



INSTITUTE FOR ADVANCED COMPUTING AND SOFTWARE DEVELOPMENT, AKURDI, PUNE

"CoinBank-Digital Wallet Application"

PG-DAC February 2025 Submitted By: Group No:27

Roll No. Name of Student

252197 Samruddhi Pawar 252095 Sneha Chunchuwar

Mrs. Monika Sindhikar Project Guide **Mr. Prashant Deshpande** Centre Coordinator

ABSTRACT

CoinBank is a web-based digital wallet system designed to simplify and secure digital currency transactions. It allows users to conveniently load funds, transfer money to other users, and withdraw funds, all through a unified online platform. The application ensures the safety of user data by encrypting personal credentials and storing financial information in a secure database. CoinBank is developed using technologies like React and Redux for a dynamic and responsive front-end, and Spring Boot for a robust and scalable backend API. Security is further enhanced through Spring Security for user authentication and authorization.

CoinBank is a reliable and scalable application designed to streamline digital transactions and provide users with a modern, user-friendly financial tool. The project aims to address the growing need for secure, fast, and accessible digital wallet solutions by delivering a platform modeled after popular services like Paytm. Built using React for the front end and Spring Boot for the back end, CoinBank offers a seamless experience for managing digital funds and supports essential features such as wallet top-up, peer-to-peer transfers, and secure withdrawals.

ACKNOWLEDGEMENT

I would like to take this opportunity to sincerely thank the Almighty for His blessings, grace, and guidance, which have played a vital role in the successful completion of this project. I am deeply grateful to my esteemed guide, Mrs. Monika Sindhikar, for her continuous support, valuable insights, and encouragement at every crucial stage of this work. I would also like to express my sincere appreciation to our respected Centre Coordinator, Mr Prashant Deshpande, for providing us with the necessary facilities and a conducive environment for learning and development. My heartfelt thanks extend to all the faculty members for their constant support, academic input, and motivation throughout the project. I am equally thankful to my peers and team members whose collaboration and assistance greatly contributed to the smooth execution of this endeavor.

Samruddhi Pawar (25024122165) Sneha Chunchuwar (250241220188)

Sr.No	Description	Page No.
1	Introduction	4
2	SRS	11
3	Diagrams	17
3.1	ER Diagram	17
3.2	Use Case Diagram	18
3.3	Data Flow Diagram	19
3.4	Activity Diagram	20
3.5	Class Diagram	23
3.6	Sequence Diagram	24
4	Database Design	25
5	Snapshots	31
6	Conclusion	43
7	Future Scope	44
8	References	45

1. INTRODUCTION

This Software Requirements Specification (SRS) provides a comprehensive and structured overview of the functional and non-functional requirements for the **CoinBank** digital wallet payment system. The document is intended to guide the design, development, and implementation of a secure, scalable, and user-friendly digital wallet platform.

CoinBank is designed as a dynamic platform supporting essential digital financial operations, enabling users to manage their funds with ease while providing administrative oversight and control through a dedicated admin interface. The system offers functionalities such as wallet top-up, peer-to-peer fund transfers, transaction history, and secure withdrawals, ensuring efficient and secure financial interactions.

The CoinBank platform consists of two integral components:

- **User Wallet Subsystem**: Provides wallet functionality for end-users to manage personal funds and perform digital transactions.
- Admin Subsystem: Enables system administrators to monitor user activity, manage accounts, and maintain platform integrity.

By integrating modern web technologies such as **React**, **Redux**, **Spring Boot**, and **Spring Security**, the CoinBank system ensures responsiveness, robustness, and secure access control. Payment transactions are securely processed via **Razorpay**.

CoinBank reflects the ongoing shift towards digital finance, promoting convenience, transparency, and financial inclusion in a secure digital ecosystem.

Key Functionalities:

☐ Separate login for customer and admin to ensure role-based access and functionality.
☐ Admin can easily add, update, or delete customer details, ensuring smooth customer
management.
☐ Customers can perform secure online transactions like fund transfers and bill payments
with ease.
☐ Admin has access to monitor all customer accounts and their transaction activities.
☐ Customers can view their transaction history and stay updated on their account activities
□ Profile management is simple — customers can update their personal details as needed.
□ Customers have the option to apply for fixed deposits (FD) or loans based on their
requirements.
☐ The application uses JWT (JSON Web Token) authentication to ensure secure login and
prevent unauthorized access.
☐ The system promotes a user-friendly interface for both admin and customers to navigate
with ease.
□ Designed to improve transparency, security, and efficiency in daily digital banking
operations.

1.1 Purpose

The purpose of CoinBank is to offer a secure and user-friendly digital banking platform that enables users to manage their financial accounts, perform fund transfers, and access essential banking services online. The system is designed to support both customer and admin roles, providing features such as user registration, account creation, transaction history tracking, and role-based dashboards. It ensures safe and authenticated access using JWT-based security and promotes operational efficiency by automating core banking functions. Through the use of modern web technologies and a layered backend architecture, CoinBank aims to deliver a seamless digital banking experience while maintaining high levels of data integrity, performance, and security..

1.2 Scope

The "CoinBank" digital wallet payment service serves as a comprehensive platform for secure and seamless financial transactions. It enables users to effortlessly manage their funds, engage in peer-to-peer money transfers, and conduct transactions with various online merchants. By creating a secure and user-friendly ecosystem, the project enhances financial inclusivity and empowers users with a digital wallet solution that adapts to modern finance trends.

The "CoinBank" project is designed to facilitate interactions between users and sellers on a global scale. Users can easily add funds to their digital wallets, make swift money transfers, and engage in online transactions with confidence. The service stands out for its ability to offer users a convenient way to manage their financial activities from a remote location, eliminating the need for physical presence.

Key features, such as recommendation models and detailed transaction histories, provide users with personalized insights and help in discovering suitable products. These features, accompanied by secure money transactions and reliable delivery services, contribute to customer satisfaction and build a sense of trust within the user community.

The "CoinBank" project is dedicated to increasing sales and customer loyalty. Corporate goals involve optimizing management costs, ensuring customer satisfaction, and fostering long-term relationships. Embracing technology, innovative marketing strategies, and adaptive research and development efforts form the cornerstone of the project's growth strategy. The vision for "CoinBank" is to establish itself as a user-centric, efficient platform that caters to the evolving financial needs of both customers and sellers, creating a robust digital finance ecosystem.

1.3 Objective of Coin Bank Digital Wallet

The objectives of the Coin Bank Digital Wallet Application outline the primary goals that the system aims to achieve, providing clear guidance on its design, implementation, and operational focus. These objectives ensure that the system effectively supports the needs of its users while driving financial efficiency, security, and growth.

- 1. Secure Digital Transactions
- 2. Real-Time Account Management
- 3. Enhanced User Experience
- 4. Robust Security and Access Control
- 5. Scalable and Flexible Architecture
- 6. Comprehensive Financial Reporting and Analytics
- 7. Cost Optimization
- 8. Enhanced Customer Engagement.
- 9. Regulatory Compliance and Audit Readiness

10. Support for Future Growth and Integration

1.4 Functionalities Provided by Coin Bank Digital Wallet

1. User Management

o User Registration and Login:

- o Users can create accounts, log in securely, and manage their profiles.
- o Secure authentication and authorization using Spring Security with support for OTP verification.

Role-Based Access Control:

- o Different user roles (e.g., Admin, Customer) with specific permissions.
- o Admins can create and manage these roles and assign them to users.

o Profile Management:

- o Users can update personal details such as name, email, phone number, and address.
- o Password management features, including change and reset options with email/OTP verification.

2. Account and Wallet Management

Account Creation and Linking:

- o Customers can open digital wallet accounts and link them with bank accounts or cards.
- o Support for multiple wallet accounts under a single user profile.

Balance Management:

- o Real-time display of wallet balance and linked account details.
- o Instant updates after deposits, withdrawals, or transfers.

Transaction History:

o Detailed logs of transactions, including date, time, transaction ID, amount, and status.

3. Transaction Processing

Money Transfer:

- o Send and receive money instantly via UPI ID, wallet ID, or QR code scan.
- o Support for peer-to-peer (P2P) and peer-to-merchant (P2M) payments.

Bill Payments and Recharges:

o Pay utility bills, recharge mobile phones, and pay for subscriptions directly from the wallet.

Payment Integration:

o Integration with payment gateways for secure processing via UPI, credit/debit cards, and net banking.

Transaction Tracking:

o Users can track payment status in real-time, from initiation to completion.

• Receipts:

o Automatic generation of transaction receipts, downloadable in PDF format.

4. Customer Management

Customer Profiles:

o Maintain detailed profiles, including transaction history.

Rewards and Cashback:

o Implementation of loyalty rewards, cashback offers, and promotional discounts for active users.

Customer Support:

o In-app customer support via live chat, FAQs, and ticket-based query resolution.

Feedback and Ratings:

o Users can provide feedback on transactions or services, which can be reviewed by the admin.

5. Reporting and Analytics

Transaction Reports:

o Detailed reports on transaction volume, payment modes, and transaction success rates.

User Activity Reports:

o Analysis of login frequency, active users, and high-value transactions.

Revenue and Commission Reports:

o Reports showing revenue generated from transaction charges or commissions.

6. Security and Compliance

Data Encryption:

o End-to-end encryption of sensitive data such as payment details, passwords, and personal information.

Two-Factor Authentication:

o Secure login and transaction confirmation using OTP or biometric authentication.

○ Audit Trails:

o Logging of all critical actions like fund transfers, account modifications, and admin changes for accountability.

7. Customer Experience Enhancement

Quick Pay and QR Code Payments:

o Instant payments by scanning merchant or personal QR codes.

Saved Beneficiaries:

o Option to save frequently used payment accounts for faster transactions.

Multi-Device Access:

o Responsive design ensuring seamless operation on mobile devices, tablets, and desktops.

Push Notifications:

o Real-time alerts for payments, received money, offers, and account activity.

8. Integration and Extensibility

API Integration:

o RESTful APIs for integrating Coin Bank with e-commerce platforms,

merchant POS systems, and third-party apps.

Third-Party Services:

o Integration with bill payment services, recharge APIs, and loyalty platforms.

Banking Integration:

o Direct integration with partner banks for instant settlement and fund transfers.

2. SOFTWARE REQUIREMENT SPECIFICATION

The functional requirements for Coin Bank Digital Wallet outline the specific features and capabilities that the system must provide to meet the needs of its users. These requirements are essential for guiding the development process and ensuring that the final product aligns with the business objectives.

2.1 Functional Requirements for Coin Bank Digital Wallet

1. User Management

• User Registration:

The system shall allow new users to create an account by providing personal details, such as name, email, mobile number, and password.

• User Authentication:

The system shall authenticate users during login using their registered credentials (email/phone and password) along with optional OTP verification.

Role-Based Access Control:

The system shall support role-based access, where different users (Admin, Customer) have specific permissions.

• Profile Management:

Users shall be able to view and update their profiles, including personal details and passwords.

2. Account and Wallet Management

Wallet Creation and Linking:

The system shall allow customers to create a digital wallet account and link it to their bank account or card.

• Balance Management:

The system shall display the current wallet balance in real time and update it after every transaction.

• Transaction History:

The system shall maintain a detailed log of all transactions, including date, time, transaction ID, amount, and status.

3. Transaction Processing

Money Transfer:

The system shall enable users to transfer money to other wallet users via UPI ID, wallet ID, or QR code.

Bill Payments and Recharges:

The system shall allow users to pay utility bills, recharge mobiles, and pay for subscriptions directly from the wallet.

Payment Processing:

The system shall integrate with secure payment gateways to support multiple payment methods, including UPI, credit/debit cards, and net banking.

• Transaction Tracking:

The system shall allow users to track the status of payments in real time.

• Invoicing and Receipts:

The system shall automatically generate digital receipts for all completed transactions, available for download.

4. Customer Management

Customer Profiles:

The system shall maintain detailed profiles for each customer, including personal details, linked accounts, and transaction history.

Rewards and Cashback:

The system shall support loyalty rewards and cashback programs for active users.

• Customer Support:

The system shall provide in-app customer support via live chat, FAQs, and ticket-based query handling.

Feedback and Ratings:

Customers shall be able to provide feedback and rate the service.

5. Reporting and Analytics

Transaction Reports:

The system shall generate reports on transaction volumes, payment methods, and success/failure rates.

• User Activity Reports:

The system shall generate reports on active users, frequent transactions, and high-value payments.

• Revenue Reports:

The system shall generate reports on earnings from transaction fees or commissions.

Fraud Detection Reports:

The system shall provide analytics to detect unusual or suspicious transaction patterns.

6. Security

Data Encryption:

The system shall encrypt sensitive information, such as payment details, passwords, and personal data, using strong encryption algorithms.

Authentication and Authorization:

 The system shall enforce secure login with password hashing, OTP verification, and rolebased access.

2.2 Non-Functional Requirements for Coin Bank Digital Wallet

1. Performance

Response Time:

The system shall respond to user actions, such as balance checks, money transfers, or bill payments, within **2 seconds** under normal operating conditions.

Scalability:

The system shall handle a growing number of users and transactions without performance degradation, supporting at least **50,000 concurrent users** during peak hours.

• Throughput:

The system shall process at least **200 transactions per second** during high-demand periods.

2. Reliability

Availability:

The system shall maintain an uptime of **99.9%** over a 12-month period, ensuring that wallet services remain accessible at all times.

• Fault Tolerance:

The system shall continue to function in the event of partial hardware or software failures, with minimal disruption to ongoing transactions.

• Error Handling:

The system shall gracefully handle transaction failures or errors and provide meaningful messages to users, with clear steps for resolution.

3. Usability

• User Interface:

The system shall have a clean, intuitive, and responsive interface for both mobile and desktop devices, ensuring minimal learning curve for new users.

4. Maintainability

Modularity:

The system shall follow a modular design, enabling updates or enhancements to individual components (e.g., payment gateway, reporting module) without affecting the entire platform.

• Code Quality:

The system shall follow clean coding practices with proper documentation, naming conventions, and maintainable code structure.

• Testing:

The system shall undergo comprehensive testing, including unit testing, integration testing, security testing, and user acceptance testing, to ensure stability and security.

5. Other Requirements

Hardware and Network Interfaces:

Back-end Server Configuration:

- Intel Core i7 Processor (or equivalent)
- 16 GB RAM
- 500 GB SSD Storage
- High-speed internet connection with secure firewall

Front-end Client Configuration:

- AMD Ryzen 5 Processor (or equivalent)
- 8 GB RAM

- 256 GB SSD Storage
- 104 Keys Keyboard
- Optical Mouse or Touchpad
- Stable broadband or 4G/5G internet connection

Software Interfaces:

Software configuration for Back-end Services:

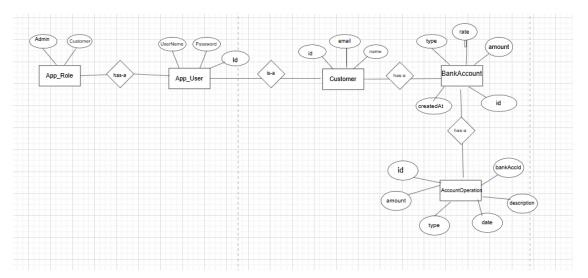
- Java EE
- Spring Boot, JPA/Hibernate, Spring Security, UPI/Payment Gateway API Integration
- MySQL Database
- STS (Spring Tool Suite) 4.x or IntelliJ IDEA

Software configuration for Front-end Services:

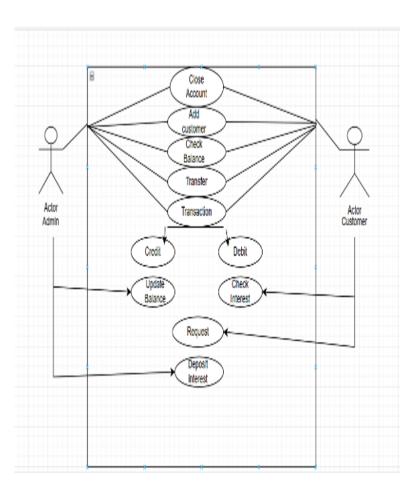
- ReactJS, Redux
- HTML, CSS, JavaScript
- Bootstrap or Material UI
- Visual Studio Code

1. Diagrams

1.1 Entity Relationship Diagram:

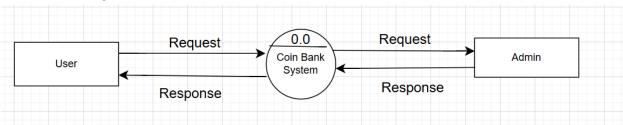


1.2 Use Case Diagram:

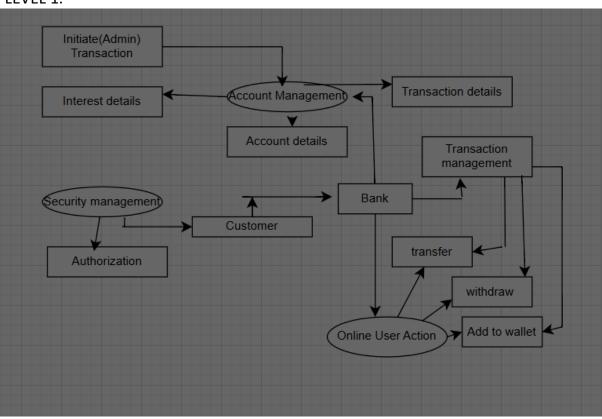


1.3 Data Flow Diagram:

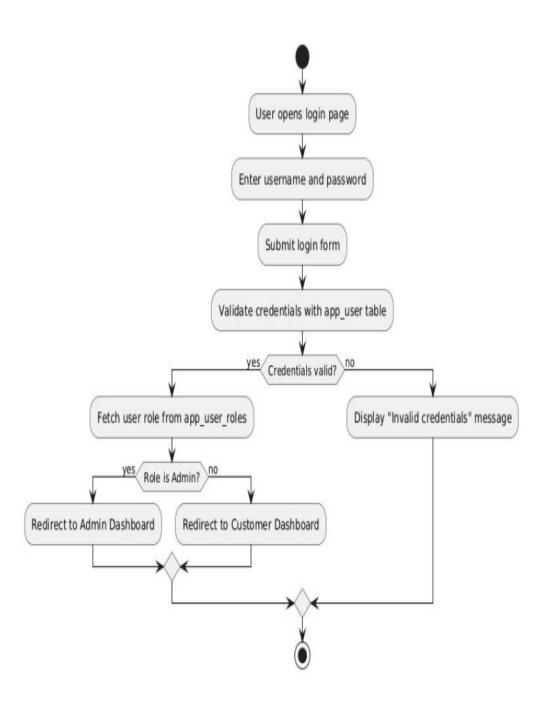
LEVEL 0:

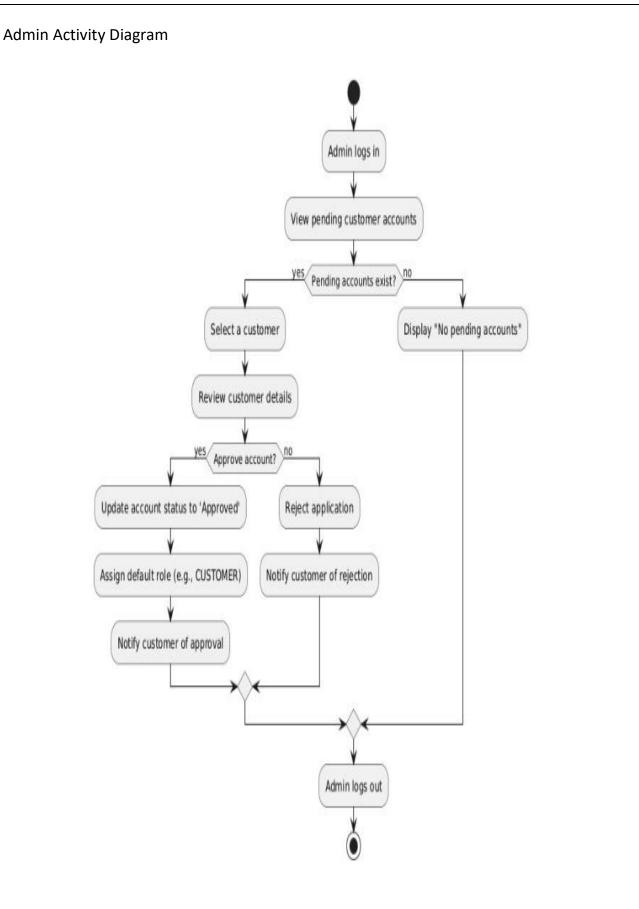


LEVEL 1:



1.4 Activity Diagram

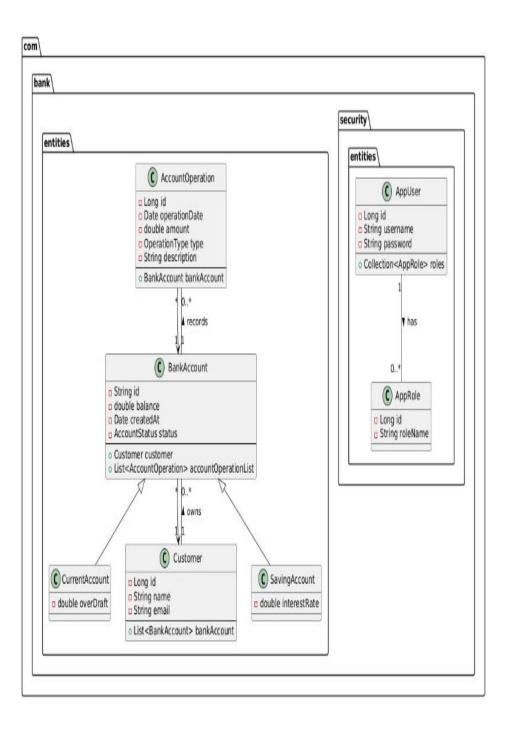




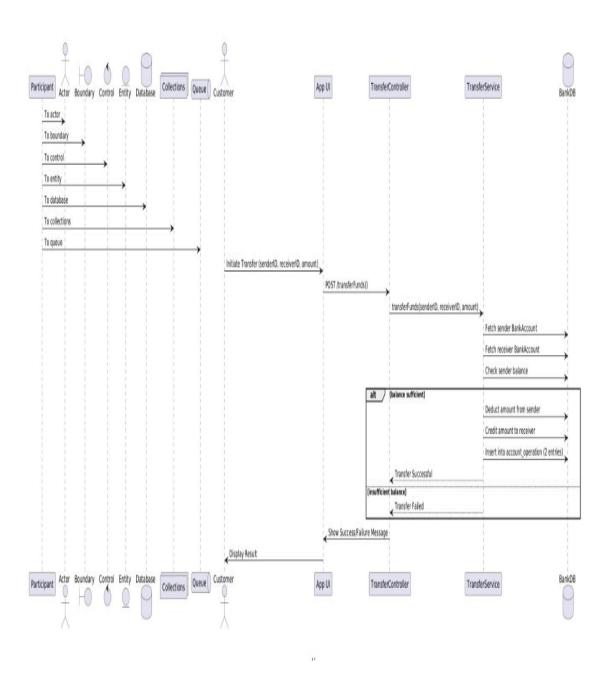
1.4.1 Customer Activity Diagram



1.5 Class Diagram:

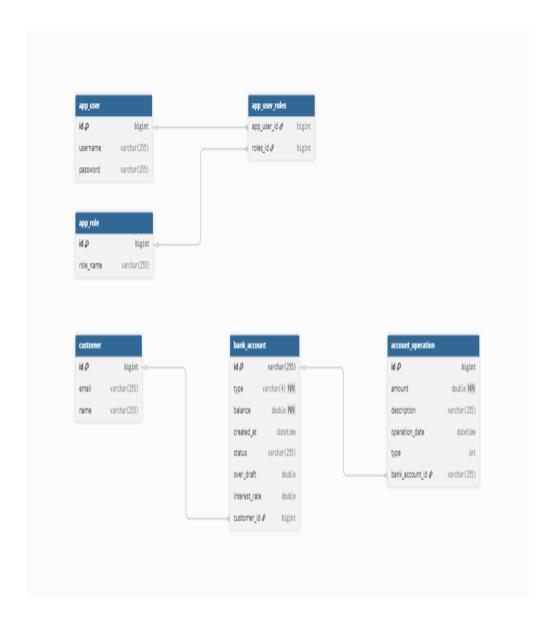


1.6 Sequence Diagram:



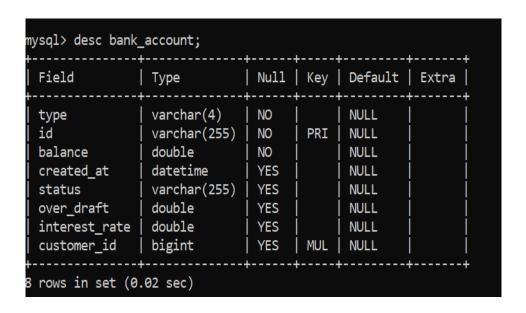
2. DATABASE DESIGN

2.1 Design



2.2 Tables:

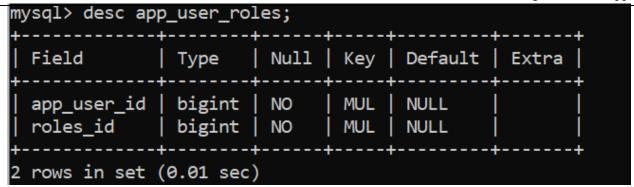
The following tables structures depict the database design



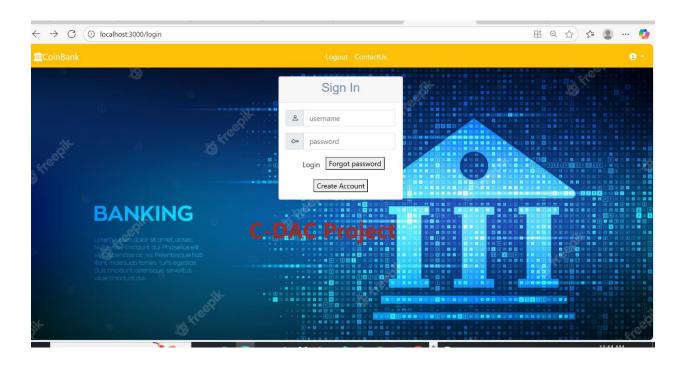
```
mysql> desc customer;
 Field | Type
                         Null
                                 Key
                                       Default
                                                  Extra
          bigint
                                                  auto_increment
 id
                         NO
                                 PRI
                                       NULL
 email
         varchar(255)
                         YES
                                       NULL
          varchar(255)
                                       NULL
                         YES
 rows in set (0.00 sec)
```

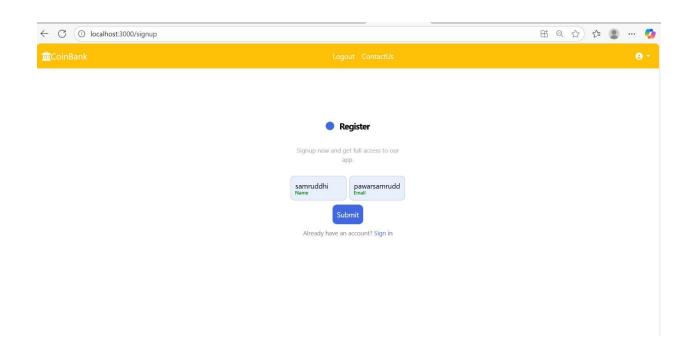
```
mysql> desc account operation;
 Field
                                | Null | Key |
                                             Default
                                                       Extra
                                        PRI
 id
                  bigint
                                 NO
                                             NULL
                                                       auto_increment
 amount
                  double
                                 NO
                                             NULL
 description
                 varchar(255)
                                 YES
                                             NULL
 operation_date | datetime
                                YES
                                             NULL
                  int
                                YES
                                             NULL
 bank_account_id | varchar(255) | YES
                                      MUL NULL
 rows in set (0.01 sec)
```

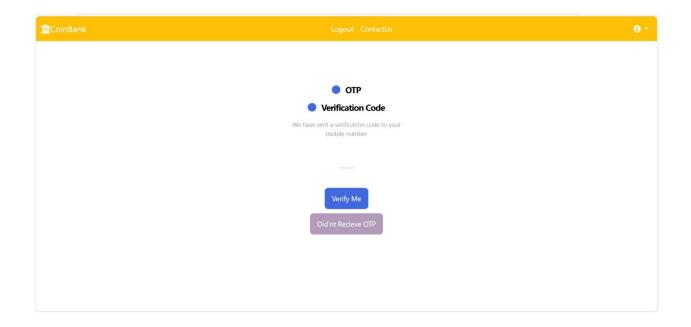
```
mysql> desc app_user;
 Field
            Type
                          Null | Key | Default | Extra
 id
            bigint
                           NO
                                  PRI
                                        NULL
                                                  auto_increment
            varchar(255)
                           YES
                                        NULL
 password
 username | varchar(255)
                           YES
                                        NULL
3 rows in set (0.01 sec)
```



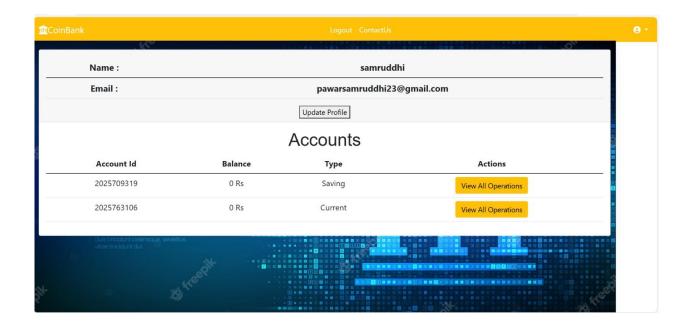
3. SNAPSHOTS

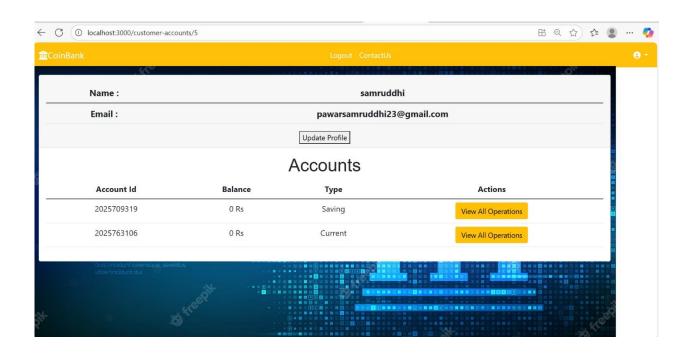


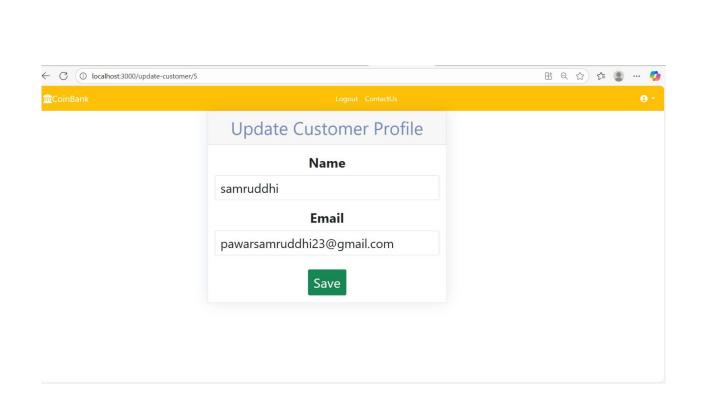


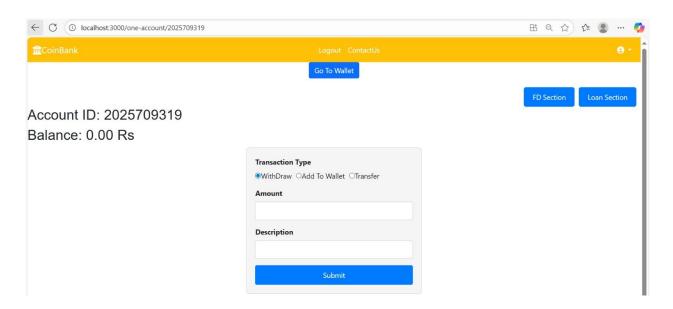


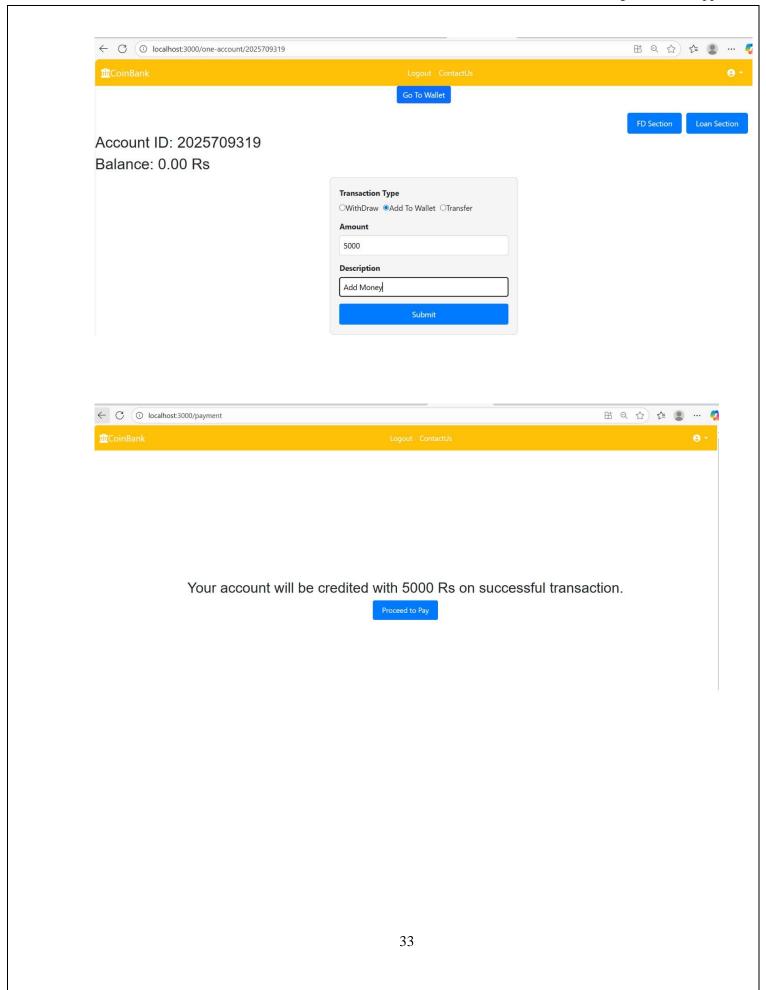


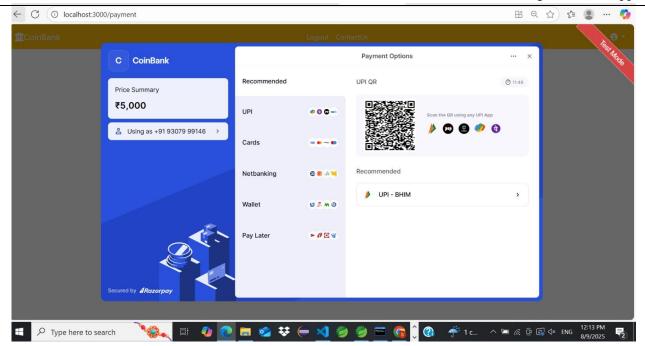


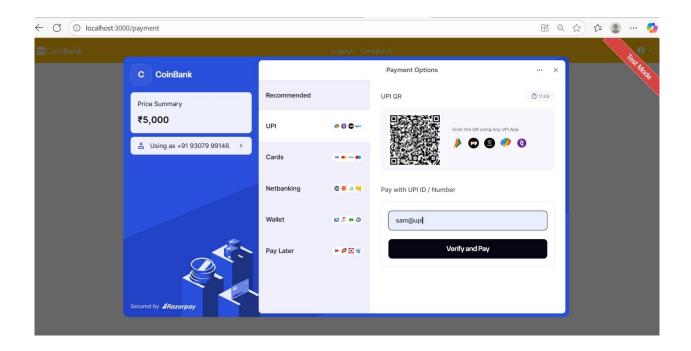


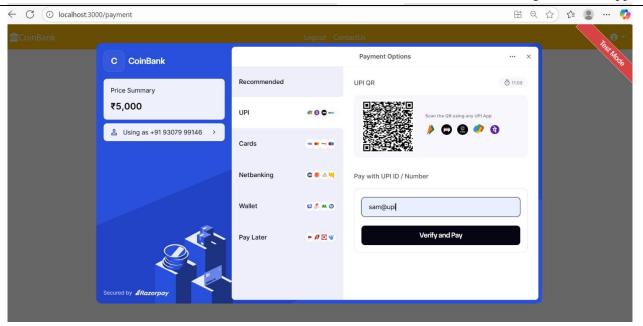


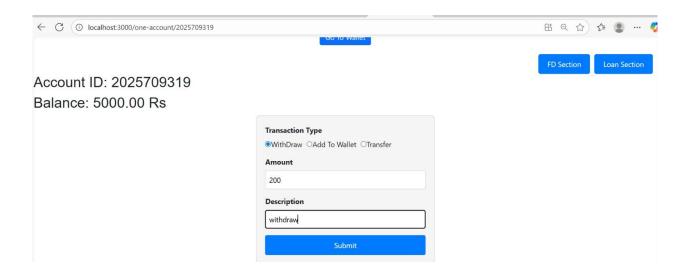


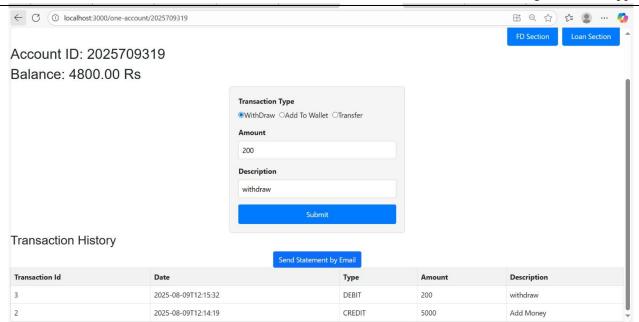


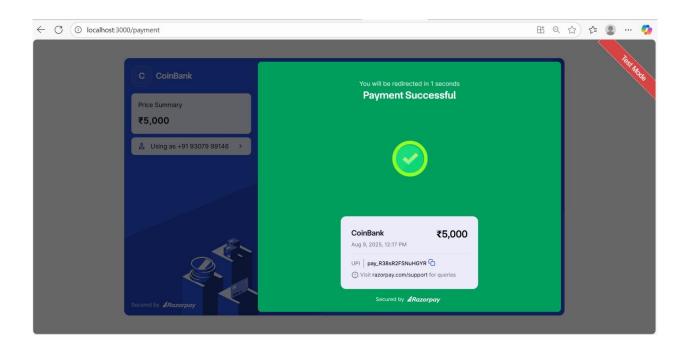


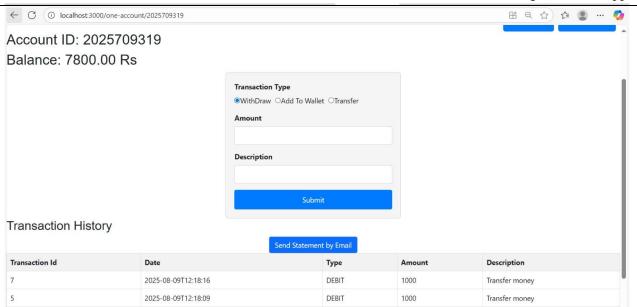


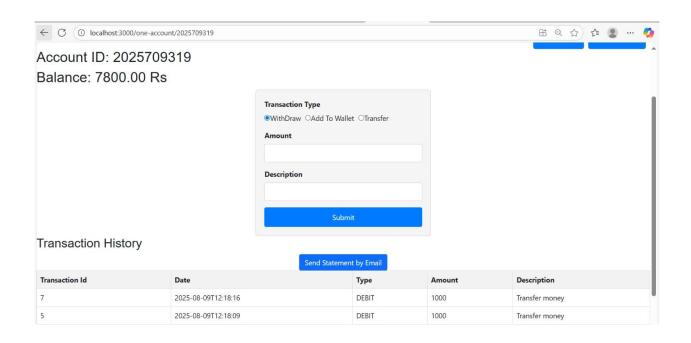


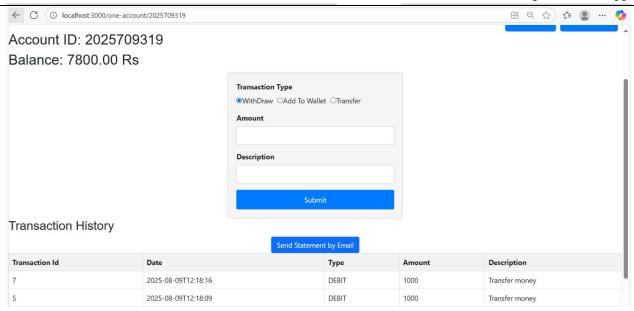


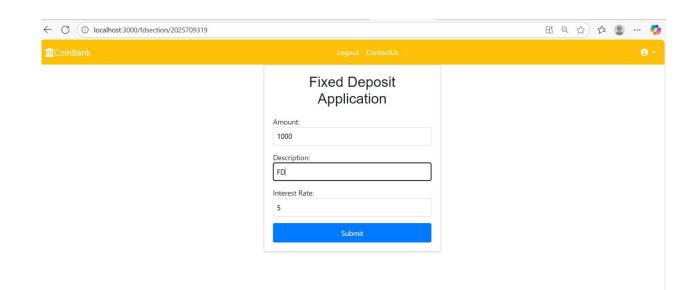


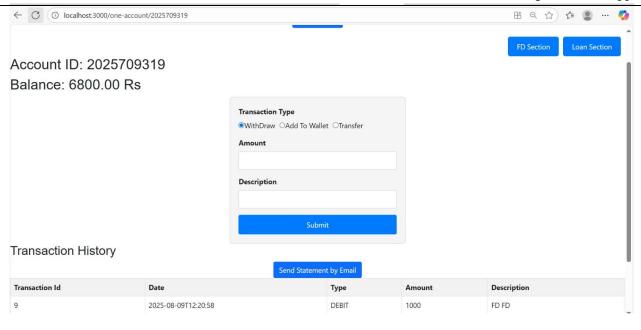


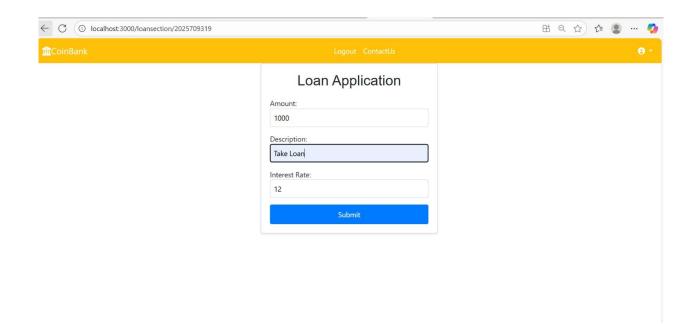


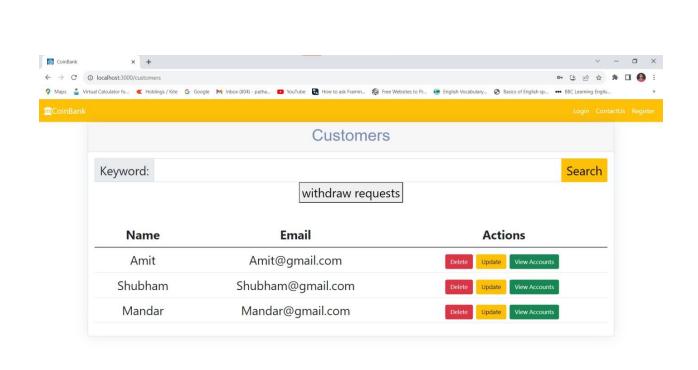




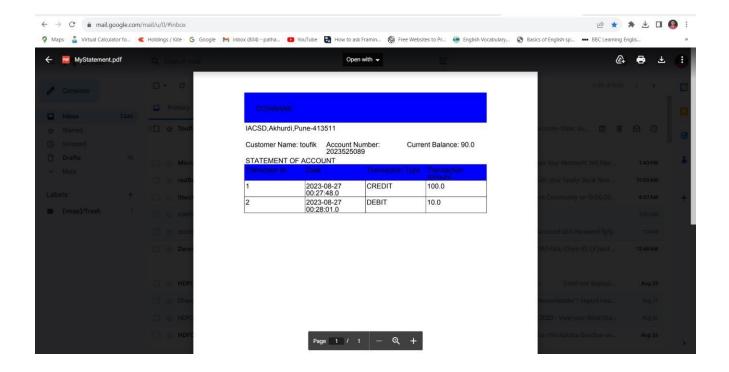


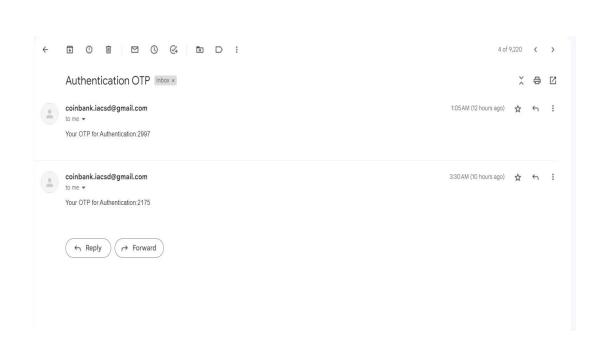


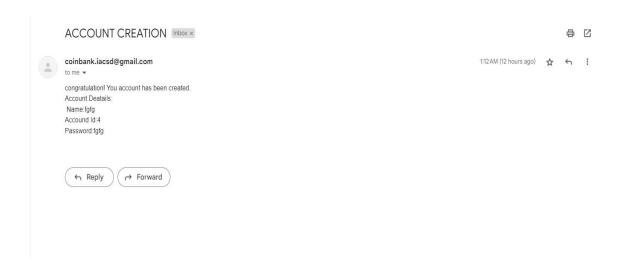












4.CONCLUSION

The "CoinBank" digital wallet payment service project has been brought to a successful culmination, fulfilling its intended objectives and purposes. The endeavor to create a secure, efficient, and user- centric digital wallet ecosystem has been achieved with diligence, resulting in a system that empowers users and facilitates seamless financial interactions.

Throughout the course of this project, significant strides have been made in the domain of modern digital finance. The project's success is attributed to its error-free development, efficiency, and time- saving capabilities. The core aim of developing a digital wallet service to streamline financial activities and online transactions has been realized effectively.

The project's implementation journey was both educational and enlightening. The utilization of cutting-edge technologies like React.js, responsive templates, REST APIs, and MySQL database management enriched our practical knowledge. The development process further deepened our understanding of software development life cycles and project management phases. Rigorous testing methodologies were employed to ensure the system's robustness and reliability.

In the context of future prospects, the "CoinBank" digital wallet payment service holds immense potential for expansion and enhancement. Possibilities for integrating features such as detailed product descriptions, user feedback mechanisms, and online payment methods exist. As the digital finance landscape evolves, the "CoinBank" project is well-positioned to adapt and grow, contributing to the continued evolution of online financial platforms.

In conclusion, the completion of the "CoinBank" digital wallet payment service project signifies a successful endeavor in crafting an application that redefines how financial

transactions are conducted. This project not only serves as an achievement in itself but also sets the stage for ongoing innovation and refinement in the realm of digital wallet solutions.

5.Future Scope

Cross-Border Payments: The scope of digital payment wallets can expand to facilitate seamless cross-border payments. IoT and Wearables Integration: With the rise of Internet of Things (IoT) devices and wearable technology, payment wallets could extend their functionality to allow for convenient and secure payments through these devices. Contactless and NFC Payments: As contactless payments gain popularity, payment wallet systems could expand their support for near-field communication (NFC) technology. This enables users to make payments simply by tapping their smartphones or cards on compatible terminals. Personal Finance Management: Future payment wallet systems could evolve into comprehensive personal finance management platforms, providing users with insights into their spending patterns, budgeting tools, and investment recommendations.

4. REFERENCES

- [1] https://aws.amazon.com/solutions/case-studies/paytm/
- [2] https://www.storegrowers.com/google-gpay-case-studies
- [3] Mc Graw Hill's, Java: The complete reference 7thEdition, HerbertScheldt
- [4] https://www.geeksforgeeks.org/web-development-projects/

ONLINE REFERENCE

- [1] www.Google.com
- [2] www.w3school.com
- [1] www.javatpoint.com