INTEGRATING RFID AND BIOMETRIC TECHNOLOGY FOR EXAM SECURITY AND CANDIDATE VERIFICATION

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Abstract- Most of the examinations is performed on Jumbling system and students are facing the difficulty to identify their examination rooms. The major goal of this initiative is to help students navigate the exam centers and locate their designated rooms. In these instances to overcome this problem, Fingerprint module is used to detect the authorized person. Each will be handed hall ticket and RFID card. When the student enters the college grounds, they must flash their RFID tags to the reader, which then displays the candidate information automatically uses the voice module to instruct the student verbally. Buzzer is provided to alert the candidate if authentication fails. By using this developed system we can detect the authentication of the student and save the student time while searching the allotted rooms in examination centers.

Index Terms RFID System, Fingerprint module, Arduino, LCD Display, Examination Room Guidance.

I. INTRODUCTION

In the modern world, education is crucial in determining a person's career. The way that exams are administered has changed along with the evolution of the educational system. With the advancement in technology, it has become essential to incorporate technology in the examination process to make it more secure and reliable.

The current education system has a lot of issues when it comes to exam and candidate management. There are cases of impersonation, cheating, and malpractice that are prevalent in the examination system. The validity of testing procedure and the accuracy of the results are severely impacted by these problems. Candidates are identified using RFID tags [4] or card thanks to RFID technology. Hence, there is a need for a fool proof examination system that ensures the authentication of candidates and prevents malpractice.

The project aims to design and implement a system for candidate authentication and guidance for examination rooms using RFID and biometric technology. The system ensures secure authentication of candidates [6] and provides guidance to the examination room the project is a system designed to authenticate the identity of candidates before they enter an examination room and provide them with guidance. The system uses two technologies: RFID (Radio Frequency Identification) and biometrics [1]. To verify the candidate's identification, the system scans the data on the RFID tag or card. By scanning the candidate's biometric information, such as their fingerprints, biometric technology is utilised to confirm their identification [7]. This makes the exam-taking process less stressful and less confusing for the students. This decreases the likelihood of fraud during the examination process and eliminates the necessity for human checking.

II. PROPOSED METHOD

The combination of RFID and biometric technologies for exam security and candidate authentication is one of several methods for candidate authentication system that is used to authenticate the candidate upon entering the test hall. However, since this technology would just authenticate the applicant, candidates may not know where to go for the examination room if they are rushed. In order to solve this issue, we can use the voice module. After authentication is complete, the major goal of this module is to provide guidance to the candidates for examination room.

III. METHODOLOGY

A. System Architecture

The system architecture for the RFID and biometric using Arduino project would consist of several components working together to achieve the desired functionality. Here is possible system architecture.

RFID Reader: This element is in charge of decoding the RFID tag's (unique identification number). It will be linked to the Arduino board and be in serial communication [3] with it.

Biometric Scanner: The job of this scanner is to collect the candidate's biometric data, such as fingerprints. Also, it will be linked to the Arduino board and be in serial communication with it.

Arduino Board: This component will act as the heart this project. It could process data it received from the RFID reader and biometric scanner to verify the candidate. It can also control the display and speaker components to guide the candidate to the correct examination room.

Display: This component will display the authentication status of the candidate and guide them to the correct examination room. It could be on LCD display.

Voice Module: This component will provide audio feedback to the candidate, guiding them to the correct examination room.

Buzzer: This component will alert the candidate when authentication fails.

Overall, the system architecture would be designed to ensure secure candidate authentication and efficient guidance to the correct examination room.

B. Block Diagram of proposed method

The block diagram will explain about overview of this project. Here all the components are connected to the arduino to achieve this project. we turn on the power supply. It will provide 12 volts to the entire system. When we place the RFID tag on the RFID reader .It send data to the controller through RFID reader (arduino) and controller sends the data to the display unit once data is matched [5] [8]. The student is authenticated using fingerprint module that is connected to an arduino. Here we used voice module and buzzer. The voice module will give guidance to the student and buzzer will alert the candidate when authentication fails.

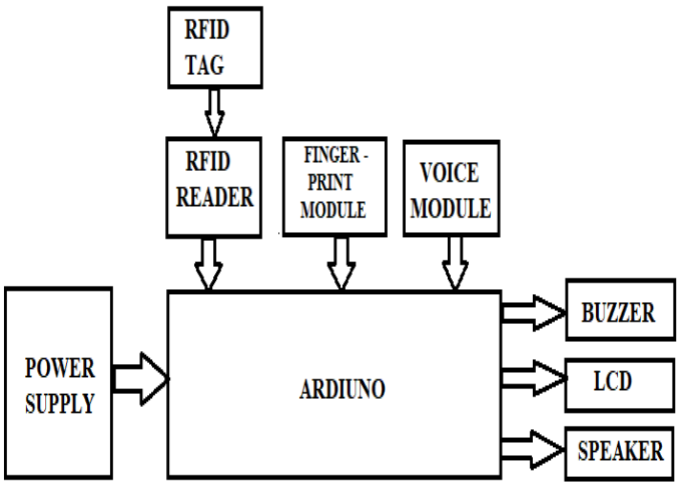

Fig 1: Block diagram of RFID and Biometric system

FLOWCHART:

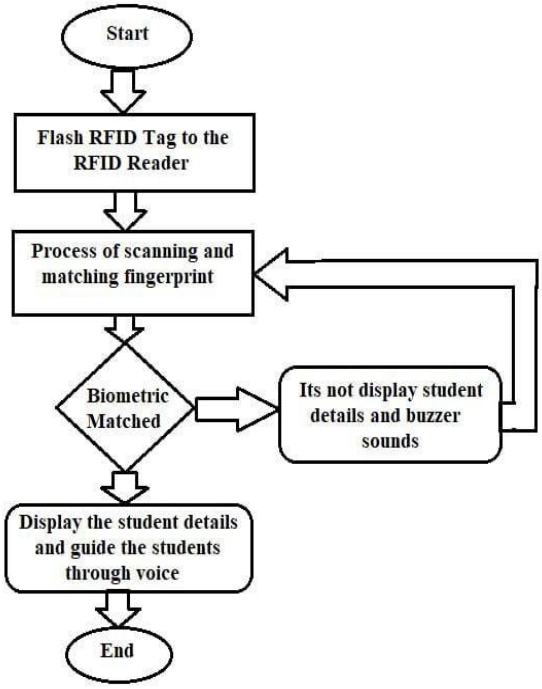

Fig 2: Flow diagram for candidate authentication with voice module.

Algorithm

Step1: Candidate Registration.

- Collect candidate details (name, ID number, etc.) and store them in a arduino.
- Capture the candidate's biometric information (fingerprint) and store it in the arduino.
- Issue an RFID tag to the candidate.

Step2: Candidate Authentication and RFID tag.

- When a candidate arrives at the entrance point of the college premises, they will be asked to flash there RFID tag.
- When flash the RFID card to the Reader it process of scanning the fingerprint.
- The Biometric scanner will verify the authentication of the candidate's information.
- If the candidate's information is verified, then display the candidate information on LCD and guided through voice module the candidate allowed to enter the examination hall.
- If the candidate's information is not verified, then buzzer will alert the candidate and this scanner will go to pervious position.

IV. RESULTS

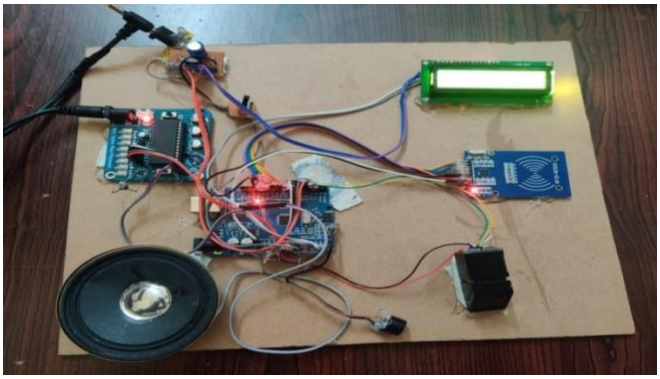

Fig 3.1: project module

Integrating RFID and biometric technology for exam security and candidate verification system output is presented the candidate details on LCD. The candidate gets directed to enter the designated room by the speaker from the above Fig 3.1

Fig 3.2: When module is Turn ON.

- When we give 12volts dc power supply to the integrating of RFID and biometric system. The system will turn ON and it displays the RFID Biometric room identity message on LCD in the above Fig 3.2

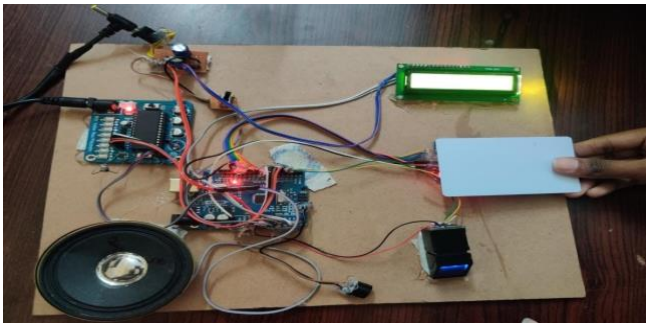

Fig 3.3: Flash the RFID card.

Fig 3.4: After flash the RFID card.

- When candidate flash there RFID card to the reader in the above Fig 3.3. The RFID reader is to identify the card and displayed card number message on LCD in the above Fig 3.4

Fig 3.5: After biometric the candidate.

Fig 3.6: voice output for guided the candidate

- If the biometric is matched then candidate is authenticated and it displays the candidate details like name, college name, room, roll no message on LCD in above Fig 3.5
- After while a second it commands the candidate for a designated room below like this message Fig 3.6 "2nd floor 1st left room."

Fig 3.7: Buzzer

- If the biometric is not matched then candidate is not authenticated it will alert the candidate (it will sound like beep) Fig 3.7

V. FUTURE WORK

It could explore new use cases, such as using these technologies for employee attendance management, access control systems, or even as a means of payment. It explore ways to address these concerns by developing more secure systems, implementing appropriate data protection measures, and ensuring that candidates' personal information is not missed. It focus on developing user-friendly interfaces, intuitive navigation, and informative feedback systems that can help improve the overall experience for all parties involved.

VI. CONCLUSION

The project goal is to develop and put into use an RFID and biometric candidate authentication and guidance system for exam rooms. Only approved candidates will be permitted to take the exam thanks to the suggested approach. The authentication procedure will be quicker [9] and more dependable with the usage of RFID and biometric technology. The system will be simple to use and understand. Time will be saved, [2] and the possibility of human error is removed.

VII. REFERENCES

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