Banking Management System
(SRS Report)

Software Requirements Specification
For
<Banking Systems>
Version <1.1>
Prepared by

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Date:	***<11/14/2024>***

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1) Introduction

1.1 Purpose:

- The purpose of this document is to provide a detailed description of the requirements for a Banking Management System. This system is designed to manage banking operations, including customer management, account management, transactions, and reporting.

1.2 Scope:

- The Banking Management System will support functionalities such as account creation, deposits, withdrawals, fund transfers, loan management, and customer service. It will ensure secure transactions and maintain a high level of data integrity and privacy.

1.3 Technologies to be used:

Web Development: HTML, CSS, JavaScript, and web frameworks for the interface, backed by server-side languages.

Database Management: Use databases like MySQL, PostgreSQL, or No SQL for data storage.

Security: Implement encryption, multi-factor authentication, and security measures.

Payment Processing: Integrate with payment processors (e.g., Stripe, PayPal).

Mobile Banking: Develop mobile apps for iOS and Android.

Cloud Computing: Hosting on AWS, Azure, or GCP for scalability and high availability.

API and Integration: Development of API to connect with third-party services.

Compliance: Adherence to financial regulations such as KYC and AML.

2) Overall Description

2.1 Product Perspective:

- The Banking System will be designed to interact with ATMs, mobile banking apps, web banking interfaces, and customer support portals. It will integrate with third-party financial services and support real-time transactions.

2.2 User Classes and Characteristics :

BMS caters to a diverse range of users with varying roles and responsibilities, including:

- **Bank Staff:** This class includes tellers, loan officers, customer service representatives, branch managers, and executives. They need different levels of system access to perform tasks related to customer accounts, transactions, approvals, and auditing. Each staff member has specific roles within the system, such as account creation, transaction processing, loan origination, and account management.
- **Customers:** The bank's clients represent a vital user class. They require access to their accounts, transaction history, and the ability to make transactions online, such as deposits, withdrawals, transfers, and bill payments. Customers must have secure and easy-to-use interfaces for their banking needs.
- **Administrators:** Administrators oversee the system's configuration and maintenance. They manage user access levels, security protocols, system updates, and ensure overall system health. Their responsibilities include system setup, troubleshooting, and managing software updates.
- **Auditors:** Auditors represent another crucial user class. They review and monitor financial transactions for compliance and security, ensuring that the bank operates within legal and regulatory frameworks. Auditors have access to advanced auditing tools and reports.

2.3 Operating Environment:

- The software should be compatible with Windows and Linux servers. It will also support web, mobile, and ATM interfaces, requiring connectivity to banking network infrastructure.

It is expected to be hosted on a dedicated server within the bank's premises and accessed through a secure network to maintain the highest level of data security.

2.4 Software Interface:

The BMS interfaces with several key software components to deliver its functionality, including:

- **Database Management System:** BMS connects to a robust and secure database management system, such as Oracle, MySQL, or SQL Server, to store and retrieve customer data, transaction records, and system logs. This integration ensures data integrity, reliability, and accessibility.
- **Web Services:** To facilitate online banking, BMS interfaces with web services for customer account access and transaction processing. This includes features like online account management, fund transfers, and account statements. Web services allow customers to interact with the bank 24/7 from various devices, including web browsers and mobile applications.
- **Payment Gateways:** The system integrates with payment gateways to enable electronic fund transfers, online payment processing, and integration with external financial networks like SWIFT and ACH.
- **Third-Party APIs:** BMS can incorporate third-party APIs for services such as credit scoring, identity verification, and payment processing, enhancing its capabilities and extending the range of services provided to customers.

2.5 Hardware Requirements:

The Banking Management System requires specific hardware resources to operate effectively. The following hardware requirements should be met for optimal system performance:

- **CPU:** An Intel Core i5 or equivalent processor is recommended to handle the system's computational demands efficiently.
- **RAM:** A minimum of 8 GB of RAM is necessary to ensure smooth operation when handling multiple users and large datasets.
- **Storage:** The system should be equipped with a minimum of 500 GB of SSD storage, ensuring fast data retrieval and ample space for logs and backups.
- **Network:** A high-speed and stable internet connection is essential for seamless access to web-based components, secure data transfers, and communication with external financial networks.
- **Security:** Robust security measures, including firewall protection and antivirus software, should be in place to safeguard the system from potential threats, ensuring data integrity and privacy.

2.6 Functionalities:

The Banking Management System provides a wide array of functionalities to meet the dynamic needs of the banking industry. Key functionalities include:

- **Customer Account Management:** BMS enables bank staff to create, modify, and close customer accounts with comprehensive customer profiles that include personal information, identification documents, and account preferences.
- **Transaction Processing:** The system supports various types of transactions, including deposits, withdrawals, transfers, bill payments, and check clearances. Real-time transaction tracking and confirmation features enhance customer and staff experience.
- **Loan Management:** BMS facilitates the origination, approval, and tracking of loans. This includes comprehensive loan application processing, risk assessment, and loan documentation.
- **Online Banking:** The system provides customers with 24/7 access to their accounts through secure online banking interfaces. This includes account balances, transaction history, electronic fund transfers, and bill payments. Customers can also apply for loans and set up automated transfers.
- **Reporting and Auditing:** BMS generates a wide variety of reports for bank staff and auditors, offering insights into customer account activities, financial transactions, and system performance. It also supports auditing and compliance reporting to meet regulatory requirements.
- **Security:** The system implements robust security measures, including user authentication, encryption of sensitive data, and access control to safeguard customer information and financial data.
- **Notifications:** BMS sends notifications to customers for transaction alerts, account updates, and promotional messages through various communication channels, including email and SMS.
- **Customer Support:** The system integrates a customer support portal, allowing customers to submit inquiries, raise issues, and track their resolution status. Bank staff can access customer support tickets and prioritize service requests.

2.7 General Constraints:

Several general constraints should be considered during the development and operation of the Banking Management System:

- **Data Privacy Regulations:** BMS must comply with data privacy laws and regulations, such as GDPR, HIPAA, and local banking regulations. It should include features for data encryption, consent management, and secure data storage.
- **Legacy System Integration:** The migration from existing legacy systems to the

BMS may pose challenges. Careful data transfer, staff training, and comprehensive

F. Online Bill Payment :

- Customers should be able to pay bills online, such as utility bills, credit card bills, and loan payments.
- The system should securely process these payments and provide payment confirmation.

G. Online Banking for Mobile Devices :

- The system should be accessible via web browsers and mobile applications.
- It should provide a user-friendly interface for mobile users.

H. Automatic Alerts for Unusual Activities :

- The system should automatically detect and alert users to unusual or suspicious account activities, such as large transactions from new locations.

3.2 Technical Issues

- Database: The Banking Management system will use the MySQL Database, which is open source and free to use.
- Operating System: The Development environment can be Windows 10.

3.3 Non Functional Requirements

A. Security :

- The system should implement robust security measures to protect against unauthorized access, data breaches, and fraud.
- It should use encryption for data transmission and storage.
- Access control should be granular, and data should be protected against SQL injection and other common vulnerabilities.

B. Performance :

- The system should provide fast response times for common operations (e.g., account balance inquiries, funds transfers).
- It should be able to handle a high number of concurrent users and transactions during peak times.
- Response times should remain within acceptable limits even during periods of heavy usage.

C. Scalability :

- The system should be scalable to accommodate an increasing number of users, accounts, and transactions.
- It should allow for the addition of new servers or resources as the system grows.

D. Reliability :

- The system should have a high level of availability, with minimal downtime for maintenance or upgrades.

- It should have a mechanism to ensure uninterrupted service in case of hardware or software failures.

E. Recovery and Backup :

- The system should have a robust data backup and recovery strategy to prevent data loss in case of system failures.
- Regular backups should be performed and tested for reliability.
- A disaster recovery plan should be in place to restore service quickly in the event of a catastrophic failure. **F. Compliance :**

- The system should adhere to relevant banking and financial industry regulations, including Know Your Customer (KYC) and Anti-Money Laundering (AML) requirements.
- It should comply with data protection and privacy laws, such as GDPR or HIPAA, as applicable.

G. Usability :

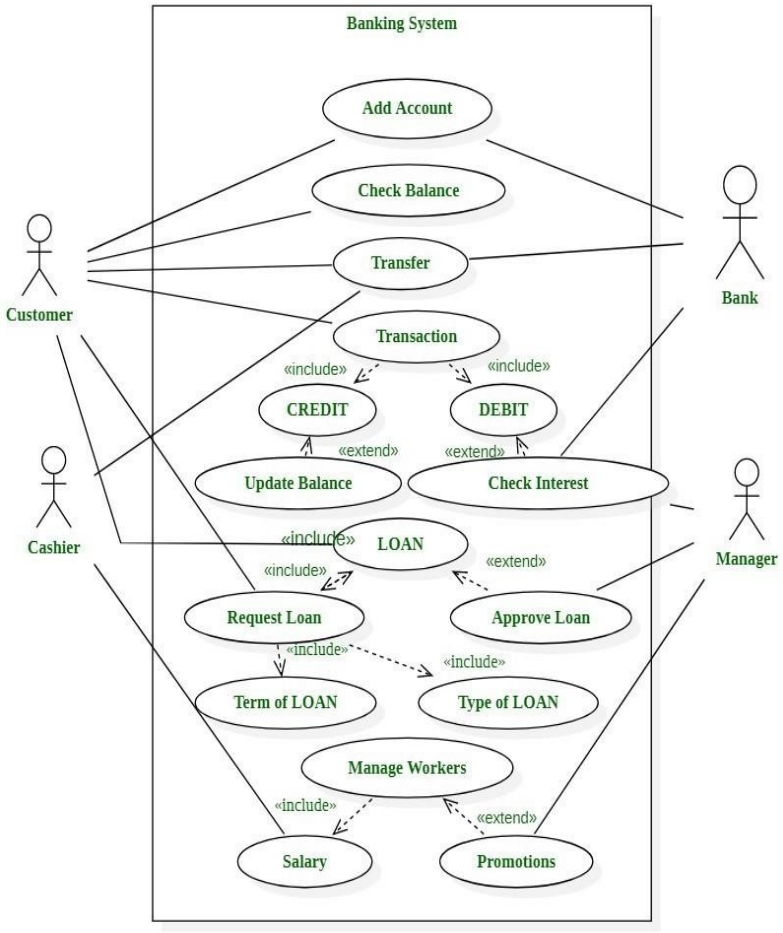
- The user interface should be intuitive and user-friendly, catering to users of varying technical abilities.
- The system should be accessible to individuals with disabilities and comply with accessibility standards (e.g., WCAG).

H. Load Testing and Performance Monitoring :

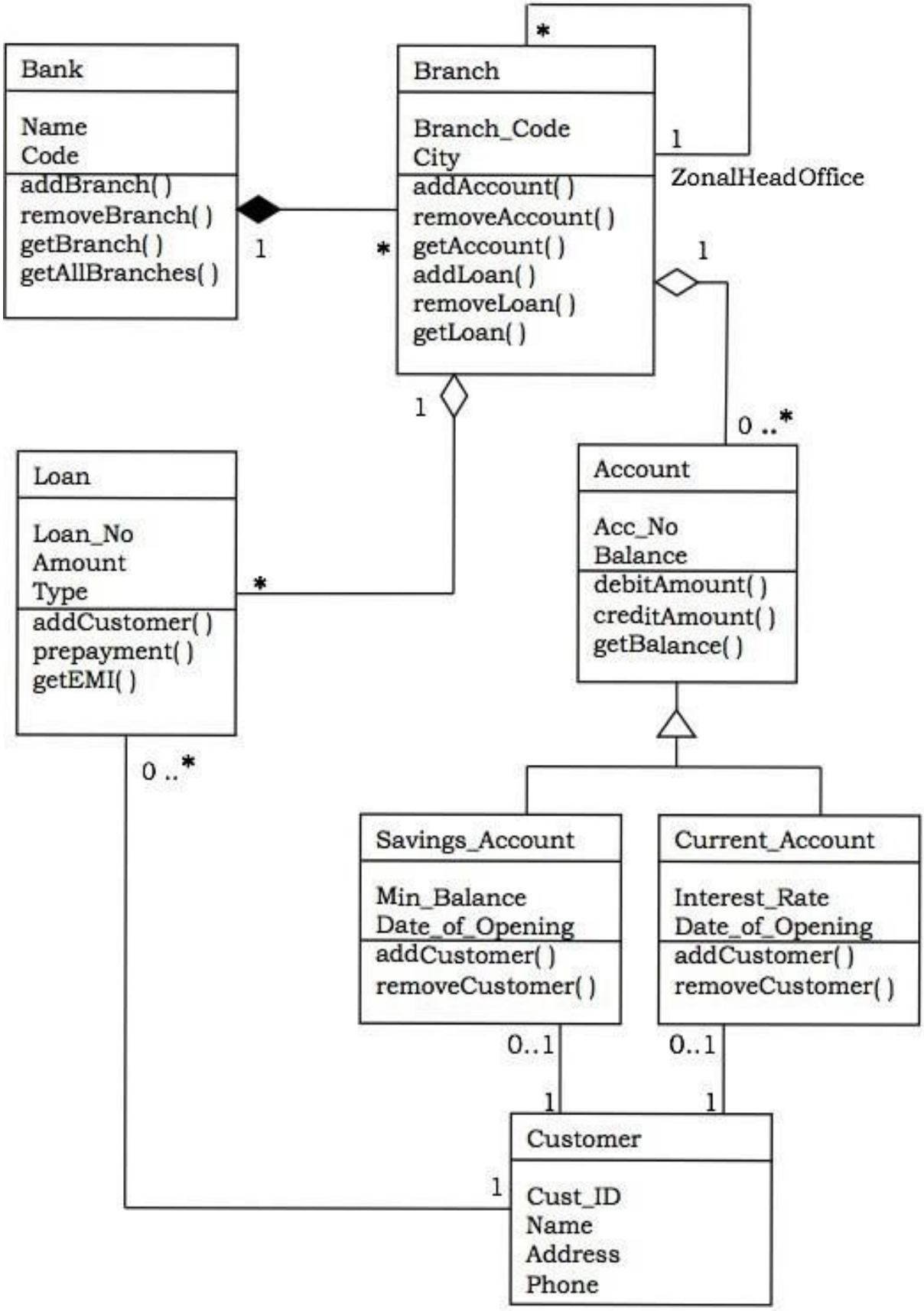
- The system should be subject to load testing to ensure it can handle expected levels of usage.
- Continuous performance monitoring should be in place to detect and address performance bottlenecks.

3) Design

4.1 use-case:

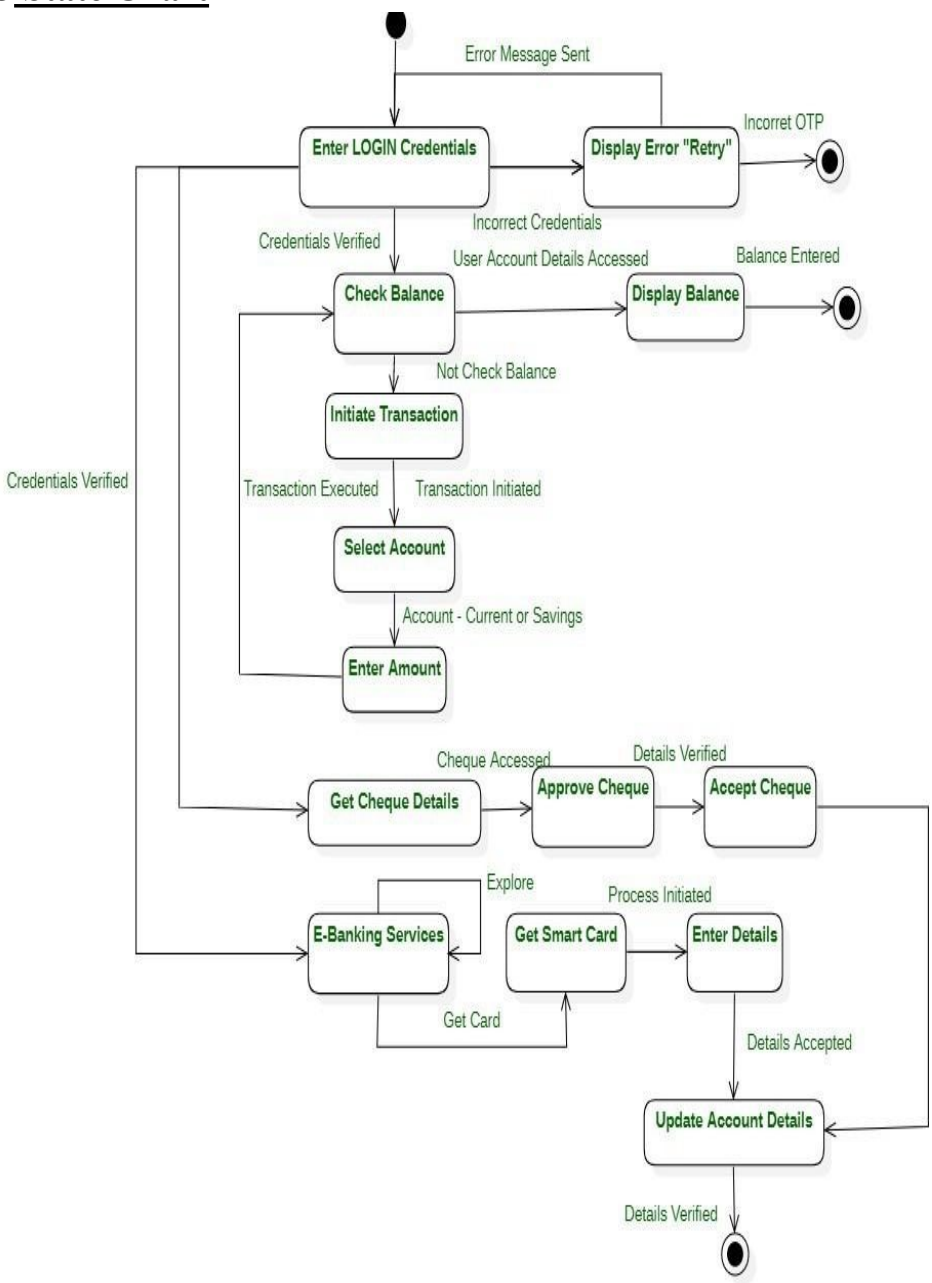


4.2 Class Diagrams



4.2

4.3 State Chart



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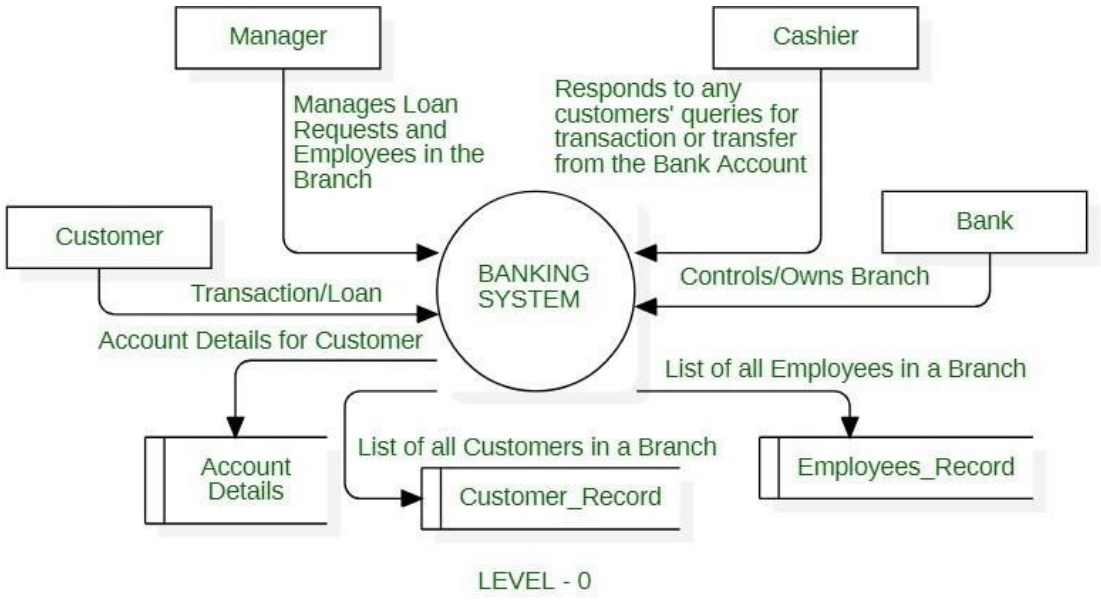
4.5 DFD 0 AND DFD 1



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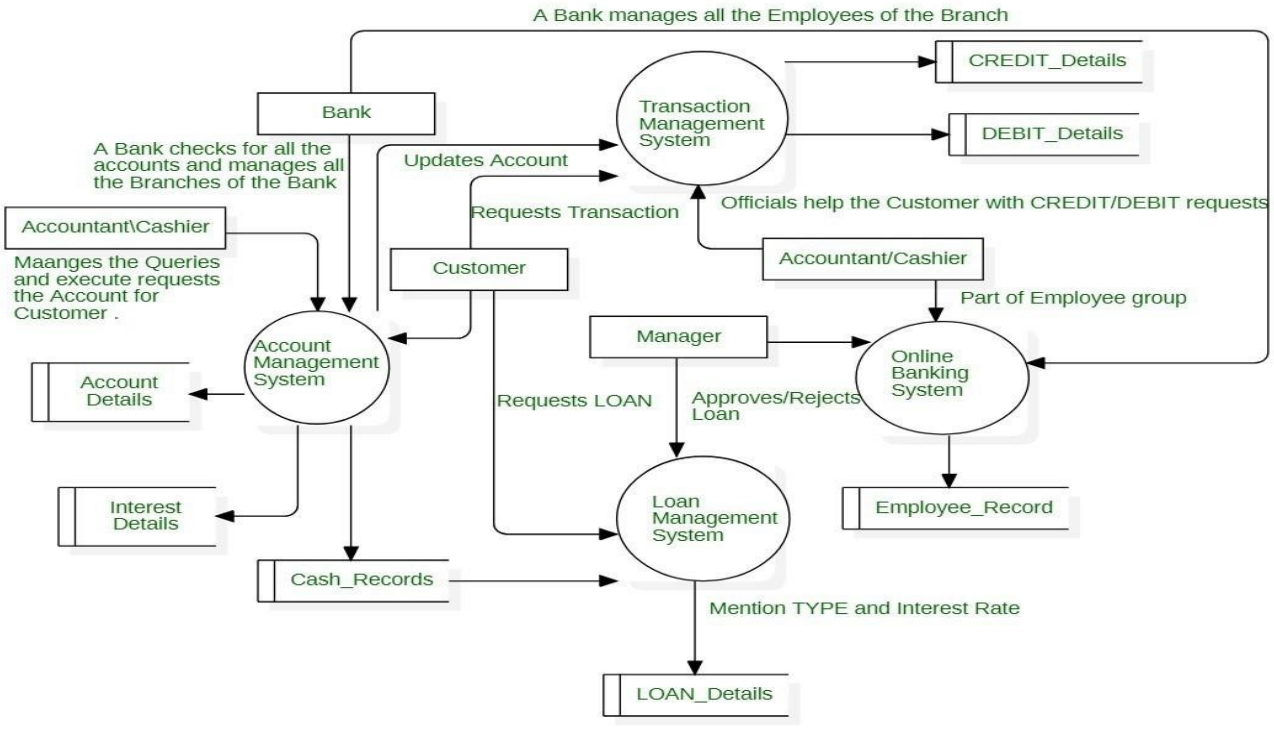

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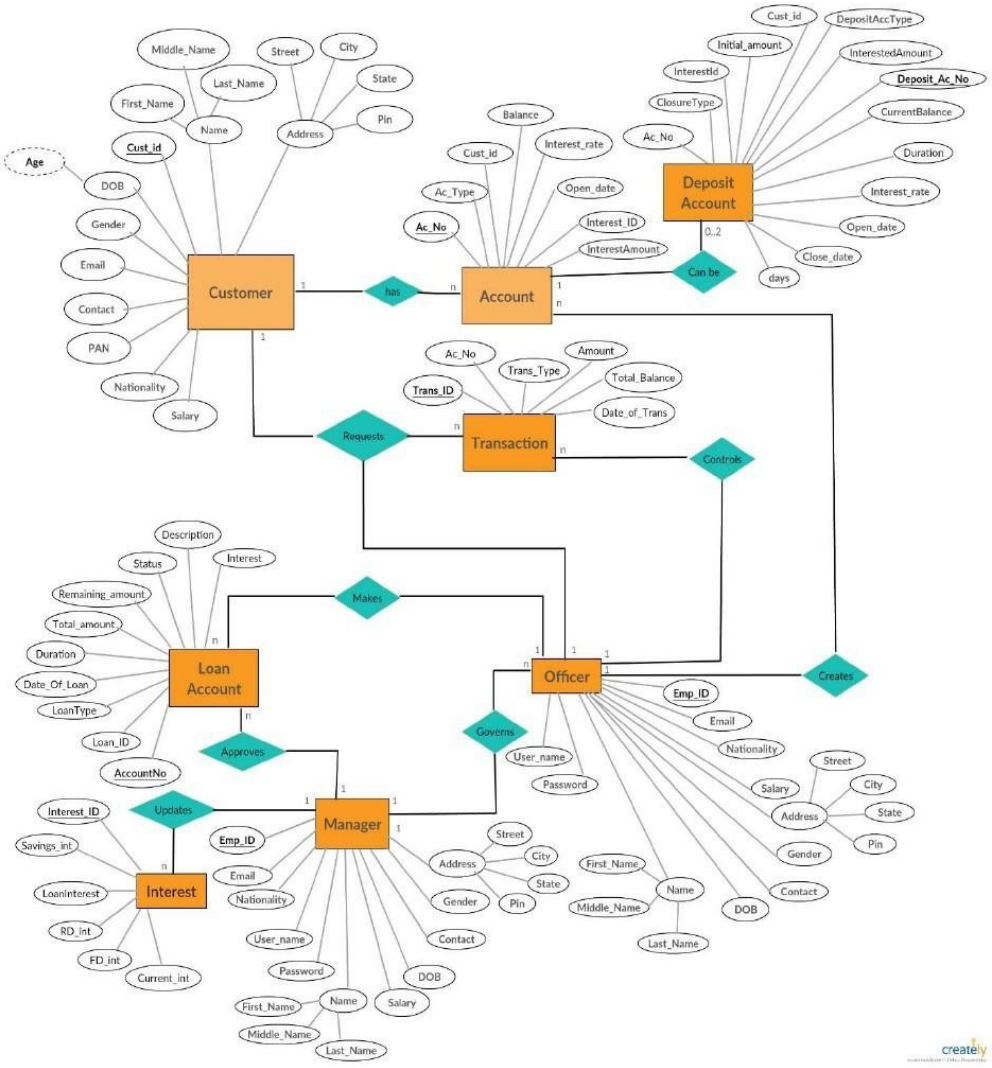
4) DATABASE DESIGN

5.1 Entity-Relationship Diagram (ERD)



Entity-Relationship Diagram Overview:

The ERD illustrates the primary entities, attributes, and relationships in the Banking Management System:

1. **Entities**:

   a. **Customer**
   - CustomerID (Primary Key)
   - First Name
   - Middle Name
   - Last Name
   - Date of Birth

- Gender
- Email
- Contact
- Permanent Account Number (PAN)
- Nationality
- Salary
- Gender
- Address

b. **Account**
- Account No (Primary Key) - CustomerID (Foreign Key)
- Account Type (e.g., Savings, Checking)
- Balance
- Interest Rate
- Date Created
- Interest ID
- Interest Amount

c. **Transaction**
- TransactionID (Primary Key)
- Account No (Foreign Key)
- Transaction Type (e.g., Deposit, Withdrawal, Transfer)
- Amount
- Transaction Date and Time
- Total Balance

d. **Deposit Account**
- Deposit Account No (Primary Key)
- Account No
- Closure type
- Interest ID
- Initial Amount
- CustomerID
- Deposit Account Type
- Interested Amount
- Current Balance
- Duration
- Interest Rate
- Open Date
- Close Date
- Days

e. **Officer**
   - EmployerID (Primary Key)
   - Username
   - Password
   - Email
   - Nationality
   - Salary
   - Address
   - Gender
   - Contact
   - Date of Birth
   - First Name
   - Middle Name
   - Last Name

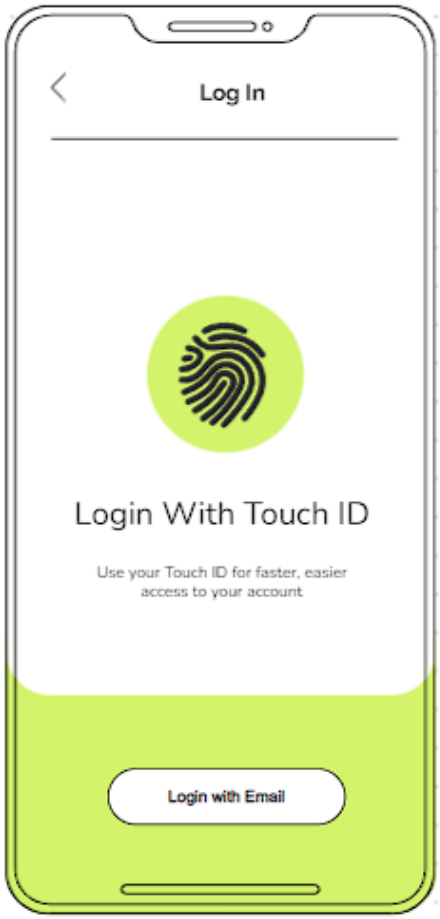
f. **Manager**
- EmployerID (Primary Key)
- Username
- Password
- Email
- Nationality
- Salary
- Address
- Gender
- Contact
- Date of Birth
- First Name
- Middle Name
- Last Name

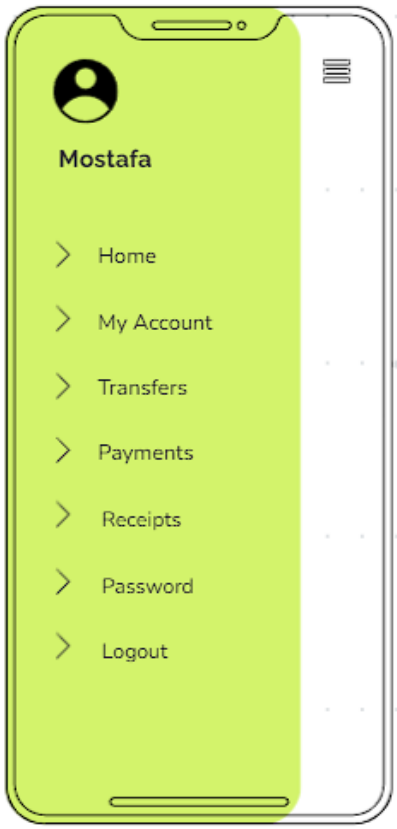
g. **Interest**
- InterestID (Primary Key)
- Savings Interest
- Loan Interest
- RD Interest
- FD Interest
- Current Interest

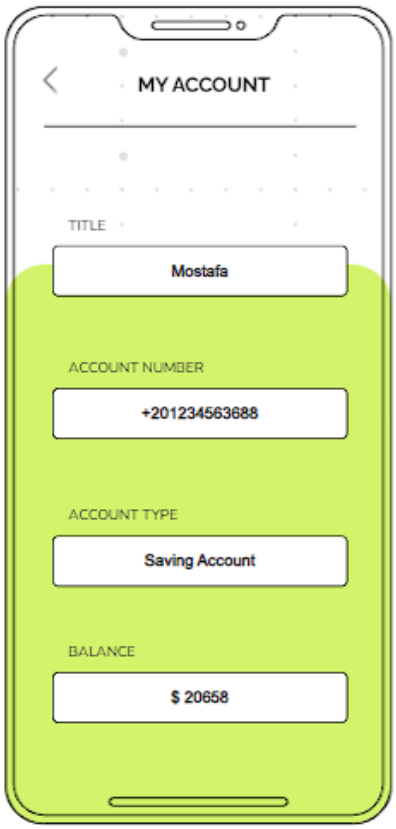
H. **Loan Account**
- Account No (Primary Key)
- Loan ID
- Loan Type
- Date of Loan
- Duration
- Total Amount
- Remaining Amount
- Status
- Description
- Interest

6)

5.2 WIREFRAME







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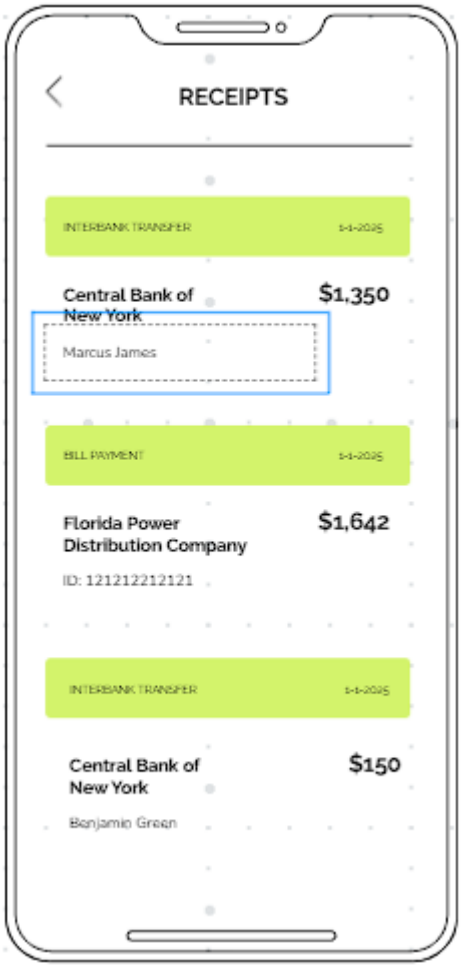

Future Scope :

The future scope of a Banking Management System includes:

1. Digital Transformation: Banks will continue to invest in digital technologies to improve customer experiences, streamline operations, and enhance security.

2. Artificial Intelligence: AI will play a crucial role in customer service, fraud detection, and data analysis for personalized financial solutions.

3. Blockchain: Blockchain technology can enhance security, transparency, and efficiency in various banking processes, including cross-border payments and identity verification.

4. Open Banking: Open banking regulations will promote collaboration between banks and fintech companies, offering customers more choices and personalized financial services.

5. Cybersecurity: With the increasing digitization of banking, cybersecurity will remain a top priority to protect customer data and financial assets.

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6. Mobile Banking: Mobile apps will continue to evolve, providing more features for managing accounts, making transactions, and accessing financial advice.

7. Personal Finance Management: Banking systems may integrate advanced tools to help customers manage their finances, make informed decisions, and save money.

8. Regulatory Compliance: Banks will need to adapt to evolving regulatory requirements, such as data privacy and anti-money laundering regulations.

9. Sustainability and ESG: Banks will focus on environmental, social, and governance (ESG) criteria in their operations and investment decisions.

10. Financial Inclusion: Banking systems will work towards greater financial inclusion, extending services to under-served populations and remote areas.

11. Data Analytics: Advanced data analytics will enable banks to gain insights into customer behavior and preferences, allowing for more targeted services.

These trends represent the evolving landscape of banking management systems, driven by technological advancements, regulatory changes, and shifting customer demands.

Conclusion :

The System Requirements Specification (SRS) for a Banking Management System is a critical document that outlines the functional and non-functional requirements of the software system. This document serves as a foundation for the design, development, and testing phases of the project, ensuring that the final system meets the needs and expectations of both the bank and its customers. In this conclusion, we will highlight the key takeaways and emphasize the importance of a well-defined SRS for such a complex and sensitive domain. First and foremost, the SRS for a Banking Management System has been designed with a strong emphasis on security and data integrity. The confidentiality, availability, and integrity of customer data are of paramount importance in the banking industry. This document provides a detailed outline of the security measures, user access controls, and encryption standards that will be implemented to safeguard sensitive information. By doing so, it ensures that customer trust is maintained and regulatory compliance is upheld. Another crucial aspect of the SRS is its comprehensive coverage of the system's functionality. It defines the various features and modules that the Banking Management System will offer, including customer account management, transaction processing, loan management, reporting, and administrative tools. This level of detail enables developers to understand the full scope of the project and minimizes misunderstandings or misinterpretations during the development process.

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In conclusion, the System Requirements Specification for a Banking Management System is an indispensable document that lays the foundation for the successful development and deployment of a sophisticated and secure banking software solution. It encompasses the critical aspects of functionality, security, performance, and user experience, all of which are essential in the banking industry. A well-defined SRS reduces ambiguity, minimizes risks, and serves as a roadmap for developers and stakeholders. By following the guidelines and requirements set forth in this document, the bank can look forward to a robust, secure, and customer-centric Banking Management System that will not only meet their immediate needs but also adapt to future challenges and opportunities in the ever-evolving world of banking.

References :

1. Academic Journals : Research articles in finance and information technology journals often discuss banking management systems and their evolution.

2. Books : Books on banking technology and management, particularly those written by experts in the field. Some books which deserve special mention are :

A) A Philosophy of Software Design

B) Fundamental of Software Engineering

C) Software Engineering elements

D) Mohapatra, H., & Rath, A. K. (2020). Fundamentals of software engineering: designed to provide an insight into the software engineering concepts. BPB Publications.

3. Online Databases : Online databases like PubMed, Google Scholar, or databases specific to the finance and technology sectors can be valuable resources for academic papers and report