

A  
PROJECT REPORT

# **Secure Rapid Paper Delivery**

Submitted in partial fulfilment of requirements for the award of degree of

Bachelor of Technology

In

Computer Engineering

By

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**CERTIFICATE**

This is to certify that the seminar report entitled  
“**Secure Rapid Paper Delivery**”  
is a bonafide project work and has been carried out by:

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## **ABSTRACT**

The thesis presents a comprehensive study on the design, development, and deployment of a web application named Rapid Secure Paper Delivery (RSPD) using the MERN Stack (MongoDB, Express.js, React.js, and Node.js) on a cloud platform. The RSPD web application aims to streamline the process of creating and delivering exam papers within an educational institute. The system consists of three consoles: the Paper Setter Console, the Moderator Console, and the Admin Console. Each console has specific roles and responsibilities to facilitate efficient paper management and moderation.

**Keywords:** *SRPD, Web application, MERN, React.js, Node.js, Mongo db.*

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## Table of content

ABSTRACT.....	iv
ACKNOWLEDGEMENT .....	v
Table of content .....	vi
List of Figures .....	1
CHAPTER 1:INTRODUCTION .....	2
1.1 Introduction – Secure Rapid Paper Delivery (SRPD).....	2
1.2 Motivation.....	3
1.3 Scope.....	4
1.4 Objective .....	5
1.5 Software/ Hardware Requirement.....	6
1.5.1 System Analysis.....	6
a)Hardware Requirements.....	6
b)Software Requirements.....	6
Chapter 2 :Literature Review .....	7
2.1 Overview .....	7
2.2 Benefits of SRPD .....	8
Chapter 3 :Web Application .....	10
3.1 Web Application .....	10
3.2 Web Application vs Desktop Application.....	11
a) Web Application: .....	11
b) Desktop Application: .....	12
3.3 Why use Web Application? .....	12
3.4 Examples of Industries that rely on Web Application .....	14
Chapter 4 :Technology Used.....	16
4.1 For this project following source tools were chosen to perform various tasks:.....	16
1) HTML.....	16
2) CSS3 .....	16
3) JavaScript.....	16
4.2 Technology Used – MERN.....	17
4.2.1 Overview of each component in the MERN stack:.....	17
a)TypeScript:.....	17
b) MongoDB .....	18
c) Express.js .....	18
d)React.js .....	18
e)Node.js .....	18
f) Visual Studio Code.....	19
Chapter 5 :Implimentation Detail .....	20
5.1 Technology Stack Selection.....	20

5.1.1 Here's a brief overview of the MERN stack components: .....	20
5.2 Server-side Development with Node.js and Express.js .....	21
5.3 Client-side Development with .....	22
5.4 Database Integration with MongoDB .....	24
5.5 NodeMailer .....	25
5.6 Code Samples .....	27
5.6.1 Application .....	27
5.6.2 Login .....	28
5.6.3 Mail .....	29
5.6.4 Database .....	30
Chapter 6 : USER ROLE .....	31
6.1 Paper Setter .....	31
6.2 Moderator .....	32
6.3 Examiner .....	33
Chapter 7 : System Design .....	37
7.1 overview .....	37
7.3 Flowchart of application .....	39
7.4 ER Diagram .....	39
Data Flow Diagram .....	40
Chapter 8 : RESULT AND ACHIEVEMENTS .....	41
8.1 User Interface .....	41
8.1.1 Home page .....	41
8.2 login pages .....	41
8.3 Admin .....	43
Moderator .....	46
Setter .....	50
Examiner .....	51
Chapter 9 : SUMMARY AND DIRECTION .....	54
SRPD .....	54
Chapter 10 : CONCLUSION .....	55
Conclusion .....	55
Chapter 11 Future Work .....	56
Chapter 12 REFERENCES .....	57

**LIST OF FIGURES**

8-1 Home page-----	41
8-2 Moderator login page -----	41
8-3 Examiner login page -----	42
8-4 Setter login -----	42
8-5 setter application form -----	43
8-6 Admin dashboard -----	44
8-7 Examiner List and Application form -----	44
8-8 moderator list and application form-----	45
8-9 subjects-----	45
8-10 setter applicant list -----	46
8-11 selected setters-----	47
8-12 upload material -----	47
8-13 select type of the material-----	48
8-14 Accept paper -----	48
8-15 review the paper-----	49
8-16 schedule the paper -----	49
8-17 setter dashboard -----	50
8-18 Upload paper-----	50
8-19 notifications-----	51
8-20 uploaded content -----	51
8-21 Examiner Dashboard -----	52
8-22 Notifications -----	52
8-23 Download paper -----	53



## **CHAPTER 1:INTRODUCTION**

### **1.1 INTRODUCTION – SECURE RAPID PAPER DELIVERY (SRPD)**

In the realm of educational institutions, the creation and secure delivery of exam papers play a pivotal role in evaluating students' knowledge and understanding. However, the traditional paper-based processes often pose challenges in terms of efficiency, security, and adherence to schedules. To address these concerns, the Secure Rapid Paper Delivery (SRPD) system has emerged as a groundbreaking solution, revolutionizing the way exam papers are created and securely delivered to institutes.

The SRPD system is a comprehensive platform designed to streamline and enhance the exam paper creation and delivery process. It is built on the foundation of security, rapidity, and meticulous operations, ensuring that institutes can focus on providing quality education while leaving the complexities of paper management to the system.

At the core of the SRPD system are three essential roles that collectively contribute to the efficient functioning of the platform. Firstly, the Paper Setter takes on the responsibility of crafting question papers for specific subjects. Their expertise and in-depth knowledge enable them to design comprehensive and well-structured exams that accurately assess students' comprehension and mastery of the subject matter.

Working alongside the Paper Setter, the Moderator assumes the crucial role of reviewing and moderating the question papers. Their expertise ensures that the papers align with the curriculum, maintain an appropriate difficulty level, and adhere to the institution's guidelines. The Moderator provides valuable feedback and suggestions to the Paper Setter, fostering a continuous improvement process and ensuring the overall quality of the exam papers.

Supporting the entire SRPD system is the Admin, who oversees the overall operations of the platform. The Admin manages user accounts, tracks the progress of paper setting and moderation, and ensures the seamless functioning of the system. With their expertise in system management and operations, the Admin plays a vital role in maintaining the integrity and security of the SRPD system.

The Secure Rapid Paper Delivery (SRPD) system represents a transformative solution for institutes seeking to optimize their exam paper creation and delivery processes. By leveraging the expertise of the Paper Setter, Moderator, and Admin,

educational institutions can streamline their operations, enhance security, and ensure timely and efficient delivery of exam papers. Embracing SRPD empowers institutes to prioritize education while entrusting the intricate aspects of exam paper management to a reliable and technologically advanced system.

## **1.2 MOTIVATION**

**Automation and Efficiency:** The manual process of paper generation and distribution in educational institutions is often time-consuming and prone to errors. By automating these processes, your system aims to improve efficiency by reducing the time and effort required to generate and distribute exam papers.

**Streamlined Workflow:** The proposed system provides a streamlined workflow for the various stakeholders involved in the paper generation and distribution process. It enables effective communication and collaboration between super admins, moderators, paper setters, and examiners, ensuring a seamless and organized flow of information.

**Enhanced Transparency and Accountability:** The system introduces transparency and accountability into the paper generation and distribution process. With clear roles and responsibilities assigned to each stakeholder, it becomes easier to track and monitor the progress of each paper, ensuring fairness and accountability in the overall evaluation process.

**Quality Assurance:** By allowing moderators to select experienced and qualified paper setters, the system promotes quality assurance in exam paper generation. The ability to specify syllabus, paper patterns, and additional material helps maintain consistency and alignment with curriculum requirements.

**Reduction of Bias:** The system helps mitigate potential biases in the paper generation and distribution process. By implementing a standardized system, it reduces the chances of favoritism or subjective influences, ensuring fairness and equal opportunities for all students.

**Scalability and Flexibility:** The proposed system is designed to be scalable and flexible, accommodating the varying needs of different educational institutions and departments. It can easily adapt to changes in syllabi, paper patterns, or staff roles, providing a long-term solution that can evolve with the institution's requirements.

### 1.3 SCOPE

**User Management:** The system will include functionality for managing different user roles such as super admin, moderators, paper setters, and examiners. It will allow for user registration, authentication, and authorization to ensure secure access to the system's features based on role-based permissions.

**Paper Generation:** The system will facilitate the generation of exam papers by paper setters. It will provide a user-friendly interface for paper setters to input relevant information such as syllabus, paper patterns, and additional material, and generate customized exam papers based on these specifications.

**Paper Moderation:** Moderators will have the ability to review and approve the exam papers generated by paper setters. They will be responsible for ensuring the quality, adherence to syllabus, and appropriateness of the papers before forwarding them to the examiners.

**Paper Distribution:** Once approved by the moderators, the system will enable the distribution of exam papers to the designated examiners. It will provide a secure and efficient mechanism to send the papers electronically, ensuring confidentiality and preventing unauthorized access.

**Examiners' Evaluation:** The system will support the evaluation process by allowing examiners to assess the received exam papers and provide their feedback, scores, or comments. It will provide a user-friendly interface for examiners to review and grade the papers based on predefined evaluation criteria.

**System Administration:** The super admin will have administrative control over the system. They will be responsible for managing user accounts, roles, and permissions. The super admin will also have the authority to oversee the entire system, monitor activity logs, and perform system maintenance tasks.

## 1.4 OBJECTIVE

**Develop an Automated Paper Generation System:** The primary objective of the project is to develop a robust and user-friendly system that automates the process of paper generation, moderation, and distribution in educational institutions. The system will replace the manual and time-consuming tasks with efficient and automated procedures.

**Enhance Efficiency and Productivity:** The project aims to improve the overall efficiency and productivity of the paper generation and distribution process. By eliminating manual tasks and introducing automation, the system will significantly reduce the time and effort required for generating, moderating, and distributing exam papers.

**Ensure Transparency and Accountability:** An important objective is to enhance transparency and accountability in the paper generation and distribution process. By implementing a system with clear roles and responsibilities, it will be easier to track and monitor the progress of papers, ensuring transparency in the evaluation process and accountability of stakeholders involved.

**Facilitate Collaboration and Communication:** The project aims to provide a platform for effective collaboration and communication among different stakeholders, including super admins, moderators, paper setters, and examiners. The system will enable seamless sharing of information, feedback, and updates, promoting better coordination and understanding among all involved parties.

**Improve Paper Quality and Standardization:** The objective is to enhance the quality and standardization of exam papers. The system will allow moderators to select experienced paper setters based on their qualifications and expertise, ensuring that the generated papers align with the prescribed syllabus, paper patterns, and additional material.

**Ensure Fairness and Equal Opportunities:** The project aims to mitigate biases and ensure fairness in the paper generation and distribution process. By implementing a standardized system, it will minimize subjective influences and favoritism, providing equal opportunities for all students during the examination process.

## 1.5 SOFTWARE/ HARDWARE REQUIREMENT

### 1.5.1 System Analysis

System requirements are all of the requirements at the system level that describe the function which the system as a whole should fulfill to satisfy the stakeholder needs and requirements, and are expressed in an appropriate combination of textual statements. Views, and non-functional requirements; the latter expressing the levels of safety, security, reliability, etc. that will be necessary.

System requirements play major roles in systems engineering, as they:

1. Form the basis of system architecture and design activities.
2. Form the basis of system integration and verification activities. Act as reference for validation and stateholder acceptance.
3. Provide a means of communication between the various technical staff interact throughout the project.

#### a)Hardware Requirements

**Disk:** Capacity >500MB for smooth performance

**RAM:** 2GB (minimum), 4GB(recommended) and above.

**Processor:** Intel Core 2 Quad or Intel i3-5<sup>th</sup> Gen and above (recommended)

#### b)Software Requirements

**OS:**windows/linux

**Front End technology:** REACT, TAILWIND, JavaScript, Bootstrap4.

**Backend technology:** Node JS, MongoDB, Express JS

**Code editor:** Visual studio, Notepad

**Web Browser:** Google Chrome, Mozilla firefox, opera, Edge.

## **CHAPTER 2 :LITERATURE REVIEW**

### **2.1 OVERVIEW**

The concept of Secure Rapid Paper Delivery (SRPD) has gained significant attention in the literature as an innovative solution for improving the efficiency, security, and timeliness of exam paper creation and delivery processes. The Secure Rapid Paper Delivery (SRPD) system, consisting of a highly proficient team of Paper Setters, Moderators, and an efficient Admin, offers institutes an advanced and secure mechanism to create exam papers and ensure their prompt delivery, thus greatly enhancing the overall examination process. Within the SRPD system, the role of the efficient Admin is crucial as they oversee the entire operations of the system. Their responsibilities encompass managing user accounts, closely monitoring the progress of paper setting and moderation, and ensuring the seamless functioning of the platform. The Admin also plays a vital role in maintaining stringent security measures, facilitating effective communication between stakeholders, and guaranteeing the timely delivery of exam papers.

To uphold the highest standards of quality and fairness, Moderators hold significant importance within the SRPD system. They meticulously review and moderate the question papers created by the Paper Setters, ensuring that each paper meets the required standards and aligns with the prescribed guidelines. The Moderators' expertise and valuable feedback greatly contribute to enhancing the overall quality and reliability of the exam papers. In the SRPD system, experienced Paper Setters are actively engaged in the process of crafting subject-specific question papers. Leveraging their wealth of knowledge and expertise, they meticulously design exam papers that accurately assess students' understanding, align with the curriculum, and strictly adhere to the institutional guidelines. Their role is pivotal in ensuring the integrity and relevance of the exam papers produced.

By expanding the capabilities of the SRPD system through the effective collaboration of the Admin, Moderators, and Paper Setters, educational institutions can embrace a cutting-edge approach that significantly improves the efficiency, security, and effectiveness of the entire exam paper creation and delivery process.

## 2.2 BENEFITS OF SRPD

1. **Efficiency and Time Savings:** SRPD systems streamline the entire exam paper creation and delivery process, eliminating manual and time-consuming tasks. Automation and digitalization of processes such as paper setting, moderation, and delivery reduce administrative burdens, saving time and allowing institutions to allocate resources more effectively.
2. **Enhanced Security:** SRPD systems prioritize the security and confidentiality of exam papers. Robust security measures, including encryption, access controls, and real-time tracking, ensure that sensitive information is protected against unauthorized access, tampering, and leaks. This promotes the integrity of exams and ensures a fair evaluation process.
3. **Standardization and Quality Control:** SRPD systems introduce standardized procedures for exam paper creation and moderation. Collaboration between paper setters and moderators, along with iterative feedback loops, enhances the quality control process. This leads to well-structured and comprehensive exams that align closely with curriculum goals, ensuring accurate assessment and fair evaluation.
4. **Timely and Reliable Delivery:** SRPD systems leverage technology to provide real-time tracking and monitoring of paper delivery. This minimizes errors, delays, and disruptions, enabling institutions to adhere to scheduled examination dates. Timely and reliable delivery ensures that exams can be conducted smoothly and without interruptions.
5. **Cost-Effectiveness:** SRPD systems can offer cost savings in the long run. By reducing the need for physical paper, printing, and manual distribution, institutions can save on material and operational expenses. Additionally, the increased efficiency of processes reduces labor costs associated with manual administrative tasks.
6. **Improved User Experience:** SRPD systems enhance the user experience for all stakeholders involved. User-friendly interfaces, easy accessibility, and efficient workflows improve engagement and productivity. Paper setters, moderators, administrators, and students benefit from a streamlined and user-centric platform, resulting in a more positive experience throughout the exam paper creation and delivery process.

7. Environmental Sustainability: SRPD systems contribute to environmental sustainability by reducing paper usage. The shift towards digital processes decreases the ecological footprint associated with paper production and waste. This aligns with the global efforts towards sustainable practices and demonstrates institutional commitment to environmental responsibility.



## **CHAPTER 3 :WEB APPLICATION**

### **3.1 WEB APPLICATION**

A web application is a software application that is accessed and run through a web browser over the internet. It is designed to provide functionality, interactivity, and services to users, enabling them to perform tasks, access information, and engage with the application's features.

Unlike traditional desktop applications that are installed locally on a device, web applications are stored on remote servers and accessed through a web browser. This allows users to access the application from any device with an internet connection, making them highly accessible and platform-independent.

Web applications consist of two main components: the client-side and the server-side. The client-side, also known as the frontend, is responsible for the user interface (UI) and user experience (UX). It encompasses the visual elements, design, and interactivity of the application that users interact with directly through their web browsers. Technologies such as HTML (Hypertext Markup Language), CSS (Cascading Style Sheets), and JavaScript are commonly used for frontend development.

The server-side, also known as the backend, handles the processing, storage, and retrieval of data. It manages the business logic, performs calculations, communicates with databases, and handles user requests. Backend development often involves programming languages such as Python, Java, PHP, or Node.js, and frameworks like Django, Spring, Laravel, or Express.js.

Web applications can range from simple forms and informational websites to complex enterprise systems and online platforms. They can provide various functionalities such as user registration and authentication, data input and storage, content management, e-commerce capabilities, social networking features, and much more.

Key advantages of web applications include their cross-platform compatibility, easy accessibility from any device with an internet connection, centralized management and updates, and the ability to reach a broad audience globally. They are widely used in

industries such as e-commerce, finance, healthcare, education, entertainment, and many others.

To ensure security, web applications implement measures such as encryption, user authentication, data validation, and protection against common web vulnerabilities. Regular updates and monitoring are essential to address security risks and maintain the integrity of the application.

In summary, web applications provide users with a flexible and accessible way to interact with software services and perform tasks over the internet. They combine frontend and backend technologies to deliver a seamless user experience and a wide range of functionalities to meet the needs of businesses and users in today's digital world.

### **3.2 WEB APPLICATION VS DESKTOP APPLICATION**

#### **a) Web Application:**

- A web application is accessed and run through a web browser over the internet.
- It is stored on remote servers and accessed by users through URLs.
- Users can access the application from any device with an internet connection, making it highly accessible and platform-independent.
- Web applications do not require installation on individual devices.
- They are typically developed using web technologies such as HTML, CSS, and JavaScript for the frontend, and backend technologies like Python, Java, PHP, or Node.js.
- Updates and maintenance are centralized on the server-side, allowing for easy deployment and version control.
- Web applications are accessible from anywhere, but they require an internet connection for operation.
- They often rely on remote servers for data storage and processing.
- Examples of web applications include online banking systems, social media platforms, e-commerce websites, and collaborative tools.

**b) Desktop Application:**

- A desktop application is installed and run directly on a local device (computer or laptop).
- It is typically distributed as an executable file or installer package that users need to install on their devices.
- Users need to have the specific operating system (e.g., Windows, macOS, Linux) compatible with the desktop application.
- Desktop applications have direct access to the local system resources, such as files, hardware, and peripherals.
- They are often developed using programming languages and frameworks specific to the target operating system, such as C++, C#, or Java.
- Updates and maintenance require distributing new versions or patches to individual devices.
- Desktop applications can work offline without requiring an internet connection, although some applications may require periodic online updates or data synchronization.
- They can store data locally on the user's device or connect to remote servers for certain functionalities.
- Examples of desktop applications include video editing software, word processors, graphic design tools, and gaming applications.

**3.3 WHY USE WEB APPLICATION?**

There are several reasons why web applications are commonly used and preferred in many scenarios:

1. **Accessibility:** Web applications are accessible from any device with an internet connection and a web browser. Users can access the application on various platforms, including desktop computers, laptops, tablets, and smartphones. This accessibility makes web applications highly versatile and user-friendly, as they can be accessed on different devices without the need for specific installations.
2. **Cross-Platform Compatibility:** Web applications are built using standard web technologies such as HTML, CSS, and JavaScript. These technologies are supported by all major web browsers, making web applications compatible across different operating systems (Windows, macOS, Linux) and platforms.

This cross-platform compatibility eliminates the need for separate development and maintenance efforts for each operating system.

3. **Centralized Management and Updates:** Web applications are hosted on remote servers, allowing for centralized management and updates. Updates and new features can be deployed on the server-side, and users can instantly access the latest version of the application without needing to install any updates on their devices. This centralized approach simplifies maintenance, ensures consistent user experiences, and enables efficient version control.
4. **Easy Deployment and Scalability:** Web applications are deployed on web servers, making deployment relatively straightforward. Once the application is deployed on a server, users can access it immediately without any additional installations. Additionally, web applications can scale easily to accommodate increasing user demands by adding more server resources or utilizing cloud-based infrastructure.
5. **Cost-Effectiveness:** Developing and maintaining web applications can be more cost-effective compared to desktop applications. With web applications, there is no need to develop and test separate versions for different operating systems, reducing development and maintenance costs. Updates and bug fixes can be applied centrally, without the need to distribute and install updates on individual user devices.
6. **Collaboration and Real-Time Updates:** Web applications enable real-time collaboration and data sharing among multiple users. Multiple users can access and edit the same data simultaneously, facilitating teamwork and enhancing productivity. Web applications can also provide real-time updates, notifications, and instant messaging features to enhance communication and collaboration.
7. **Instant Access to New Features:** With web applications, new features and updates can be rolled out to users immediately. Users can benefit from new functionalities without the need for manual installations or upgrades. This ensures a seamless and consistent user experience, and users can take advantage of new features as soon as they are available.
8. **Integration and APIs:** Web applications can easily integrate with other web services and APIs, allowing for seamless data exchange and integration with third-party systems. This enables web applications to leverage the power of existing services and integrate with external platforms, expanding their

functionality and providing additional value to users.

### **3.4 EXAMPLES OF INDUSTRIES THAT RELY ON WEB APPLICATION**

Web applications are utilized in various industries to meet specific needs and enhance business processes. Here are some examples of industries that heavily rely on web applications:

1. **E-commerce:** Online retail businesses rely on web applications to provide a platform for customers to browse products, place orders, make payments, and track shipments. Web applications enable seamless online shopping experiences, inventory management, customer relationship management, and secure payment processing.
2. **Banking and Finance:** Web applications play a crucial role in the banking and financial sector. They facilitate online banking, allowing customers to perform transactions, manage accounts, access statements, and apply for financial services. Web applications also provide secure portals for trading stocks, managing investments, and conducting financial analysis.
3. **Healthcare:** Web applications are used in the healthcare industry for electronic medical records (EMR), appointment scheduling, telemedicine consultations, patient portals, and health information exchange. Web applications improve the efficiency of healthcare workflows, enable remote access to medical data, and enhance patient engagement and communication.
4. **Education and E-learning:** Web applications are used in the education sector for online learning platforms, course management systems, virtual classrooms, and educational content delivery. They enable remote learning, student assessment, collaboration among teachers and students, and personalized learning experiences.
5. **Human Resources and Recruitment:** Web applications are utilized in HR departments and recruitment agencies for applicant tracking systems (ATS), employee onboarding, performance management, payroll processing, and talent management. Web applications streamline HR processes, automate workflows, and improve communication between HR professionals and employees.
6. **Travel and Hospitality:** Web applications are employed in the travel and

hospitality industry for online travel booking, hotel reservations, flight tracking, and itinerary management. Web applications provide real-time information, personalized recommendations, and seamless booking experiences for travelers.

7. Social Networking: Web applications power popular social networking platforms that connect users, facilitate communication, and enable content sharing. These platforms offer features such as user profiles, news feeds, messaging, photo and video sharing, and event organization.
8. Supply Chain and Logistics: Web applications support supply chain management, inventory tracking, order management, and logistics coordination. They enable businesses to monitor and optimize their supply chain operations, track shipments, manage warehouses, and facilitate seamless collaboration with suppliers and distributors.
9. Government Services: Web applications are utilized by government agencies to provide online services to citizens, such as tax filing, license renewal, permit applications, and online forms. Web applications enhance government efficiency, reduce paperwork, and improve accessibility to government services.

## **CHAPTER 4 :TECHNOLOGY USED**

### **4.1 FOR THIS PROJECT FOLLOWING SOURCE TOOLS WERE CHOSEN TO PERFORM VARIOUS TASKS:**

#### **1) HTML**

HTML (Hypertext Markup Language) is the standard markup language used for creating web pages. It provides the structure and formatting for content displayed on the internet. HTML uses a system of tags to define elements such as headings, paragraphs, links, images, and more. These tags are enclosed in angle brackets (< >) and provide instructions to web browsers on how to render the content. With HTML, you can create the basic structure of a web page, format text, insert images, create links to other pages, and define lists and tables. It serves as the foundation for building web pages and is essential for creating and presenting content on the World Wide Web.

#### **2) CSS3**

CSS3 (Cascading Style Sheets 3) is the latest version of the CSS language used for styling and visually enhancing web pages. It works alongside HTML to control the layout, design, and presentation of web content. With CSS3, you can define colors, fonts, spacing, borders, backgrounds, and other visual aspects of elements on a web page. CSS3 is widely supported by modern web browsers, making it a valuable tool for designing visually appealing and responsive web pages. It enhances the overall user experience by allowing developers to style and present content in a more engaging and customizable way.

#### **3) JavaScript**

JavaScript is a high-level, interpreted programming language that enables dynamic and interactive functionality on web pages. It is primarily used for front-end web development but can also be used on the server-side (Node.js) and for developing desktop and mobile applications. JavaScript allows developers to add interactivity, validate user input, manipulate web page elements, and respond to events such as button clicks, form submissions, and mouse movements. It provides the ability to dynamically modify the content and behavior of web pages without requiring a page reload.

## 4.2 TECHNOLOGY USED – MERN

The MERN stack is a popular web development technology stack used for building full-stack web applications. It consists of four main components: MongoDB, Express.js, React.js, and Node.js. Each component serves a specific purpose and works together to enable efficient and scalable web application development.

### 4.2.1 OVERVIEW OF EACH COMPONENT IN THE MERN STACK:

#### a) TypeScript:

**Strong Typing:** TypeScript introduces static typing to JavaScript, allowing you to declare and enforce variable types. This helps catch errors during development and provides better code documentation and readability. TypeScript's type system includes primitives, complex types, and support for custom types.

**Enhanced Tooling and IDE Support:** TypeScript offers excellent tooling and IDE support, making development more efficient and productive. With TypeScript, you can benefit from features like code autocompletion, type inference, static analysis, and refactoring support, enabling faster development and fewer errors.

**Improved Code Maintainability:** By adding static types, TypeScript enhances code maintainability. Types act as documentation, making it easier for developers to understand the expected input and output of functions and methods. This reduces the chances of introducing bugs during maintenance and collaboration.

**Advanced Language Features:** TypeScript provides additional language features that are not available in standard JavaScript. This includes features like interfaces, enums, generics, classes, decorators, and modules, enabling developers to write more structured, modular, and scalable code.

**Compatibility with JavaScript:** TypeScript is a superset of JavaScript, meaning that any valid JavaScript code is also valid TypeScript code. This allows you to gradually introduce TypeScript into existing JavaScript projects and leverage existing JavaScript libraries and frameworks.

**Enhanced Error Checking:** TypeScript performs static type checking, catching potential errors before runtime. This helps identify issues such as type mismatches, undefined variables, and incorrect function signatures during the development phase, leading to more robust and reliable code.

**Increased Productivity:** With TypeScript, you can catch errors early, benefit from better tooling, and write more maintainable code. This leads to increased developer



productivity, as it reduces the time spent on debugging and improves the overall development experience.

**Ecosystem and Community Support:** TypeScript has a large and active community, providing extensive documentation, libraries, and frameworks. It integrates well with popular JavaScript frameworks like React, Angular, and Node.js, enabling you to leverage the existing ecosystem and take advantage of community-driven resources.

#### **b) MongoDB**

MongoDB is a NoSQL document database that stores data in a flexible, JSON-like format called BSON (Binary JSON). It provides scalability, high performance, and a flexible data model, making it suitable for handling large volumes of structured and unstructured data. MongoDB allows developers to store and retrieve data for their applications efficiently.

#### **c) Express.js**

Express.js is a lightweight web application framework for Node.js. It simplifies the process of building web applications and APIs by providing a robust set of features and tools. Express.js handles routing, middleware, and HTTP request/response handling, making it easier to define routes, handle requests, and manage application flow.

#### **d) React.js**

React.js is a JavaScript library for building user interfaces. It allows developers to create reusable UI components that efficiently update and render when data changes. React.js follows a component-based architecture, enabling the development of complex user interfaces with a modular and maintainable approach. It also offers virtual DOM (Document Object Model) manipulation, enhancing performance and responsiveness.

#### **e) Node.js**

Node.js is a server-side JavaScript runtime environment. It allows developers to execute JavaScript code on the server, enabling server-side application development. Node.js provides an event-driven, non-blocking I/O model that allows for scalable and efficient network applications. It is widely used for building fast and scalable web servers, APIs, and real-time applications.

**f) Visual Studio Code**

Visual Studio Code (VS Code) is a popular source code editor developed by Microsoft. It is free, open-source, and available for Windows, macOS, and Linux. VS Code is designed to provide a lightweight yet powerful editing experience for various programming languages and frameworks. VS Code is compatible with Windows, macOS, and Linux operating systems, allowing developers to use the same editor across different platforms. VS Code offers a high level of customization. Users can install and configure various extensions, themes, and settings to tailor the editor to their specific needs and preferences. Visual Studio Code has gained popularity among developers due to its intuitive interface, extensive feature set, and vibrant community support. Its lightweight nature, coupled with its ability to handle large codebases efficiently, makes it a go-to choice for many developers and teams working on diverse projects.

Implementing an SRPD system provides educational institutions with numerous benefits, including increased efficiency, enhanced security, standardized quality control, timely delivery, cost-effectiveness, improved user experience, and environmental sustainability. These advantages enable institutions to optimize their exam paper creation and delivery processes, ensuring a secure, swift, and reliable assessment experience for all stakeholders involved

## CHAPTER 5 :IMPLIMENTATION DETAIL

### 5.1 TECHNOLOGY STACK SELECTION

The MERN stack is a technology stack commonly used for building full-stack web applications. It comprises four key components: MongoDB, Express.js, React.js, and Node.js. Each component serves a specific purpose and works together to enable efficient and scalable web application development.

#### 5.1.1 Here's a brief overview of the MERN stack components:

**MongoDB:** MongoDB is a NoSQL document database that provides scalability, flexibility, and performance. It stores data in a JSON-like format called BSON and allows developers to work with structured and unstructured data.

**Express.js:** Express.js is a minimalistic web application framework for Node.js. It simplifies the development of server-side applications by providing a robust set of features and tools for routing, middleware, and handling HTTP requests and responses.

**React.js:** React.js is a popular JavaScript library for building user interfaces. It follows a component-based architecture, allowing developers to create reusable UI components. React.js efficiently updates and renders components when data changes, enabling interactive and responsive user interfaces.

**Node.js:** Node.js is a JavaScript runtime environment that allows developers to run JavaScript on the server-side. It offers a non-blocking, event-driven I/O model, making it efficient for handling concurrent requests and building scalable server applications.

The MERN stack leverages JavaScript throughout the entire development process, enabling a unified programming language from front-end to back-end. This simplifies development and allows for seamless communication between different components of the application.

The MERN stack is known for its flexibility, scalability, and versatility, making it well-suited for developing modern web applications. It has a large and active community, extensive documentation, and a wide range of third-party libraries and tools that enhance development productivity.

By combining MongoDB for data storage, Express.js for server-side logic, React.js for dynamic user interfaces, and Node.js for server-side operations, developers can build end-to-end web applications efficiently and create interactive, real-time, and feature-rich experiences for users.

## **5.2 SERVER-SIDE DEVELOPMENT WITH NODE.JS AND EXPRESS.JS**

Server-side development with Node.js and Express.js allows developers to build robust and scalable web applications that handle server-side operations efficiently. Here's some information about Node.js and Express.js in the context of server-side development:

1.     Node.js: Node.js is a JavaScript runtime built on the V8 engine. It allows developers to execute JavaScript code on the server-side, enabling server-side application development. Key features of Node.js include:

Asynchronous and Non-blocking I/O: Node.js utilizes an event-driven, non-blocking I/O model, making it highly efficient for handling concurrent requests. This allows for better scalability and performance in server applications.

- Extensive Package Ecosystem: Node.js has a vast ecosystem of packages and modules available through the npm (Node Package Manager) registry. Developers can leverage these packages to add additional functionality and features to their server-side applications.
- Cross-platform Compatibility: Node.js is cross-platform and can be run on various operating systems, including Windows, macOS, and Linux. This allows for flexibility in deploying and hosting Node.js applications.

2.     Express.js: Express.js is a minimalistic and flexible web application framework for Node.js. It simplifies the process of building server-side applications by providing a robust set of features and tools. Key features of Express.js include:

- Routing: Express.js provides a simple and intuitive routing system, allowing developers to define routes for handling HTTP requests. It enables easy mapping of URLs to specific functions or handlers, making it convenient to handle various endpoints of an application.
- Middleware: Express.js uses middleware functions that can be inserted into the

request-response cycle. Middleware functions handle tasks such as parsing request bodies, authenticating requests, logging, and more. It allows for modular and reusable code and enables developers to add custom functionality to the application flow.

- **Template Engine Support:** Express.js has support for various template engines like Pug, EJS, and Handlebars. These template engines enable dynamic rendering of server-generated HTML content, allowing for flexible and dynamic web page generation.
- **Error Handling:** Express.js provides built-in error handling capabilities, allowing developers to define error-handling middleware. This ensures that errors occurring during request processing are captured and handled gracefully, improving the stability and user experience of the application.
- **Integration with Middleware and Libraries:** Express.js seamlessly integrates with a wide range of middleware and third-party libraries, extending its capabilities. Developers can leverage these libraries for features such as authentication, database integration, session management, and more.

Node.js and Express.js together provide a powerful foundation for server-side development. They offer a lightweight and efficient environment for building scalable and high-performance server applications. The combination allows developers to handle complex server-side logic, manage data, communicate with databases, and provide APIs for client-side applications.

### **5.3 CLIENT-SIDE DEVELOPMENT WITH**

Client-side development with React.js using TypeScript enables developers to leverage the benefits of both technologies in building robust and type-safe web applications. TypeScript is a statically typed superset of JavaScript that brings additional advantages to React.js development. Here's an updated version of the implementation details, incorporating TypeScript:

**Component-Based Architecture:** React.js, along with TypeScript, allows developers to create reusable and type-safe components. TypeScript provides static typing, enabling better type checking and validation of component props, state, and function signatures. This ensures that components are used correctly and helps catch potential errors early in the development process.

**Virtual DOM and Efficient Rendering:** React.js, combined with TypeScript, continues to utilize the virtual DOM and optimized rendering approach. TypeScript aids in maintaining type safety during state updates and ensures that the components interact correctly with the virtual DOM, resulting in efficient rendering and performance improvements.

**JSX Syntax and Type Safety:** TypeScript's type annotations and support for JSX syntax enable developers to write strongly typed React components. TypeScript performs type checking on JSX elements, props, and event handlers, ensuring that the correct types are passed and preventing potential errors at compile-time.

**State Management with Typing:** TypeScript provides enhanced support for state management in React applications. It enables developers to define and manage component state with precise typing, ensuring that the state properties are accessed and updated correctly. This helps prevent accidental state mutations and improves overall code quality.

**React Router and Typed Routing:** When using React Router in combination with TypeScript, developers can benefit from type-safe routing. TypeScript allows for precise definition and typing of route parameters, query parameters, and route configurations, ensuring that routing-related code is more reliable and less error-prone.

**Type-Safe Libraries and Ecosystem:** TypeScript seamlessly integrates with the vast React.js ecosystem, including third-party libraries and UI frameworks. TypeScript provides type declarations for popular React.js libraries, enabling developers to utilize type-safe components and APIs from these libraries, enhancing code quality and productivity.

**Robust State Management Libraries:** TypeScript enhances the development experience when using state management libraries like Redux or MobX. TypeScript's static typing helps enforce type safety in actions, reducers, and selectors, reducing the likelihood of runtime errors and providing better tooling and IDE support.

**TypeScript Community and Resources:** The TypeScript community offers extensive resources, documentation, and best practices specifically tailored for React.js development. TypeScript developers can benefit from the rich ecosystem of TypeScript-

specific tools, libraries, and community-driven support, enabling them to build high-quality React.js applications more efficiently.

## **5.4 DATABASE INTEGRATION WITH MONGODB**

Integrating a MongoDB database into your application involves establishing a connection and interacting with the database to store, retrieve, and manipulate data. MongoDB, as a powerful NoSQL document database, offers scalability, flexibility, and high-performance storage capabilities for both structured and unstructured data. Below, you will find an expanded version of the content, providing more details on the process of integrating MongoDB into your application:

**MongoDB Drivers:** To integrate MongoDB into your application, you'll need to use a MongoDB driver. MongoDB provides official drivers for various programming languages, including Node.js, Python, Java, and .NET. These drivers offer APIs and utilities to connect to the MongoDB server, interact with databases, and perform CRUD (Create, Read, Update, Delete) operations on collections and documents.

**Connection Setup:** To establish a connection to a MongoDB database, you need to provide the connection details, such as the host address, port, and authentication credentials (if required). The MongoDB driver handles the connection establishment process and provides methods to connect and disconnect from the MongoDB server.

**Schema Design:** Unlike traditional relational databases, MongoDB is a schema-less database. This means you don't need to define a rigid schema upfront. Instead, you can store documents with varying structures within a collection. However, it's important to design a schema that aligns with your application's data requirements and querying patterns. You can define indexes to improve query performance and enforce uniqueness or other constraints on your data.

**CRUD Operations:** MongoDB supports CRUD operations for working with data. You can insert new documents, retrieve existing documents based on various query criteria, update specific fields within a document, and delete documents from collections. The MongoDB driver provides methods and APIs to perform these operations and interact with the database programmatically.

**Querying and Aggregation:** MongoDB offers powerful querying capabilities to retrieve specific data based on filters, comparisons, and conditions. The query syntax allows you to perform operations like equality matching, range queries, regular expressions, and more. Additionally, MongoDB provides an aggregation framework that allows you to perform complex data analysis and aggregation operations, including grouping, sorting, joining, and transformation of data.

**Indexing:** Indexing is crucial for optimizing query performance in MongoDB. By creating indexes on specific fields, you can speed up data retrieval and improve query execution times. The MongoDB driver offers methods to define indexes on collections based on single fields, compound fields, or text search. Proper indexing strategy is essential for efficient data retrieval.

**Error Handling and Transactions:** The MongoDB driver provides mechanisms to handle errors and exceptions that may occur during database operations. It also supports transactions, allowing you to group multiple operations into atomic and consistent units of work.

**Data Validation and Security:** MongoDB offers features for data validation and security. You can define validation rules to enforce data integrity and consistency. Additionally, MongoDB supports authentication and access control mechanisms, allowing you to secure your database by defining user roles, permissions, and authentication mechanisms like username/password or certificates.

Integrating MongoDB into your application brings forth a multitude of advantages associated with its scalable and flexible document-oriented database. With MongoDB, you gain the capability to efficiently store, retrieve, and manipulate data, all while benefiting from its rich querying and aggregation framework. MongoDB's unique blend of a flexible schema and impressive scalability renders it an optimal choice for a diverse range of applications, ranging from modest, small-scale projects to sprawling, large-scale distributed systems.

## **5.5NODEMAILER**

**Email Integration:** Nodemailer is a popular email sending library for Node.js applications. It provides a simple and efficient way to integrate email functionality into your project, allowing you to send emails programmatically.

**Easy Configuration:** Nodemailer offers straightforward configuration options, making



it easy to set up and connect with various email service providers. You can configure the library to work with popular email services like Gmail, Outlook, or your own custom SMTP server.

**SMTP Protocol Support:** Nodemailer supports the Simple Mail Transfer Protocol (SMTP), which is the standard protocol for sending emails. It provides a reliable and secure method for delivering emails to the recipients' mail servers.

**Attachment Support:** Nodemailer enables you to attach files, such as generated question papers or reports, to the emails you send. This allows you to include additional information or documents alongside the email content. **Template Engine Integration:** Nodemailer can be integrated with popular template engines like Handlebars or EJS. This allows you to create dynamic email templates, making it easier to generate personalized and customized emails.

**Error Handling and Logging:** Nodemailer provides robust error handling capabilities, allowing you to handle any issues that may occur during the email sending process. It also offers logging functionality, which can be useful for tracking and troubleshooting email-related problems.

**Email Verification and Security:** Nodemailer supports email verification features, such as validating email addresses or implementing verification links. Additionally, it provides options for securing email communication, such as using Transport Layer Security (TLS) or Secure Sockets Layer (SSL) encryption.

**Integration with Project Workflow:** Nodemailer can be seamlessly integrated into your project workflow. For example, you can use it to send notifications to paper setters when their application is approved, or to send generated question papers to examiners for evaluation.

**Error Reporting and Notifications:** Nodemailer can be utilized to send error reports or notifications to system administrators or relevant stakeholders. This helps in keeping track of any issues or failures related to the email sending process. **Community Support and Active Development:** Nodemailer has a vibrant community of developers and is actively maintained and updated. This ensures that you have access to ongoing support, bug fixes, and new features

## 5.6 CODE SAMPLES

### 5.6.1 Application

```
import { Router } from "express";

const applyRouter = Router();

applyRouter.post("/create", async (req, res) => {
  const { payload } = req.body;

  if (!payload) {
    return res.status(201).json({
      success: false,
      message: "Empty body.",
    });
  }

  const role = payload.role;
  if (role === "setter") {
    try {
      const aksg = await applicationModel.create({
        ...payload,
        name: `${payload.fname} ${payload.lname}`,
      });

      res.status(200).json({
        success: true,
        message: "Successfully applied",
      });
    } catch (error) {
      console.log(error);
      res.status(200).json({
        success: false,
        message: "Duplicate email or phone number found.",
      });
    }
  }
});
```

### 5.6.2 Login

```
import express from "express";
const loginRouter = express.Router();

// setter login
loginRouter.post("/setter", async (req, res) => {
  try {
    const { email, password } = req.body;
    console.log(email, password)
    const akg = await paperSetterModel.findOne({
      email,
      password,
    });

    if (!akg) {
      return res.status(400).json({ data: null, error: "No user found." });
    }
    return res
      .status(200)
      .json({ data: akg, message: "Paper setter logged in", success: true });
  } catch (error) {
    console.log(error);
    return res.status(400).json({ data: null, error: "Something went wrong." });
  }
});
```

### 5.6.3 Mail

```
const e import { Router } from "express";
mailRouter = Router();

emailRouter.post("/notify/setter", async (req, res) => {
  const { name, email, subject } = req.body;
  if (!name || !email || !subject) {
    return res.send({
      success: false,
      message: "Please provide required fields",
    });
  }
  try {
    const email_akg = await sendMail({
      from: process.env.EMAIL,
      to: email,
      html: notify_setter({ name, subject }),
      subject: "Notification regarding question paper application",
    });
    await notificationModel.create({
      email,
      subject: "Notification regarding question paper application",
      description: notify_setter({ name, subject }),
      name,
      to: "paper-setter",
    });
    return res.status(200).json({
      success: true,
      message: `Notification send to ${name} for the subject
${subject}`,
    });
  } catch (error) {
    console.log(error);
    return res.send({
      success: false,
      message: "Error while notifying candidate, please try again.",
    });
  }
});

export default emailRouter;
```

### 5.6.4 Database

```
{
  "_id": "646c9f995378e1a769155375",
  "name": "Sushant Nirphal",
  "experience": 48,
  "qualification": "M.Tech(CD)",
  "institute": "GCOE Yavatmal",
  "subject": [
    {
      "_id": "647331e840bab806d0eb80ba",
      "name": "Compiler Design",
      "code": "COC0J5IL96DCE8"
    },
    {
      "_id": "647331e840bab806d0eb80bb",
      "name": "Geography",
      "code": "GE15JKMK7I9L93"
    }
  ],
  "email": "sushnirph3al@gmail.com",
  "phone": "+91 9544 243 333",
  "address": "At naringe nagar",
  "profile":
  "https://avatars.githubusercontent.com/u/76222991?v=4",
  "password": "abc",
  "previousWork": [
    "djngvjfng59u89m5vjkg",
    "fcjmf49385mthvg"
  ],
  "role": "moderator",
  "createdAt": "2023-05-23T11:12:25.647Z",
  "updatedAt": "2023-05-23T11:12:25.647Z",
  "__v": 0
},
```

## CHAPTER 6 :USER ROLE

### 6.1 PAPER SETTER

The paper setter console in the SRPD (Secure Rapid Paper Delivery) system is a dedicated interface designed for paper setters, who are responsible for creating question papers for specific subjects. It provides a user-friendly environment where paper setters can efficiently and securely perform their tasks. Here's a brief overview of the paper setter console:

1. **User Authentication:** The paper setter console requires authentication to ensure that only authorized individuals can access and use the system. This helps maintain the integrity and confidentiality of the question paper creation process.
2. **Subject Selection:** The console allows paper setters to select the subject for which they are responsible for setting the question paper. This ensures that each paper setter has access to the relevant subjects and maintains organization and clarity in the system.
3. **Question Paper Creation:** The paper setter console provides a set of tools and features to facilitate the creation of question papers. Paper setters can generate new question papers from scratch or use templates and predefined question formats. They can add different types of questions, such as multiple-choice, descriptive, or practical questions, and assign marks and instructions to each question.
4. **Question Management:** The console allows paper setters to manage and organize the questions for a specific subject. They can edit, modify, or delete questions as needed. They can also rearrange the order of questions to create a logical flow in the question paper.
5. **Version Control:** The paper setter console may include version control features to track and manage different versions of question papers. This helps keep a record of changes made to the question paper over time and enables easy retrieval of previous versions if needed.
6. **Collaboration and Moderation:** In some cases, the paper setter console may provide collaboration features to facilitate communication and collaboration between paper setters and moderators. This allows for the moderation and review of question papers, ensuring quality and accuracy before finalization.

7. **Submission and Approval:** Once the question paper is ready, the paper setter console enables the submission of the question paper to the moderator or designated authority for approval. This ensures that the question paper goes through a review process and meets the necessary standards and guidelines.

**Security Measures:** The paper setter console in the SRPD system incorporates security measures to protect the confidentiality and integrity of the question papers. It may include features such as user access controls, encryption of data, and secure storage to prevent unauthorized access or tampering. Overall, the paper setter console in the SRPD system streamlines the process of question paper creation for paper setters. It provides a dedicated environment with tools and features to facilitate efficient, organized, and secure creation of question papers, ensuring the smooth operation of the examination process in educational institutes.

## **6.2 MODERATOR**

The moderator console in the SRPD (Secure Rapid Paper Delivery) system is a specialized interface designed for moderators who are responsible for reviewing and approving the question papers created by paper setters. The moderator console provides a centralized platform where moderators can efficiently perform their tasks while ensuring the quality and integrity of the question papers. Here's a brief overview of the moderator console.

1. **User Authentication:** The moderator console requires authentication to ensure that only authorized individuals can access and use the system. This helps maintain the confidentiality and security of the question papers and the review process.
2. **Question Paper Review:** The moderator console allows moderators to review question papers submitted by paper setters. They can access and evaluate the content, structure, and formatting of the question papers to ensure they meet the required standards and guidelines.
3. **Editing and Moderation:** Moderators can make necessary edits or suggestions to improve the quality and clarity of the question papers. They can provide feedback to the paper setters on specific questions, instructions, or formatting. This collaborative approach helps refine the question papers before finalization.

4. **Version Control:** The moderator console may include version control features to track and manage different versions of the question papers. This allows moderators to review changes made by paper setters and maintain a revision history for auditing and reference purposes.
5. **Communication and Collaboration:** The console may include communication features to facilitate interaction between moderators and paper setters. Moderators can provide clarifications, request revisions, or seek additional information from the paper setters. This collaborative approach helps ensure that question papers meet the required standards.
6. **Approval and Finalization:** Once the review process is complete, moderators can approve the question papers for finalization. The moderator console enables them to mark question papers as approved, indicating that they are ready for further processing and secure delivery to the examination centers.
7. **Security Measures:** The moderator console incorporates security measures to protect the confidentiality and integrity of the question papers. It may include features such as user access controls, encryption of data, and secure storage to prevent unauthorized access or tampering.
8. **Workflow Management:** The moderator console may include workflow management features to streamline the review and approval process. It enables moderators to track the progress of question papers, assign tasks to other moderators if necessary, and ensure timely completion of the review process.

Overall, the moderator console in the SRPD system provides moderators with a dedicated platform to review, edit, and approve question papers. It facilitates effective communication and collaboration between moderators and paper setters, ensuring that the question papers meet the required standards and guidelines before being securely delivered to the examination centers.

### **6.3 EXAMINER**

The Examiner Console is a vital component of the Rapid Secure Paper Delivery (RSPD) web application. Its purpose is to provide examiners with the necessary tools and functionalities to efficiently download and assess the exam papers assigned to them.



**The Examiner Console offers the following key features:**

1. **Paper Download:** The examiner can access and download the assigned exam papers from the console. The papers are securely stored and made available for download based on the examiner's permissions and assigned subjects.
2. **Paper Assessment:** Once the exam papers are downloaded, the examiner can assess and evaluate them using the tools provided within the console. This may include features such as highlighting, commenting, or adding annotations to specific sections of the paper.
3. **Time Management:** The Examiner Console may include features to track and manage time spent on assessing each paper. This helps examiners ensure they allocate sufficient time to evaluate each paper thoroughly and adhere to any deadlines.
4. **Communication and Collaboration:** The console may provide a means for examiners to communicate with other stakeholders involved in the assessment process. This could include moderators or paper setters, enabling efficient collaboration and addressing any queries or concerns.

Overall, the Examiner Console plays a critical role in facilitating the efficient and effective evaluation of exam papers. It empowers examiners with the necessary tools and features to assess papers securely, provide accurate grading, offer feedback, and collaborate with other stakeholders involved in the process. By leveraging the capabilities of the RSPD web application, the Examiner Console enhances the overall efficiency and accuracy of the exam paper assessment workflow.

**Admin Console**

The admin console in the SRPD (Secure Rapid Paper Delivery) system is a comprehensive interface designed for administrators who oversee the overall operations of the system. The admin console provides administrative capabilities and controls to manage various aspects of the SRPD system. Here's a brief overview of the admin console:

**User Management:** The admin console allows administrators to manage user accounts

within the system. They can create new accounts, assign roles and permissions, and deactivate or delete accounts when necessary. User management ensures that only authorized individuals have access to the system.

**System Configuration:** Administrators can configure system settings and parameters through the admin console. They can define and manage global settings such as security configurations, database connections, server configurations, and other system-level configurations required for the smooth functioning of the SRPD system.

**Access Control:** The admin console provides access control features to manage user permissions and roles. Administrators can define and assign different levels of access to different users based on their responsibilities and requirements. This helps enforce security and restrict unauthorized access to sensitive functionalities and data.

**Data Management:** Administrators can manage data within the SRPD system through the admin console. They can view and analyze data related to user activity, question papers, examination schedules, and other system data. They may also have the ability to perform administrative data operations such as data backups, restorations, or data migrations.

**System Monitoring:** The admin console allows administrators to monitor the system's performance, usage, and resource utilization. They can track system logs, error reports, and usage statistics to identify potential issues, troubleshoot problems, and ensure optimal system performance.

**Reporting and Analytics:** Administrators can generate reports and gather analytics from the admin console. They can retrieve data and generate reports on various aspects of the SRPD system, such as user activity, question paper status, examination results, and system usage. These reports provide insights into the system's performance and help administrators make informed decisions.

**System Maintenance:** The admin console provides tools and functionalities for system maintenance. Administrators can perform routine maintenance tasks such as database optimization, software updates, and system backups. They can also manage system resources and ensure high availability and reliability of the SRPD system.

**Security and Compliance:** The admin console incorporates security features and

controls to safeguard the SRPD system. Administrators can enforce security policies, manage encryption keys, configure firewall rules, and monitor system vulnerabilities. They can also ensure compliance with relevant data protection regulations and standards.

Overall, the admin console in the SRPD system empowers administrators to manage and maintain the system effectively. It provides a centralized platform to configure system settings, manage user accounts, monitor system performance, generate reports, and enforce security measures. The admin console plays a crucial role in ensuring the smooth operation and security of the SRPD system

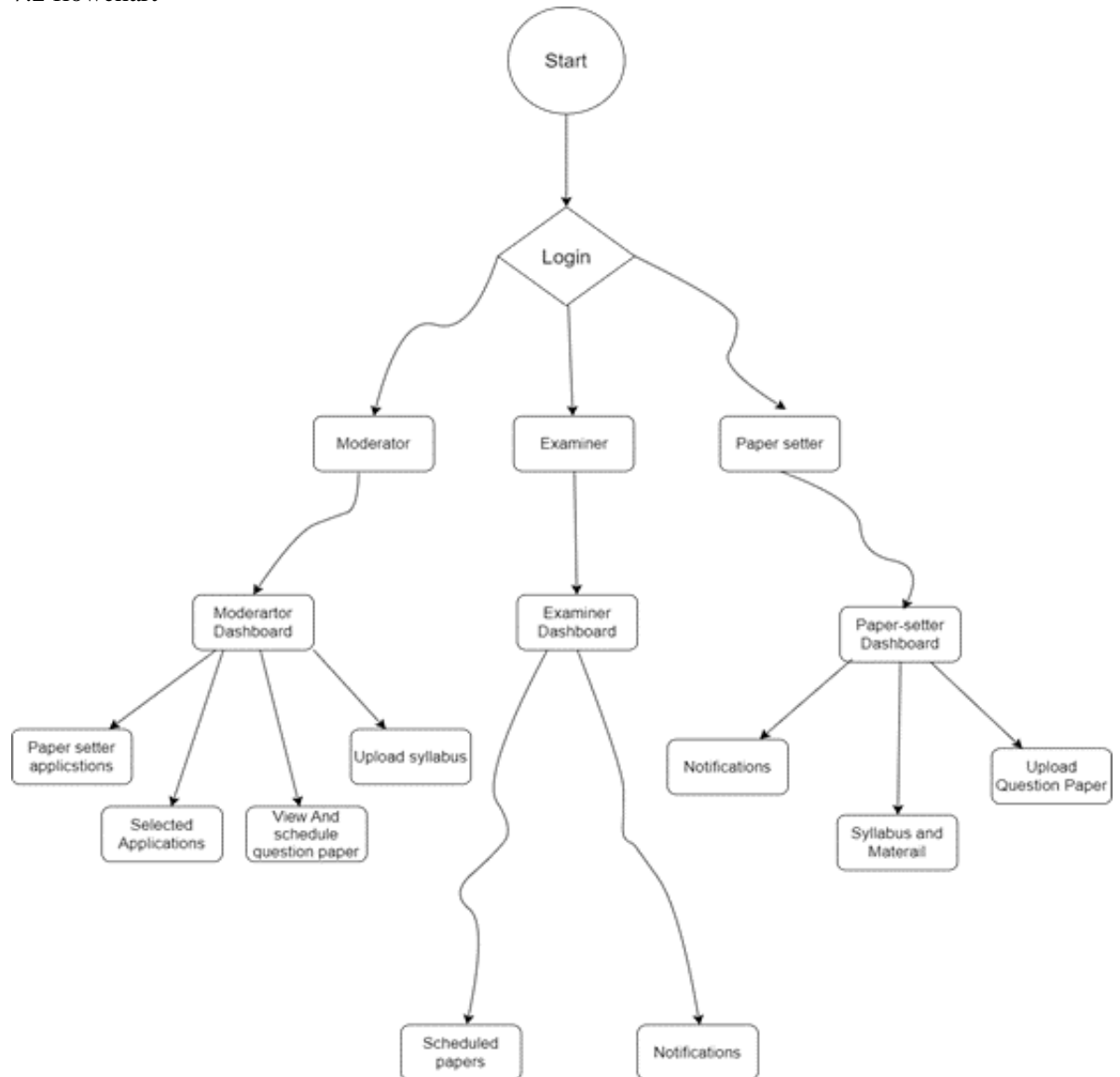
## **CHAPTER 7 :SYSTEM DESIGN**

### **7.1 OVERVIEW**

1. **Super Admin:** The Super Admin has overall control and authority over the system. They manage and oversee the activities of moderators, paper setters, and examiners. The Super Admin ensures the smooth functioning of the system and handles administrative tasks such as user management and system configuration.
2. **Moderators:** Moderators are responsible for specific subjects or departments. They have the authority to select paper setters and manage the paper generation process. Moderators collaborate with paper setters to provide necessary information such as syllabus, paper pattern, and additional materials. They review and moderate the generated papers before sending them to examiners.
3. **Paper Setters:** Paper setters are experienced individuals who generate question papers based on the provided information by moderators. They create subject-specific papers that align with the curriculum and adhere to institutional guidelines. Once the papers are generated, paper setters submit them to moderators for review.
4. **Examiners:** Each department in the college has an examiner who is typically a head of department or a professor/staff member. Examiners receive the papers from moderators and evaluate them. They ensure the quality, fairness, and suitability of the papers for the respective department's examinations.

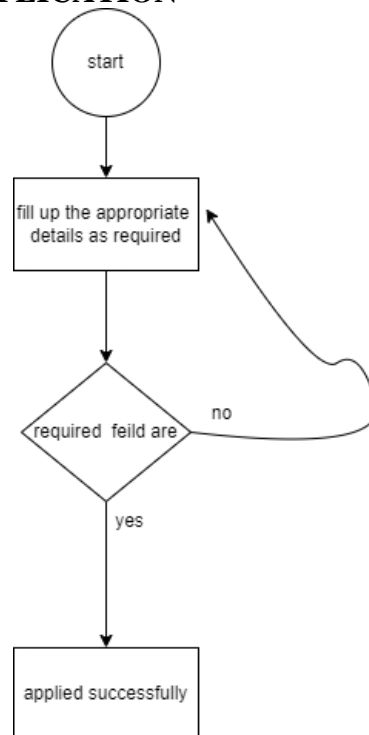
The system design revolves around a hierarchical structure where the Super Admin oversees the entire system, moderators manage subjects and paper setters, and examiners evaluate the generated papers. The collaboration between moderators and paper setters ensures that the generated papers meet the required standards and align with the curriculum. This system aims to streamline the process of paper generation and evaluation, enhancing the efficiency, accuracy, and fairness of the overall examination process.

## 7.2 flowchart



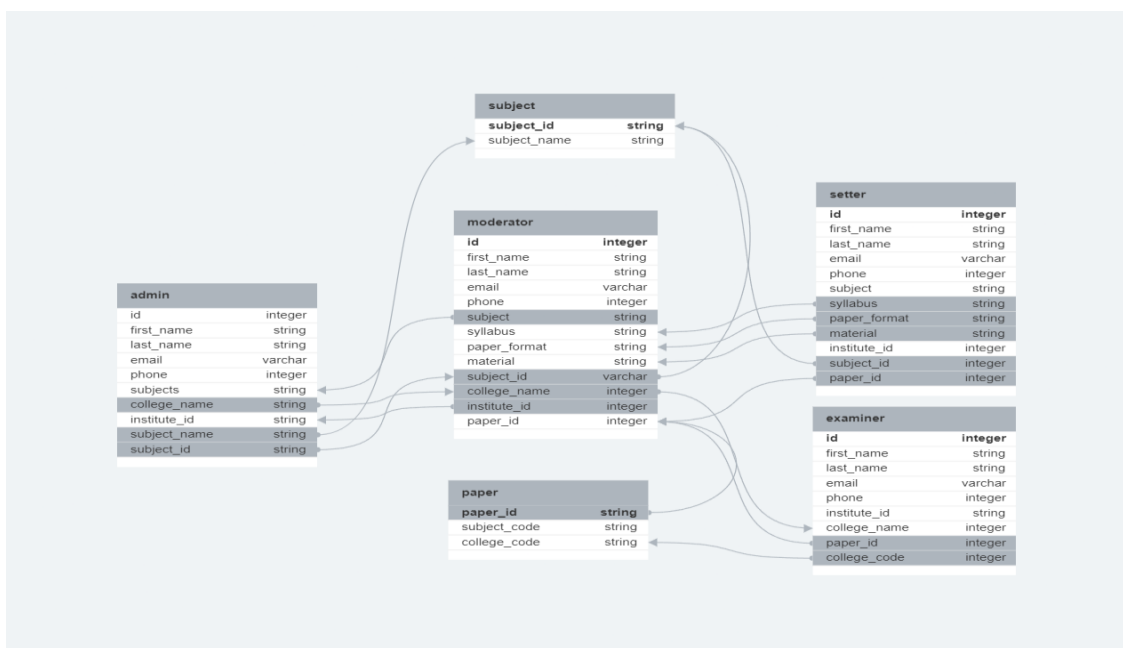
7-1 Flow-chart

### 7.3 FLOWCHART OF APPLICATION

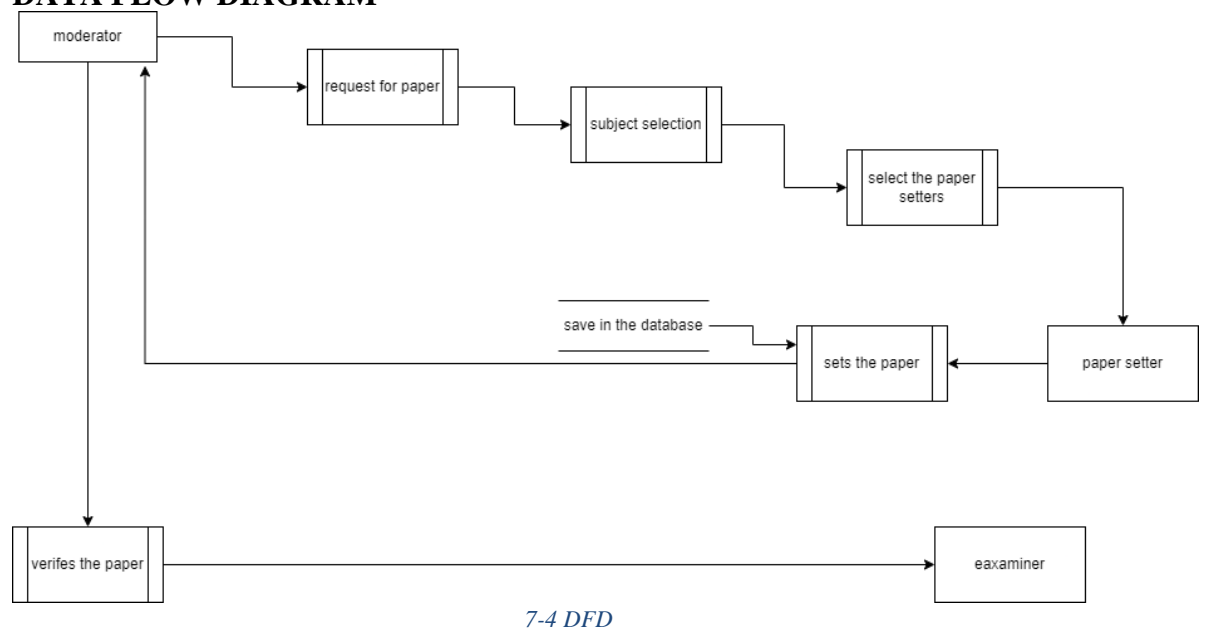


7-2 Application forms

### 7.4 ER DIAGRAM



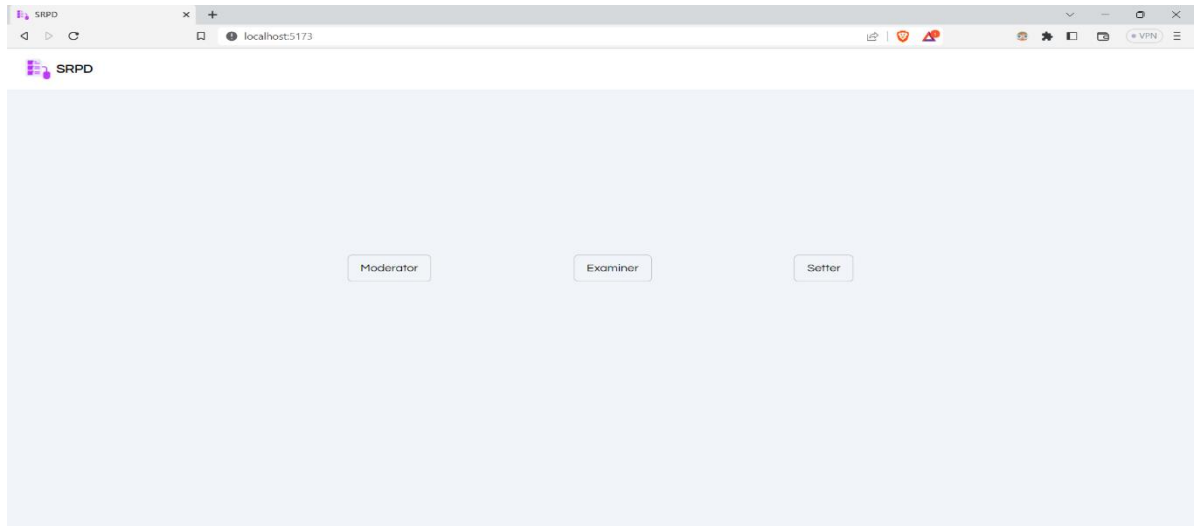
7-3 ER Diagram

**DATA FLOW DIAGRAM***7-4 DFD*

## CHAPTER 8 : RESULT AND ACHIEVEMENTS

### 8.1 USER INTERFACE

#### 8.1.1 Home page

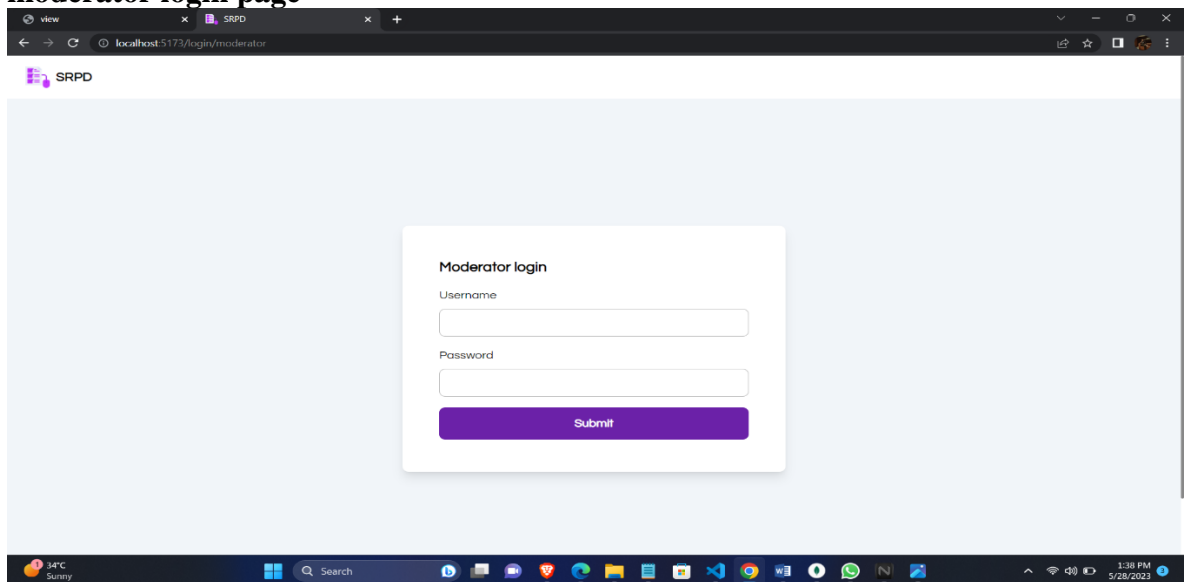


8-1 Home page

-This is Home page user need to select the role to login

### 8.2 LOGIN PAGES

#### moderator login page

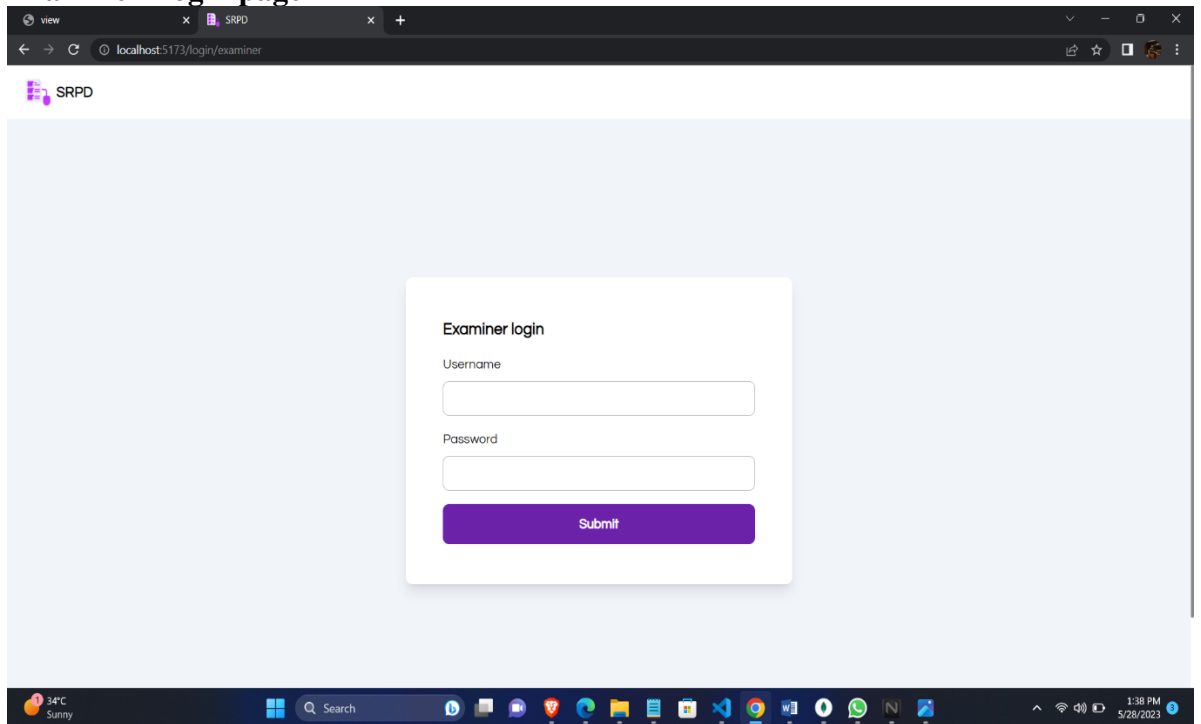


8-2 Moderator login page

-This Moderator login page



## Examiner Login page

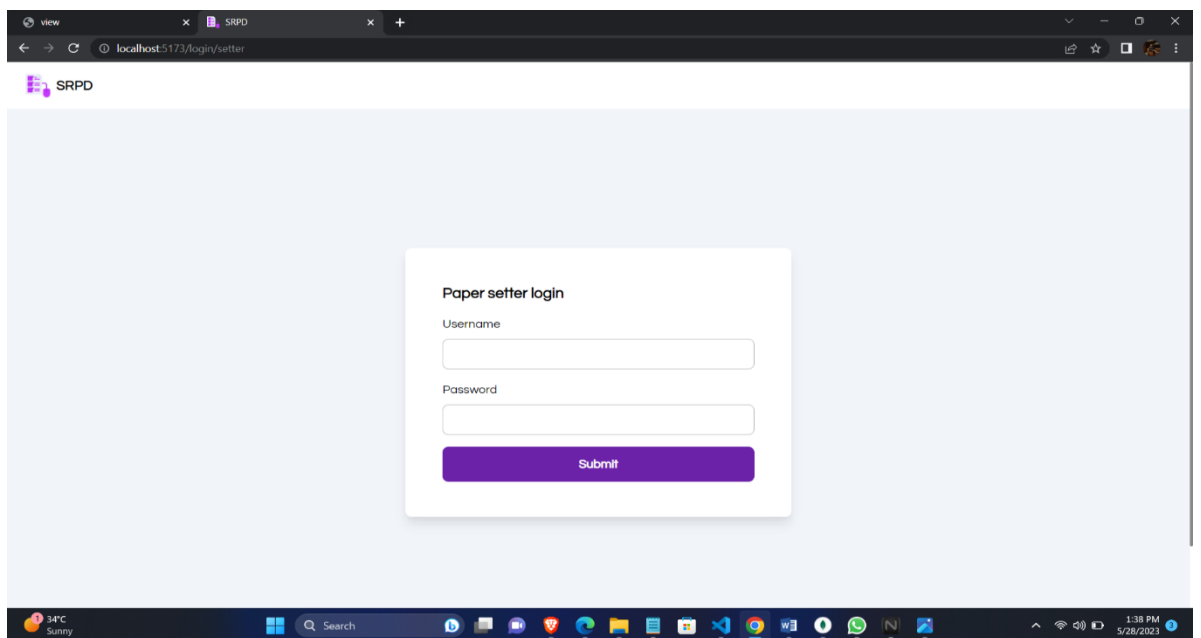


The screenshot shows a web browser window with the address bar displaying 'localhost:5173/login/examiner'. The page features the SRPD logo in the top left corner. The main content area is a light blue gradient. In the center, there is a white card titled 'Examiner login'. This card contains two input fields: 'Username' and 'Password', both with placeholder text. Below these fields is a purple 'Submit' button. The browser's taskbar at the bottom shows the system clock as 1:38 PM on 5/28/2023, along with various application icons and a weather widget indicating 34°C and 'Sunny'.

8-3 Examiner login page

-Examiner can login here

## Setter Login



The screenshot shows a web browser window with the address bar displaying 'localhost:5173/login/setter'. The page features the SRPD logo in the top left corner. The main content area is a light blue gradient. In the center, there is a white card titled 'Paper setter login'. This card contains two input fields: 'Username' and 'Password', both with placeholder text. Below these fields is a purple 'Submit' button. The browser's taskbar at the bottom shows the system clock as 1:38 PM on 5/28/2023, along with various application icons and a weather widget indicating 34°C and 'Sunny'.

8-4 Setter login

-setter can login here

**Application form of paper setter**

Choose File No file chosen

\*Please upload your profile image. (jpg, jpeg, png) under 250kb

First name:

Last Name:

Email:

Phone:

Subject:

Qualification:

Institute:

Experience (in months):

Institute Id:

Choose File No file chosen

Address:

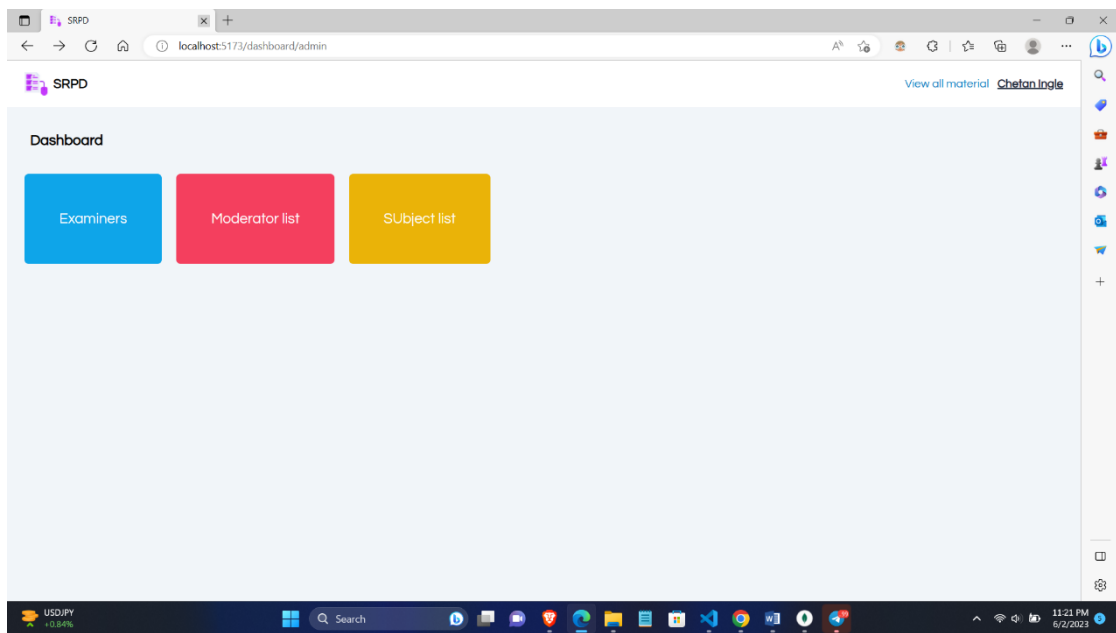
Submit

*8-5 setter application form*

Application link is shared manually by the Co-ordinators of the respective colleges which are connected with universities or any organization

**8.3 ADMIN**

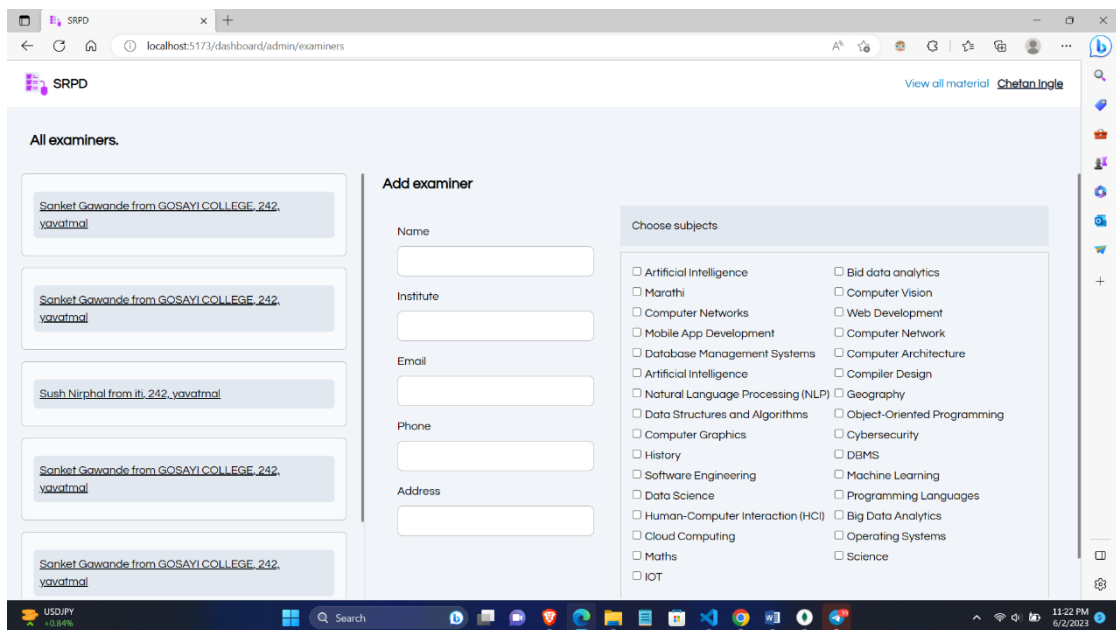
## Admin dashboard



8-6 Admin dashboard

This is the dashboard of the admin

## Examiner list and application form



8-7 Examiner List and Application form

This is the examiner list page and the admin can add examiners form here

## moderator list and application form

The screenshot shows the SRPD dashboard with the URL `localhost:5173/dashboard/admin/moderators`. The page is titled "All moderators" and displays a list of moderators on the left and an "Add moderator" form on the right.

**All moderators:**

- Sushant Nirahai from GCOE Yavatmal, At naringe nagar
- chetan from gcoe, vdi
- Sushant Nirahai from GCOE Yavatmal, At naringe nagar
- Sanket Gawande from GOSAYI COLLEGE, 242, yavatmal
- chetan ingale from gcoe, vdi

**Add moderator form:**

Name:

Institute:

Email:

Phone:

Address:

**Choose subjects:**

- ☐ Artificial Intelligence
- ☐ Marathi
- ☐ Computer Networks
- ☐ Mobile App Development
- ☐ Database Management Systems
- ☐ Artificial Intelligence
- ☐ Natural Language Processing (NLP)
- ☐ Data Structures and Algorithms
- ☐ Computer Graphics
- ☐ History
- ☐ Software Engineering
- ☐ Data Science
- ☐ Human-Computer Interaction (HCI)
- ☐ Cloud Computing
- ☐ Maths
- ☐ IOT
- ☐ Bid data analytics
- ☐ Computer Vision
- ☐ Web Development
- ☐ Computer Network
- ☐ Computer Architecture
- ☐ Compiler Design
- ☐ Geography
- ☐ Object-Oriented Programming
- ☐ Cybersecurity
- ☐ DBMS
- ☐ Machine Learning
- ☐ Programming Languages
- ☐ Big Data Analytics
- ☐ Operating Systems
- ☐ Science

8-8 moderator list and application form

## Subjects

The screenshot shows the SRPD dashboard with the URL `localhost:5173/dashboard/admin/subjects`. The page is titled "Subject" and displays a list of subjects on the right.

**Subject:**

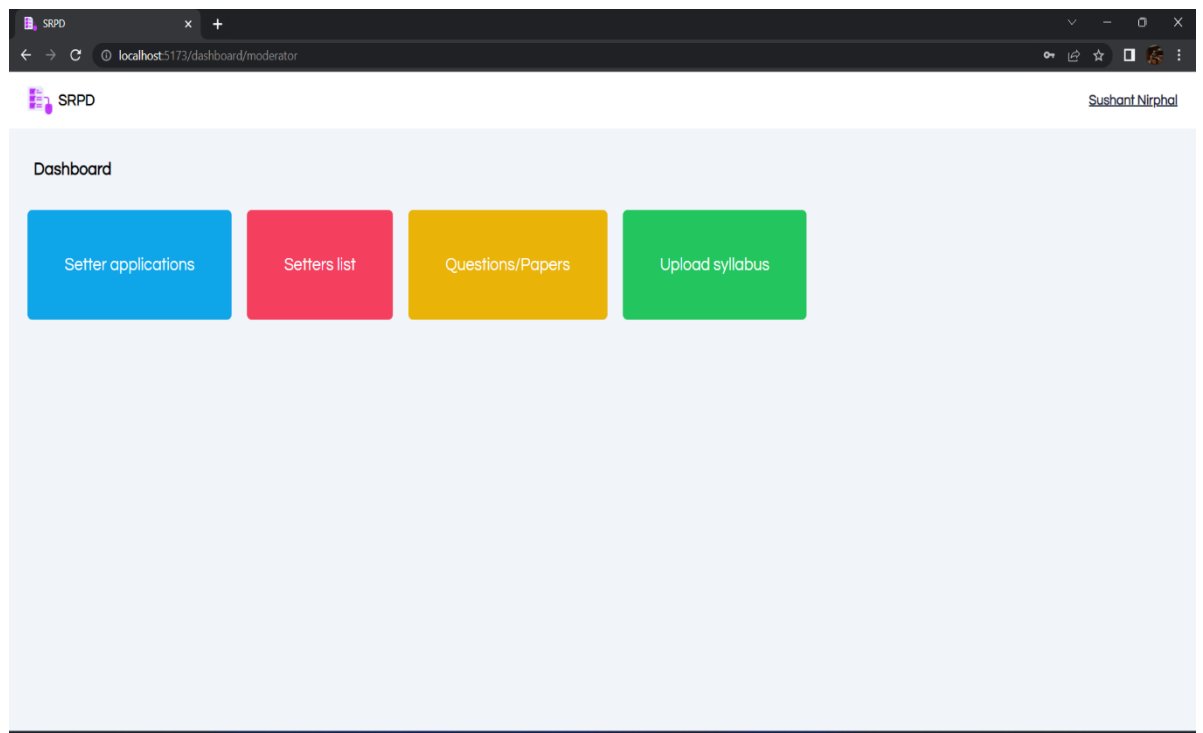
**Submit**

**Subjects:**

- Artificial Intelligence**  
ARCN8HLAJAF765
- Marathi**  
MAN3GMAFMH40FD9
- Computer Networks**  
CO5DELI77GEOK
- Mobile App Development**  
MOD1NESHBI1CABM
- Database Management Systems**  
DAC2MGJE72J458
- Artificial Intelligence**  
ARB8IHUF34M69J
- Natural Language Processing (NLP)**  
NA7NM1JK2JH4B
- Data Structures and Algorithms**  
DAH11643KC7B8
- Bid data analytics**  
BID03L9GIC41N7
- Computer Vision**  
COLF2028DAACAD
- Web Development**  
WELLMKH4J3N69C6
- Computer Network**  
COH8NHKDND0CB27
- Computer Architecture**  
CO9GNFK1D7MUG8
- Compiler Design**  
COOJ5IL96DCE8
- Geography**  
GE15JKMK79L93
- Object-Oriented Programming**  
OBKA4NB920UKB

8-9 subjects

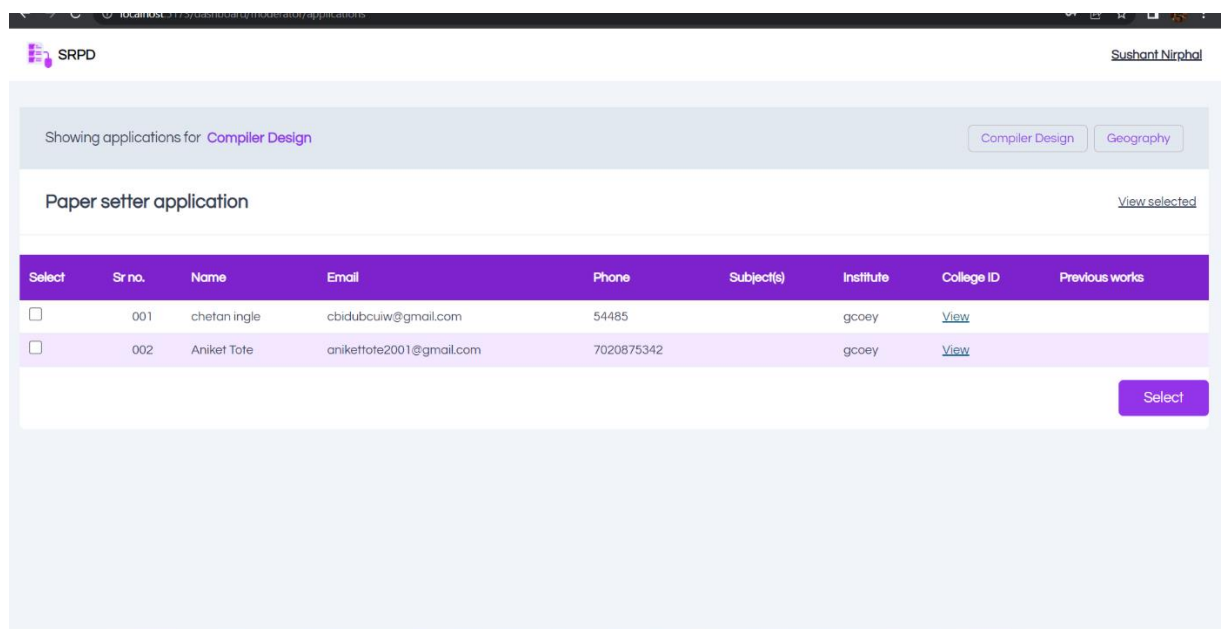
## Moderator



*Fig 7.6. Moderator Dashboard*

-Moderator have four option as shown in fig(7.6)

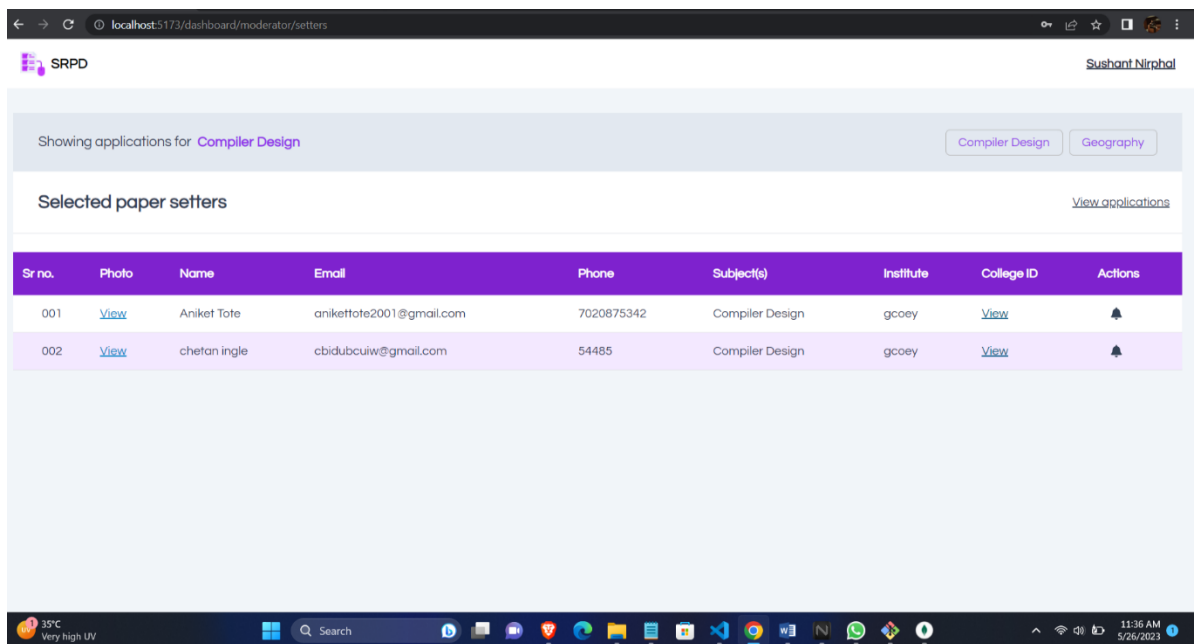
## Applications



*8-10 setter applicant list*

-this is the list of candidates who apply for the paper setter role

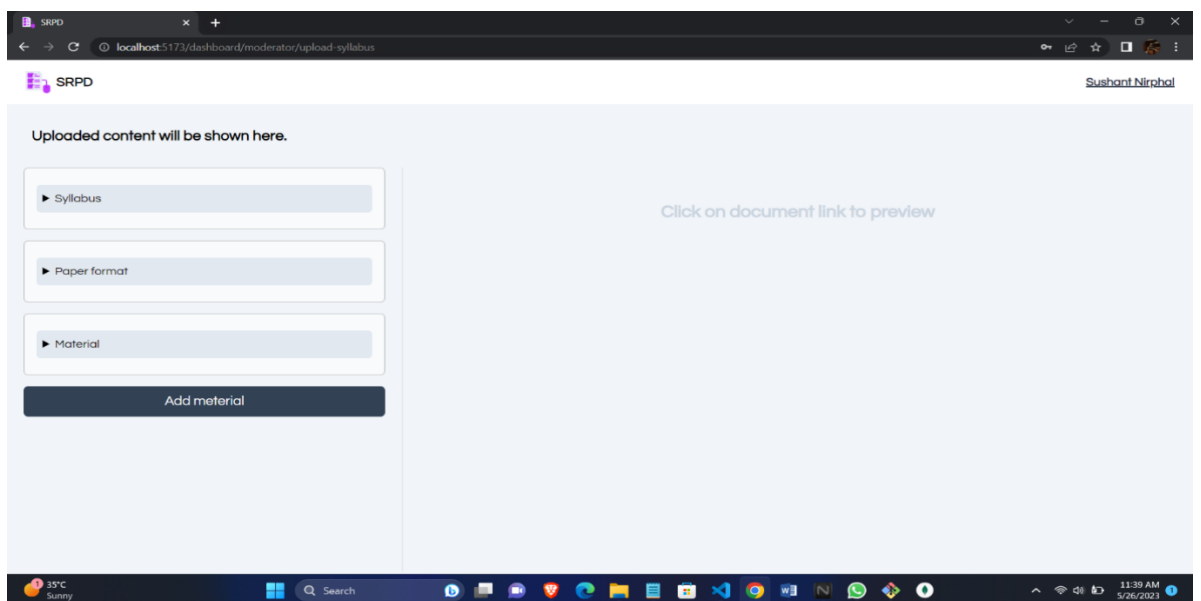
## Selected Applications



8-11 selected setters

-selected applicant will list down here in this fig(7.8)

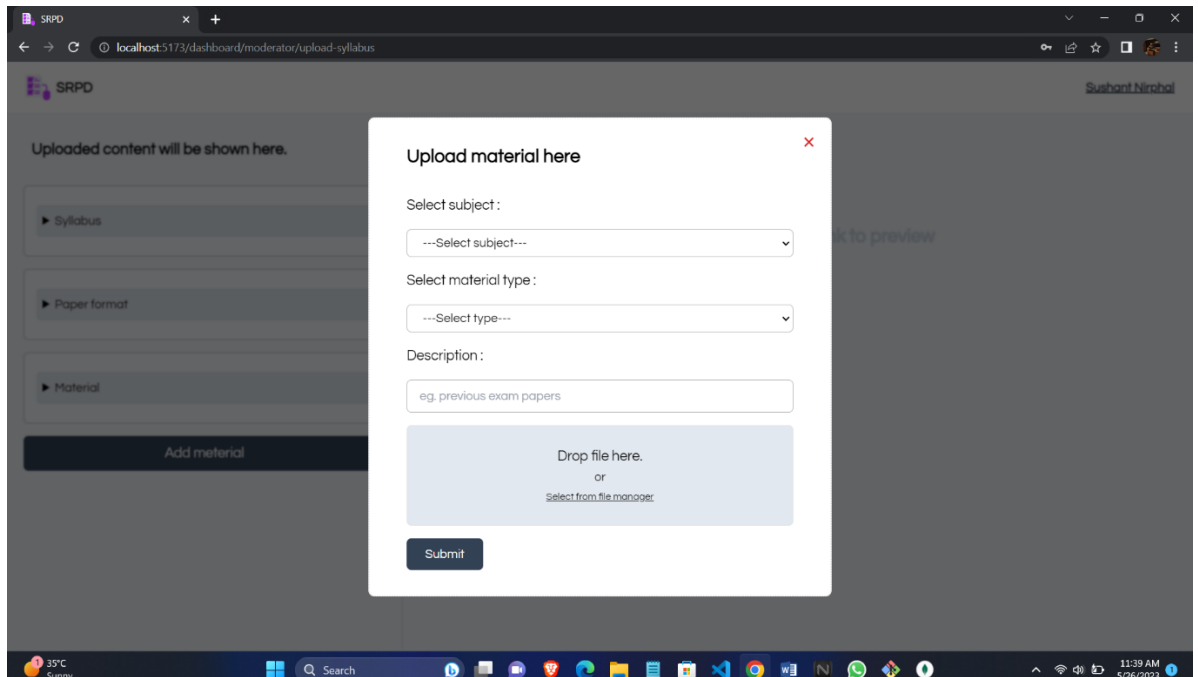
## Upload content



8-12 upload material

-Upload content from here like syllabus ,paper format and materials

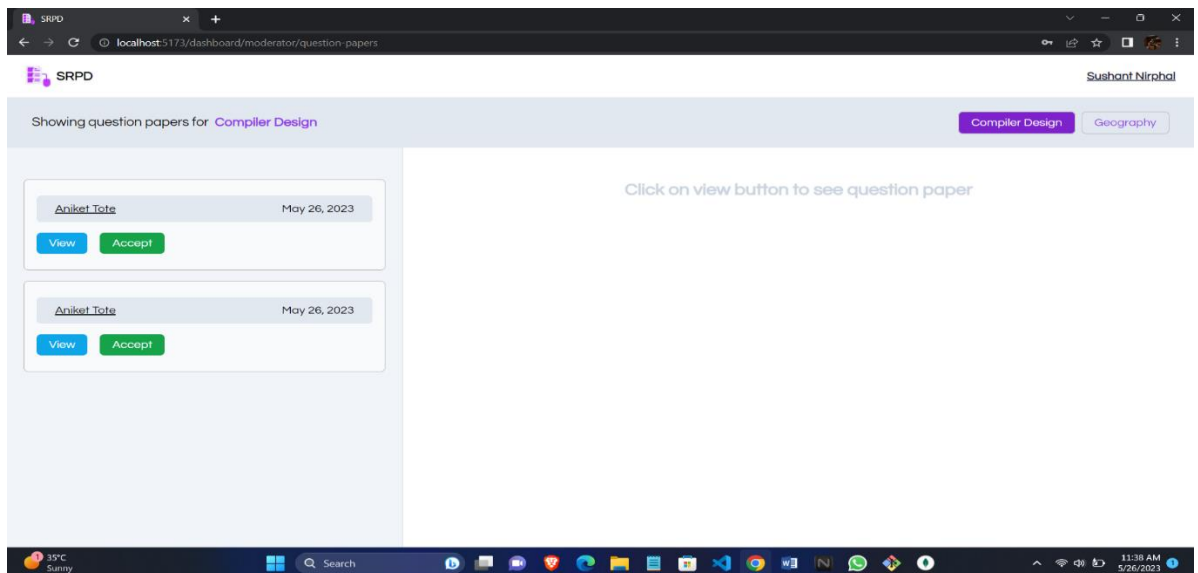
## Type selection



8-13 select type of the material

-select the type of content from here.

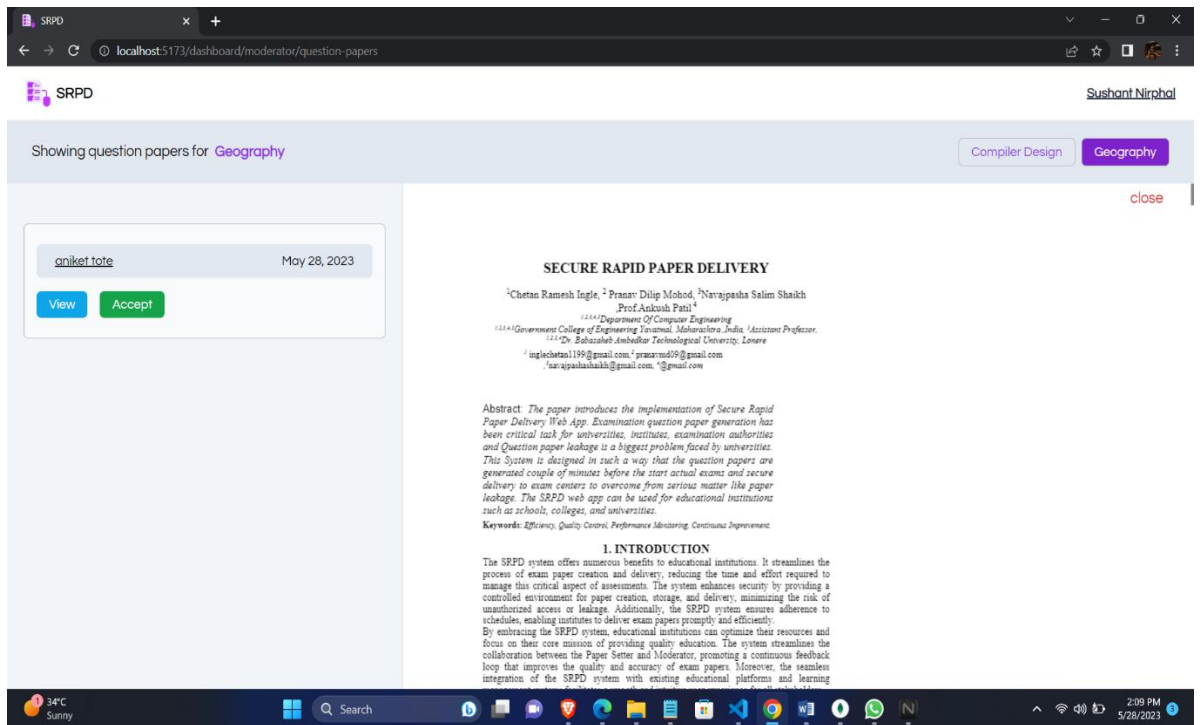
## Accept paper



8-14 Accept paper

-Accept paper

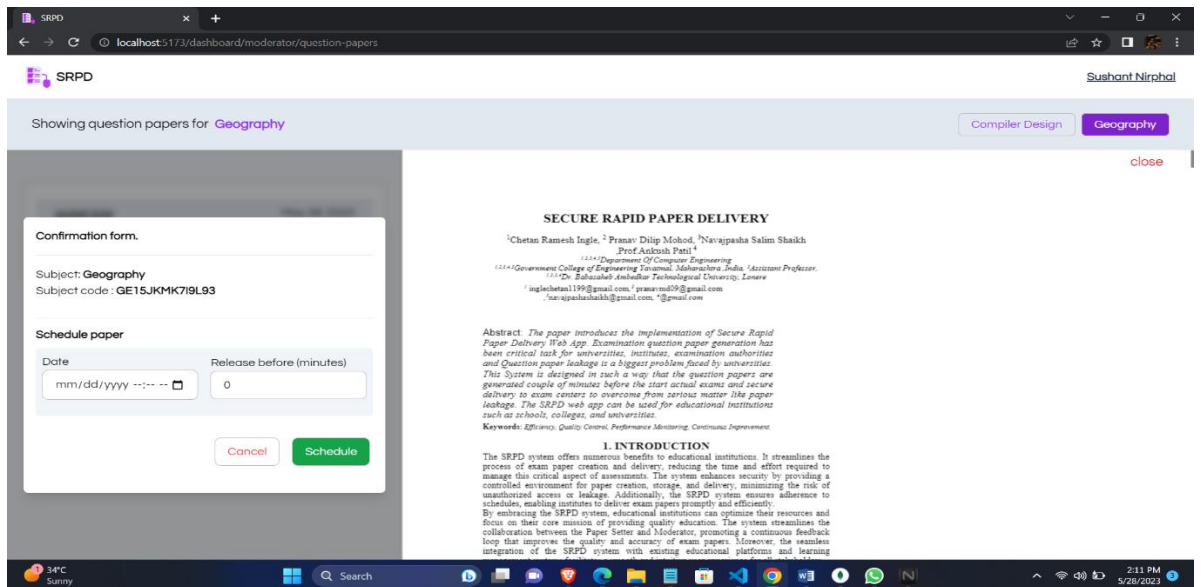
## Preview



8-15 review the paper

-Preview of paper is look like this fig 7.12

## Schedule of paper



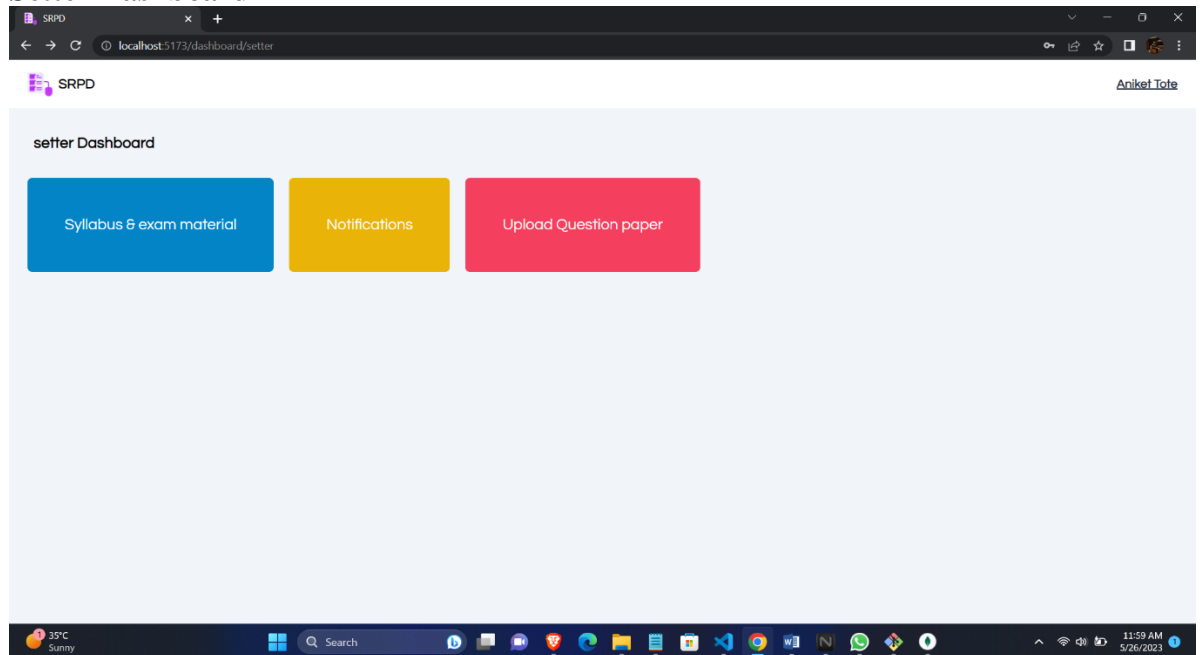
8-16 schedule the paper

-Paper can schedule from here as per time table



## Setter

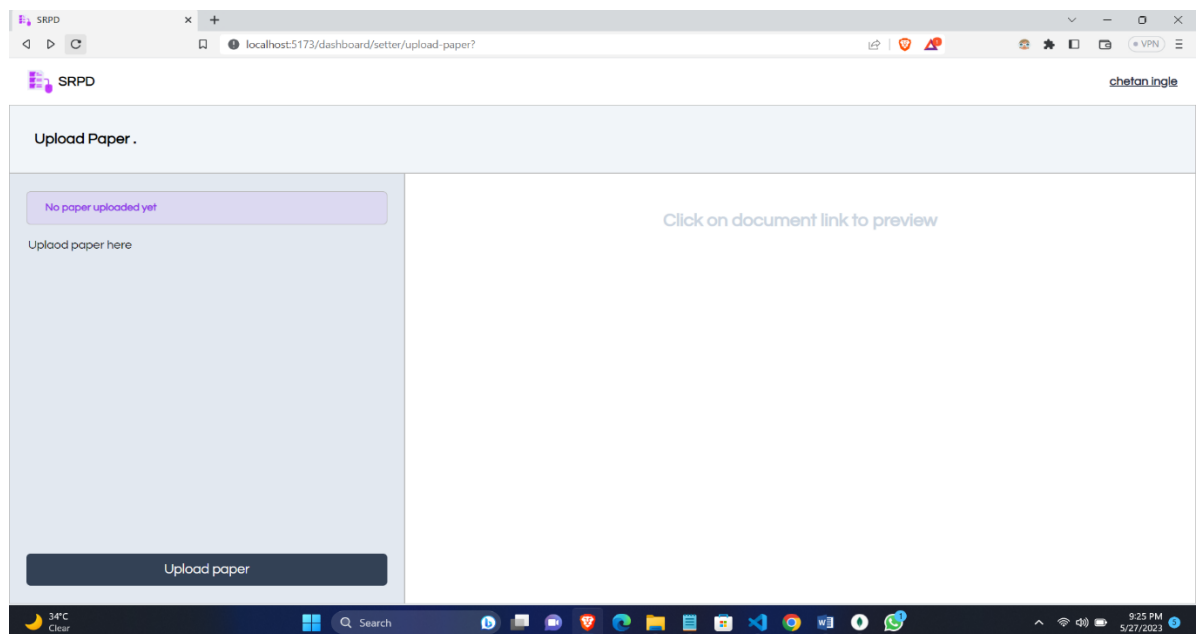
### Setter Dashboard



8-17 setter dashboard

-This is the setter dashboard setter have several option as shown in the fig 7.14

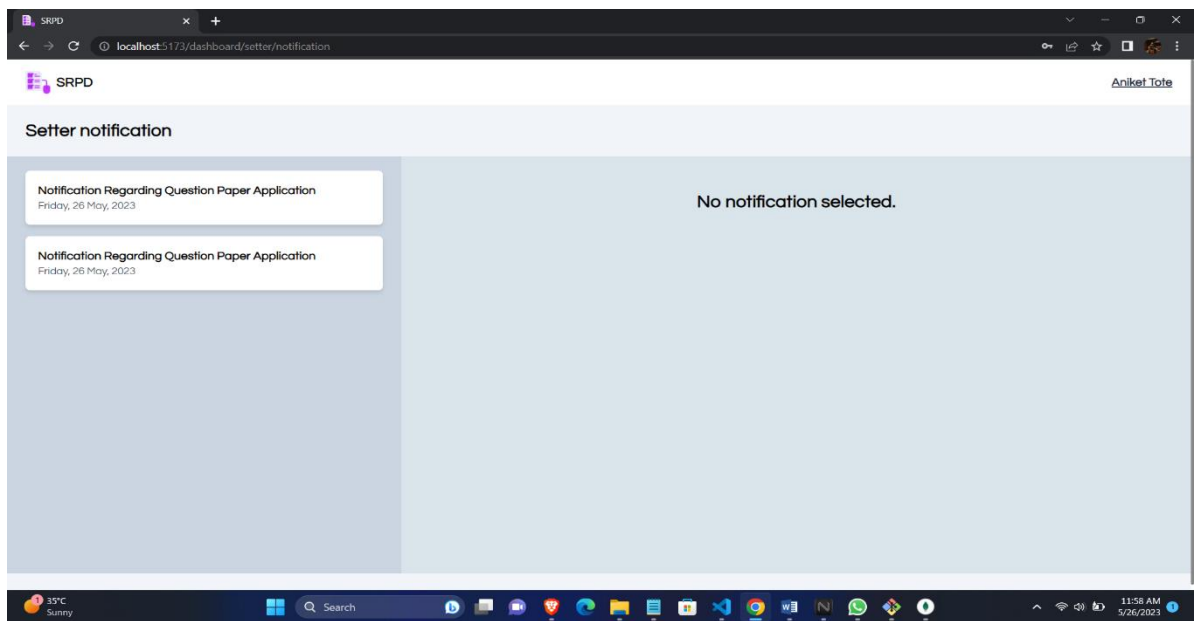
### Upload paper



8-18 Upload paper

-Paper setter can upload paper from here

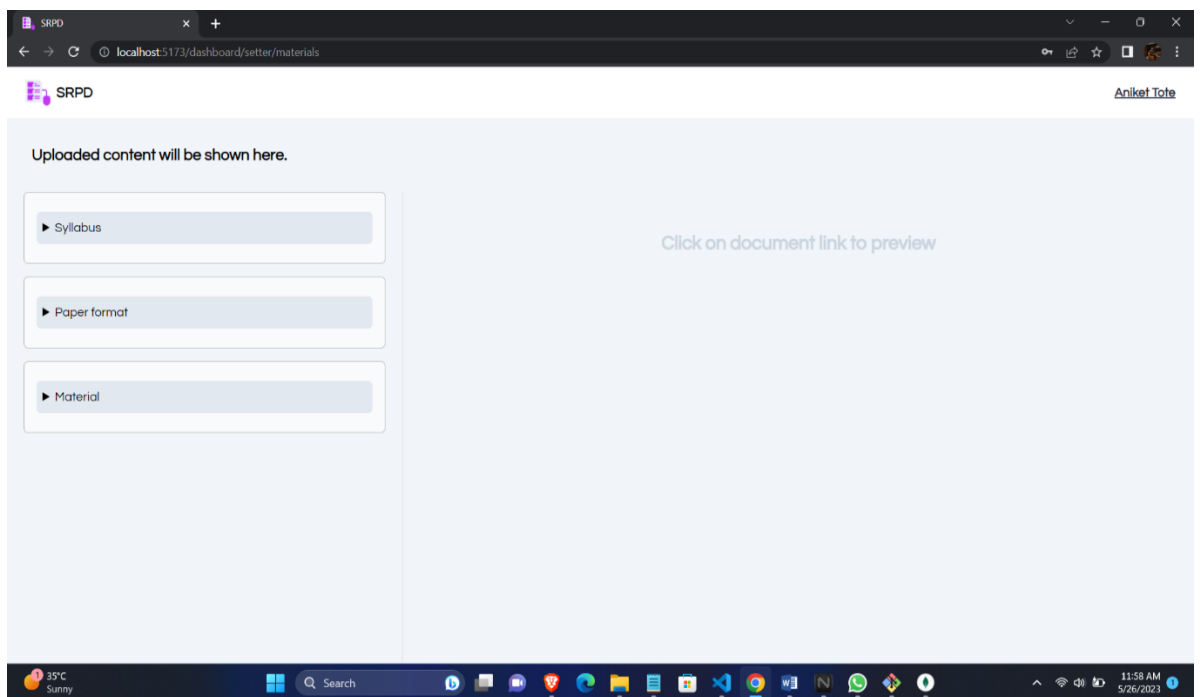
## Notification



*8-19 notifications*

-setter will receive the mail and notification shown here as well

## Content for reference

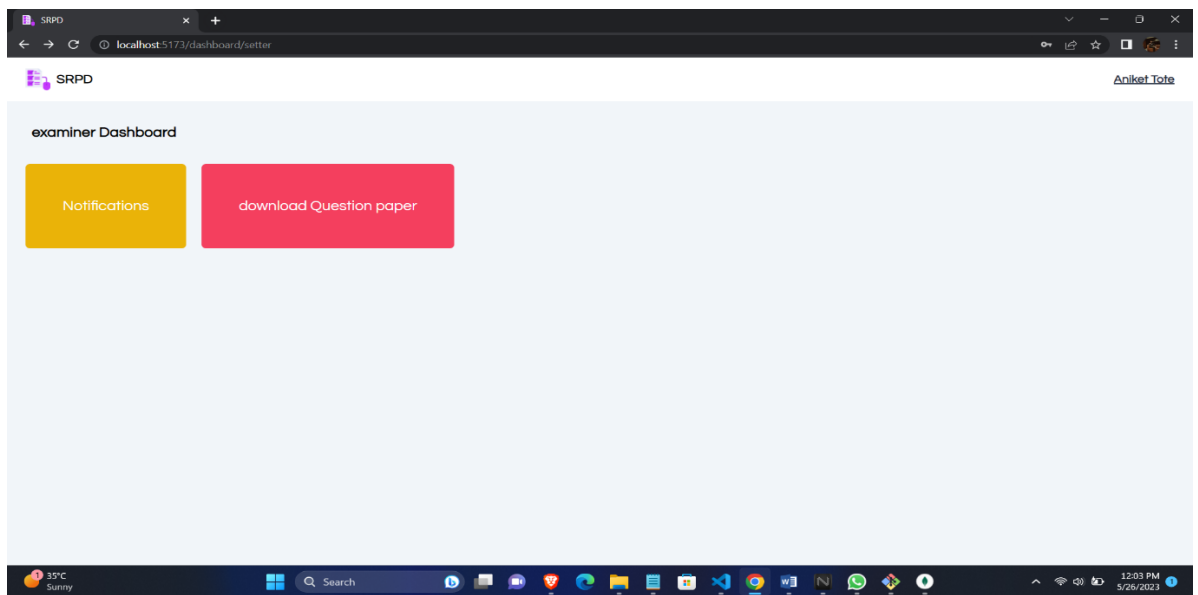


*8-20 uploaded content*

-Setter must refer the content from here to set the paper ,like the paper format and syllabus

## Examiner

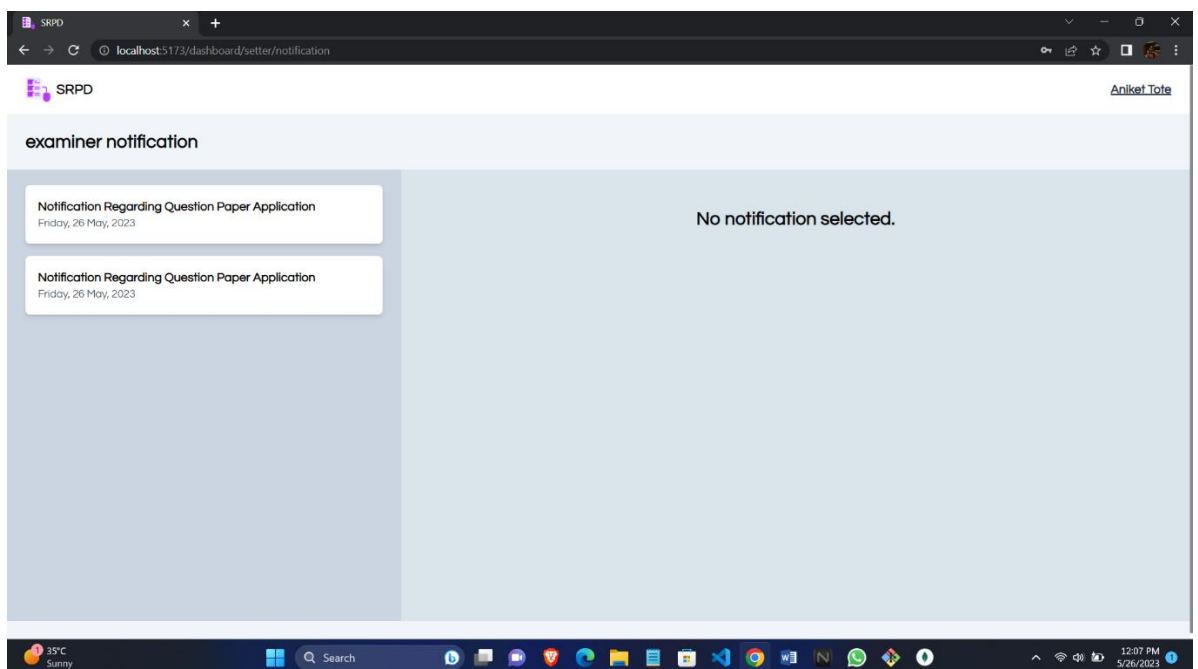
## Examiner dashboard



8-21 Examiner Dashboard

-this is the examiner dashboard ,the examiner are categorized by the colleges/department

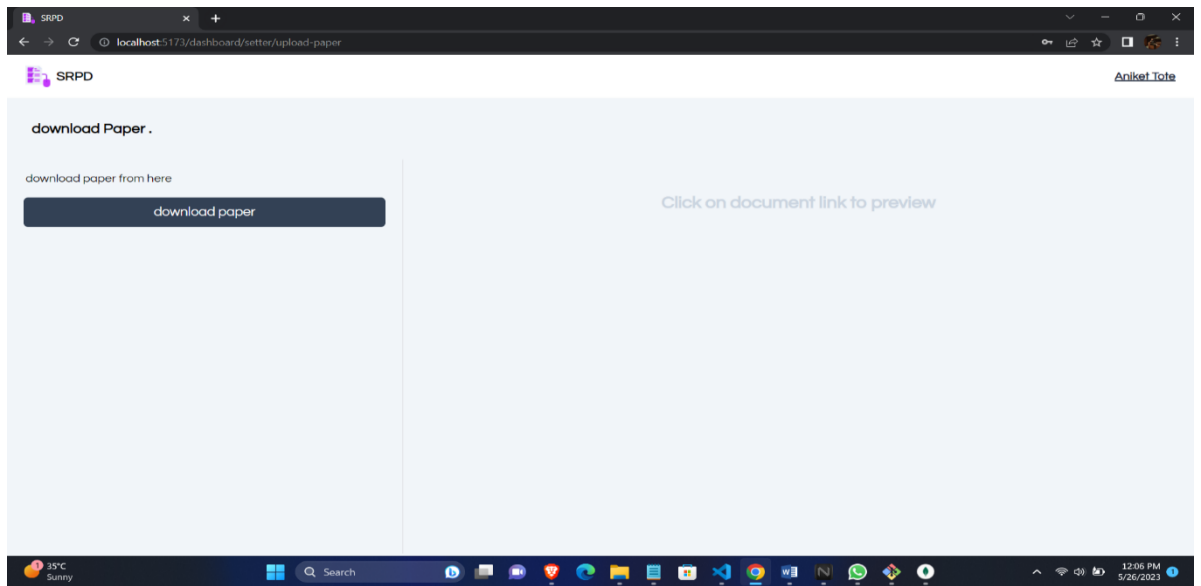
## Notification



8-22 Notifications

-If the moderator schedule the paper the notification will shownand on the email as well

## Download Paper



*8-23 Download paper*

-Setter can download paper from here

## CHAPTER 9 :SUMMARY AND DIRECTION

### SRPD

-Secure Rapid Paper Delivery is a system designed to help institutes create and securely deliver exam papers on scheduled examination dates. The SRPD system consists of three main components: the paper setter console, the moderator console, and the admin console. The paper setter console is responsible for setting question papers for specific subjects. Paper setters create and submit the question papers, ensuring the quality and relevance of the content. They play a crucial role in maintaining the integrity and standards of the examination process.

The moderator console acts as a quality control checkpoint in the SRPD system. Moderators review and moderate the question papers created by the paper setters. They ensure that the question papers meet the required standards, adhere to guidelines, and are error-free. Moderators also communicate with the paper setters, providing feedback and guidance throughout the paper creation process. The admin console oversees the overall operations of the SRPD system. Administrators manage user accounts, maintain system security, and handle any technical issues that arise. They have the authority to assign roles, track progress, and ensure smooth functioning of the SRPD system.

SRPD offers several benefits to institutes. First, it streamlines the process of creating exam papers, ensuring consistency, accuracy, and adherence to guidelines. Second, it enhances the security of the examination process by providing a secure platform for paper creation and delivery. It reduces the risk of unauthorized access or tampering with question papers. Third, SRPD enables efficient collaboration between paper setters and moderators, facilitating effective communication and feedback. This improves the overall quality of question papers. Finally, the admin console provides administrators with better control and oversight, making it easier to manage the entire examination process.

In summary, SRPD is a comprehensive system that addresses the challenges associated with creating and securely delivering exam papers. It optimizes the process, enhances security, and improves collaboration among stakeholders. By implementing SRPD, institutes can ensure the integrity and efficiency of their examination systems, ultimately benefiting both the educational institution and the students.

## **CHAPTER 10 :CONCLUSION**

### **CONCLUSION**

The Secure Rapid Paper Delivery (SRPD) system offers a robust solution for institutes to streamline the process of creating and securely delivering exam papers. With its three main components - the paper setter console, moderator console, and admin console - SRPD ensures the integrity, quality, and timeliness of the examination process. The benefits of SRPD include improved efficiency, enhanced security, and effective collaboration among stakeholders.

By utilizing SRPD, institutes can experience a more efficient and standardized approach to paper creation. The system's features, such as the paper setter console and moderator console, enable better coordination and communication between paper setters and moderators. This collaboration results in high-quality exam papers that meet the required standards and guidelines.

Moreover, SRPD enhances the security of the examination process. By providing a secure platform for paper creation and delivery, institutes can mitigate the risk of unauthorized access, tampering, or leakage of question papers. This ensures a fair and transparent examination environment, preserving the integrity of the assessment process.

## CHAPTER 11 FUTURE WORK

While the SRPD system offers significant advantages, there are opportunities for future enhancements and developments. Some areas to consider for future work include:

1. **Enhanced Question Paper Analysis:** Implementing advanced analysis techniques to evaluate the difficulty level, topic coverage, and performance of different questions or question patterns can provide valuable insights for further improving the quality of question papers.
2. **Integration with Online Assessment Platforms:** Integrating SRPD with online assessment platforms can offer a seamless end-to-end solution for exam management. This integration can include features such as online exam scheduling, automated grading, and real-time performance analytics.
3. **Artificial Intelligence and Machine Learning Integration:** Exploring the integration of AI and machine learning algorithms to automate certain aspects of question paper creation, such as generating distractor options for multiple-choice questions or suggesting question topics based on curriculum guidelines, can further streamline the process and reduce manual effort.
4. **User-Friendly Interfaces:** Continuously improving the user interfaces of the paper setter console, moderator console, and admin console to enhance usability, provide intuitive workflows, and ensure a seamless user experience.
5. **Scalability and Performance Optimization:** As the user base and volume of exam papers grow, optimizing the performance and scalability of the SRPD system becomes crucial. Future work can focus on optimizing the system's architecture, database management, and resource utilization to handle increasing demands efficiently.

By addressing these areas for future work, the SRPD system can continue to evolve and provide even more efficient, secure, and user-friendly solutions for institutes in the domain of exam paper creation and delivery.

## CHAPTER 12 REFERENCES

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- 9.