to connect with the tags. Additionally, the reader is equipped with a receiver that decodes a reply signal it receives from the tags. The data content of the tag is reflected in the reply signal from the tags. Passive "backscatter" is how

the reply signal is generated. An antenna and tiny microprocessor make up an RFID tag. There are many uses for RFID alone, but the possibilities increase when it is combined with a microcontroller.RFID technology is continually developing, leading to increased memory sizes, broader reading ranges, and quicker processing.

RFID Data Reader: Although an RFID scanner uses electromagnetic waves to scan the barcode, a barcode scanner uses a laser beam. This is how the reader/scanner works. The scanner communicates with the tag antenna through an antenna that sends out a signal in order to transmit these waves. The tags antenna communicates with the scanner byreceiving data from it and sending specific chip information to it.

RFID READER MODULE RC522: This reader module, which runs at a frequency of 13.56MHz, is a widely used RFID (Radio Frequency Identification) reader module. It is based on the MFRC522 chip and can read and write data to Mifare cards as well as RFID tags and cards. Numerous applications, including payment systems, time and attendance systems, and access control, use this module extensively. The antenna, control module, and communication interface are some of the parts that make up the RC522 reader module. RFID tags and cards are communicated with via the antenna, and the contmodule manages the module's operations, including data reading and writing to RFID tags and cards. RFID tags and cards are communicated with via the antenna, and the contmodule manages the module's operations, including data reading and writing to RFID tags and cards. The RC522 reader module uses the Serial Peripheral Interface (SPI) bus as its communication interface. Through this interface, the module can speak with other SPI-compatible devices, such as microcontrollers. The RC522 reader module can be connected to external devices via a number of pins.

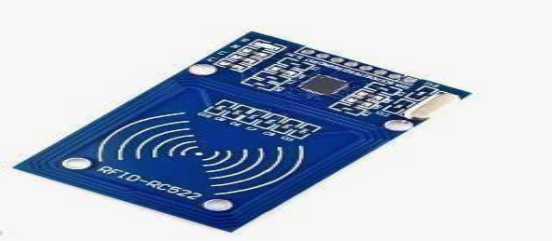


Figure5:RC522RFIDReaderModule

As a convenient and portable memory, the data on the chip is typically saved in digital cameras and one of two types of tablets. Read-Only Memory (ROM) is the most widely used type of data storage and transfer. Once readonly memory is programmed onto a chip during the manufacturing process, it cannot be changed, as the name implies. A tiny device called an RFID tag transmits and saves data to an RFID reader. Active tags and passive tags are the two categories into which they fall. Active tags are those that run on an internal battery and don't need the reader's electricity.

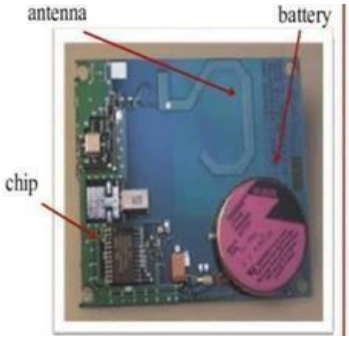


Figure6:activetag

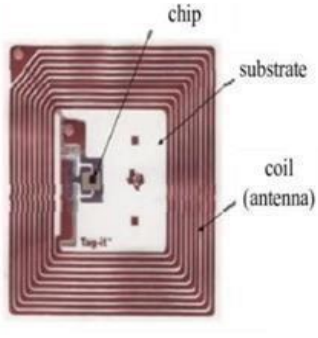


Figure7:Passive

Figure8:RFIDTag

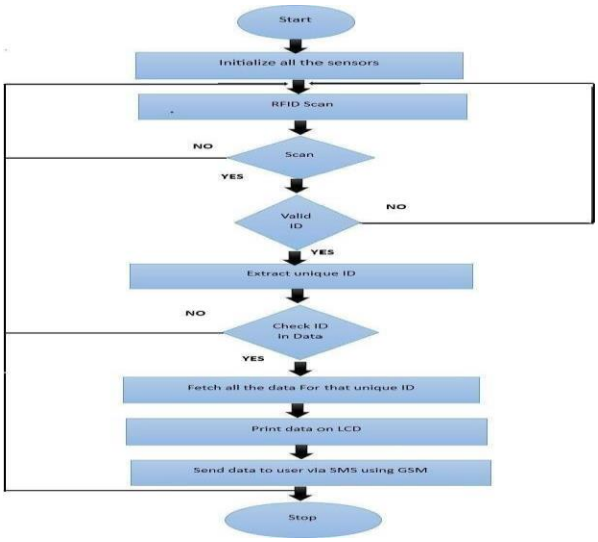
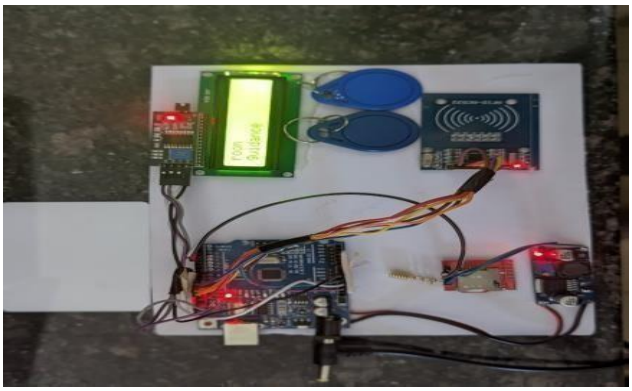


Figure9: Flowchart

IV. IMPLENTATION



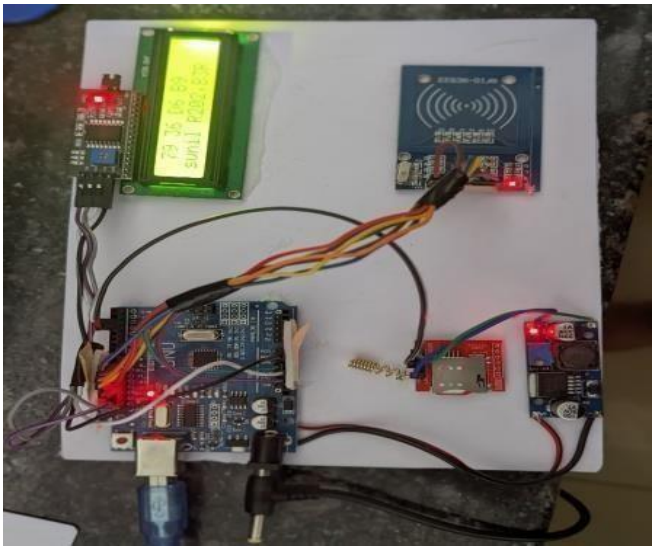
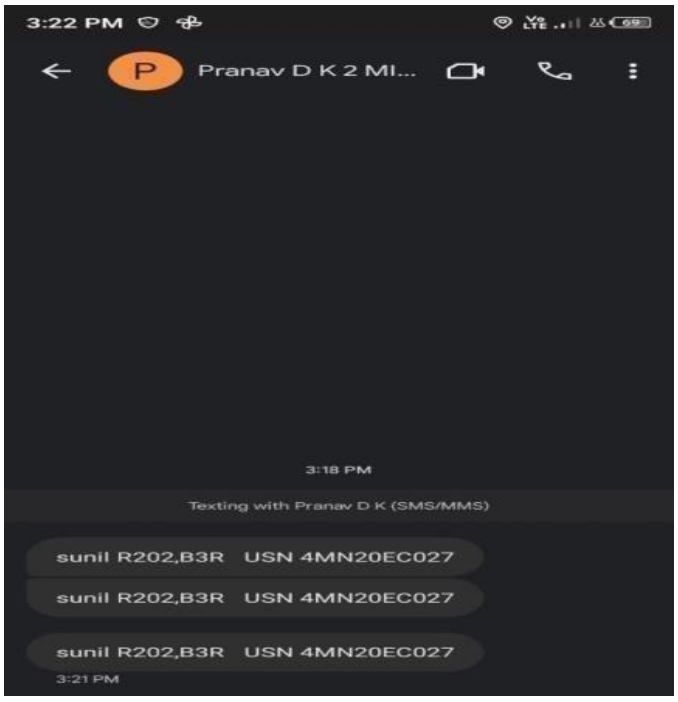


Figure:10:DisplayingofStudentinformation



V. CONCLUSIONS

The majority of educational establishments use cutting-edge technologies for their exams. The approved individual is identified and the correct hall allocation details are shown using an RFID reader and RFID tags in the proposed system. Preventing pupils' perplexity at the last minute is the primary use of this proposed approach. The primary function of this system is to perform examinations without any fraud. Prior to entering the examination room, pupils retrieve their information from the RFID card reader. Data is gathered from the student's RFID tag by the card reader. Using the RFID reader, the pupils swipe their cards. The data is cross-checked by the reader against the stored data. Next, show the student's name, room number, seat number, and USN on the LCD screen.

The RFID reader module is waiting for input while the system initialises at the beginning of the flow chart. The RFID reader module recognises the student's RFID tag, which is implanted in their ID card, when they approach the examination room and shows it to the instructor. It then transmits the tag's information to the Arduino Uno for validation. When the Arduino Uno successfully verifies the RFID tag, the GSM module is triggered, allowing the student to get an SMS verifying their access into the exam room.

REFERENCES

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