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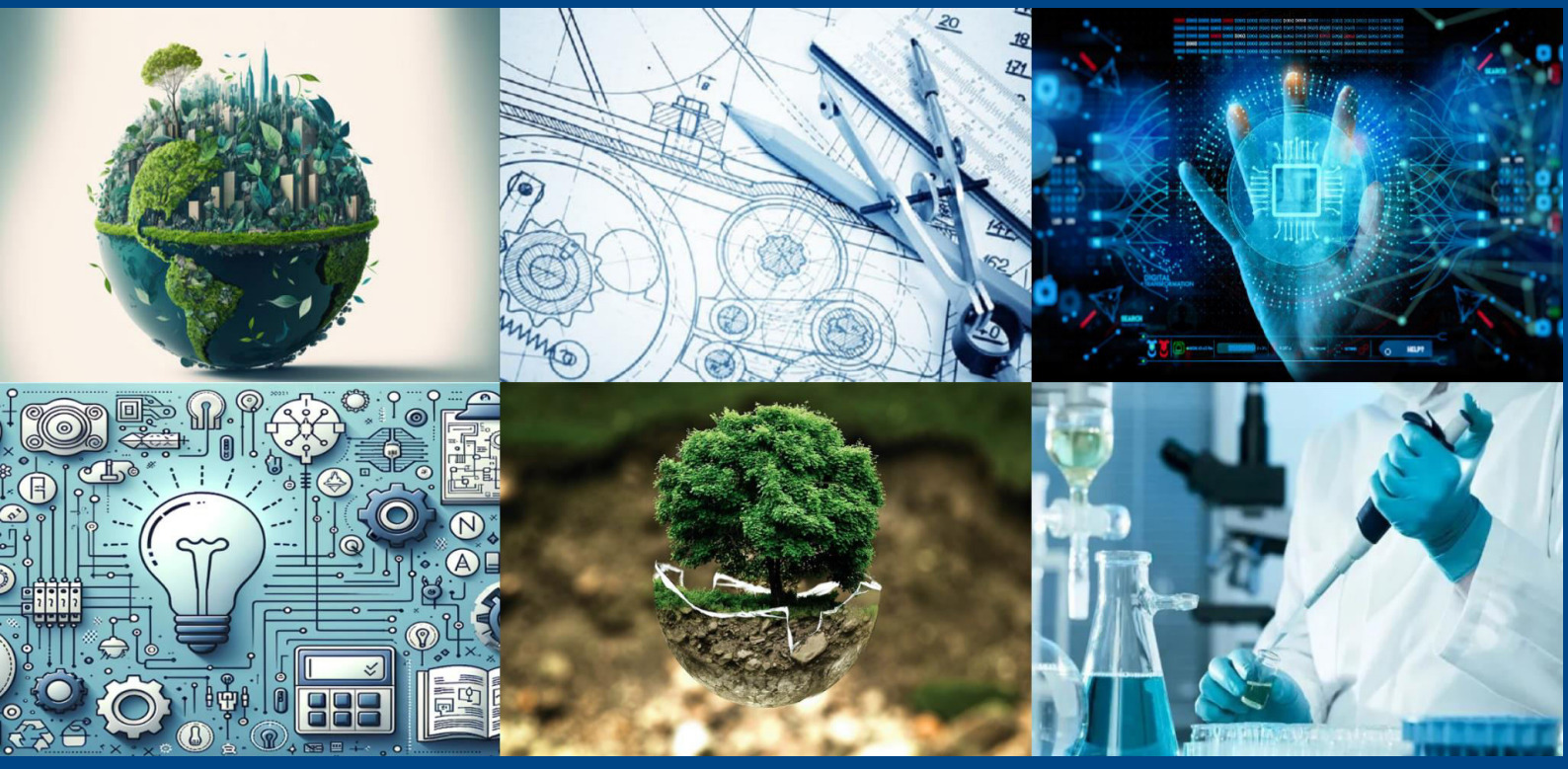

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Hall Ticket Scanner

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ABSTRACT-This project presents the development of a Hall Ticket Scanner application using Java and XML within the Android framework. The primary goal of this system is to streamline and digitize the verification process of hall tickets during academic examinations by utilizing QR code scanning technology. The application enables examiners to scan QR codes printed on hall tickets, which contain encoded student information such as name, roll number, subject, and exam session details. Upon scanning, the application decodes the QR content and displays the extracted data on the screen, allowing quick and accurate identification. This approach significantly reduces manual entry errors and verification time. In traditional exam settings, manual verification of student hall tickets can be time-consuming and prone to errors. This application addresses these issues by allowing invigilators to scan a QR code printed on the hall ticket, which contains encoded student details such as name, roll number, course, and exam date. Upon scanning, the app decodes the QR code and displays the student information instantly on the screen, allowing for faster and more accurate verification.

I. INTRODUCTION

In today's digital era, educational institutions are steadily moving towards automation and paperless systems. Traditional hall ticket verification processes during examinations often involve manual checking, which is time-consuming, error-prone, and inefficient—especially when dealing with large volumes of students. To overcome these challenges, the use of mobile technology and QR code systems provides a fast and reliable solution.

The Hall Ticket Scanner is an Android-based mobile application developed using Java and XML, designed to scan hall tickets encoded with QR codes. Upon scanning, the app instantly displays essential student information such as name, roll number, course details, date, and subject. This automation not only saves time but also eliminates manual entry errors and improves the overall examination process.

The application uses the ZXing (Zebra Crossing) library for QR code scanning and SQLite for local data storage. It features a simple and user-friendly interface, making it accessible to both students and examination staff. The system is capable of storing scan history for further validation or reporting purposes.

This project demonstrates how mobile applications can be effectively utilized to streamline academic procedures and enhance administrative efficiency. The implementation of this application bridges the gap between traditional hall ticket handling and smart exam systems.

II. LITERATURE REVIEW

The concept of automated hall ticket verification systems is gaining popularity in academic institutions due to the increasing need for security, efficiency, and accuracy during examination processes. Traditional manual verification methods are often time-consuming, prone to human error, and inefficient, especially in large-scale academic environments.

Automation in educational institutions has been widely adopted for tasks such as attendance management, grading, and identity verification. Several studies highlight the benefits of digital transformation in education, which include improved operational efficiency, better data management, and enhanced security. Automating hall ticket scanning ensures real-time verification, reducing administrative workload and minimizing fraudulent entries.

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Java remains a robust and platform-independent programming language widely used for building desktop-based applications. Its object-oriented nature, along with rich libraries and tools such as JavaFX or Swing, makes it suitable for developing interactive and secure user interfaces. In hall ticket scanning systems, Java plays a vital role in processing scanned data, validating credentials, and integrating with backend databases or XML files.

XML (extensible Markup Language) is commonly used for data representation and configuration. It is both human-readable and machine-processable, making it suitable for storing hall ticket data, including student names, roll numbers, examination dates, and subjects. XML ensures structured data management and simplifies parsing using Java-based XML parsers like DOM, SAX, or JAXB.

Several university-level systems have implemented digital hall ticket verification mechanisms. For example, some institutions use mobile apps or desktop scanners integrated with backend systems to scan hall tickets during exams. These systems demonstrate significant time-saving and reduced human error in exam entry processes.

III. METHODOLOGY

The development of the Hall Ticket Scanner system follows a structured approach using the Waterfall Model, which includes phases such as requirement analysis, system design, implementation, testing, and deployment. This model ensures a clear and systematic flow of activities from the beginning to the end of the project.

In the initial phase, detailed requirements were gathered by studying existing manual verification processes and identifying their limitations. The objective was to create a desktop-based application that automates the hall ticket verification process with enhanced accuracy and efficiency.

The system design involved creating use case diagrams, class diagrams, and interface designs. Java was chosen for application development due to its platform independence, strong GUI support, and seamless XML integration capabilities. The GUI was designed using Java Swing, providing a user-friendly interface for administrators and examiners.

For the scanning feature, QR codes were generated and embedded into each hall ticket, representing unique student data in encoded form. The ZXing (Zebra Crossing) library was integrated into the Java application to decode these QR codes using a webcam or barcode scanner. Once decoded, the system verifies the information by matching it with the XML data.

The application includes built-in error handling for mismatches, missing entries, and invalid QR codes. It also logs each successful verification for auditing and tracking purposes. Role-based access is implemented to restrict administrative functions and ensure data security.

The final application was tested using multiple sample hall tickets and scenarios to ensure accuracy, speed, and robustness. Test cases included successful scans, invalid QR codes, XML mismatches, and performance under high usage.

IV. IMPLEMENTATION

The Hall Ticket Scanner system was implemented as a desktop application using Java for backend processing and GUI, with XML as the primary data storage format. The implementation process involved integrating various components to ensure a smooth, accurate, and secure hall ticket verification mechanism.

The graphical user interface (GUI) was developed using Java Swing, providing an interactive and user-friendly environment for users such as invigilators or administrative staff. The main interface allows users to scan a hall ticket using a webcam or an external barcode/QR code scanner.

Each hall ticket contains a QR code that encodes student-specific information such as roll number, name, course, exam center, date, and subject details. These QR codes were generated using the ZXing (Zebra Crossing) library, an open-source tool that supports QR code encoding and decoding within Java applications.

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Upon scanning a QR code, the application decodes the data and retrieves the student's record from an XML file that serves as the system's local database. XML was chosen due to its simplicity, readability, and compatibility with Java. Each student's record is stored in a structured format within the XML file, and Java's DOM parser is used to read and navigate the data.

The verification logic compares the decoded QR data with the data retrieved from the XML file. If the information matches, the system displays a successful verification message along with the student's details. If there is any mismatch or missing data, an error alert is shown, and the incident is logged for further inspection.

V. WORKING PRINCIPLE

The Hall Ticket Scanner system operates based on the principle of data extraction, decoding, and verification using Java and XML technologies. It automates the process of hall ticket validation by scanning QR codes and comparing the extracted data with pre-stored student records in an XML file.

Each student's hall ticket contains a QR code that encodes important examination details such as roll number, name, course, exam center, subject list, and date of the examination. When the hall ticket is presented at the examination venue, the QR code is scanned using a webcam or external QR scanner integrated with the Java application.

If the data from the QR code matches a valid entry in the XML database, the student is considered verified, and their information is displayed on the screen. The system confirms successful verification with a message and logs the event. In case of discrepancies such as a mismatched roll number, missing entry, or invalid QR code, the system triggers an alert and records the failed attempt in a log file for future reference.

This principle ensures a fast, accurate, and secure method of hall ticket verification, significantly reducing manual errors and streamlining the entry process during examinations.

VI. SYSTEM REQUIREMENTS

To develop and run the Hall Ticket Scanner app efficiently, certain hardware and software requirements must be fulfilled. These requirements ensure the smooth functioning of the application during development and after deployment

Hardware Requirements
To ensure the smooth functioning of the Hall Ticket Scanner application, certain minimum hardware requirements must be met both for development and end-user usage. Since the application is designed to run on Android smartphones, the hardware specifications are relatively modest and accessible for most users and institutions
Software Requirements
To successfully develop, test, and deploy the Hall Ticket Scanner using Java and XML, a specific set of software tools and platforms is required. These requirements include both development environment tools and runtime software dependencies necessary for the application to function smoothly on Android devices.

VIII. RESULTS AND DISCUSSION

The Hall Ticket Scanner system was successfully developed and tested to demonstrate the automation of hall ticket verification using Java and XML technologies. The application effectively scanned QR codes, extracted encoded data, and validated it against records stored in an XML file.

During the testing phase, multiple hall tickets with QR codes were created and scanned under different conditions. The system accurately decoded the QR data and matched it with the corresponding student records. Successful matches displayed a confirmation message with the student's details, while invalid or unregistered tickets were flagged immediately with appropriate error messages.

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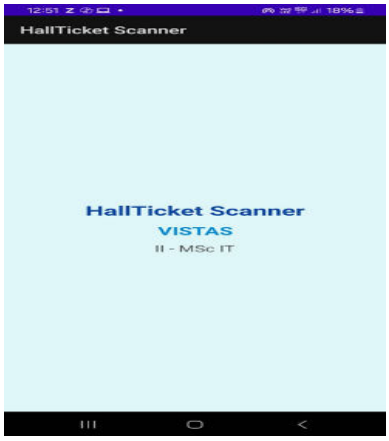

Figure 1. project picture

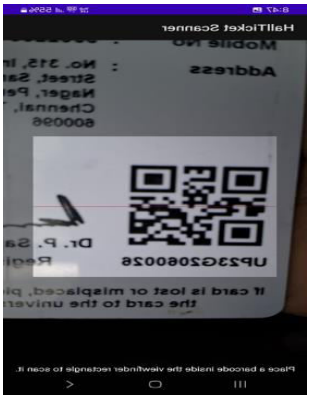

Figure 2. scan the QRcode

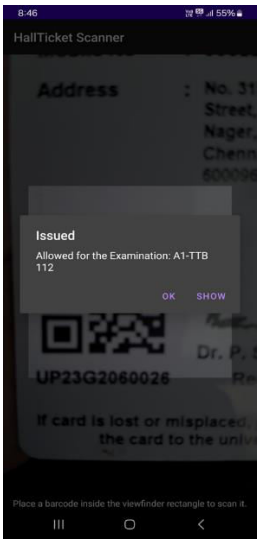

Figure 3. Verified the QR code

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Figure 3. show the verified hall ticket

The Hall Ticket Scanner system was implemented with the objective of streamlining and automating the verification of student hall tickets during examination sessions. Built using Java for backend processing and XML for structured data storage, the application successfully delivered a fast, accurate, and user-friendly solution to replace traditional manual checking methods. The core of the system lies in its use of QR codes, which are generated for each hall ticket and encode critical student information such as roll number, name, course, subject, and exam center. Upon scanning, the encoded data is decoded using the ZXing library and compared against XML-stored records to validate the student's eligibility for the examination.

The system was further evaluated for robustness by testing it with larger XML datasets containing hundreds of student entries. Even under load, the application maintained stable performance, highlighting Java's efficiency in handling XML parsing and memory management. Java's built-in DOM parser allowed smooth navigation through the XML tree structure, ensuring quick access to the required elements for data comparison. The user interface, developed using Java Swing, was intuitive and required minimal training for staff members to operate. The interface displayed student details on successful scans and clearly flagged any mismatches or invalid scans, making the process both transparent and reliable.

Overall, the project achieved its intended goals by replacing manual hall ticket verification with a fast, reliable, and scalable digital solution. The use of Java and XML proved to be a practical choice, offering cross-platform compatibility, simplicity, and strong data handling capabilities. This system is well-suited for academic institutions of various sizes and could easily be extended to support biometric verification, mobile-based scanning, or web integration in the future. The results obtained through testing clearly indicate that the system not only improves the efficiency of examination processes but also enhances the security and accuracy of student verification, making it a valuable addition to institutional digital infrastructure.

VIII. CONCLUSION

The Hall Ticket Scanner project successfully addresses the need for a fast, reliable, and efficient method to scan, validate, and store hall ticket information using QR codes. By utilizing Android's platform capabilities and integrating the ZXing library for QR scanning, the system simplifies the process of retrieving student details during examinations or academic events.

The project demonstrates how modern mobile technology can be applied in academic environments to solve real-world problems. Through thorough system analysis, design, implementation, and testing, the project was completed effectively, meeting both functional and non-functional requirements.

In conclusion, the Hall Ticket Scanner stands as a practical and efficient tool that can be readily adopted by educational institutions to enhance examination workflows and ensure more organized and secure student validation processes.

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