

# IMPLEMENTATION OF RFID AND OTP BASED EXAM PAPER LEAKAGE PROTECTION SYSTEM USING RTC

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**Abstract**— In this paper, the examination is mainly the heart of the education system. The main purpose of the examination is to select the capable candidates for different positions. Each and every year we hear news about postponed/cancelled exam due to paper leakages. So we have come up with a compact and portable solution and decided to design and implement an examination paper leakage protection system which is a highly secured system based on Arduino. Along with GSM modem, RFID module, keypad, and electromagnetic lock are used in this system. First the question paper comes to the college from university in an electronic sealed box which is called Electronic Control Box.

The Electronic Control Box is an embedded system that was designed using Arduino processor, which has inbuilt RTC to monitor the Electronic Control Box. If anyone tries to open that box before and after the RFID swipe time duration, the system communicates to the university authorities by sending an SMS (Short Message Service) through GSM that "some malfunctioning has taken place with the Electronic Control Box. In case if the password doesn't match, the user who has access will get the message in his phone. The buzzer will be ON once if the invalid password is entered. So we can easily identify that the exam papers have been leaked.

**Keywords**— RFID, RTC, Microcontroller, GSM.

## I. INTRODUCTION

Education is basically the motivating force of the society. An examination is the assessment planned to measure the skill, knowledge, physical fitness or aptitude and also classification in so many subjects. An exam may be on paper, on the computer, orally, in exam centers, which are conducted to test, calculate or examine the set of skills. Also the main purpose of the examination is to select the capable candidates for different positions

For the students main issues are question paper leakage, who suffer from the postponed or cancellation of the examination. Each and every year we hear news about postponed/cancelled exam due to paper leakages in the newspaper or on television. Sometimes the university itself doesn't know how there is leakage of any information content related to question papers. Hence, some student gets good rank in minimum time and with less effort and those students who really deserve the rank will not score even after hard work and maximum efforts.

This aspect will create negative effect on students and demoralize the growth of society. So we have come up with a compact and portable solution and decided to design and implement an examination paper leakage protection system based on Arduino. Along with the Arduino, GSM modem, RFID module, keypad, LCD and electromagnetic lock are used in this system.

## II. RELATED WORK

The practice surveyed from many years. This system contains "the sealed boxes "comprising the exam papers that will be dispersed to the examination centers. This framework includes a lot of restrictions that might lead to exam papers leakage at different instances same time the box is moved from "printing area to examination centers". This happens because of not difficult tampering of sealed boxes and more interference of people. Another technique that is in use today includes the mailing of the exam papers from the university to particular college's former to examination. The colleges take the Xerox of the exam paper and then the examination methodology follows. Significantly this specific strategy also includes lots of limitations. The sever interruption might occur, the website might have a chance to be hacked, and more than 100 colleges must take Xerox that includes the threats such as framework failure, energy failure, and the paper leakage. The

knowledge for the suggested framework that includes the electronic security may be determined from current equipment such as “Electronic lockers, automated teller machine (ATM), and other security improved electronic frameworks”. This framework includes the incorporation of specific electronic peripherals that operates on the methodologies depend on GSM, UART, RFID, and I2C [7], [8].

### III. EXISTING SYSTEM

In the existing system Survey the question papers are dispersed in fixed boxes. This framework is being taken after since numerous years. The burdens of this framework are it might prompt spillage of question papers at different cases in the voyage of box from printing area to examination focuses. This occurs because of simple altering of fixed boxes and more human impedance. Other strategy includes the e-duplicate of the question papers sent from the college to the universities earlier to examination. The schools take the printouts of the question paper and afterward are disseminated to the examinees impediments.

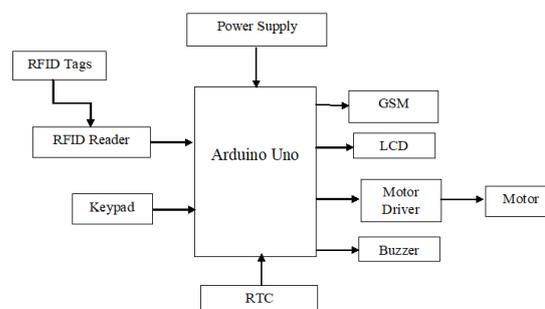
The site might be hacked, server may likewise breakdown and number of schools needed to take printouts which includes the dangers like power disappointment, framework disappointment and may prompt spillage or issues in conduction of examination. The thought for the proposed framework which includes the electronic insurance is gotten from advanced applications like Electronic lockers in bank, Home security frameworks, office security frameworks and other security upgraded electronic framework.

### IV. PROPOSED SYSTEM

The proposed system principle enclose contains the sub boxes which address papers are proposed to be kept. The RFID tag and GSM modem are associated with the container alongside the Arduino.

GSM modem interfaced to Arduino dependably sends the report of exercises to college by means of instant messages. Fundamental issues of students are “exam paper leakage”, who endures from the cancellation or postponed of the exam. Every year we gather news something like postponed/ canceled exam because of paper leakages in the daily paper or on TV.

Sometimes the university itself does not recognize how there will be spillage of the data related to exam papers. Therefore, some candidates won't get the rank that put maximum efforts and hard work, and some candidates get the good rank in less time and minimum effort. This perspective will make a negative impact on students and discourage the society's development. Thus we have come up with a convenient and portable result and decided to execute “an examination paper leakage security framework”. Together with “the Arduino Mega, keypad, GSM modem, LCD, RFID module, and the electromagnetic lock” would be utilized in this framework. First, the university will send the exam paper to the college in “an electronic sealed box” that will be termed as “Electronic Control Box”. This “electronic control box” is an embedded framework, which might have been proposed utilizing “the Arduino Mega” that has inherent RTC to observe “the electronic control box”. Whether anybody attempts to unlock the box previous and afterwards the time duration of the RFID swipe the framework communicates to the university powers by sending “a SMS (Short Message Service)” through “Global system for mobile communication (GSM)”, which several malfunctioning has taken place with “the Electronic Control Box”.



**Figure:** Proposed Block diagram

RFID(radio frequency identification) it works on the principle of wireless systems, It is made up of two components RFID tags and RFID readers. Where RFID tags are portable chips and RFID readers are mounted on Electronic Concealed Box. The RFID tags are given to the main examiner and the invigilator and there data is stored in Arduino memory. Whenever a tag is swiped on the reader it detects the tags is valid or not using electromagnetic fields of tags. There are two

types of tags active tags and passive tags. Active tags use power from its power storage where as passive tags depend on RFID readers for power. RFID is a best protection layer for this layer because we can manage who can assess the Electronic Concealed Box from RFID.

Arduino UNO module, a microcontroller that has 14 digital pins(D0-D13) and as 6 analog pins(A0-A6). We used Arduino microcontroller for this project because it consumes less power and it's cheaper. We choose Arduino because we don't need any communication from Electronic Concealed Box and Arduino does not have inbuilt communication module so it's cheaper compatible. We use Arduino to basically deals with the receiving the signal from RFID reader and give signal to servo motor and electronic lock to open.

LCD is Liquid Crystal Display. We use 16\*2 display, which shows or guides the invigilator to do next step to open the box and print question paper through displaying messages on it.

Motor driver L293D is used in this project which has 16 pins it is used drive motors in this case it is used to drive dc servo motor which controls the locking and unlocking of solenoid lock. This motor driver receives input from Arduino which guides it to perform the function.

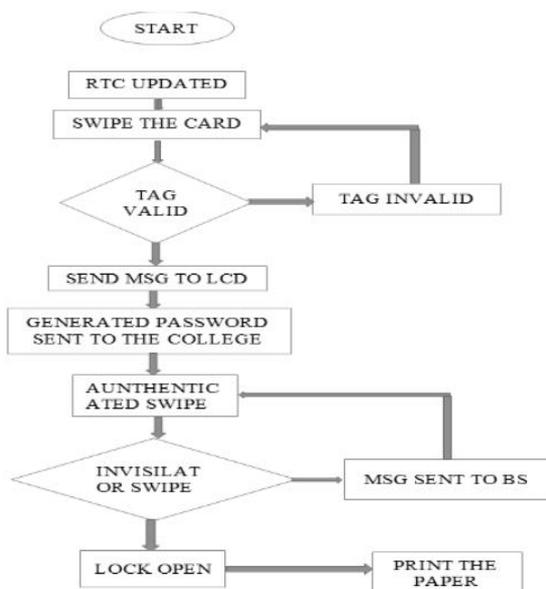


Figure: Flow Chart

**V. RESULTS**

In this paper microcontroller was used, to perform the various operations the several circuits are designed and interfaced to the microcontroller. The signal received from the GSM module is converted by using TTL logic circuit. The figure shows the experimental setup for GSM based motor control for irrigation system.

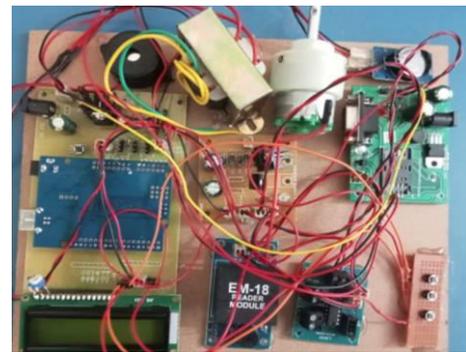


Figure: Hardware Kit



**VI. CONCLUSION**

The compact and cost effective solution for the examination paper leakage system was achieved with ARDUINO. This project can be extended to protect the answer sheets to send it to the university authorities.

It can also be used in various other applications where protection of documents or any valuables is needed. The embedded system can be programmed to close the Electronic Control Box after the completion of the exam.

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