Industrial Internship Report on

”Bank Management System”

Prepared by

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Executive Summary
This report provides details of the Industrial Internship provided by upskill Campus and The IoT Academy in collaboration with Industrial Partner UniConverge Technologies Pvt Ltd (UCT). This internship was focused on a project/problem statement provided by UCT. We had to finish the project including the report in 6 weeks’ time. My project was **Bank Management System based on core java”** This internship gave me a very good opportunity to get exposure to Industrial problems and design/implement solution for that. It was an overall great experience to have this internship.

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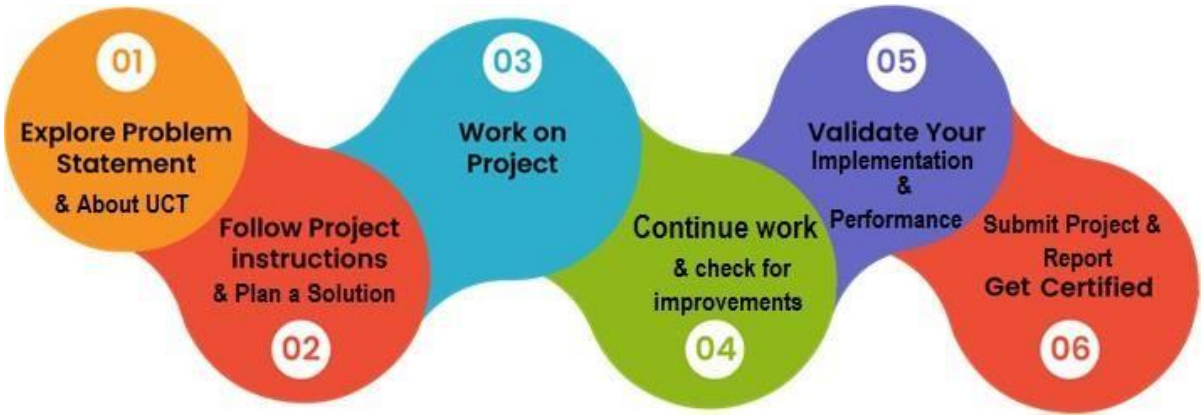
1 Preface

Relevant internships are crucial for building one's career as they provide practice experience, industry exposure, and the opportunity to develop essential skills. They bridge the gap between theoretical knowledge and real-world application, enhancing employability and opening doors to future job prospects.



Summary of 6 weeks music player application

- **Week1:** Learned about UniConverge Technologies and IoT academy.

  The first progress was to form a team to complete this project. And we had a team consisting of four members. We discussed about the internship program and the industry partner.

  To explore the projects given to us and to plan accordingly for coming weeks.

- **Week2**: assigned a project Bank Management System to do.

  Learned many basic requirements to meet the project.

  Learned about many libraries in java.

- **Week3**: Started understanding writing of code for interference.

Referred many GitHub codes to develop interface.

- **Week4:** Learned about GitHub and LinkedIn from different platforms like you tube and websites.

  Trying to reach the basic requirements of the application.

  Implemented the all the basic operation of application like pause, stop, play, duration.

- **Week5**: Understand what makes difference from other application, and tried to implement it.

- Add the feature like album, artist, favorites (add/remove from source library) and playlists (add/remove from playlist, create/remove playlists) etc.

- **Week6:** Completed project with all requirements.

  Add the project into GitHub.

- Gratitude towards internship provider: Being selected for an internship under USC/UCT is a significant opportunity. It provides a unique chance to work alongside esteemed faculty members, access advanced resources and facilities, and contribute to groundbreaking research. This internship enables students to enhance their knowledge, develop critical skills, and establish valuable connections in their field of interest. It is a prestigious opportunity that adds credibility to one's academic and professional profile, paving the way for future success and our career achievements.

- This project provided valuable learnings and an enriching overall experience. I gained practical knowledge in designing and developing a Music player application, utilizing programming languages, and tools. I enhanced my problem-solving skills, collaboration abilities, and project management capabilities. The project allowed me to understand the complexities of making separate playlist, import of local and online files, and user interface design. Overall, this project deepened my technical skills, expanded my understanding of the Music player, and provided a hands-on learning experience that will benefit my future endeavors.

- I would like to express my sincere gratitude to "Kaushlendra Singh Sisodia (Founder)" and the entire back-end team for their invaluable support and contributions throughout this project. The expertise and dedication have been instrumental in the successful implementation of the system. Thank you for your collaboration and assistance.

2 Introduction

2.1 About UniConverge Technologies Pvt Ltd

A company established in 2013 and working in Digital Transformation domain and providing Industrial solutions with prime focus on sustainability and RoI.

For developing its products and solutions it is leveraging various **Cutting Edge Technologies e.g. Internet of Things (IoT), Cyber Security, Cloud computing (AWS, Azure), Machine Learning, Communication Technologies (4G/5G/LoRaWAN), Java Full Stack, Python, Front end** etc.

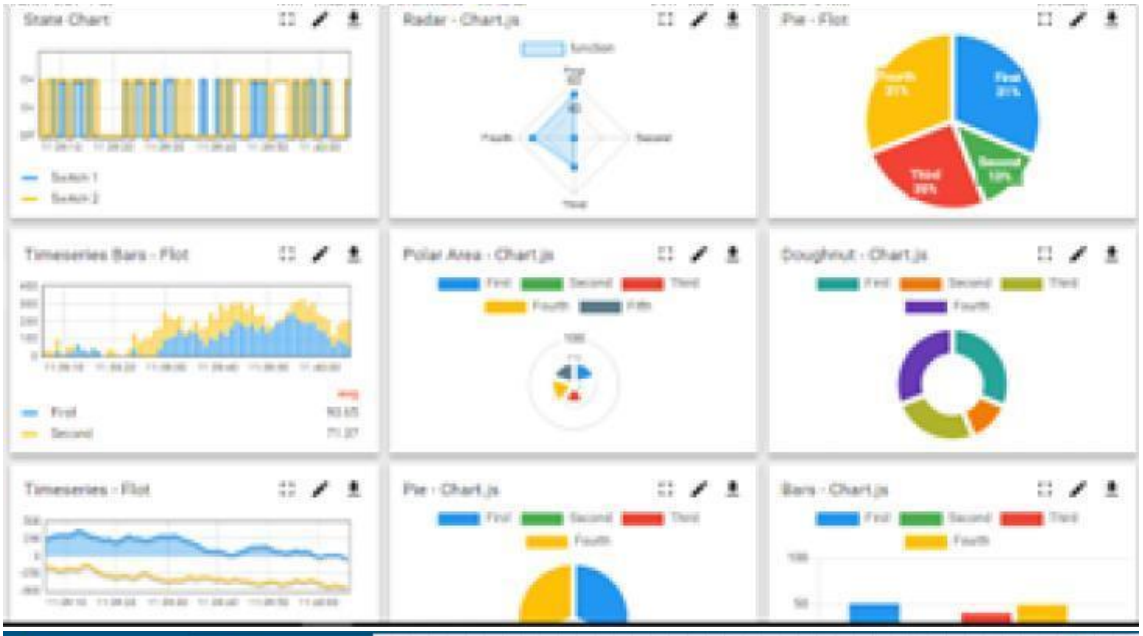
i. UCT IoT Platform (UCT Insight)

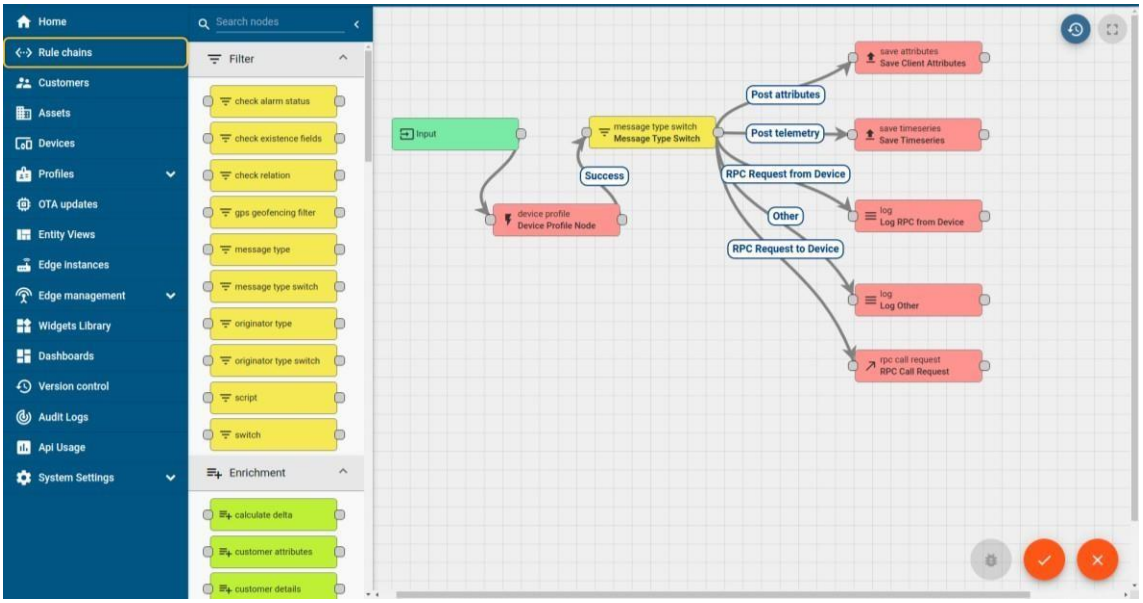
UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- It enables device connectivity via industry standard IoT protocols - MQTT, CoAP, HTTP, Modbus TCP, OPC UA
- It supports both cloud and on-premises deployments.

It has features to

- Build Your own dashboard
- Analytics and Reporting
- Alert and Notification
- Integration with third party application(Power BI, SAP, ERP)
- Rule Engine





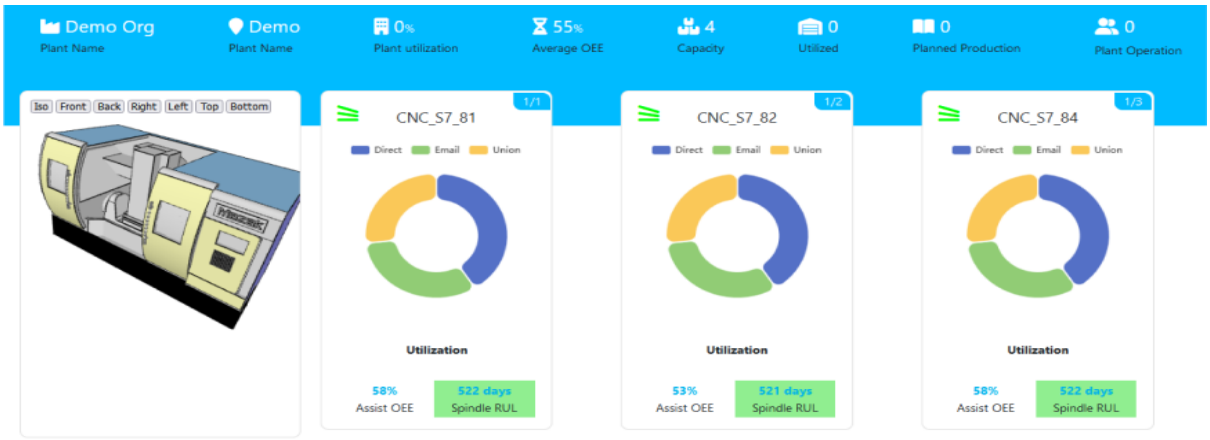
ii. Smart Factory Platform (FACTORY WATCH)

Factory watch is a platform for smart factory needs.

It provides Users/ Factory

- with a scalable solution for their Production and asset monitoring
- OEE and predictive maintenance solution scaling up to digital twin for your assets.
- to unleased the true potential of the data that their machines are generating and helps to identify the KPIs and also improve them.
- A modular architecture that allows users to choose the service that they what to start and then can scale to more complex solutions as per their demands.

Its unique SaaS model helps users to save time, cost and money.



Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i

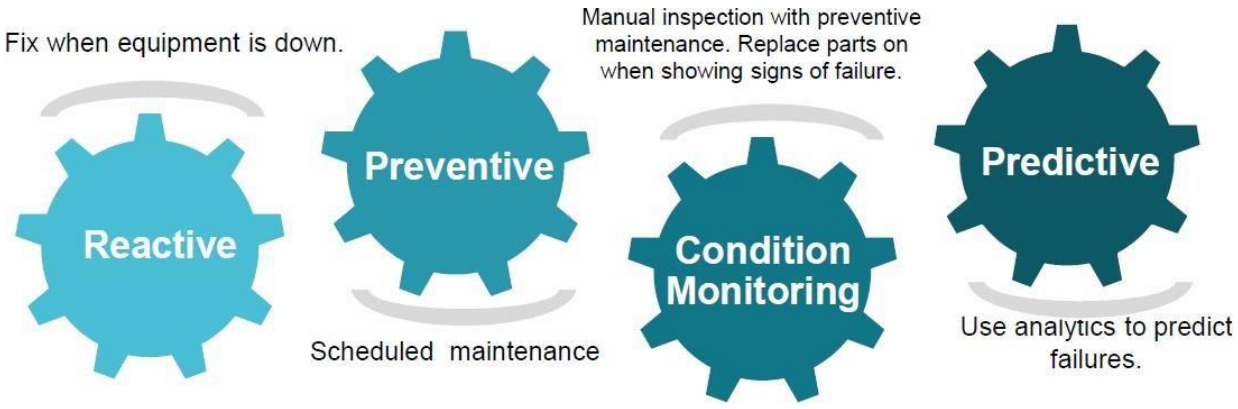
LoRaWAN™

i. based Solution

UCT is one of the early adopters of LoRAWAN technology and providing solution in Agritech, Smart cities, Industrial Monitoring, Smart Street Light, Smart Water/ Gas/ Electricity metering solutions etc.

ii . Predictive Maintenance

UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



1.2 About upskill Campus (USC)

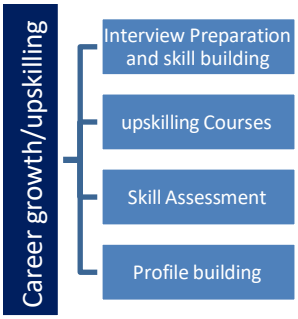
upskill Campus along with The IoT Academy and in association with Uniconverge technologies has facilitated the smooth execution of the complete internship process.

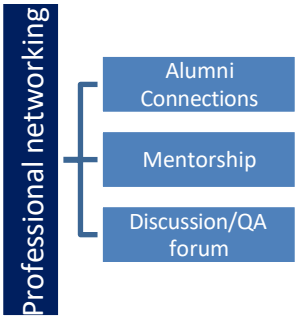
USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.

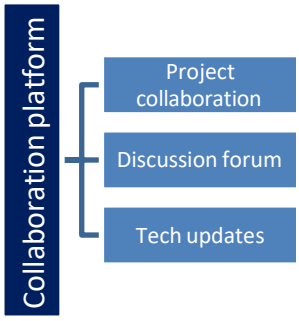
Seeing need of upskilling in self paced manner along-with additional support services e.g. Internship, projects, interaction with Industry experts, Career growth Services

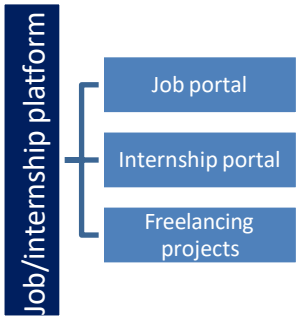
upskill Campus aiming is to upskill I million learners in next 5 years

https://www.upskillcampus.com/









1.1 The IoT Academy

The IoT academy is EdTech Division of UCT that is running long executive certification programs in collaboration with EICT Academy, IITK, IITR and IITG in multiple domains.

1.2 Objectives of this Internship program

The objective for this internship program was to

- ☛ get practical experience of working in the industry.
- ☛ to solve real world problems.
- ☛ to have improved job prospects.
- ☛ to have Improved understanding of our field and its applications.
- ☛ to have Personal growth like better communication and problem solving.

1.3 Reference

[1] Database Link : https://www.mysql.com/products/workbench/

[2] Text Book for Reference : https://docs.oracle.com/en/java/

2 Problem Statement for the Project: Bank Management System

Develop a prototype of a Banking Information System in Core Java that provides a working preview of the key functionalities of a real banking system. The prototype should demonstrate the core features and flow of the system, showcasing its functionality and usability.

Key Functionality to Include in the Prototype:

1. User Registration: Implement a simplified user registration process where users can provide basic details to create an account.
2. Account Management: Develop the ability to create and manage user accounts, including assigning unique account numbers and tracking account balances.
3. Deposit and Withdrawal: Enable users to make deposits and withdrawals from their accounts, updating the account balance accordingly.
4. Fund Transfer: Implement a simplified version of fund transfer functionality, allowing users to transfer funds between their accounts or to other registered users.
5. Account Statements: Provide users with a preview of their account statements, displaying transaction history, dates, amounts, and remaining balances.
6. Password Protection: Develop a basic login system with password authentication to ensure secure access to user accounts.
7. Error Handling: Implement basic error handling mechanisms to handle common exceptions, such as insufficient funds and invalid transactions, and display relevant error messages to users.
8. User Interface: Design a user-friendly interface for the prototype that allows users to navigate through the system, perform banking operations, and view relevant information.
9. Persistence: Implement basic data persistence by storing user account information and transaction history temporarily during the prototype session.

By developing this prototype, stakeholders will have a tangible working preview of the key features and functionality of the Banking Information System. This will allow them

to evaluate the system's usability, identify any necessary improvements or enhancements, and make informed decisions for further development and deployment of the complete system.

Minimum Requirements and System Output

1. User Registration:

- Form Creation: Create a user registration form that prompts users to input their personal details, such as name, address, contact information, and initial deposit amount.
- Output: Upon successful registration, the system will generate a unique account number for the user, and the user's details will be stored in the system's memory or File System.
  The output will be a confirmation message indicating successful registration.

2. Account Management:

- Form Creation: Develop an account management form that allows users to view and update their account information, such as name, address, contact details, and account settings.
- Output: After making any updates or changes, the system will display a confirmation message indicating that the account information has been successfully updated.

3. Deposit and Withdrawal:

- Form Creation: Design a form where users can enter the amount they wish to deposit or withdraw from their account.
- Output: Upon successful deposit or withdrawal transaction completion, the system will update the account balance accordingly and display a confirmation message indicating the transaction details, such as the transaction amount and the resulting balance.

4. Fund Transfer:

- Form Creation: Create a form that allows users to specify the recipient's account number and the amount they wish to transfer.

- Output: After a successful fund transfer, the system will deduct the transferred amount from the sender's account, add it to the recipient's account, and display a confirmation message indicating the transaction details, including the transferred amount and the updated balances of both accounts.

5. Account Statements:

Output: Implement a feature that allows users to view their account statements, which will be displayed as a comprehensive list showing transaction history, including dates, transaction amounts, and resulting balances. Users can access their account statements through a designated section of the system's user interface.

3 Existing and Proposed solution

Actually I there is so many existing and these all are very wonderful . I took the reference to do the completion of the project but Some of the work I took refer from some textbook . and rest of I prepare it with myself by learning the concept from the textbook of core java and advance java .

About

Introduction:

The Bank Management System project is a comprehensive software application designed to automate and streamline the operations of a banking institution. The system aims to simplify the day-to-day tasks of managing customer accounts, transactions, and other banking processes. This project was undertaken as part of our college coursework, with the objective of gaining practical experience in software development and understanding the intricacies of banking operations.

Features:
1. User Authentication :The system provides secure login functionalities for both bank staff and customers, ensuring authorized access to their respective accounts and functionalities.

2. Customer Account Management: Bank staff can efficiently manage customer accounts, including account creation, deletion, and updates. This enables seamless customer onboarding and account maintenance.

3. Account Transactions: The system facilitates various types of transactions, such as deposits, withdrawals, and fund transfers. It ensures accurate and real-time processing of transactions.

4. Interest Calculation: Automated interest calculation mechanisms help determine interest amounts for savings and fixed deposit accounts, providing customers with up-to-date information.

5. Loan Management: The system allows bank officials to handle loan applications, approvals, and repayments, simplifying the loan processing cycle.

6. Bank Reports: Comprehensive reports are generated to help bank administrators analyze key metrics, such as account balances, transaction histories, and overall bank performance.

7. Account Statements: Customers can access and download their account statements, offering them insights into their financial activities.

8. Notifications: The system sends timely notifications to customers regarding transactions, due payments, and other account-related activities.

Technologies Used:
- Programming Languages: Java (Backend) and JavaFX (Frontend)
- Database: MySQL
- Integrated Development Environment (IDE):Netbean
- Version Control: Git
- Documentation: Microsoft Word

Challenges Faced:
- Integrating the frontend and backend components to ensure seamless data flow and real-time updates.
- Handling complex interest calculation algorithms for various account types.
- Implementing robust security measures to safeguard customer data and prevent unauthorized access.

Conclusion:

The Bank Management System project provided us with invaluable hands-on experience in software development, database management, and project collaboration. It showcased the importance of precision and efficiency in managing banking operations and served as a stepping stone in our academic journey. Through this project, we not only honed our technical skills but also gained a deeper understanding of the critical role technology plays in modern banking systems.

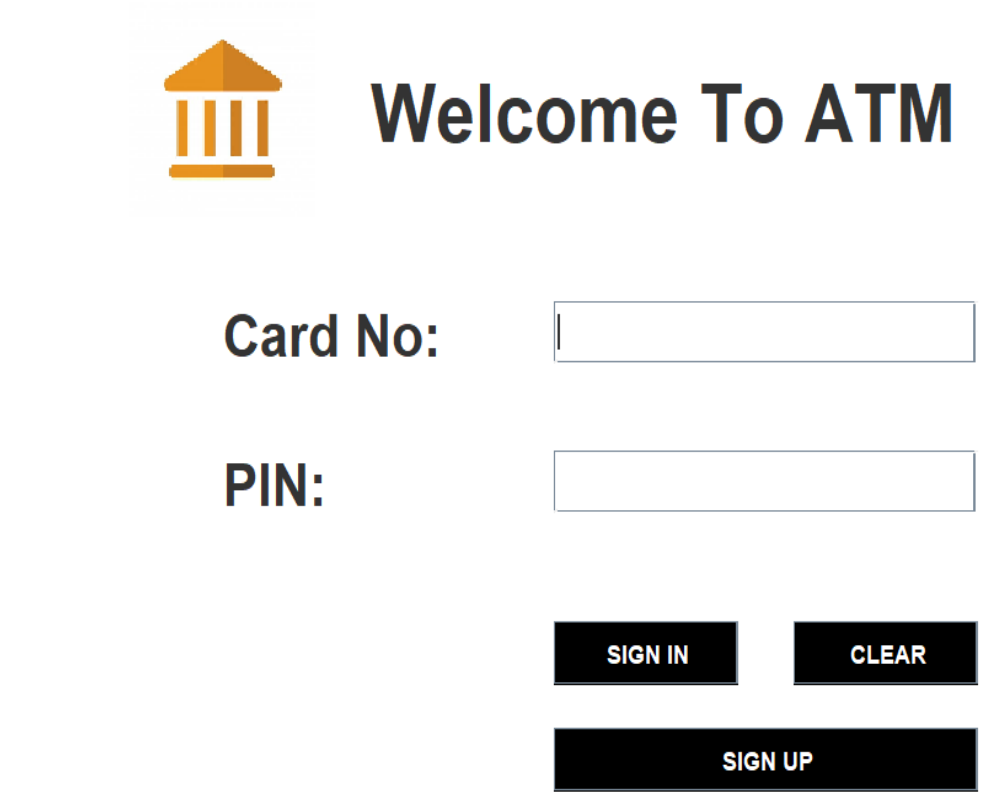
3.1 Code submission (Github link) : https://github.com/narottam-kumar/upskill_campus

3.2 Report submission (Github link) :

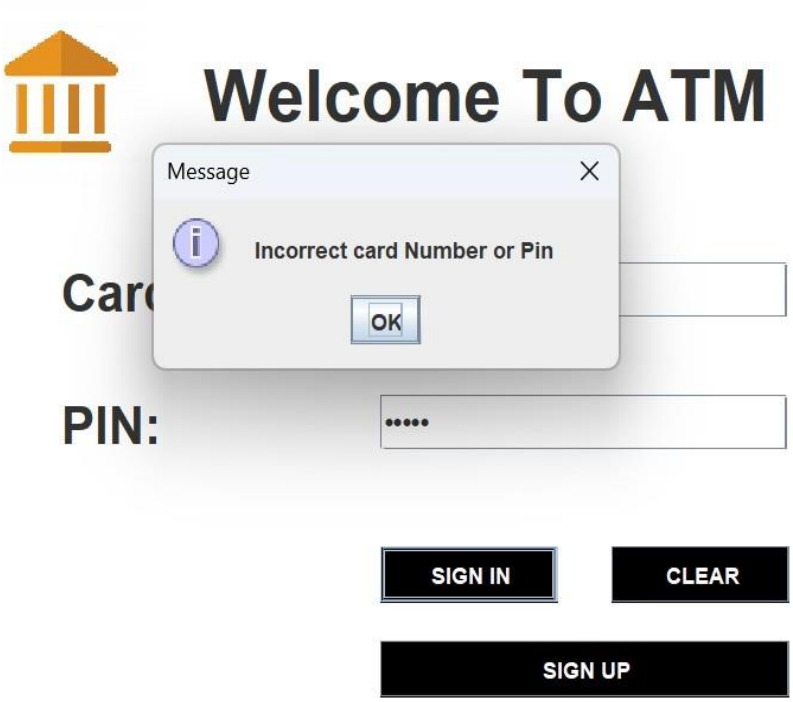
https://github.com/narottam-kumar/upskill_campus/blob/main/project_report.pdf

4 Proposed Design/ Model

4.1 Interfaces



If information “Card No “ or “ PIN “ is not correct then


Welcome To ATM
Message
Incorrect card Number or Pin
OK
Car
PIN:
SIGN IN
CLEAR
SIGN UP

Registration Page :

APPLICATION FORM NO:5126

Page 1:Person Details

Name:

Father's Name:

Date Of Birth:

Gender: Male Female

Email Address:

Marital Status: Married Unmarried Other

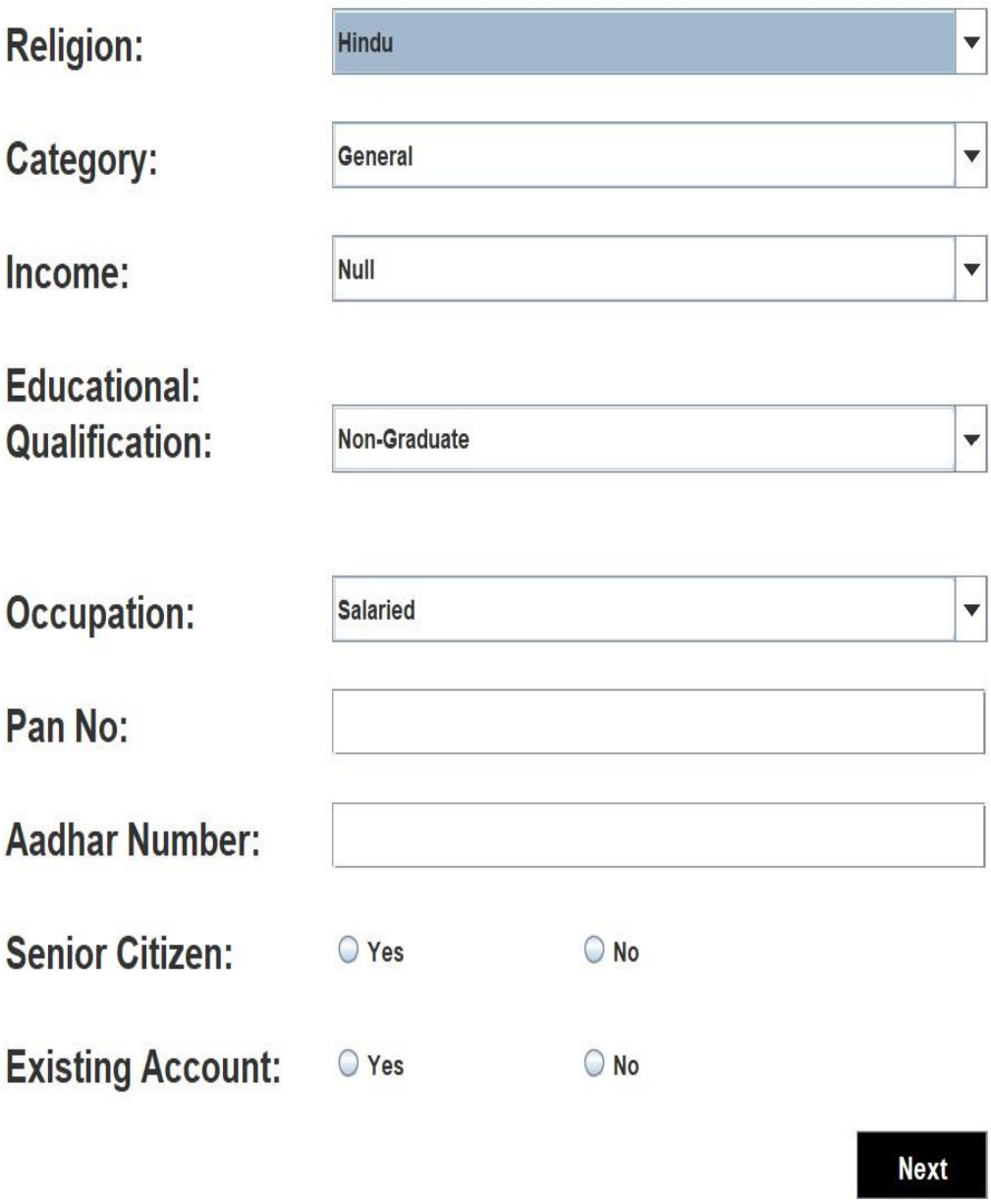
Address:

City:

State:

Pin Code:

Next


Page 2:Additional Details
Religion:
Hindu
Category:
General
Income:
Null
Educational:
Qualification:
Non-Graduate
Occupation:
Salaried
Pan No:
Aadhar Number:
Senior Citizen:
Yes
No
Existing Account:
Yes
No
Next

Page 3: Account Details

Account Type

(•) Saving Account ( ) Fixed Deposit...

( ) Current Account ( ) Recurring Deposit Account

Card Number XXXX-XXXX-XXXX-4184

Your 16 Digit Card Number

PIN: XXXX

Your 4 Digit Pin Number

[ ] Internet Banking

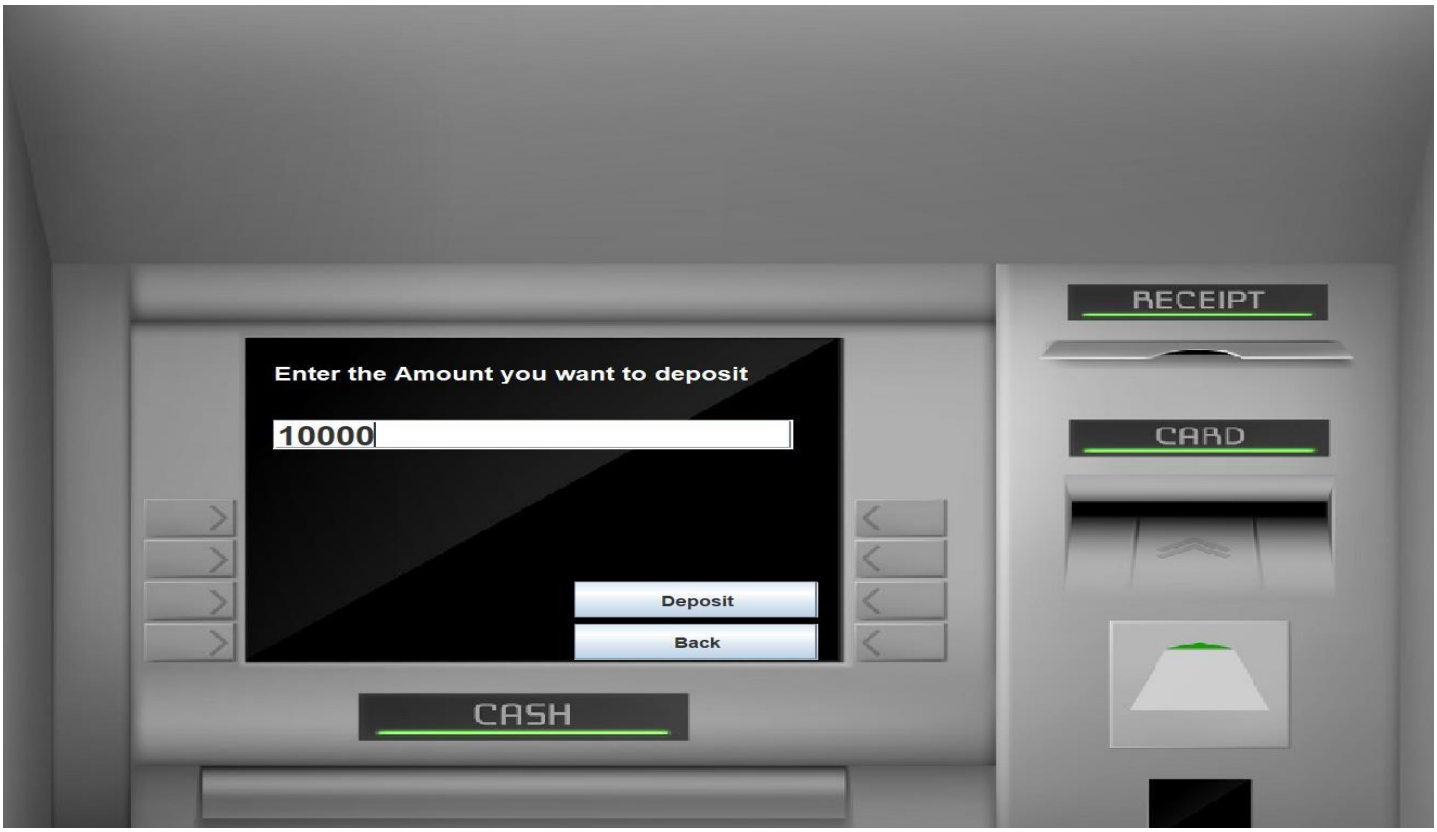
[ ] Email & SMS Alert

[ ] Cheque Book [ ] E-Statement

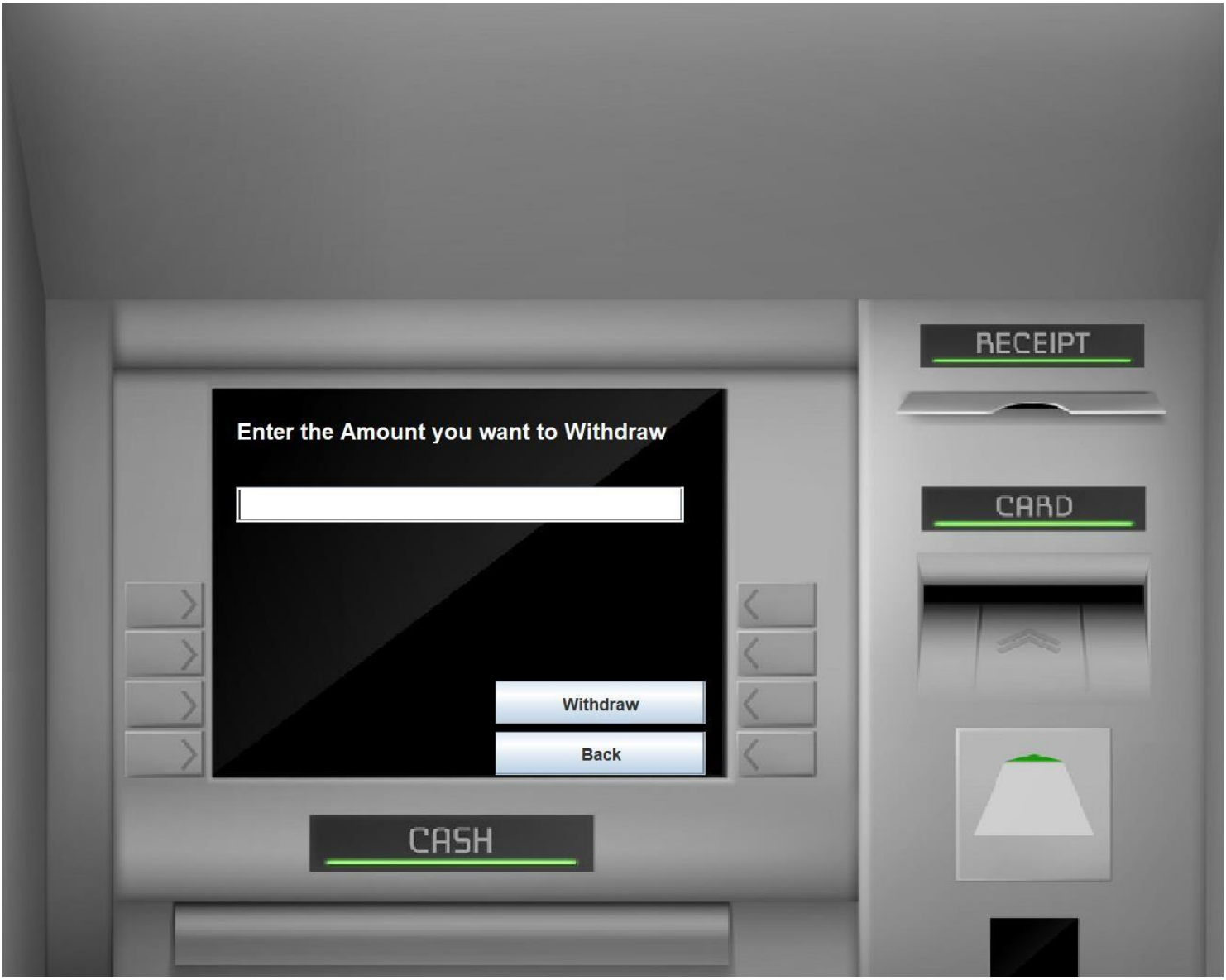
[✓] I hereby declares that the above entered details are correct to the best of my knowledge

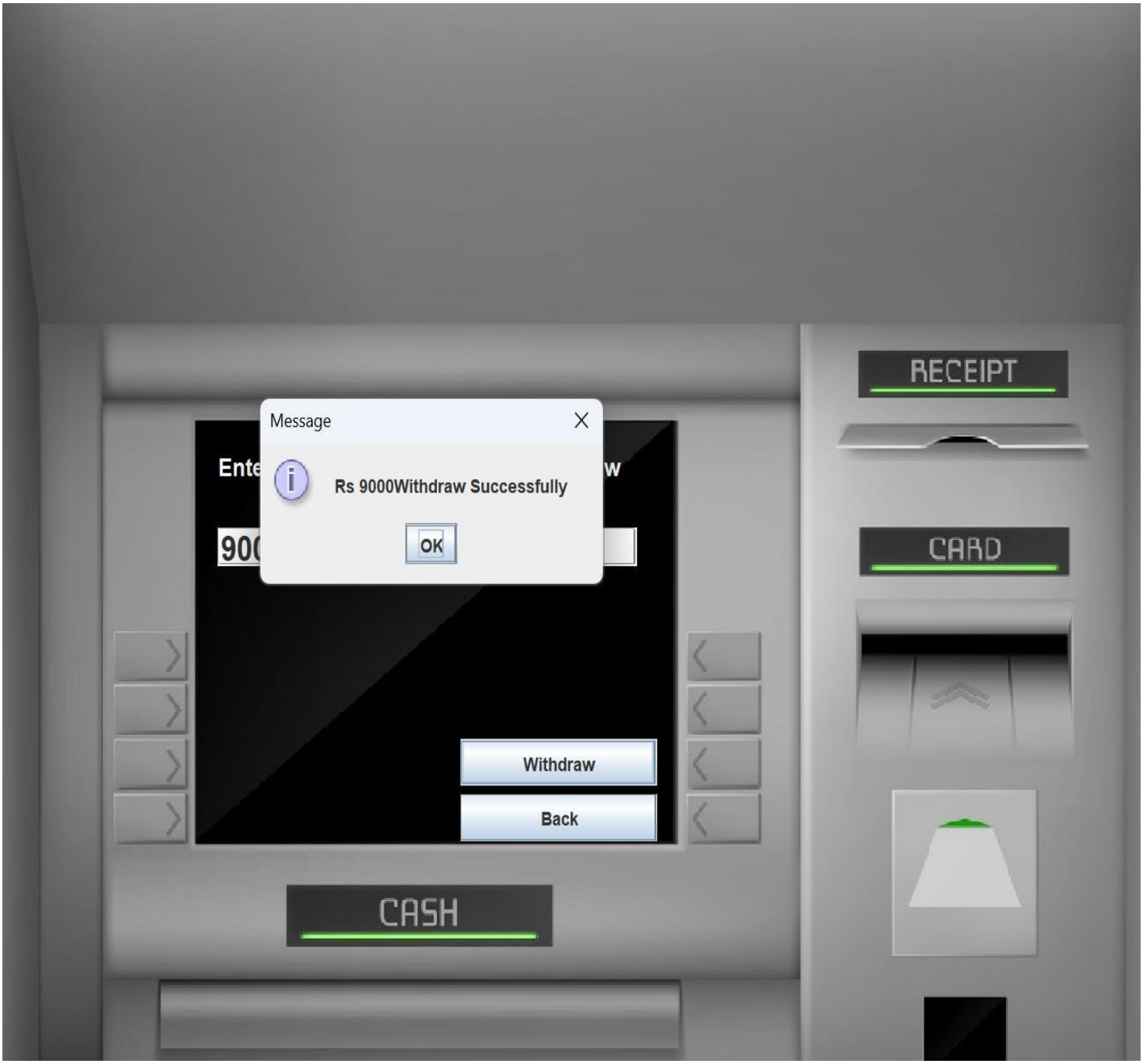
SUBMIT CANCEL


RECEIPT
Please select your Transactions
CARD
Deposit
Cash Withdrawal
Fast Cash
Mini Statement
Pin Change
Balance Enquiry
Exit
CASH


Enter the Amount you want to deposit
10000
Deposit
Back
CASH
RECEIPT
CARD


Message
Rs 500Debited Successfully
OK
Rs 100
Rs 500
Rs 1000
Rs 2000
Rs 5000
Rs 10000
BACK
CASH
RECEIPT
CARD


RECEIPT
Enter the Amount you want to Withdraw
CARD
Withdraw
Back
CASH


Message
Rs 9000Withdraw Successfully
OK
Withdraw
Back
RECEIPT
CARD
CASH


SELECT WITHDRAWL AMOUNT
Rs 100
Rs 500
Rs 1000
Rs 2000
Rs 5000
Rs 10000
BACK
CASH
RECEIPT
CARD


Your Current Account Balance is the 177700
Back
RECEIPT
CARD
CASH
1
2
3
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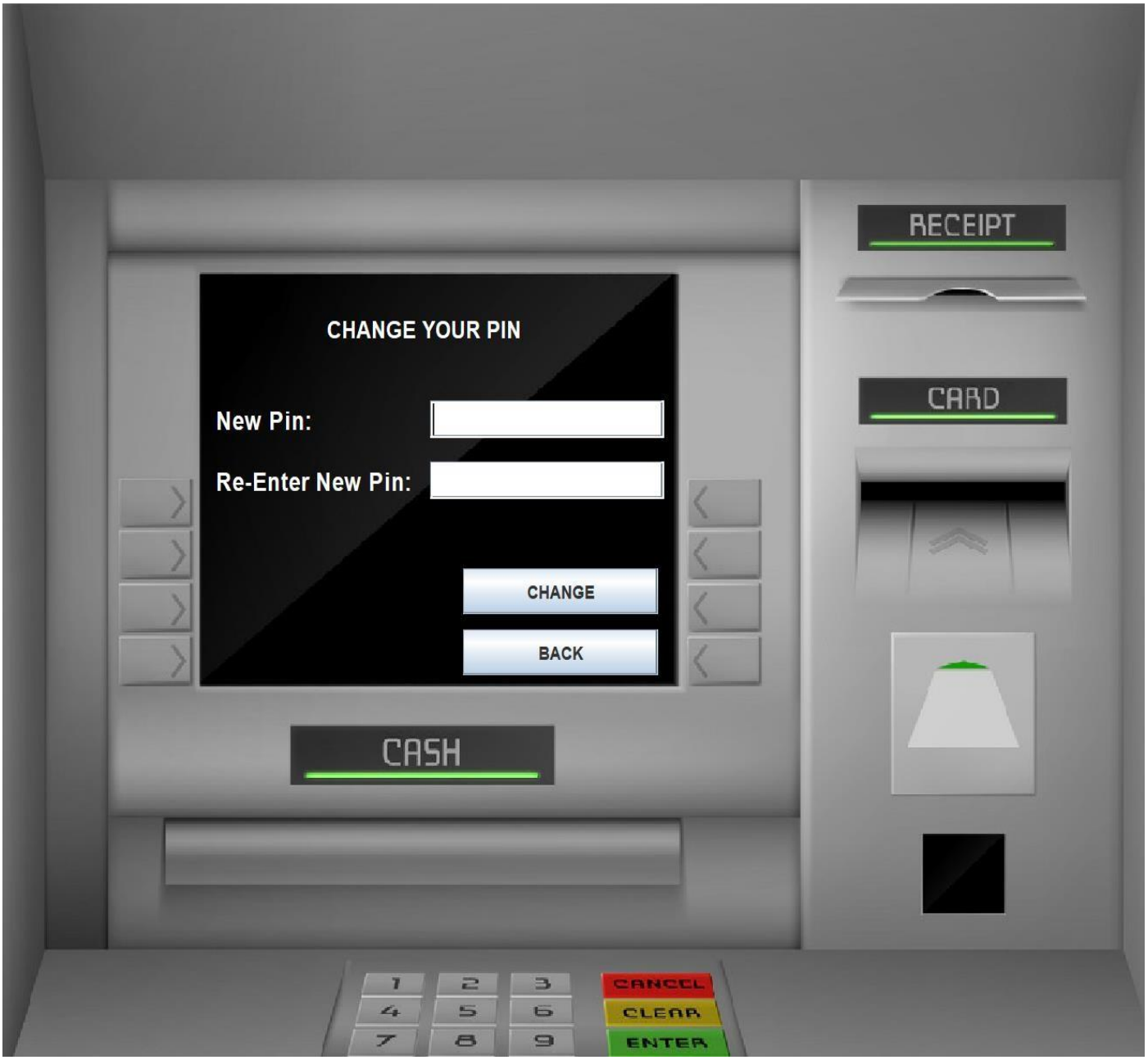
5
6
7
8
9
CANCEL
CLEAR
ENTER


CHANGE YOUR PIN
New Pin:
Re-Enter New Pin:
CHANGE
BACK
RECEIPT
CARD
CASH
1
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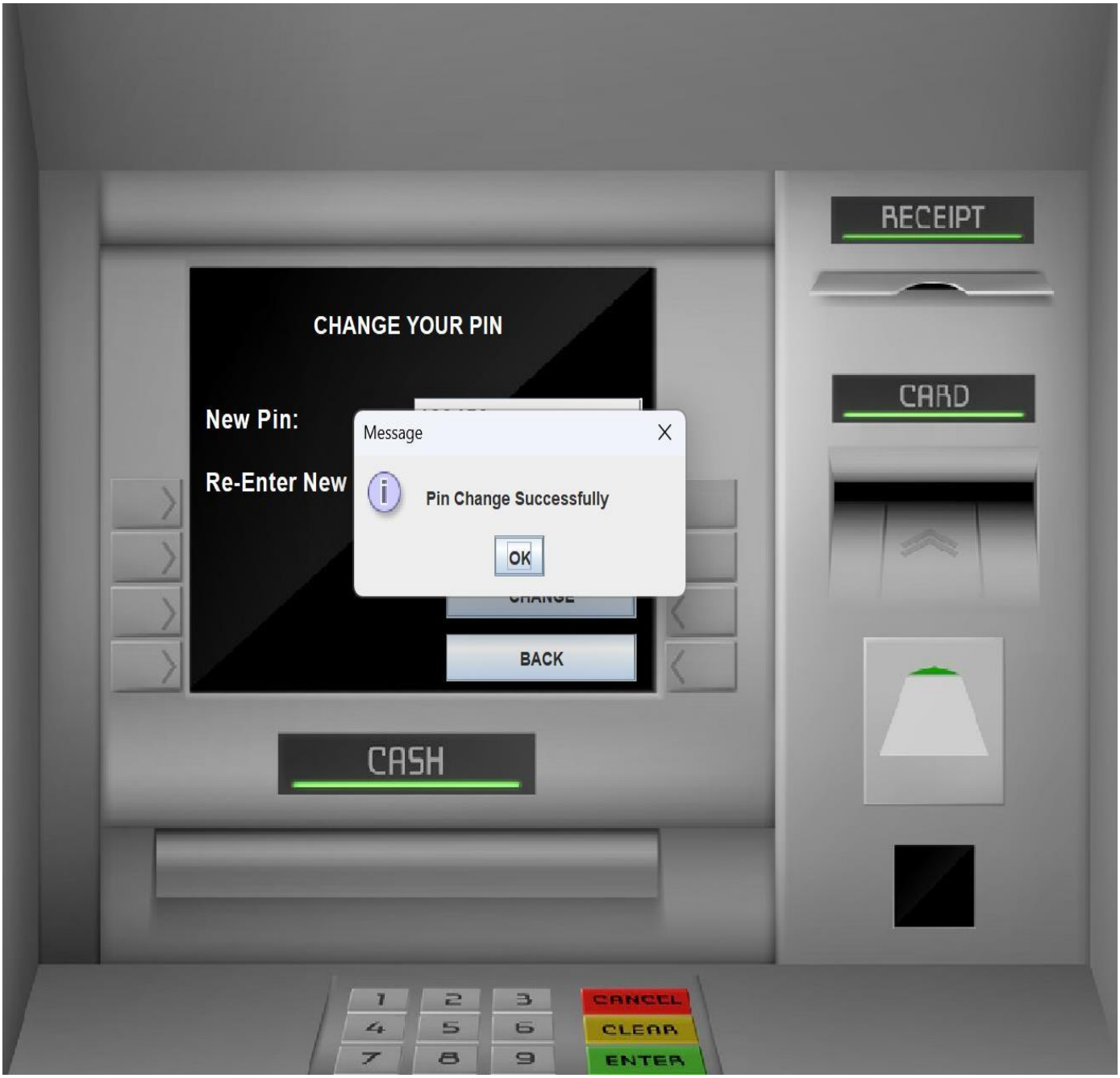
9
CANCEL
CLEAR
ENTER


RECEIPT
CHANGE YOUR PIN
New Pin:
Re-Enter New
Message
Pin Change Successfully
OK
BACK
CARD
CASH
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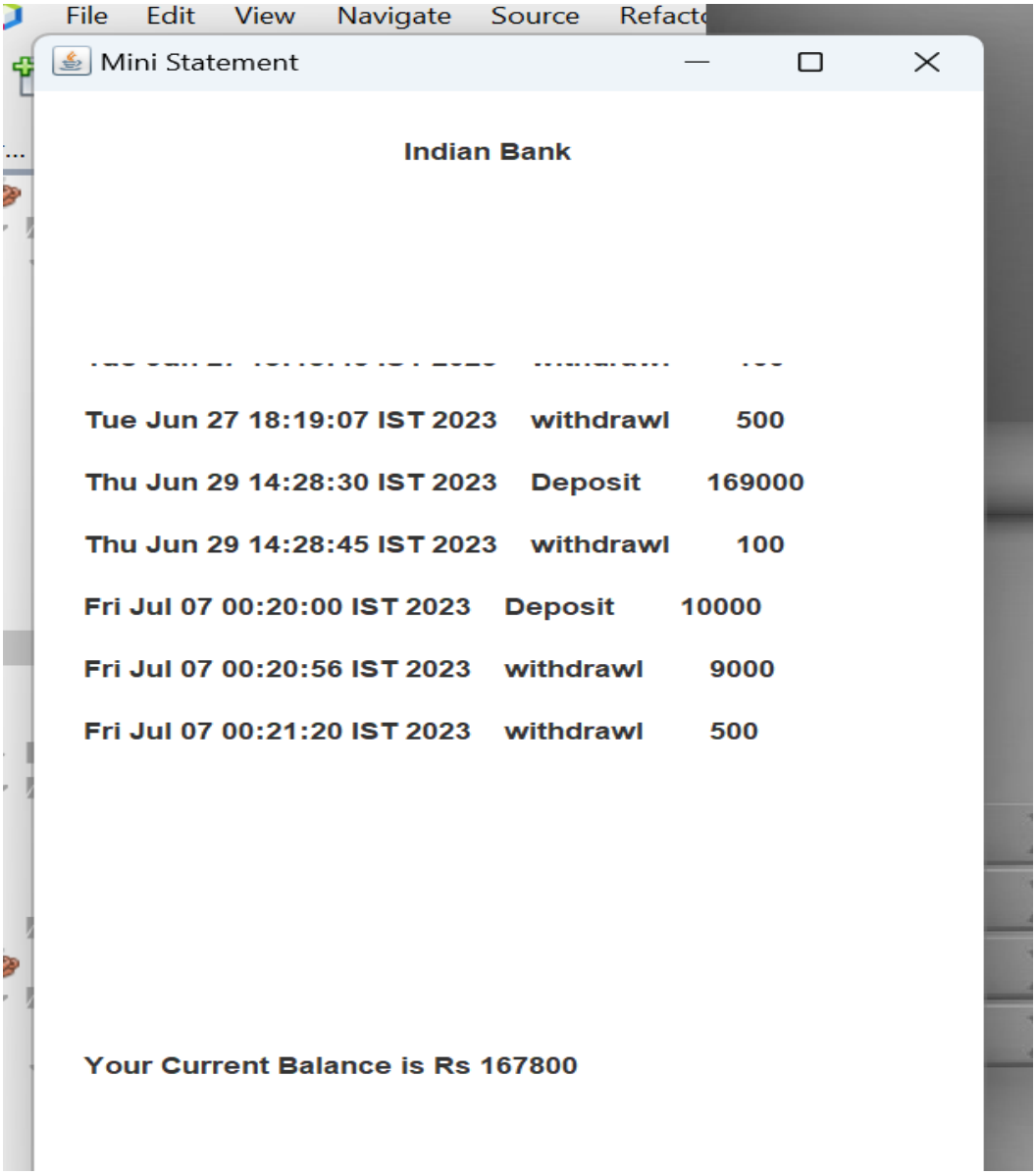
CANCEL
CLEAR
ENTER


File Edit View Navigate Source
Mini Statement
Indian Bank
Tue Jun 27 18:19:07 IST 2023 withdrawl 500
Thu Jun 29 14:28:30 IST 2023 Deposit 169000
Thu Jun 29 14:28:45 IST 2023 withdrawl 100
Fri Jul 07 00:20:00 IST 2023 Deposit 10000
Fri Jul 07 00:20:56 IST 2023 withdrawl 9000
Fri Jul 07 00:21:20 IST 2023 withdrawl 500
Your Current Balance is Rs 167800

5 Performance Test

5.1 Test Plan/ Test Cases

Introduction

The purpose of the Bank Management System project is to develop a software application that automates and streamlines the operations of a banking institution. The system aims to efficiently manage customer accounts, transactions, Debited , Withdraw . It provides a secure and user-friendly platform, enhancing overall efficiency, accuracy, and customer service in the banking sector.

Test Objectives

The test plan aims to ensure the Bank Management System is thoroughly tested to verify its functionality, security, correctness and performance. It seeks to identify and resolve defects to deliver a reliable providing a reliable and efficient solution for banking and robust application.

Methodology

The performance test followed the following methodology:

The project follows an Agile software development methodology to ensure flexibility, collaboration, and incremental progress throughout the development lifecycle. The Agile methodology is ideal for complex projects, allowing frequent iterations.The main phases are:

1. Project Planning:
   - Define project scope, objectives, and requirements in collaboration with stakeholders.
   - Identify roles and responsibilities of the development team.
   - Create a high-level project schedule and allocate resources accordingly.

2. Requirement Gathering:
   - Engage with Information of bank related to gather detailed functional and non-functional requirements.

3. Design and Prototyping:
   - Design the system architecture, database schema, and user interfaces.
   - Create prototypes and mock-ups to validate design concepts with stakeholders.

4. Development and Iterations:
   - Divide the project into sprints (short development cycles) with specific deliverables.
   - Implement features and functionalities incrementally based on prioritized user stories.
   - Conduct daily stand-up meetings to discuss progress, challenges, and adjustments.

5. Testing and Quality Assurance:
   - Conduct rigorous testing throughout development, including unit testing, integration testing, functional testing, security testing, and performance testing

6. Deployment and Release:
   - Deploy the Bank Management System to the production environment.

5.2 Performance Outcome

Test Result

The test results for the Bank Management System project indicate a successful implementation of a

reliable and efficient banking solution. The application meets the specified requirements, adheres to security standards, and provides a seamless user experience for both bank staff and customers. With thorough testing and positive feedback from end-users, the Bank Management System is ready for deployment in a production environment.

Recommendations

Based on the performance test results, the following recommendations are provided:

1. Enhance Security Measures:

   While the security testing showed no major vulnerabilities, it is crucial to continuously monitor and improve security measures.

2. User Interface Improvements:

   Focus on making the system more intuitive, visually appealing, and user-friendly to enhance user satisfaction and adoption.

3. Error Handling and Validation:

   Strengthen error handling and data validation mechanisms to provide more informative error messages and prevent data inconsistencies. Proper validation will help reduce the risk of incorrect data entries and potential system crashes.

6. Documentation and User Manuals:

   Create comprehensive documentation and user manuals to assist bank staff and end-users in understanding the system's functionalities and operations. Clear and well-structured documentation will ease system adoption and support.

7. Usability Testing with Diverse Users:

   Conduct usability testing with a diverse group of users to identify potential accessibility challenges and ensure the system is inclusive and accessible to all customers.

Conclusion:

By implementing these recommendations, the Bank Management System project can evolve into a robust, secure, and user-friendly banking solution that aligns with the evolving needs of the banking industry and ensures customer satisfaction. Continuous improvements and adherence to best practices will contribute to the long-term success and effectiveness of the system.

6 My learnings

Introduction:

During my internship, I had the opportunity to work on Bank Management System, which involved developing Secure , optimizing functionality, and collaborating with a team of experienced developers. The internship provided me with invaluable practical experience and deepened my understanding of software development and the Banking System.

Understanding the Requirements:

Before diving into the development process, I spent time thoroughly understanding the requirements of the Bank Management System. This involved studying the project specifications, conducting research on existing Banking System , and identifying key features to be implemented. This initial stage taught me the importance of clear requirements gathering and effective communication with stakeholders.

Programming Languages and Technologies:

During the internship, I had the opportunity to work with java programming language and technologies. The primary languages used were JAVA, and I gained proficiency in implementing

features using these languages. Additionally, I learned about libraries and frameworks commonly used in Bank Management System. Understanding these technologies helped me enhance my programming skills and adapt to industry-standard practices.

Feature Development:

Bug Fixing and Testing:

Throughout the internship, I was involved in identifying and fixing bugs in my project. I learned about the importance of thorough testing and the different testing techniques, including unit testing and integration testing. Collaborating with the quality assurance team, I gained experience in debugging, troubleshooting, and ensuring the application's stability and performance.

Collaboration and Teamwork:

Working within a team of experienced developers and designers exposed me to effective collaboration and teamwork. I participated in daily stand-up meetings, contributed to discussions, and actively sought guidance from senior team members. This experience not only improved my technical skills but also taught me the significance of effective communication, task delegation, and adapting to different work styles.

Time Management and Prioritization:

Throughout the internship, I had the opportunity to work on multiple tasks simultaneously. This experience taught me the importance of effective time management and prioritization. I learned to balance competing priorities, break down complex tasks into manageable sub-tasks, and meet deadlines consistently. These skills will be invaluable in my future career as a software developer.

Conclusion:

My internship experience working on a Bank Management System Software provided me with practical knowledge, technical skills, and exposure to real-world software development practices. I gained a deeper understanding of UI/UX design principles, programming languages, and technologies relevant to my project . Furthermore, I developed essential skills in collaboration, time management, and bug fixing. This internship has been instrumental in shaping my career aspirations and has laid a strong foundation for my future growth as a software developer in the Bank Management System Application .

1 Future work scope

The future work scope of the Bank Management System project includes:

1. Mobile Application Development:
   Extending the system to a mobile application to provide convenient banking services on smartphones and tablets.

3. Integration with Payment Gateways:
   Enabling secure online transactions by integrating the system with popular payment gateways for seamless payment processing.

4. Data Analytics and Business Intelligence:
   Implementing data analytics and business intelligence tools to gain insights into customer behavior and improve decision-making processes.

5. Multi-Language Support:
   Adding support for multiple languages to cater to a more diverse customer base.

6. Machine Learning for Fraud Detection:
   Utilizing machine learning algorithms to enhance fraud detection and security measures.

7. Chatbot Integration:
   Implementing a chatbot to offer instant customer support and assistance.

8. Enhanced Reporting and Dashboards:** Developing advanced reporting and dashboard features for better data visualization and analysis.

9. Cloud Migration:
   Migrating the system to the cloud to enhance scalability, flexibility, and cost-effectiveness.

10. Integration with Third-Party Services:
    Integrating the system with third-party financial services and APIs to offer additional features and functionalities.

These future enhancements will help the Bank Management System evolve into a more comprehensive, efficient, and customer-centric banking solution.