Exam Paper Leakage Detection system and alert Over IOT

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ABSTRACT

The idea behind this project is to guard the leak of question papers sometimes we receive cancelled exam messages due to paper leakage. Therefore, we have come up with a affordable and concise outcome and we have decided to design and implement the "Exam paper Leak protection Framework" which will be a much more secure structure depending on the controller.
The Electronic control Box is an embedded system that was designed using Arduino Nano along with the IR Sensor to monitor the Electronic control Box. Together with the fingerprint scanner, Camera, GSM S modules are used. If the fingerprint of the person opening the box not matched with the authorized person, the system communicates to the university authorities by sending an SMS(short Message Service) through GSM. Hence we can easily identify that exam papers have been leaked.

Key Words: ESP32Camera, Fingerprint Scanner, Metal detector Sensor, GSM and SG90

I.INTRODUCTION

Education is important for both men and women as both have an essential role in the development of a healthy and smart society. Education is a best way for delivering a brilliant future and at the same time performs most significant part in growth and improvement of the nation. The citizens of the nation are responsible for the greater future and progress of the nation. Education is the soul of a community; it goes from one generation to another. Exam is the prime responsibility of an educational framework.

The reason for an examination is to select talented applicants for multiple positions. Exam is an important aspect of the education system to test students' abilities online and in oral papers.In the transportation or after papers reached to the centers the leakage of papers is occurring in some areas.

Exam paper leaks pose a significant threat to the integrity of educational assessments worldwide. Traditional security measures often prove inadequate in preventing these breaches. This project introduces an innovative IoT-based Exam Paper Leakage Detection and Alert System, designed to provide real-time monitoring and automated alerts. By integrating sensors, network connectivity, and cloud computing, this system aims to enhance security, deter unauthorized access, and ensure the fairness of examinations." Exam paper leaks undermine the value of academic qualifications and erode public trust in educational institutions. They create an uneven playing field, giving unfair advantages to those with access to leaked materials. Exam Paper Leakage Detection systems aim to move beyond reactive measures by implementing proactive security protocols. These systems also provide audit trails and forensic data, facilitating investigations and holding perpetrators accountable.

I. OBJECTIVE OF PROJECT

- ✓ To implement real time secure exam paper box, with fingerprint biometric sensor for secure accessing exam box system.
- ✓ To develop a robust and reliable IoT-based system for exam paper leakage detection.
- ✓ To implement real-time monitoring and alerting mechanisms.
- ✓ To enhance the security and integrity of the examination process.
- ✓ To provide a user friendly interface for monitoring.
- ✓ To create a system that is cost effective

II. BLOCK DIAGRAM

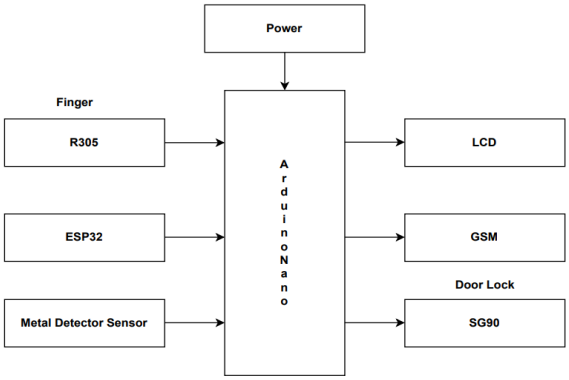

Figure 1. Block diagram of Exam Paper Leakage Detection system

The Arduino Nano Carrier has two 5V supplies, each regulated down from the 7-12V input. The signal 5V supply provides up to 500mA for the Arduino Nano itself, as well as low-power components such as a radio receiver. The power 5V supply provides up to 3A for servos. Though they are nominally the same voltage, the two supplies are kept separate with the exception of a single common ground connection. This allows the signal 5V supply to remain clean and stable even if the power 5V supply is loaded heavily by servos. Liquid Crystal Display (LCD) and the Internet of Things (IoT) are related in that LCDs are often used as display devices for IoT devices and systems. For example, LCD screens can be used to display real-time data from IoT sensors or to provide a user interface for controlling IoT devices.

A register select (RS) pin that controls where in the LCD's memory you're writing data to A Read/Write (R/W) pin that selects reading mode or writing mode. An Enable pin that enables writing to the registers.8 data pins (D0 -D7). The ESP32-CAM is a small, low-power camera module that can be used in a variety of applications, including: Smart home devices: Image upload, video surveillance, and facial recognition Industrial automation: Wireless control and monitoring Smart agriculture: Intelligent agriculture Smart cities: QR identification Wireless video monitoring: Wi-Fi image upload. The basic function of every type of scanner is to obtain an image of a person's fingerprint and find a match for it in its database. The measure of the fingerprint image quality is in dots per inch (DPI). Optical scanners take a visual image of the fingerprint using a digital camera. Finger Print Sensor (R305) -TTL UART is a finger print sensor module with TTL UART interface. The user can store the finger print data in the module and can configure it in 1:1 or 1: N mode for identifying the person. The finger print module can directly interface with 3v3 or 5v Microcontroller. GSM, or Global System for Mobile Communications, is a digital cellular network that allows mobile devices to communicate with each other and with the network. GSM is essentially a digital, open cellular radio network and functions in nearly every country. GSM is used not just for voice calls but for data storage and messages. The SG90 servo is controlled by sending a PWM (Pulse Width Modulation) signal, where the duty cycle of the pulse determines the angle of the servo arm. The SG90 can be rotated from 0° to 180° while the SG90-HV has the ability to continuously rotate

IV CIRCUIT DIAGRAM

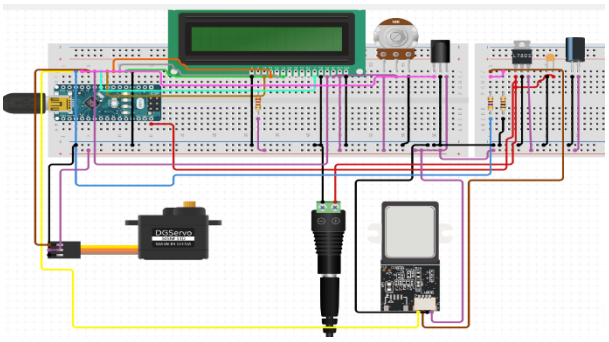

Figure 2. Circuit Diagram Of Exam Paper Leakage Detection System

V.WORKING

In our advance security lock system, it is real time system .in this system there is fingerprint sensor is used, with help of biometric sensor system can access for open the exam paper, there is a real time clock in our project advance system is like that system is assessed in a particular time. if fingerprint accessed in another time, system will not be accessed. In this project there is a GSM modem for sending the text message to the authentication person. In advance security lock system biometric sensor connected to microcontroller. If fingerprint not match in valid time the door will opened automatically. We have connected a SG90 Motor to the system. Authorized personnel (e.g., exam administrators) will have their fingerprints enrolled and stored in the R305 fingerprint sensor's database, managed by the ESP32. When someone attempts to access the exam papers, they must place their finger on the R305 sensor. The ESP32 compares the scanned fingerprint with the stored database. If the fingerprint matches, the ESP32 proceeds to the next security checks. If it doesn't match, access is denied, and optionally, an alert is sent. The metal detector sensor is positioned to detect any metallic objects that might be used to tamper with the exam papers (e.g., tools, electronic devices). If the sensor detects metal, it sends a signal to the ESP32.The ESP32 reads the signal from the metal detector sensor. If a metal object is detected, the ESP32 triggers an alarm and sends an alert. The SG90 servo motor is used to control a physical locking mechanism (e.g., a locking bolt or a latch) on the exam paper storage container.When the ESP32 verifies the fingerprint and no metal is detected, it sends a signal to the SG90 to unlock the container. If the SG90 is forced, the system can be designed to detect that movement, and trigger an alert. If any unauthorized access or tampering is detected (failed fingerprint authentication, metal detection, or other breaches), the ESP32 sends an alert message to the GSM module. The GSM module then sends an SMS message to designated authorities (e.g., exam administrators, security personnel). The SMS message can include details such as:

- "Exam Paper Leakage Detected"
- "Unauthorized Access Attempt"
- "Metal Detected"
- Time and date of the event.

A stable power supply is essential to ensure the system's reliable operation. The power supply must provide the required voltage and current for all components.

ADVANTAGES

- Security: The system can use a multi-layered security approach to reduce the risk of paper leakage. This can include sensors to detect tampering, RFID and keypad authentication, and real-time monitoring.
- Cost: The system can be cost-effective, with low power consumption and minimal peripheral interfaces.
- Portability: The system can be portable and compact.
- Alerting authorities: The system can send automated alerts to authorities if unauthorized access is detected.
- Other uses: The system can be used to protect other valuables or documents.

DISADVANTAGES

- Security Risks
- System Downtime: IoT systems are susceptible to technical issues like software bugs, sensor malfunctions, or network failures, which can disrupt the timely detection of leaks.

APPLICATIONS

- Education system and became a worldwide standard.
- Civil Services.
- Bank system(Bank Money Box).
- Home security systems
- office security systems

DEVELOPMENT PROCESS

Alerting System: Define how alerts will be sent (email, SMS, phone calls, or automated messages to security personnel or administrators).Develop different alert levels (e.g., critical, medium, low) based on the severity of the detected anomaly.

Alerts Log: A place to view historical alerts and review past issues.

User Interaction: Determine how users (staff, administrators) will interact with the system.

VI.CONCLUSION

While IoT-based exam paper leakage detection systems offer potential for improved security and monitoring, their drawbacks include security vulnerabilities, privacy issues, high costs, and technical challenges.

Careful consideration of these disadvantages is essential when designing, deploying, and maintaining such systems.

Ensuring robust security, user privacy, and ethical use of surveillance technologies will be crucial for successful implementation.

The system was tested with the help of fingerprint scanner and face detection Camera. This will ensure that the exams go well and that no unethical practices detract from the purpose of assessing a person's knowledge through education.

Future Scope

In future, camera is used for face recognition using raspberry pi and unknown face image is send through email. Internet of Things IoT concept will used. Developing international standards and best practices for exam paper security and IoT-based detection systems.

III.REFERENCES

[1]. International journal of advanced electronics & communication systems approved by csir- niscairissn no: 2277-7318 proceedings of international conference on modeling and simulation in engineering & technology (icmset- 2014) 15th - 16th february, 2014

[2]. Kenneth J Ayala, The 8051 microcontroller, Penram international Publishing Pvt. Ltd., 1997.

[3]. The Microcontroller and Embedded system using assembly and C by Muhammad Ali Mazidi,Janice gillispie Mazidi,Rowling D McKinlay,Pearson publication ,second edition,2007. [3]RFID- A guide to radio frequency identificationby V.Daniel Hunt, Albert Puglia, Mike Puglia, Pearson publication.

[4]. Carelin Felix and I. Jacob Raglend, "Home Automation Using GSM", Proceedings of 2011 International Conference on Signal Processing,

Sirisha. M, and Syamala. N (2018). RFID Based Security for Exam Paper Leakage System. International Journal of Engineering & Technology, 7(4.36), p.841.

[5].Kimia Tuz Zaman, WordhUl Hasan, MonsurHillas, Abdullah Al Mahfuj Shaan, Khan Afnan Rahad"IOT based question paper delivery box: A Solution towards preventing question paper leakage "-2020. van Leeuwen, J. (ed.): Computer Science Today. Recent Trends and Developments. Lecture Notes in Computer Science, Vol. 1000. Springer-Verlag, Berlin Heidelberg New York (1995)

[6].K. Srikanth, M. Osman, A. Sultana, M. Imran and A. Uddin, "A Review on Smart Question Paper Leakage Detection System," 2020 Fourth International Conference on Computing Methodologies and Communication (ICCMC), Erode, India, 2020, pp. 1009-1012, doi:10.1109/ICCMC48092.2020.ICCMC000188.

[7].G.K Verma and P. Tripathi, "A Digital Security System with Door Lock System Using RFID Technology", International Journal of Computer Applications, vol. 5, no. 11, pp. 6-8, 2010.