European Journal of Molecular & Clinical Medicine
ISSN 2515-8260 Volume 7, Issue 4, 2020

Protection for Exam Paper Leakage Using Arduino

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Abstract. The examination plays a predominant role in assessing the standard of an education system. Even today most of the examinations are being conducted using paper scripts. This paper is used to control the leakage of question paper[1]. We found that sealing the question paper in the cover is not safe method to prevent the leakage of question paper[2]. We proposed electronic protection for paper leakage using Arduino[3].

1. Introduction

Since so many years most of the examinations are being conducted through question papers sealed in an envelope. To protect the question paper leakage presently, we are using sealed covers method[2]. If we use this method, there is chance of breaking the seal and resealing it. This method of protecting exam papers is not secure and there is a possibility of leakage as an unauthorized person may easily open the sealed envelopes. So, to prevent the leakage of exam paper, the papers are placed in an electronically protected box and are sent to the examination centres. The examination controller will set the predefined date and time[3][4]. These boxes are allowed to open only by a particular authorized user. The boxes in which the papers are placed will be protected with passwords. To open the box, the password is sent as message. If the date and time matches then the electromagnetic lock will open[10]. Authorized user will have RFID tags[4][9]. when they swipe the card then the passwords are sent. If the authorizer types wrong password then the message is sent to the exam controller.

2. Proposed System

Now-a-days question papers are protected in sealed covers to prevent leakage, but in this system if the seal is broken then it can be resealed[1][2]. So, to overcome this we proposed an automated system. In this design Arduino is the heart of the system. Whenever the authorizer wants to open the lock, the authorizer should show the RFID tag in front of RFID card reader, then the signal is sent to the exam controller from there GSM module receives signal and the password is sent to authorizer if authentication is success then the lock will open[10][7].

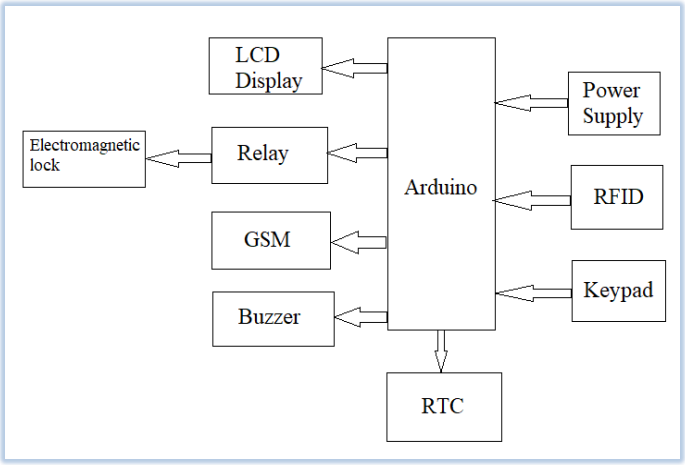

Fig.1. Functional block diagram of the proposed system

A. Working

In order to prevent the question paper leakage, we protect them with sealed covers. But if the seal is broken then it means that someone opened the seal[1]. To prevent this question papers are placed in electronically locked box.

In this system the papers are placed in electronic box and these boxes are sent to exam centres. The exam controller will set a predefined date and time to the authorized user. These boxes are protected with password. We use RTC to track the time[5]. RTC is a Real Time Clock which is used to store time and date while opening the box. To send password from the controller and to receive signal to authorizer we use RFID card reader. This card reader sends signals and receive signal to RFID tag, GSM module is used to send message to the exam controller if it is opened at wrong time[7][10]. The relay acts as switch. The authorizer will have RFID cards[6]. At the predefined time authorizer swipes the RFID tags. These tags have particular password for each card. When authorizer swipes the tag a message is sent to exam centre and the controller sends password to particular signal. If the authorized user types the wrong password then buzzer beeps sound. The keypad is used to type password[7]. If they type the correct password at particular time and date then the LCD displays password is correct and the electromagnetic lock opens.

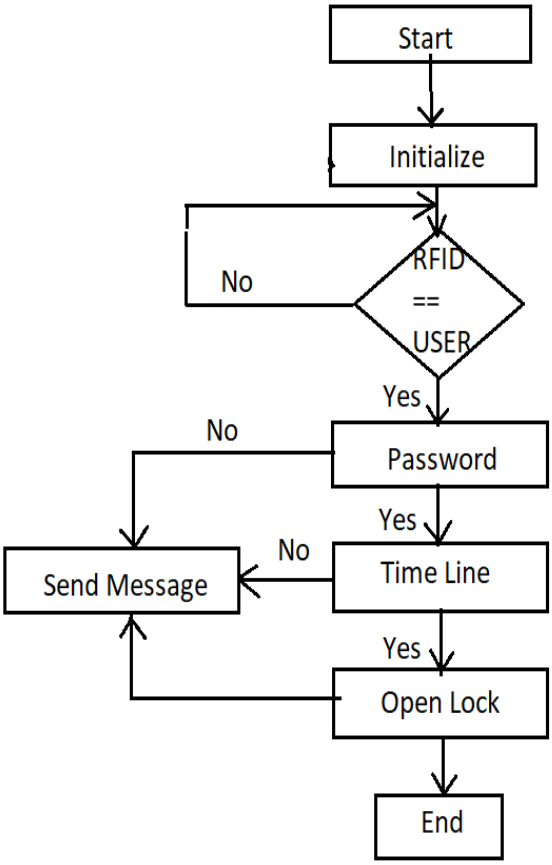

Fig 2. Flow chart of the proposed system

3. Hardware and Software Requirements

A. Hardware

1. RFID: Radio Frequency Identification is used for wireless system. It uses radio frequencies to transfer data from a tag.
2. ARDUINO UNO: It is a microcontroller board based on the ATmega328.
3. GSM: Global System for Mobile communication is digital cellular technology used for transmitting signal from the SIM.
4. RTC: Real Time Clock is used to track the current time. It avoids the confusion with ordinary clock.
5. ELECTROIC LOCK: When current flows through then it creates magnetic field and it opens the lock.

6. BUZZER: It is used to produce beep sound when it goes in wrong way.
7. KEYPAD: It is used to type passwords.
8. RELAY: Relay acts as a switch. It has inputs and outputs. They are used to open and close circuits.

B. Software
1. Arduino IDE
2. Arduino UNO Tool

4. Applications
1. This paper can be used to protect several question papers from leakage.
2. It is used to protect answer sheets when they need to be transported from individual colleges to the respective universities.
3. This paper suggests a way that can be used in banks to store various important documents to provide required security.
4. It can be used to move valuable things from one place to another place.

5. Results and Discussion
With all the components connected on a bread board, we successfully designed our module to protect exam paper from leakage and we are able to get correct results out of it.

Fig 3 Hardware Model of the proposed system

After placing the authorized RFID tag in front of the RFID card reader, the authorized person got the code successfully to his mobile through GSM module. when we entered the correct code, the electromagnetic lock opened.

To check for its correct functionality at time we entered wrong password then it has shown a message permission unauthorized on LCD display placed on board according to our programming and the buzzer started giving beep sound.
Hence, we are able to get the accurate operation from the designed prototype.

6. Conclusion
The main advantage of this method of protecting exam paper is that the implementation of question paper leakage and its design were carried out with very low cost. The response of this design is tested in system functionality. The solution is achieved with Arduino. This design is also used for other applications and extended in many ways like it can be programmed to close the box after the exam.

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