A

PROJECT REPORT
ON

SMART DOCUMENTATION HUB

Submitted in partial fulfillment for the award of

Post Graduate Diploma in Advance Computing

(PG-DAC) from

INSTITUTE OF EMERGING TECHNOLOGIES

Authorized Training Centre

Under the Guidance of

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CERTIFICATE

This is to certify that the project report entitled **SMART DOCUMENTATION HUB** is a bonfire work carried out by **Disha Gaikwad, Saket Deshmukh, Abdul Rahman, Hridaynath Mandowkar, Manas Pawar** and submitted in partial fulfilment of the requirement for the C-DAC ACTS, DAC course in Institute of Emerging Technology in the batch of Aug 2025.

Course Coordinator **External Examiner**

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ABSTRACT

The rapid growth of digital information has increased the need for secure, efficient, and collaborative document management systems. The **Smart Documentation Hub** is a web-based platform designed to centralize document storage while enabling secure real-time collaboration among multiple users. The system provides core functionalities such as document upload and organization, real-time editing, inline commenting, version control, and role-based access management to ensure data integrity and controlled document sharing.

The platform supports real-time synchronization to maintain consistency across multiple user sessions and minimize conflicts during collaborative editing. Secure authentication and authorization mechanisms are implemented to protect sensitive information and maintain user privacy. By integrating modern full-stack web technologies, the system ensures scalability, responsiveness, and reliability.

The **Smart Documentation Hub** enhances productivity by reducing manual document handling, streamlining collaborative workflows, and improving transparency in document management. This project demonstrates the practical application of real-time web technologies to address contemporary document management challenges in academic and professional environments.

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1. INTRODUCTION

In today's digital world, organizations and individuals generate, share, and manage a large volume of documents on a daily basis. Traditional document handling methods, such as manual storage or isolated file systems, often lead to issues including data redundancy, lack of version control, security vulnerabilities, and inefficient collaboration. With the increasing adoption of remote work and digital processes, there is a growing need for a secure, centralized, and collaborative document management solution.

The **Smart Documentation Hub** is designed to address these challenges by providing a web-based platform that enables secure document storage, real-time collaboration, and controlled document sharing. The system allows users to upload, edit, organize, and manage documents efficiently while supporting features such as real-time editing, inline commenting, and version tracking. These capabilities help reduce version conflicts and enhance teamwork among multiple users working on the same document.

Security is a critical aspect of modern document management systems. The proposed platform incorporates secure authentication, authorization, and role-based access control to ensure that documents are accessed only by authorized users. Real-time synchronization mechanisms ensure data consistency across multiple user sessions and improve collaborative efficiency.

By integrating collaboration tools with secure document handling, the **Smart Documentation Hub** streamlines document workflows, improves productivity, and supports efficient information management. This project demonstrates the application of modern web technologies and real-time communication mechanisms to develop a scalable and user-friendly document management system suitable for academic and professional environments.

2. PROBLEM DEFINITION

In many academic and professional environments, document management is still handled using scattered storage systems, email-based sharing, or standalone file repositories. These approaches lack real-time collaboration, proper version control, and centralized access, leading to issues such as document duplication, unauthorized access, data inconsistency, and loss of important information. Collaboration among multiple users often results in conflicting document versions, making it difficult to track changes and maintain accuracy.

Additionally, existing systems provide limited support for secure external document sharing, especially in recruitment or verification processes. Sharing documents through unsecured links or manual methods increases the risk of data breaches and unauthorized usage. The absence of intelligent access control and monitoring mechanisms further complicates document security and management.

Therefore, there is a need for a secure, centralized, and collaborative document management system that enables real-time editing, controlled access, version tracking, and secure profile-based document sharing while maintaining data integrity and user privacy.

In modern academic and professional environments, managing documents efficiently and securely has become a significant challenge due to the increasing volume of digital data and the need for collaborative work. Existing document management practices often rely on fragmented storage systems, manual file sharing, or email-based communication, which lack real-time collaboration, effective version control, and centralized access. These limitations result in document duplication, version conflicts, unauthorized access, and reduced productivity.

Furthermore, sharing documents with external users, such as recruiters or verification authorities, is often done through unsecured links or manual processes, increasing the risk of data breaches and loss of sensitive information. The absence of role-based access control and proper tracking mechanisms makes it difficult to ensure data integrity and accountability.

Therefore, there is a need for a centralized, secure, and collaborative document management system that supports real-time editing, controlled access, version tracking, and secure profile-based document sharing. The **Smart Documentation Hub** aims to address these challenges by providing an efficient, scalable, and user-friendly platform for modern document handling and collaboration.

2.1 SCOPE OF THE PROJECT

The scope of the **Smart Documentation Hub** includes the design and development of a web-based document management platform that supports secure document storage and real-time collaboration. The system enables users to upload, organize, edit, and manage documents through an intuitive and user-friendly interface. Features such as real-time editing, inline commenting, and version control are implemented to enhance collaborative efficiency and reduce document conflicts.

The platform incorporates secure user authentication and role-based access control to restrict document access according to assigned user roles. Controlled document sharing is supported to allow authorized users to access selected documents while maintaining data privacy and security. The system is designed to be scalable, responsive, and accessible across multiple devices, ensuring consistent performance in academic and professional environments.

The project primarily focuses on software-based solutions and does not include hardware-level security mechanisms or offline document processing. Future enhancements may include advanced analytics, improved cloud storage optimization, and integration with third-party services to extend system functionality.

2.2 GOALS & OBJECTIVES

Goal :

The primary goal of the **Smart Documentation Hub** is to design and develop a secure, centralized, and collaborative web-based document management system that enables efficient document handling, real-time collaboration, and controlled document sharing for academic and professional use.

Objectives :

The specific objectives of the project are as follows:

- To develop a centralized platform for secure document storage and management.
- To enable real-time document editing and collaboration among multiple users.
- To implement version control mechanisms to track document changes and avoid version conflicts.
- To provide role-based access control for secure and authorized document sharing.
- To support inline commenting and collaboration tools to enhance team communication.
- To ensure data privacy and security through authentication and authorization mechanisms.
- To design a scalable, responsive, and user-friendly web interface using modern technologies.
- To reduce manual effort and improve efficiency in document workflow management.

2.3 MAJOR CONSTRAINTS & OUTCOMES

MAJOR CONSTRAINTS

The development and implementation of the **Smart Documentation Hub** are subject to the following constraints:

- **Time Constraint:** The project is developed within a limited academic timeframe, which restricts the implementation of advanced features.
- **Resource Constraint:** Limited availability of hardware resources and testing environments may affect large-scale performance evaluation.
- **Internet Dependency:** The system requires a stable internet connection for real-time collaboration and synchronization.
- **Scalability Limitation:** The current implementation supports a limited number of concurrent users and documents.
- **Security Scope:** While basic authentication and access control are implemented, advanced security mechanisms such as end-to-end encryption and audit logging are outside the current scope.
- **Browser Dependency:** System performance may vary depending on browser compatibility and device capabilities.
- **Data Storage Limitation:** The project uses constrained storage capacity suitable for academic use rather than enterprise-scale deployment.

OUTCOMES

The successful implementation of the **Smart Documentation Hub** achieves the following outcomes:

- A centralized and secure platform for document storage and management.
- Efficient real-time collaboration with synchronized document editing.
- Reduced document redundancy and version conflicts through version control.
- Secure and controlled document sharing using role-based access.
- Improved productivity and streamlined document workflows.
- A scalable and user-friendly web application suitable for academic and professional environments.
- Practical exposure to full-stack web development and real-time communication technologies.

3. SOFTWARE REQUIREMENT SPECIFICATION

1. Functional Requirements

FR1. User Registration and Authentication

- The system shall allow users to register and log in using secure credentials.
- The system shall authenticate users before granting access.

FR2. Document Upload and Management

- The system shall allow users to upload, view, edit, download, and delete documents.
- The system shall support document organization and categorization.

FR3. Real-Time Collaboration

- The system shall allow multiple users to edit the same document simultaneously.
- The system shall synchronize document changes in real time.

FR4. Inline Commenting

- The system shall allow users to add, edit, and delete inline comments.
- The system shall support collaboration through comments.

FR5. Version Control

- The system shall maintain document versions automatically.
- The system shall allow users to view and restore previous versions.

FR6. Role-Based Access Control

- The system shall restrict document access based on user roles.
- The system shall allow document owners to define access permissions.

2. Non-Functional Requirements

NFR1. Security

- The system shall protect user data through authentication and authorization.

NFR2. Performance

- The system shall respond to user actions with minimal delay.

NFR3. Scalability

- The system shall support future expansion of users and documents.

NFR4. Reliability

- The system shall ensure data consistency during real-time collaboration.

NFR5. Usability

- The system shall provide an intuitive and user-friendly interface.

NFR6. Availability

- The system shall be available for use at all times except scheduled maintenance.
-

3. Hardware Requirements

- Server system for application hosting
- Client devices such as desktop or laptop
- Minimum 4 GB RAM recommended

4. Software Requirements

- Operating System: Windows
- Web Browser: Chrome, Edge, Firefox
- Backend Framework: ASP.NET Core
- Frontend Framework: React
- Database: SQL Server
- Real-Time Communication: WebSockets / SignalR

3.1 PURPOSED SYSTEM

The purpose of the **Smart Documentation Hub** is to design and develop a web-based document management system that overcomes the limitations of traditional document handling methods. The proposed system aims to provide a centralized platform for secure document storage, real-time collaboration, and controlled document sharing in academic and professional environments.

The system enables users to upload, organize, edit, and manage documents efficiently through a single platform. By supporting real-time document editing, inline commenting, and version control, the Smart Documentation Hub allows multiple users to collaborate simultaneously while minimizing version conflicts and maintaining document consistency.

Security is a primary objective of the project. The platform incorporates secure user authentication, role-based access control, and authorization mechanisms to ensure that documents are accessed only by authorized users. All document modifications are tracked to maintain data integrity, accountability, and transparency.

By leveraging modern full-stack web technologies, the Smart Documentation Hub aims to improve productivity, reduce manual effort, and streamline document workflows. The project demonstrates the practical application of real-time collaboration technologies to deliver a scalable, reliable, and user-friendly document management solution.

4. SYSTEM MODULES

1. User Authentication Module

This module handles user registration, login, and logout functionalities. It ensures secure access to the system through authentication mechanisms. User roles and permissions are assigned during registration to control access to system features.

2. Document Management Module

This module allows users to upload, store, organize, view, edit, and delete documents. It manages document metadata and ensures secure storage. Users can categorize documents for easy retrieval.

3. Real-Time Collaboration Module

This module enables multiple users to edit the same document simultaneously. It ensures real-time synchronization of changes and prevents data inconsistency during collaborative editing.

4. Version Control Module

The version control module tracks all changes made to documents. It allows users to view previous versions and restore documents if required, ensuring data integrity and accountability.

5. Inline Commenting Module

This module allows users to add comments directly within documents. It facilitates communication and feedback among collaborators without altering the main document content.

6. Access Control Module

This module implements role-based access control to restrict document access. Document owners can define permissions such as view, edit, or comment access for different users.

7. Admin Management Module

The admin module allows administrators to manage users, roles, permissions, and system configurations. It ensures smooth operation and monitoring of the platform

5. PERFORMANCE-REQUIREMENTS

- The system shall support concurrent access by multiple users without noticeable delay.
- The system shall ensure real-time synchronization of document edits with minimal latency.
- The system shall respond to user actions such as login, document upload, and document retrieval within acceptable time limits.
- The system shall efficiently handle large documents without significant performance degradation.
- The system shall maintain stable performance during peak usage hours.
- The system shall ensure consistency of document data during simultaneous edits.
- The system shall optimize server and network resource usage to support scalability.
- The system shall provide uninterrupted service except during scheduled maintenance.

5.1 H/W REQUIREMENTS & S/W REQUIREMENTS

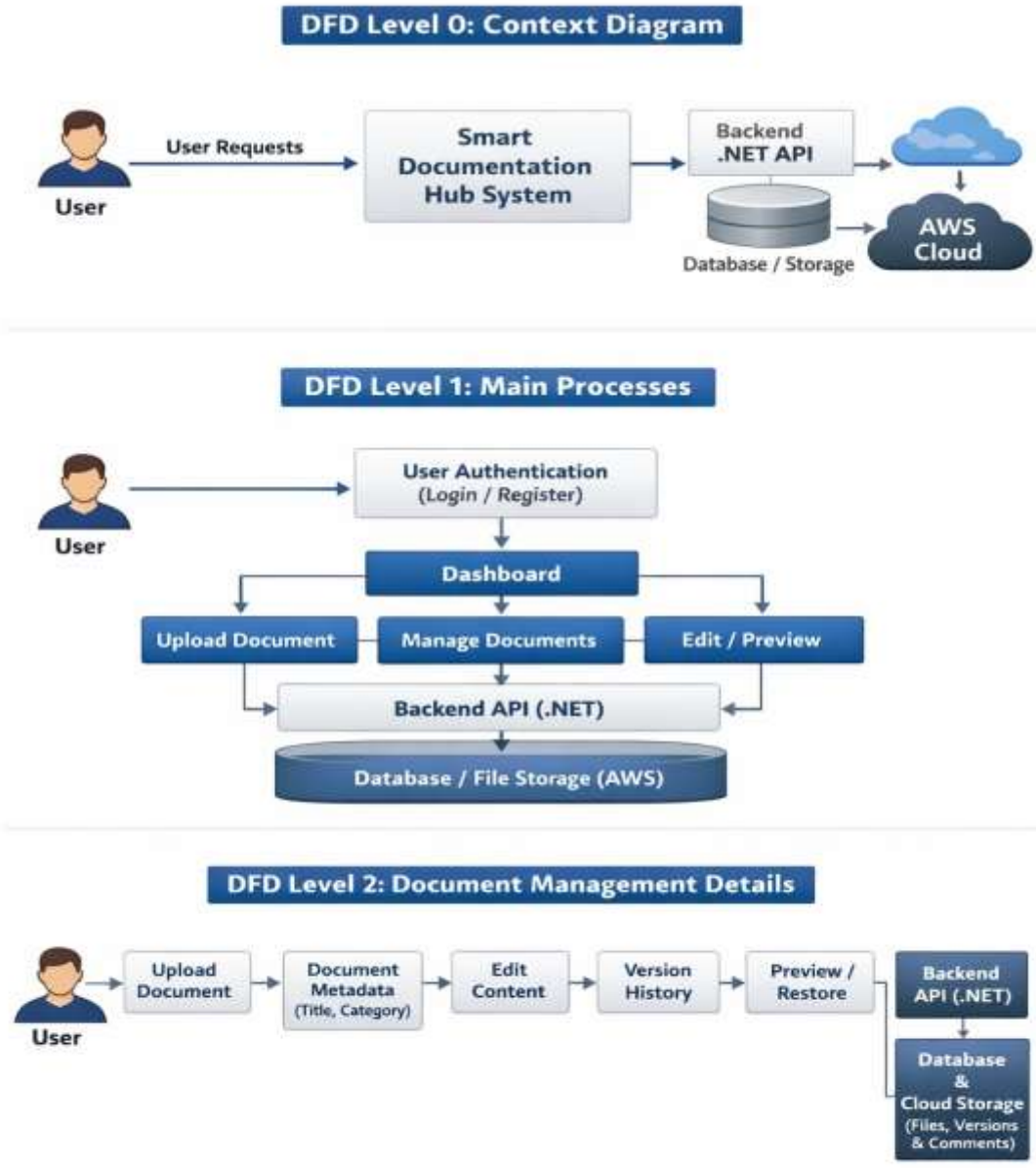
HARDWARE REQUIREMENTS

- **Processor:** Intel Core i3 or higher
- **RAM:** Minimum 4 GB (8 GB recommended)
- **Hard Disk:** Minimum 50 GB free space
- **Server:** Cloud or local server for application hosting
- **Client Devices:** Desktop or Laptop
- **Network:** Stable internet connection

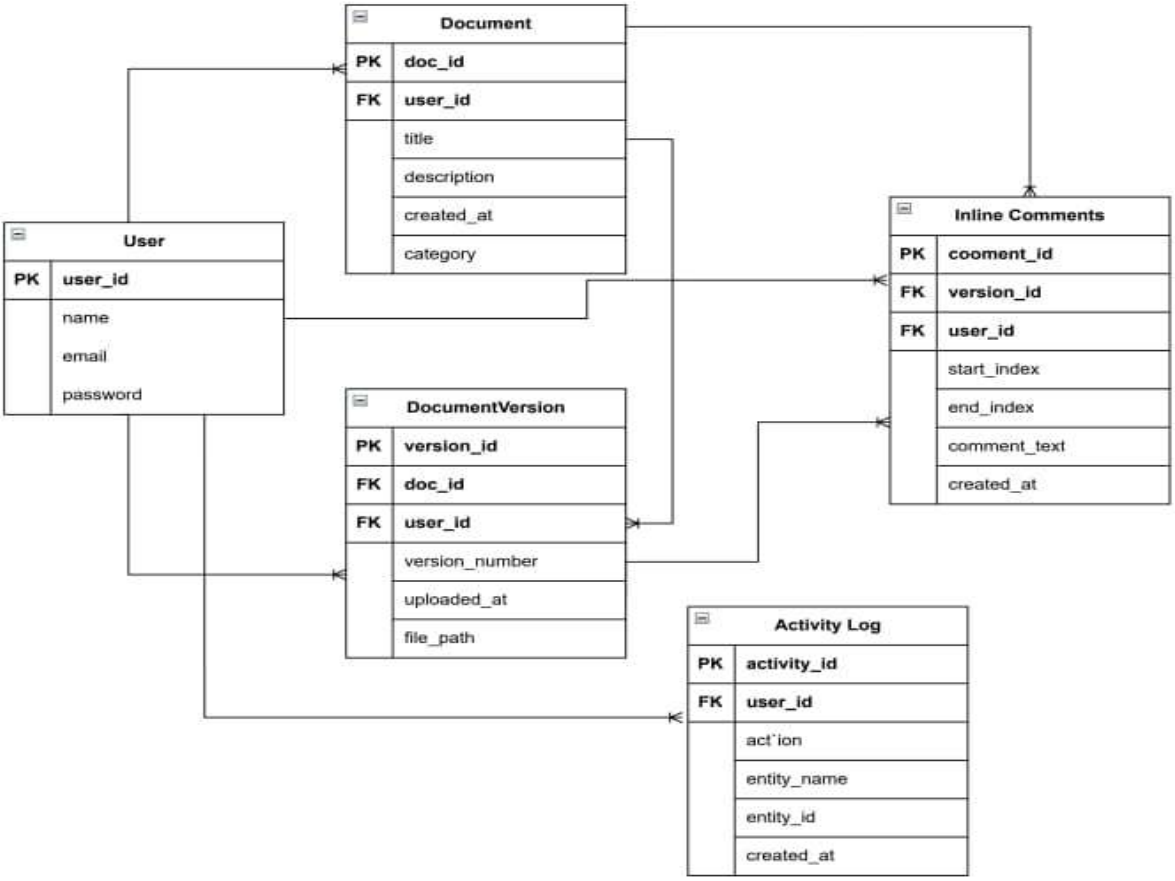
SOFTWARE REQUIREMENTS

- **Operating System:** Windows 10 / Linux
- **Frontend:** React.js
- **Backend:** ASP.NET Core
- **Database:** SQL Server
- **Real-Time Communication:** SignalR / WebSockets
- **Web Browser:** Google Chrome, Microsoft Edge, Mozilla Firefox
- **Development Tools:** Visual Studio, Visual Studio Code
- **Version Control:** Git

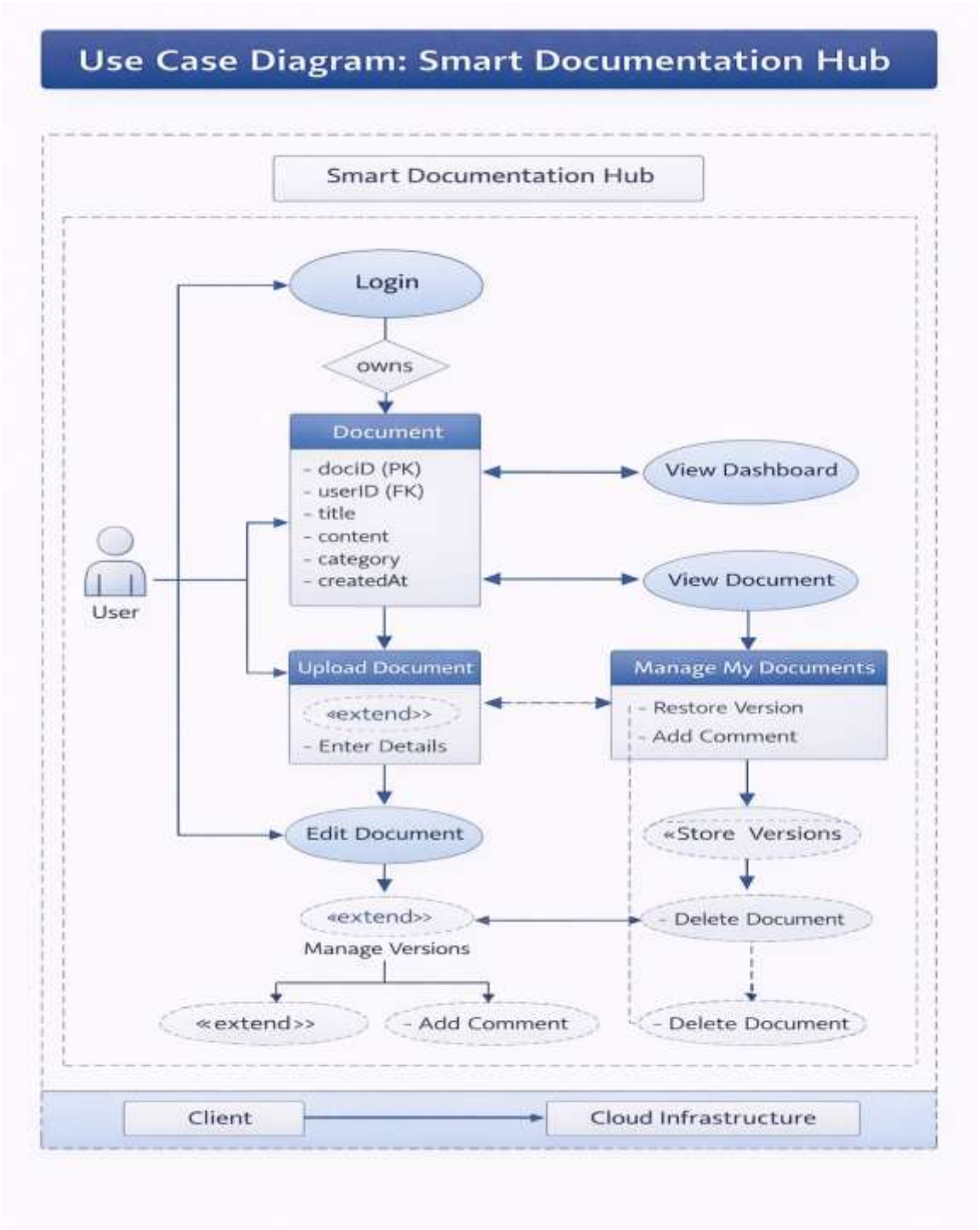
6.1 DATA FLOW DIAGRAM



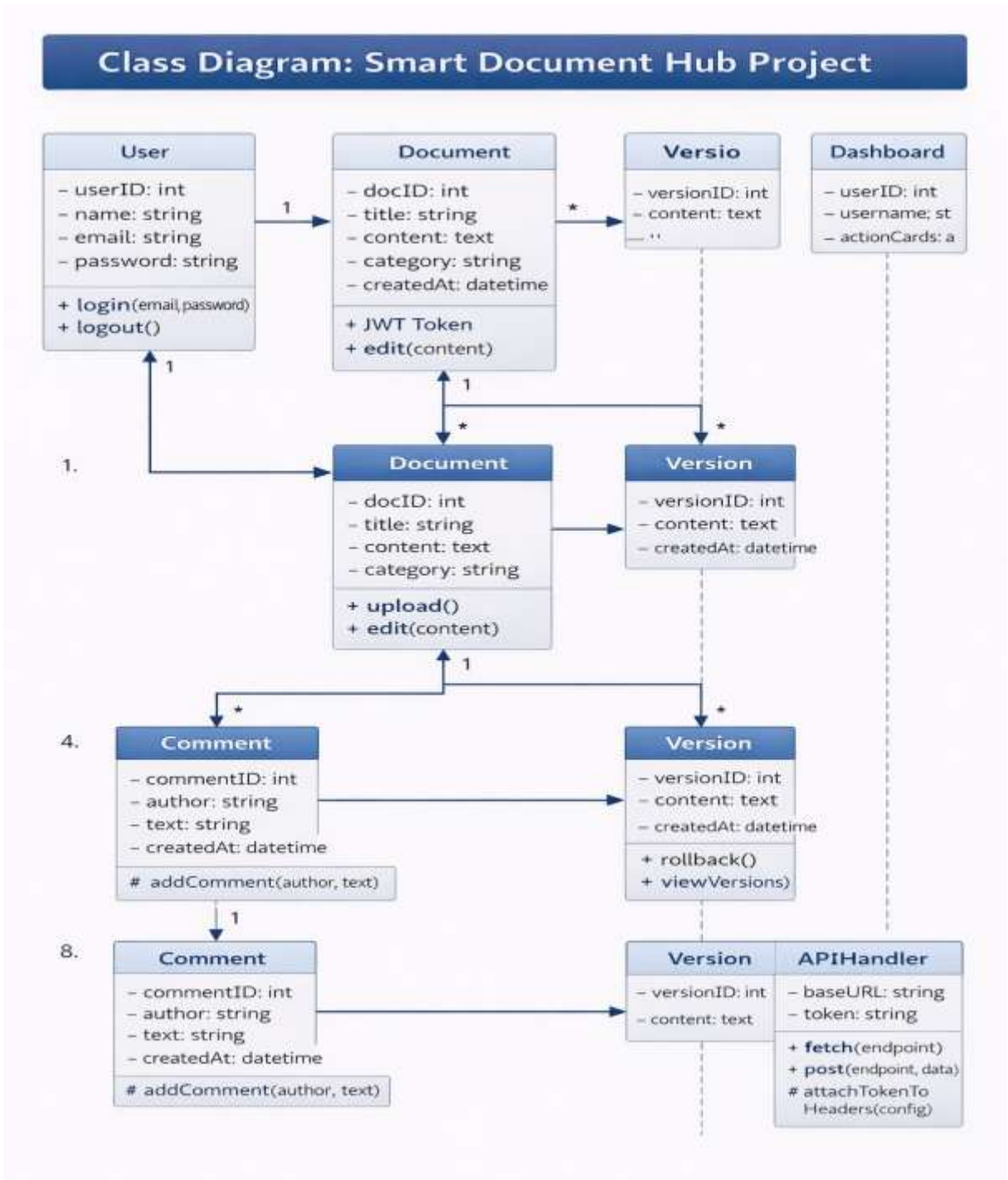
6.2 ENITITY-RELATIONSHIP DIAGRAM



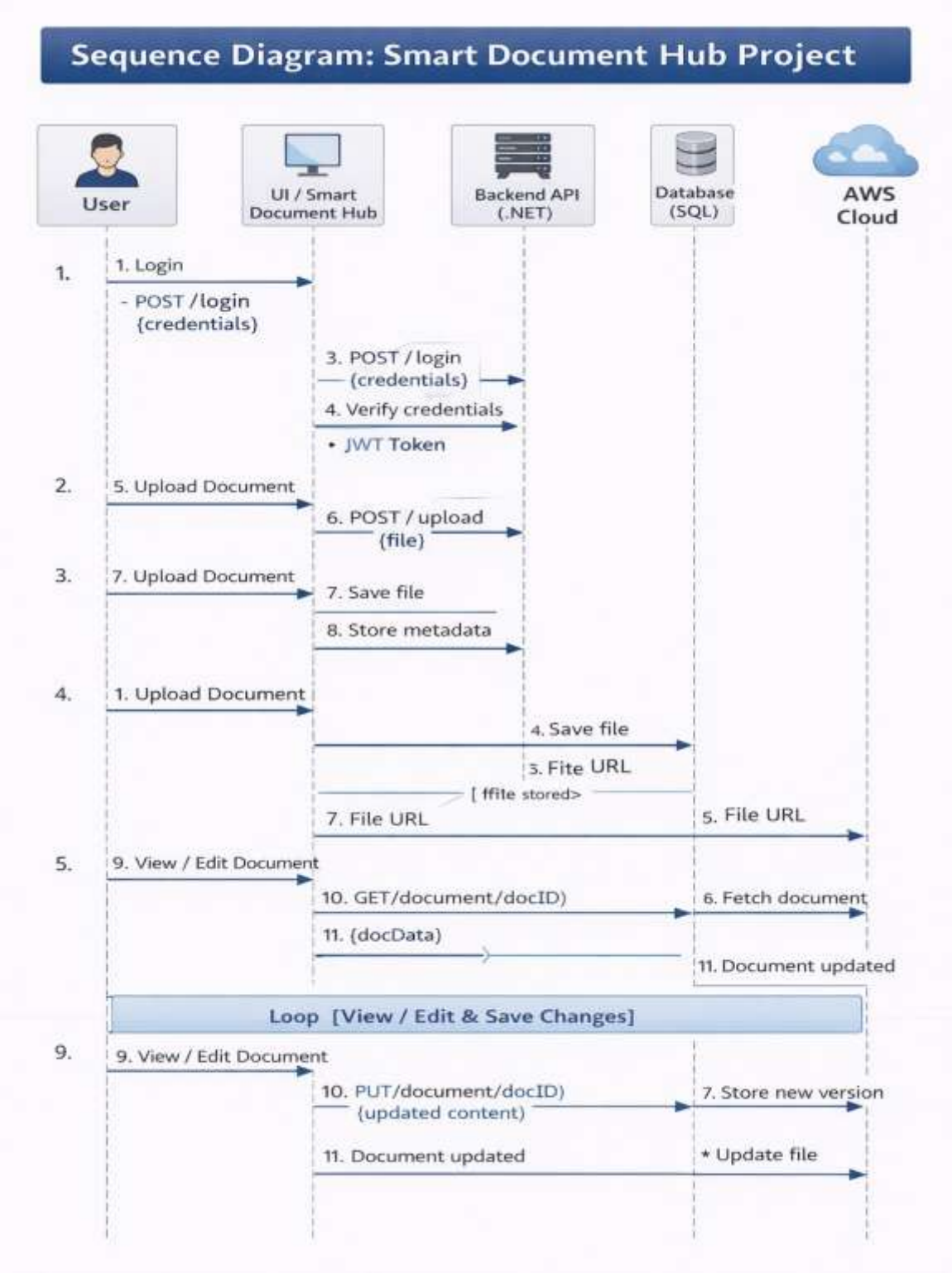
6.3 USE CASE DIAGRAM



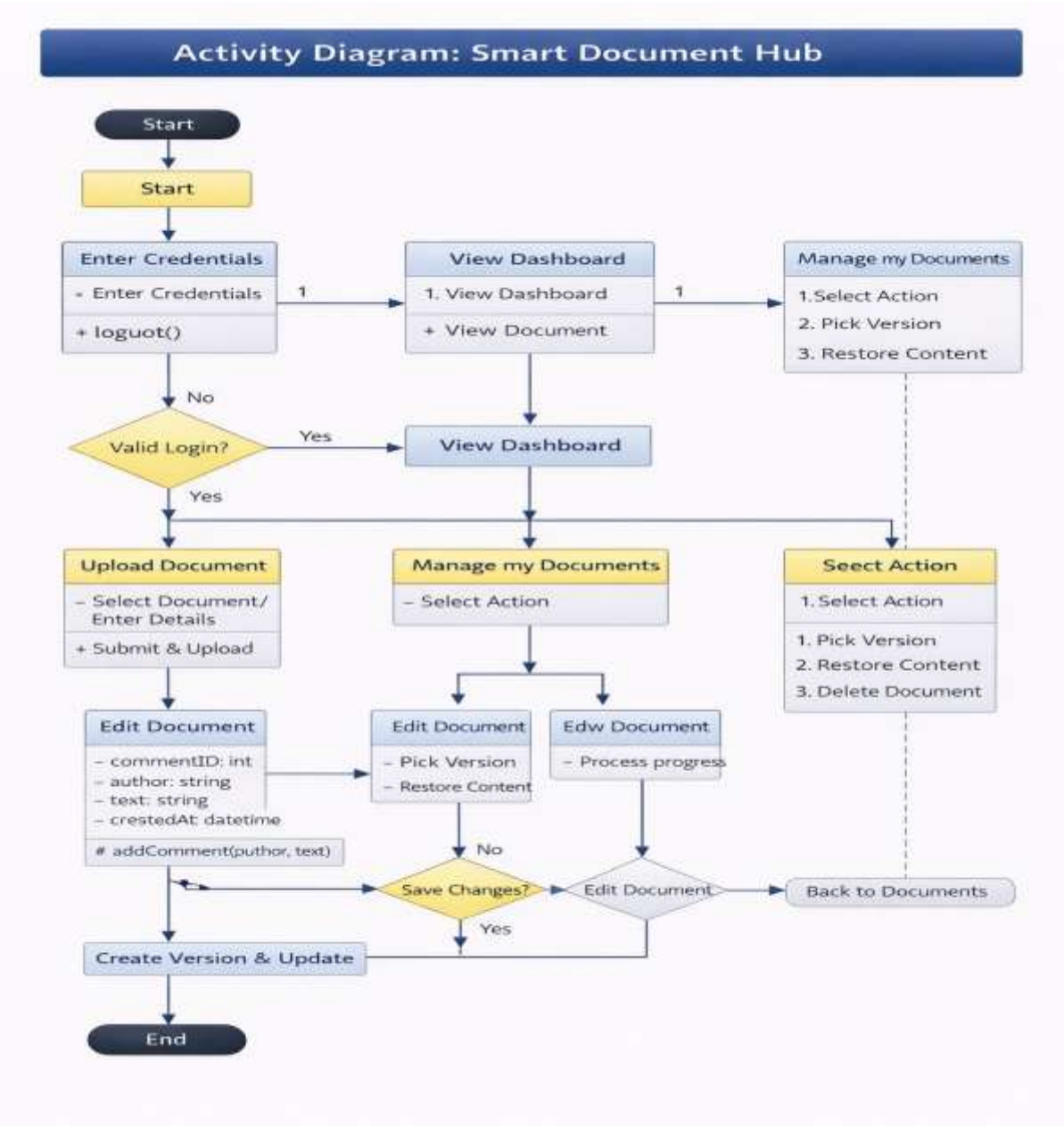
6.4 CLASS DIAGRAM



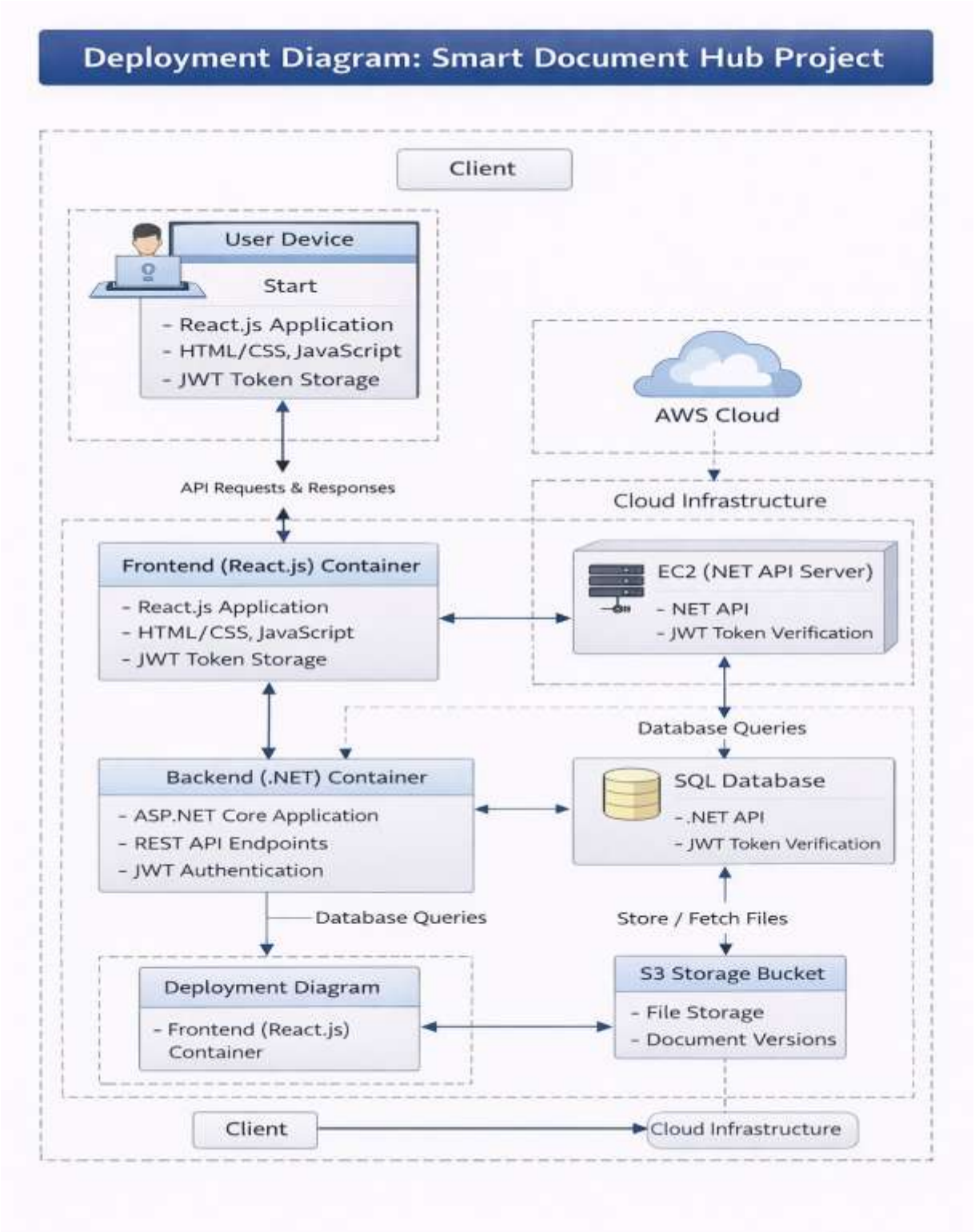
6.5 SEQUENCE DIAGRAM



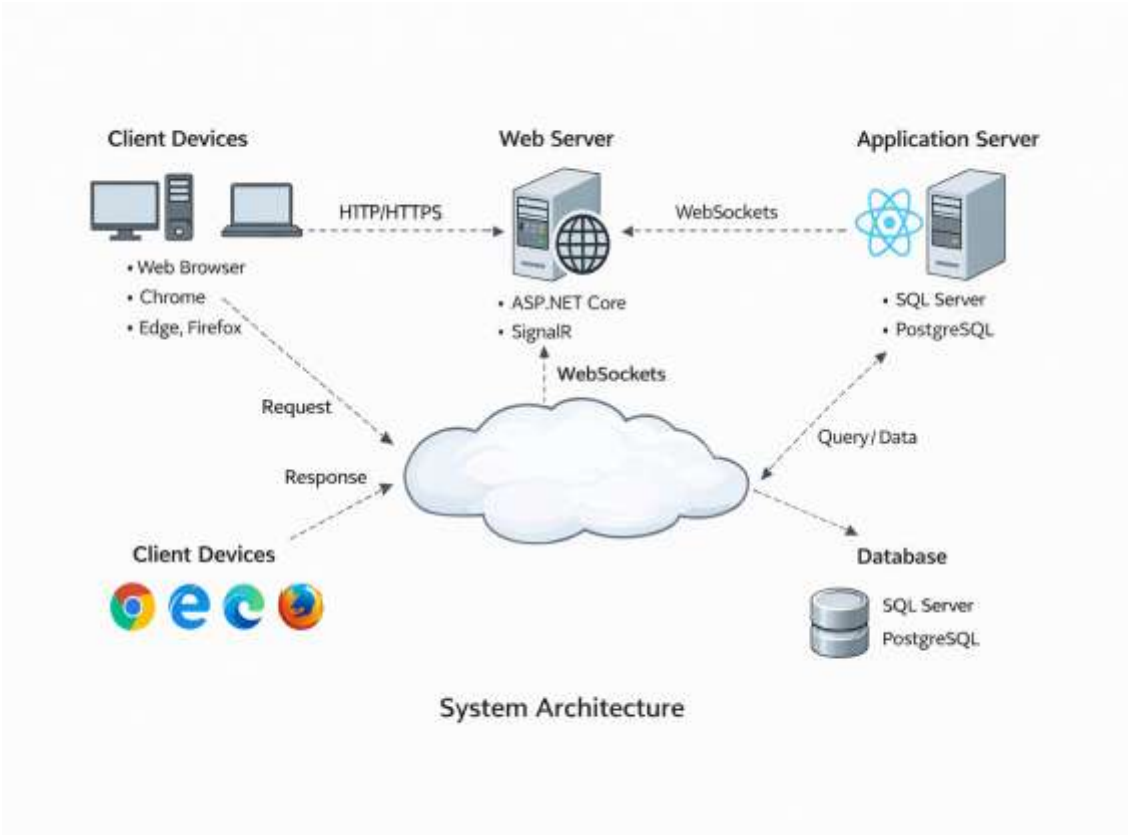
6.6 ACTIVITY DIAGRAM



6.7 DEPLOYMENT DIAGRAM

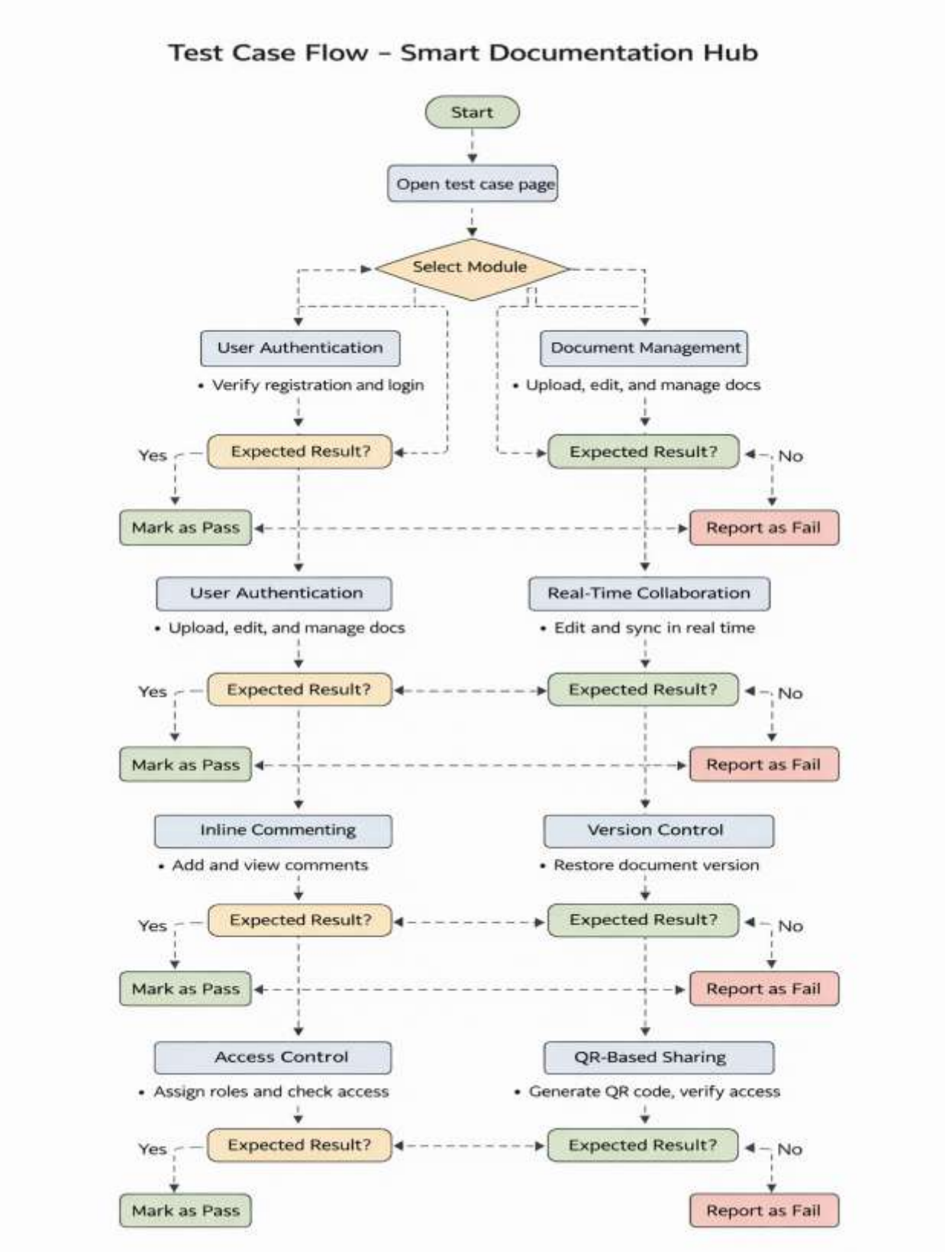


6.8 SYSTEM ARCHITECTURE

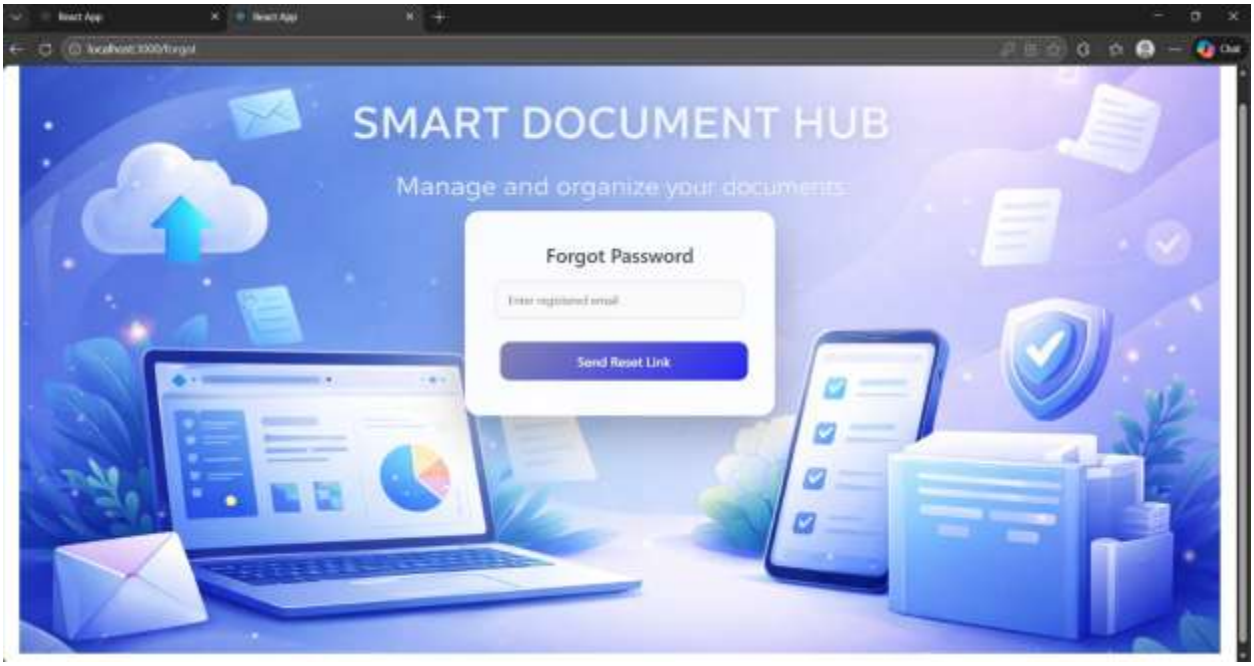


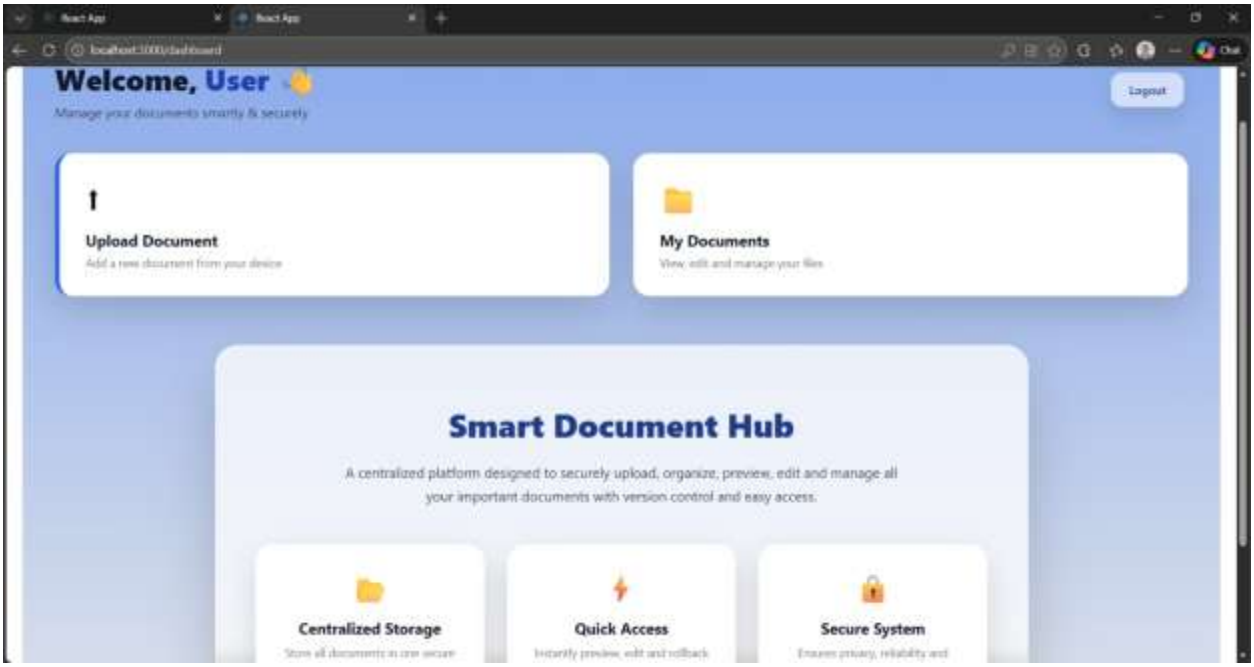
System Architecture

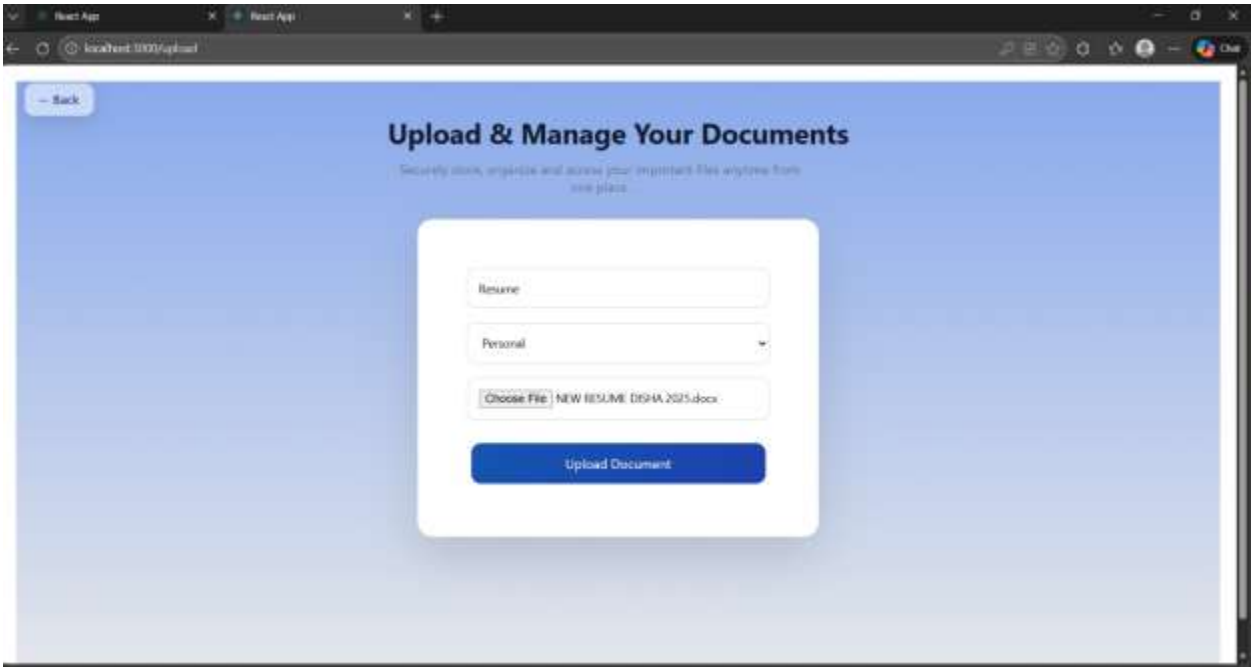
7. Test Cases

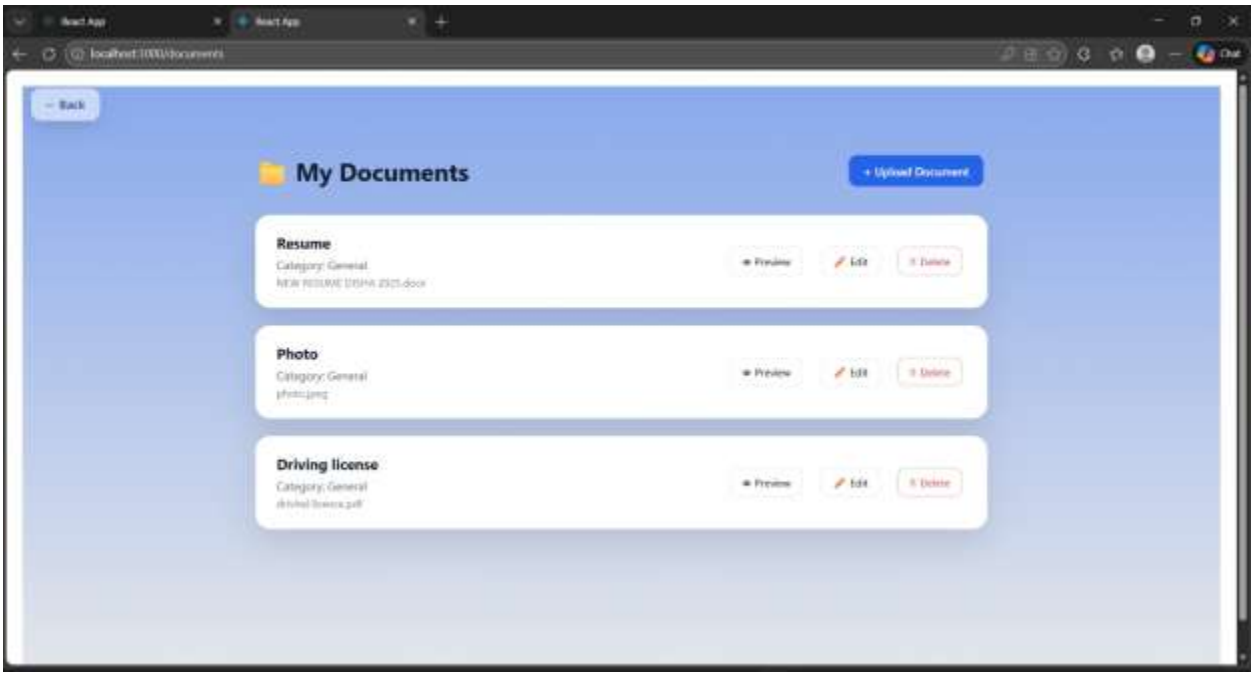

Test Case Flow – Smart Documentation Hub
Start
Open test case page
Select Module
User Authentication
• Verify registration and login
Document Management
• Upload, edit, and manage docs
Expected Result?
Yes
No
Mark as Pass
Report as Fail
User Authentication
• Upload, edit, and manage docs
Real-Time Collaboration
• Edit and sync in real time
Expected Result?
Yes
No
Mark as Pass
Report as Fail
Inline Commenting
• Add and view comments
Version Control
• Restore document version
Expected Result?
Yes
No
Mark as Pass
Report as Fail
Access Control
• Assign roles and check access
QR-Based Sharing
• Generate QR code, verify access
Expected Result?
Yes
No
Mark as Pass
Report as Fail

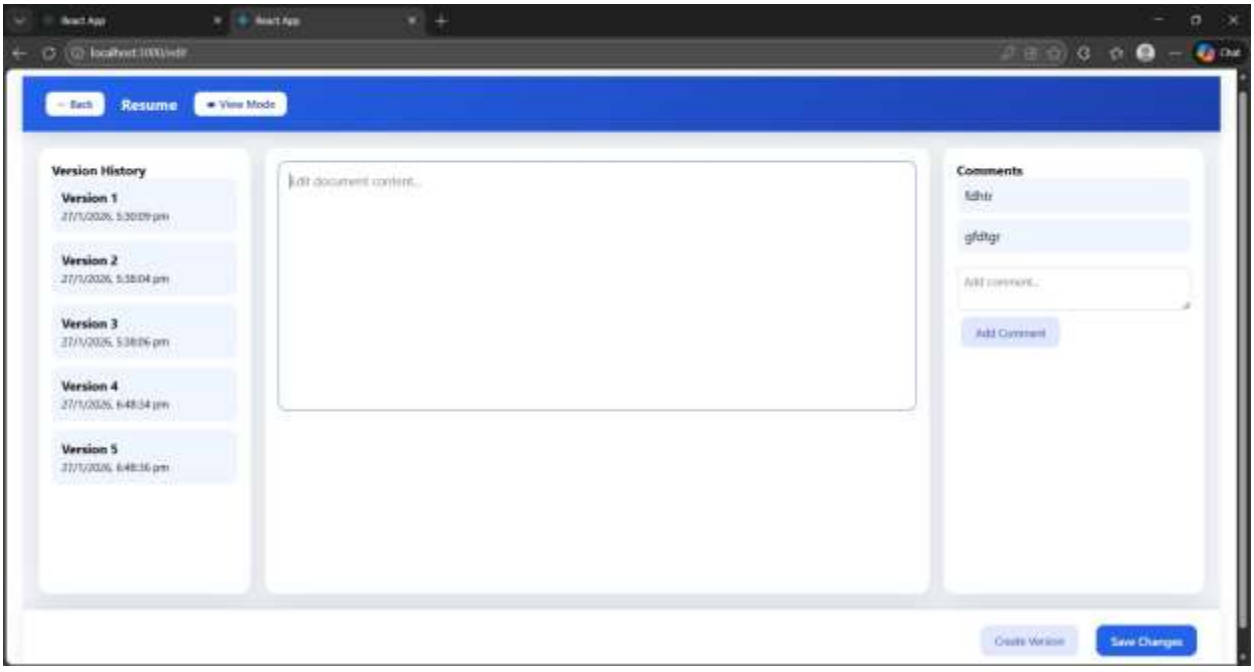
8. SCREEN SHOTS




Welcome, User
Logout
Upload Document
My Documents
Smart Document Hub
A centralized platform designed to securely upload, organize, preview, edit and manage all your important documents with version control and easy access.
Centralized Storage
Quick Access
Secure System


Back
Upload & Manage Your Documents
Resume
Personal
Choose File
Upload Document


Back
My Documents
+ Upload Document
Resume
Category: General
Preview
Edit
Delete
Photo
Category: General
Preview
Edit
Delete
Driving license
Category: General
Preview
Edit
Delete


Back
Resume
View Mode
Version History
Version 1
Version 2
Version 3
Version 4
Version 5
Comments
fdhtr
gfdtgr
Add Comment
Save Changes

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