Electronic Protection for Exam Paper Leakage

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Abstract:
This paper describes Electronic protection for exam paper leakage which is a highly secured system. The examination is mainly the heart of the education system. We have proposed an electronic system to detect and prevent exam paper leakages. In this intended system, the question papers which are in the electronically locked box will be sent to the examination centers. The box will be opened after a predefined date, time and only by an authorized user. Actually the question papers are present in the sub boxes. These boxes are password protected. To open the individual sub boxes the exam controller will send a message along with the password. If the date, time and password match, only then the box will open through electromagnetic lock. In this system we are using a buzzer for any sort of unauthorized interference.

Index Terms: Examination papers, ARM processor (LPC2148), RFID, GSM, Keypad

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 ARM processor. Along with the ARM processor (LPC2148), GSM modem, RFID module, keypad, LCD and electromagnetic lock are used in this system.

The university authorities send a unique password to the chief authority of the college before 10 minutes of the exam. The chief authority has been given a valid RFID card along with a dummy RFID card from the university. The authorized person swipes the card. The system acknowledges for the password if the card is valid. Chief examiner needs to type the password which is provided by the university using the keyboard. If password is correct, the electromagnetic lock rotates and unlocks the Electronic Control Box. This system has two transceivers. The transceiver 1 is an embedded system related to the Electronic Control Box. The transceiver 2 is the mobile phone with the university authorities. The present module work deals with the hardware and software part

II. PROBLEM DEFINITION
In this system we are using first level security which is an RFID card with a particular or unique number which is provided by university to every college. GSM is used for any unauthorized user tampering. If any unauthorized users try to open the box, then immediately a message will go to the university authorities through the GSM. The Keypad is the second level security in this system for date, time and password matching.

III. SYSTEM IMPLEMENTATION
We are designing such a highly secured electronics system which prevents the leakages of exam papers. In this system, there are three levels of security. First is a mechanical lock second is RFID card using an RFID reader and the third is keypad security. The system consists of two sections as mentioned. Transceiver 1 and Transceiver 2. Fig. 6 shows the block diagram of section 1 i.e. Embedded system for question paper leakage protection system based on ARM processor and section 2 is a mobile with the university authorities. Transceiver 1 consists of ARM processor LPC2148 which is interfaced with Keypad, RFID, GSM, LCD, electromagnetic lock.
The RFID and GSM modules are connected to the two UART ports respectively. The language in which the system is programmed such that ‘Embedded C’. Flowchart regarding the software is as shown in the Fig7.

The GSM Modem is connected to the Electronic Control Box. Mobile of the university authorized person acts as the Base Station. The RFID card is to be swiped to open the Electronic Control Box. Let us assume that the card swipe time period is taken as 10am to 10:10am. Then, Electronic Control Box system sends a message to the pre-stored mobile number of university authorities which says “EARLY ACCESS”. If the RFID card is swiped between 10am and 10:10am which is a valid time, then If the RFID card is swiped before 10am then “EARLY ACCESS” displays on the LCD as the time does not match with the RTC date and time. Then, Electronic Control Box system sends a message to the pre-stored mobile number of university authorities which says “EARLY ACCESS”. If the RFID card is swiped between 10am and 10:10am which is a valid time, then “VALID CARD” displays on the LCD. Once the RFID card is swiped, a distinct password is entered in the system through the keypad.

If the RFID tag address and GSM password which is entered through keypad and that stored on E2PROM matches, then the stepper motor rotates to open the box. If the RFID card is swiped after 10.10am which is an invalid time, then the system LCD will display “LATE ACCESS”. If the college authority types a wrong password then “PASSWORD MISMATCH” message is displayed on the LCD. The university provides two RFID cards as mentioned above; valid and invalid or dummy card. If anybody tries to open the box with the invalid RFID card the GSM modem sends a message to the university which says “INVALID CARD ACCESS”. Hence, the leakage of question papers is prevented.

V. RESULT

The Design and its implementation of ARM processor based electronics protection for the exam paper leakage system were effectively carried out with the advantages of minimum peripheral interfaces, low power consumption, low cost, high portability. The system was tested with the help of keypad and RFID card swipe time duration from 10am to 10:10am. The response of the system is successfully tested in all the conditions of the system that is mentioned in the system functionality. Test conditions include:

1. Invalid RFID card swiped and the system did not respond then message “INVALID CARD” on the LCD.
2. The RFID card was valid and GSM pass code was wrong, then system displayed “PASSWORD MISMATCH ERROR” and a message was sent to +91-7507315930.
3. Both RFID and GSM pass code were valid; the system granted access and electromagnetic lock open (to open the electronic-box).

4. When an RFID card was swiped before 10am and after 10:10am the system displayed "UNAUTHORIZED ACCESS" and a message was sent to +91-7507315930.

VI. CONCLUSION

The compact and cost effective solution for the examination paper leakage system was achieved with ARM processor controller. 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.

VII. ACKNOWLEDGEMENT

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VI. REFERENCES


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