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EXAM PAPER LEAKAGE PROTECTION SYSTEM USING RFID TECHNOLOGY

[1]Mrs. K. Swetha,[2]Siripuram Supritha
[1]Assistant Professor,[2]Student
Department of ECE
Sree Chaitanya College of Engineering, Karimnagar

ABSTRACT:

The examination is the key component of the instructional system and education itself. We acknowledge that this soul has irreversibly been polluted, both unintentionally and on purpose. The primary cause of this is test paper leaks.To put an end to this, substantial action must be done. Thus, we propose an electronic approach here to detect and prevent exam paper. Question papers for the proposed module are sent to the testing locations electronically secured in a package that cannot be opened before the scheduled time and date. Only the genuine user may open a box. They need a password to access. An OTP message will be sent by the test organiser to access each individual subbox. A motorised mechanism will unlock the box when the password, date, and time coincide. For this reason, the papers must be kept locked and sealed until the test time.

I. INTRODUCTION OF PROJECT

Many logistics service companies still operate in the old-fashioned, basic manner of the past, seeing logistics management as a distinct, independently managed sector that includes transportation, storage, distribution, and processing. Many logistics enterprises have inadequate levels of information technology, making it impossible for customers to share information, which has caused businesses to react slowly and inefficiently [1]. The transformation of Chinese wisdom logistics is being driven by the advancement of Internet of things technology. In order to facilitate the connectivity of objects, RFID and ZigBee technologies have grown in popularity. This will provide corporate logistics systems, including environment monitoring systems, a platform [2, 3]. This article presents the design of an Internet of things-based intelligent logistics system. The system can monitor environmental security and commodities information in real-time, reducing the need for humans.

II. LITERATURE SURVEY

The system that is widely in use today incorporates a long-standing tradition. This has to do with the sealed boxes that hold the test questions that will be sent out to the testing locations. Numerous issues with this technique might result in question papers leaking at different times while the box is being transported from the printing place to the testing locations. More human intervention and simple access to sealed boxes are the causes of this.

The alternative approach still in use today is shipping the test question papers to the appropriate institutions ahead of time, straight from the university. After the colleges get the printouts of the test questions, the examination process is carried out.Even this specific approach has a lot of drawbacks. There is a risk of a severe breakdown, a website hack, and more than 100 universities need to take printouts of the dangers, which include power outages, system failures, and paper leaks. Modern devices like automated teller machines (ATMs), electronic lockers, and other security-enhanced electronic systems are the source of inspiration

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for the suggested solution, which incorporates electronic protection.

III. DESIGN OF HARDWARE

This chapter provides a quick explanation of the hardware. It goes into great depth about each module's circuit diagram.

ARDUINO UNO

A microcontroller board based on the ATmega328 is called the Arduino Uno (datasheet). It has a 16 MHz ceramic resonator, 6 analogue inputs, 14 digital input/output pins (six of which may be used as PWM outputs), a USB port, a power connector, an ICSP header, and a reset button. It comes with everything required to support the microcontroller; all you need to do is power it with a battery or an AC-to-DC converter or connect it to a computer via a USB connection to get going.The FTDI USB-to-serial driver chip is not used by the Uno, setting it apart from all previous boards. As an alternative, it has the Atmega16U2 (or Atmega8U2 up to version R2) configured as a serial-to-USB converter. The 8U2 HWB line on the Uno board is pulled to ground by a resistor, which facilitates DFU mode entry. The Arduino board now includes the following updates:

• 1.0 pin out: two further new pins, the IOREF, are positioned next to the RESET pin, the SDA and SCL pins that were introduced, and they enable the shields to adjust to the voltage supplied by the board. Shields will eventually work with both the Arduino Due, which runs on 3.3V, and the boards that utilise the AVR, which runs on 5V. The second pin is unconnected and set aside for future uses.

• A more robust RESET circuit.

• The 8U2 is replaced with an ATMega 16U2.

"Uno" is an Italian word for one, and it was chosen to commemorate the impending introduction of Arduino 1.0. Going future, the Arduino reference versions will be the Uno and version 1.0. The Uno is the most recent in a line of USB Arduino boards and the platform's standard model; see the index of Arduino boards for a comparison with earlier iterations.

Fig: ARDUINO UNO

POWER SUPPLY:

The purpose of the power supplies is to convert the high voltage AC mains energy into a low voltage supply that is appropriate for use in electronic circuits and other devices. One may disassemble a power supply into a number of blocks, each of which carries out a specific task. "Regulated D.C. Power Supply" refers to a d.c. power supply that keeps the output voltage constant regardless of differences in the a.c. main or the load.

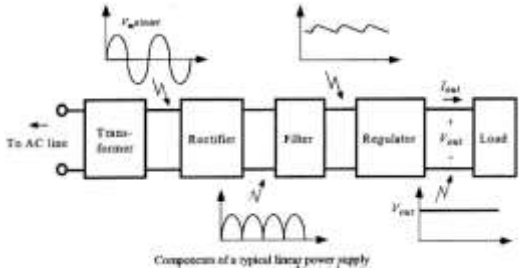

Fig: Block Diagram of Power Supply

LCD DISPLAY

The model shown here is the one that is most often utilised in practice due to its cheap cost and enormous potential. Its HD44780 microcontroller (Hitachi) platform allows it to display messages in two lines of sixteen characters each. All of the alphabets, Greek

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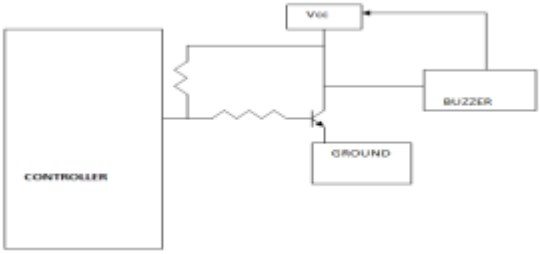
letters, punctuation, mathematical symbols, etc., are shown. Furthermore, it is possible to show custom symbols created by the user. Some important features are the automatic changing of the message on the display (shift left and right), the presence of the pointer, the lighting, etc.

Fig: LCD

BUZZER

Relays, buzzer circuits, and other circuits cannot be driven by the current available on digital systems and microcontroller pins. The microcontroller pin can provide a maximum of 1-2 milliamps of current, even though these circuits need around 10 milliamps to work. Because of this, a driver—such as a power transistor—is positioned between the buzzer circuit and microcontroller.



WIFI MODULE:

A low-cost Wi-Fi microprocessor with complete TCP/IP stack and microcontroller functionality, the ESP8266 is made by Chinese firm Espressif Systems, located in Shanghai.[1]

In August 2014, a third-party producer named Ai-Thinker's ESP-01 module brought the chip to the attention of western manufacturers for the first time. With the help of this little module, microcontrollers may establish basic TCP/IP connections and connect to Wi-Fi networks by utilising Hayes-style instructions. But at the time, there wasn't much documentation available in English on the chip or the commands it could execute.[2] Many hackers were drawn to investigate the module, chip, and software on it as well as translate the Chinese documentation because of its very cheap cost and the fact that it had very few external components, suggesting that it may someday be very affordable in production.[3]

With its 1 MiB of integrated memory, the ESP8285 is an ESP8266 that enables single-chip Wi-Fi capable devices.[4] The ESP32 is these microcontroller chips' replacement.

RFID (RADIO FREQUENCY IDENTIFIER)

Radio-frequency identification (RFID) is an automated identification technique that uses RFID tags or transponders, which are devices that store and retrieve data remotely. An RFID tag is anything that may be put on or integrated into a product, an animal, or a human being in order to identify them using radio waves. Certain tags are readable from a distance of several meters and outside the reader's line of sight. RFID tags typically consist of two or more elements. An integrated circuit may be used for

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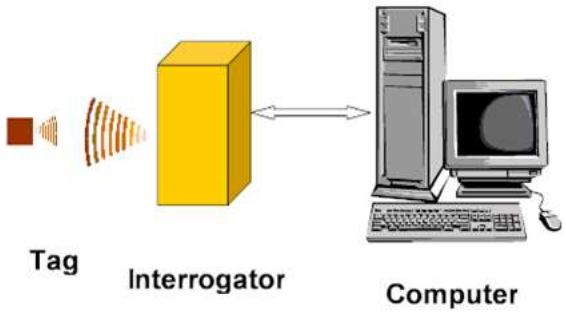
several specialised tasks like as information processing, data storage, and RF signal modulation and demodulation. An antenna for both receiving and sending the signal is the second component. Chip-less RFID technology enables distinct tag identification without the need for an integrated circuit, making it more affordable to print tags directly onto assets than with standard tags.

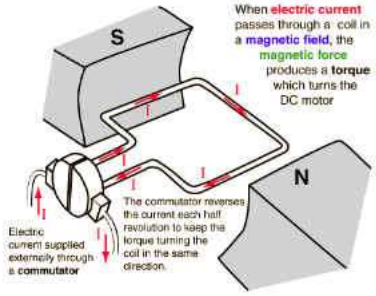


L293D:

Half-H drivers with triple high-current include the L293 and L293D. With voltages ranging from 4.5 V to 36 V, the L293 is intended to provide bidirectional driving currents of up to 1 A. Up to 600 mA of bidirectional driving current may be achieved with the L293D at voltages ranging from 4.5 V to 36 V. In positive-supply applications, these devices are intended to drive inductive loads such solenoids, relays, dc, and bipolar stepping motors, in addition to other high-current/high-voltage loads. Every input is compatible with TTL. With a pseudo-Darlington source and a Darlington transistor sink, each output is a full totem-pole driving circuit. Drivers 1 and 2 are enabled by 1,2EN, while drivers 3 and 4 are enabled by 3,4EN. Drivers are enabled in pairs. The corresponding drivers are activated and their outputs are active and in phase with their inputs when an enable input is high. These drivers are disabled and their outputs are turned off and in the high-impedance condition when the enable input is low. Each pair of drivers creates a full-H (or bridge) reversible drive appropriate for solenoid or motor applications when the right data inputs are provided.

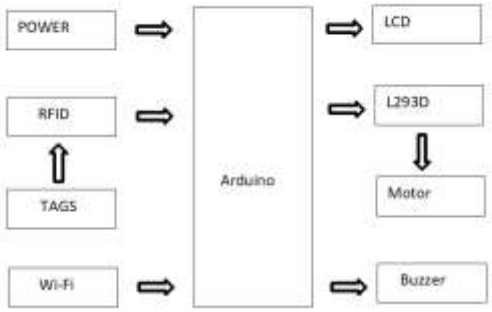
DC MOTOR

A DC motor is intended to operate with DC electricity. Michael Faraday's homopolar motor, which is rare, and the ball bearin motor, which is a recent invention, are two instances of pure DC designs. The two most popular forms of DC motors are brushed and brushless, which are not strictly speaking DC machines since they require internal and external commutation, respectively, to produce an oscillating AC current from the DC source.



IV. BLOCK DIAGRAM AND HARDWARE DISCRIPTION

BLOCK DIAGRAM:



WORKING:

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Test Paper Leakage Protection System uses RFID technology, Arduino, and a DC motor to manage access in order to prevent unwanted access to sensitive documents, including test papers. The automatic and secure mechanism of the system guarantees that only authorised persons may obtain or view test papers. This is the step-by-step operation of the system:

1. System Initialization and Setup

- As soon as the system is turned on, the Arduino microcontroller initialises all of the parts, including the DC motor, LCD screen, buzzer, and RFID reader.
- Cards with RFID tags embedded in them are given to authorised persons (such exam officers or security personnel). The RFID reader is configured to read these tags.

2. RFID Authentication

- An individual has to show their RFID card to the RFID reader in order to access the test papers.
- The unique identification number (UID) inscribed in the RFID tag is read by the RFID reader after it scans the card.
- The Arduino microcontroller receives this UID in order to verify it.
- The system has a memory-stored predetermined list of approved RFID UIDs.
- The system unlocks the storage compartment if the scanned UID matches one of the approved IDs.

3. Verification Process

- If the RFID card is approved: o The DC motor, which manages the lock mechanism of the compartment (such as a box or drawer) holding the test papers, receives a signal from the Arduino.
- To open the compartment, a mechanical mechanism (such as a servo-operated lock or latch) is turned by the DC motor.
- A notification indicating that access has been approved appears on the LCD screen at the same moment, and a green LED may start to glow.
- In addition, an optional GSM module may notify administrators for further security, or the system may register the access in an internal log along with the time and date.
- In the event that the RFID card is not valid: o The DC motor stays dormant (the lock stays closed) and the system refuses entry.
- An LCD panel may flash red and provide a warning like "Unauthorised Access."
- In the event that someone tries to enter the compartment without authorisation, a bell may ring to notify security staff.
- In the event of many unwanted access attempts, the system could activate a GSM module to notify administrators for increased security.

4. Motorized Lock Mechanism

- The DC motor starts up when the approved RFID card is found. The motor has the potential to: o Rotate, releasing a latch that secures the container.
- Use a servo motor to spin in order to open a little hatch or door.
- Exam papers may be retrieved by authorised workers after the lock is released.
- The DC motor automatically moves the lock back to its initial position after a

certain amount of time (for example, when the compartment is opened and closed), resecuring the compartment.

ADVANTAGES

1. Enhanced security and safety.
2. Less human errors.
3. Providing a contactless identification and tracking.
4. Real-time delivery status.
5. Less money and time spent on tracking and handling of the package

V. CONCLUSION

Exam question paper leaking method's goal and execution were successfully completed with the benefits of reduced paper use, high mobility, minimal outlying edges, and cheap cost. The system's reaction is successfully tested for a microcontroller solution that is both practical and affordable. This project might be continued in order to secure the answer sheet and question paper before sending it to the university administration. It is also used in a number of different applications where safeguarding papers or other valuables is necessary.

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