PROJECT SYNOPSIS

of

Bank Management System

Submitted to :

Mr. Anuj Kumar

Submitted by :

Aarifa

AnjilaChoudhary

BatchCode:C6985

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INTRODUCTION

1.

A banking management system encompasses a wide range of features and functionalities aimed at streamlining banking operations, enhancing customer service, and ensuring regulatory compliance

Bank Management System (BMS) is a robust software solution designed to streamline and optimize banking operations through the efficient management of five core entities: Bank, Branch, Customer, Employee, and Account. This system serves as a comprehensive platform for overseeing various aspects of banking, from organizational-level decision-making to personalized customer service delivery. By providing centralized control and seamless integration across these entities, the BMS empowers financial institutions to enhance operational efficiency, ensure regulatory compliance, and elevate the overall customer experience. Through this synopsis, we offer a glimpse into the pivotal role of the BMS in modernizing banking practices and driving sustainable growth in the ever-evolving financial landscape.

Employees play a pivotal role in driving organizational success, and the BMS empowers banks to effectively manage their workforce across various functions and levels. By streamlining recruitment, training, performance evaluation, and task assignment processes, the system enhances employee productivity, morale, and job satisfaction. It cultivates a culture of excellence, innovation, and collaboration, aligning individual efforts with the institution's overarching objectives.

Accounts represent the financial relationships between the bank and its customers, encompassing a diverse range of products and services. The BMS provides comprehensive account management functionalities, including account creation, maintenance, transaction monitoring, and risk assessment

Key features of Bank Management System

➢ **Customer Management:** This feature allows banks to manage customer data, including personal information, account details, transaction history, and other relevant information.

It may also include tools for customer segmentation and analysis.

➢ **Account Management:** This feature enables the creation, modification, and closure of different types of accounts such as savings, checking, loans, and certificates of deposit.

It should also facilitate account inquiries, balance checks, and account statement generation.

Security and Compliance: Given the sensitive nature of financial data, BMS should have robust security measures in place to protect against unauthorized access, fraud, and data breaches.

It should also ensure compliance with relevant regulatory standards such as GDPR, PCI-DSS, and banking regulations.

Branch Management:

➢ Branch Information: Maintain detailed records of branch locations, including addresses, contact details, operating hours, and services offered.

Expansion and Closure Management: Support the process of opening new branches or closing existing ones, including site selection, regulatory approvals, and resource allocation. Update branch information in the system accordingly. PC Configura

2.   **TECHNOLOGIES AND TOOLS**

The Bank Management System (BMS) is built upon a robust technology stack, utilizing industry-leading tools and frameworks to ensure seamless performance and scalability.

1. Java Programming Language:

Java serves as the foundation of the BMS, providing a reliable and versatile platform for building enterprise-grade applications. Its object-oriented approach, strong typing, and vast ecosystem of libraries and frameworks make it an ideal choice for developing complex banking systems.

2. JPA (Java Persistence API) and Hibernate : JPA is a Java standard for object-relational mapping (ORM), while Hibernate is a popular ORM framework that implements JPA specifications.Bank Management System can utilize JPA with Hibernate to interact with the database, perform CRUD (Create, Read, Update, Delete) operations on entities (e.g., Add **account** ,Update Account), and manage Relationship.

3. MySQL : MySQL is a relational database management system (RDBMS) that can be used as the backend database for Bank Mgmt System. It stores data related to user accounts, Employee details , and other aspects of the Banking System . SQL queries and statements are usedto interact with the MySQL database, facilitated by JPA andHibernate.

4. Integrated Development Environment (IDE):

IntelliJ IDEA: IntelliJ IDEA serves as the primary Integrated Development Environment (IDE) for building and maintaining the BMS. Its comprehensive suite of tools, intelligent code assistance, and seamless integration with version control systems streamline the development process, enabling developers to write clean, efficient code and collaborate effectively on projects.

3. SYSTEM REQUIREMENTS SPECIFICATIONS

➢ **Hardware and Software Requirement :**

For a minimal setup to host the Bank Management System:

Hardware :

1. Server:
- ❖ **RAM:** 8GB
- ❖ CPU: Dual-core processor
- ❖ **Storage:** 250GB HDD or SSD
- ❖ **Network:** Ethernet or Wi-Fi connectivity for accessing remote resources

2. Database Server:

- ❖ **CPU:** Dual-core processor
- ❖ **RAM:** 8GB DDR4
- ❖ **Storage:** 250GB HDD or SSD

3. Networking Equipment:

- ❖ Basic router
- ❖ Ethernet switch

Software:

1. Operating System:
- ❖ Windows/MAC

2. Database Management System:

- ❖ MySQL as the relational database management system (RDBMS) for storing product information, user data, and transaction records**.**

3. Integrated Development Environment (IDE):

- ❖ Eclipse IDE for Java EE development, including coding servlets, JSPs, and managing the project.

This combined hardware and software configuration forms the basic infrastructure required to deploy and operate the Bank Management System . Additional resources and optimizations may be necessary based on the scale and requirements of the project.

4.   **BENEFITS AND LIMITATIONS :**

The Bank Management System (BMS) offers a multitude of benefits, revolutionizing banking operations while acknowledging certain limitations inherent in its design and implementation.

Benefits:

Enhanced Efficiency: The BMS streamlines banking processes, automating routine tasks such as account management, transaction processing, and report generation. This leads to increased operational efficiency, reduced manual errors, and faster service delivery.

Improved Customer Service: With features such as personalized account management, quick transaction processing, and automated notifications, the BMS enhances the overall customer experience. Customers benefit from faster service, real-time access to account information, and personalized support, leading to higher satisfaction levels and increased loyalty.

Comprehensive Data Management: The BMS centralizes data storage and management, providing banks with a holistic view of customer interactions, account activities, and financial performance. This enables informed decision-making, targeted marketing strategies, and regulatory compliance.

Scalability and Flexibility: Designed with a modular architecture, the BMS can scale seamlessly to accommodate the evolving needs of banks, from small branches to large multinational institutions. Its flexible design allows for easy customization, integration with third-party systems, and adaptation to changing market trends.

Enhanced Security: With robust authentication mechanisms, data encryption, and access controls, the BMS ensures the security and confidentiality of sensitive financial information. Banks can mitigate risks associated with fraud, data breaches, and unauthorized access, safeguarding their reputation and protecting customer trust.

Limitations :

- ➢ **Learning Curve:** Transitioning to the BMS may require training and re-skilling of bank staff to familiarize them with the new system

- ➢ **Initial Implementation Costs:** The deployment of the BMS may involve significant upfront costs related to software licensing, hardware procurement, and system integration. Small or resource-constrained banks may face challenges in financing the initial investment required for implementation.

- ➢ **Dependency on Technology:** The effective functioning of the BMS relies heavily on technology infrastructure, including servers, networks, and software applications. Any disruptions or failures in the underlying technology stack could impact the system's performance, leading to downtime and service interruptions.

5. DATABSE DESIGN
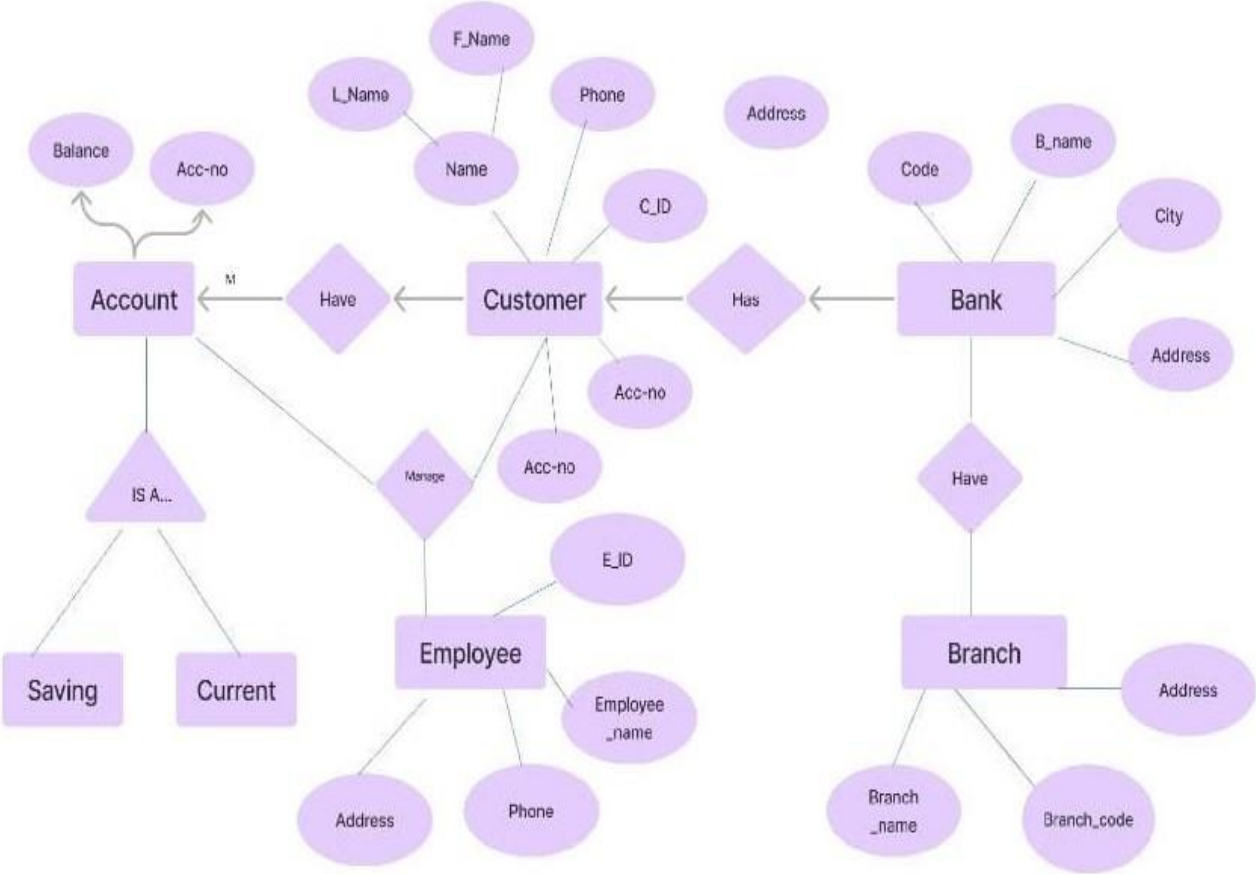
Bank Table:

```
sql> show tables;
--------------------------+
Tables_in_bankingsystem |
--------------------------+
account                 |
bank                    |
branch                  |
customer                |
customer_mobile         |
employee                |
--------------------------+
rows in set (0.16 sec)

sql> desc account;
--------------+--------------+------+-----+---------+----------------+
Field         | Type         | Null | Key | Default | Extra          |
--------------+--------------+------+-----+---------+----------------+
accountNo     | int          | NO   | PRI | NULL    | auto_increment |
accountType   | varchar(255) | YES  |     | NULL    |                |
balance       | double       | NO   |     | NULL    |                |
customer_id   | int          | YES  | MUL | NULL    |                |
employee_id   | int          | YES  | MUL | NULL    |                |
--------------+--------------+------+-----+---------+----------------+
rows in set (0.16 sec)
```

Branch Table :-

```
ysql> desc branch;
------------+--------------+------+-----+---------+----------------+
Field       | Type         | Null | Key | Default | Extra          |
------------+--------------+------+-----+---------+----------------+
id          | int          | NO   | PRI | NULL    | auto_increment |
address     | varchar(255) | YES  |     | NULL    |                |
branchCode  | varchar(255) | YES  |     | NULL    |                |
branchName  | varchar(255) | YES  |     | NULL    |                |
bank_id     | int          | YES  | MUL | NULL    |                |
------------+--------------+------+-----+---------+----------------+
rows in set (0.33 sec)

ysql> select * from branch;
----+---------+------------+------------+---------+
id | address | branchCode | branchName | bank_id |
----+---------+------------+------------+---------+
 2 | Noida   | 1023       | ABC1       |    NULL |
----+---------+------------+------------+---------+
row in set (0.00 sec)
```

Customer Table

```
ysql> desc customer;
+-------------+--------------+------+-----+---------+----------------+
| Field       | Type         | Null | Key | Default | Extra          |
+-------------+--------------+------+-----+---------+----------------+
| id          | int          | NO   | PRI | NULL    | auto_increment |
| address     | varchar(255) | YES  |     | NULL    |                |
| customerId  | varchar(255) | YES  |     | NULL    |                |
| firstName   | varchar(255) | YES  |     | NULL    |                |
| lastName    | varchar(255) | YES  |     | NULL    |                |
| bank_id     | int          | YES  | MUL | NULL    |                |
| employee_id | int          | YES  | MUL | NULL    |                |
+-------------+--------------+------+-----+---------+----------------+
rows in set (0.05 sec)

ysql> select * from customer;
+----+----------------------+------------+-----------+-----------+---------+-------------+
| id | address              | customerId | firstName | lastName  | bank_id | employee_id |
+----+----------------------+------------+-----------+-----------+---------+-------------+
|  1 | Greater Noida        | 2001       | Ajay      | yadav     | NULL    | NULL        |
|  2 | aplha1 greater noida | 3          | Anjila    | choudhary | NULL    | NULL        |
+----+----------------------+------------+-----------+-----------+---------+-------------+
rows in set (0.05 sec)
```

Account Table

```
ysql> desc account;
+-------------+--------------+------+-----+---------+----------------
| Field       | Type         | Null | Key | Default | Extra
+-------------+--------------+------+-----+---------+----------------
| accountNo   | int          | NO   | PRI | NULL    | auto_increment
| accountType | varchar(255) | YES  |     | NULL    |
| balance     | double       | NO   |     | NULL    |
| customer_id | int          | YES  | MUL | NULL    |
| employee_id | int          | YES  | MUL | NULL    |
+-------------+--------------+------+-----+---------+----------------
rows in set (0.16 sec)

ysql> select * from account;
+-----------+-------------+---------+-------------+-------------+
| accountNo | accountType | balance | customer_id | employee_id |
+-----------+-------------+---------+-------------+-------------+
|         3 | NULL        |    1589 |           1 | NULL        |
+-----------+-------------+---------+-------------+-------------+
row in set (0.12 sec)
```

Employee Table

```
sql> desc Employee;
+-----------+--------------+------+-----+---------+----------------+
| Field     | Type         | Null | Key | Default | Extra          |
+-----------+--------------+------+-----+---------+----------------+
| empId     | int          | NO   | PRI | NULL    | auto_increment |
| address   | varchar(255) | YES  |     | NULL    |                |
| empName   | varchar(255) | YES  |     | NULL    |                |
| mobileNo  | varchar(255) | YES  |     | NULL    |                |
| branch_id | int          | YES  | MUL | NULL    |                |
+-----------+--------------+------+-----+---------+----------------+
rows in set (0.00 sec)

sql> select * from Employee;
+-------+---------+---------+------------+-----------+
| empId | address | empName | mobileNo   | branch_id |
+-------+---------+---------+------------+-----------+
|     4 | Alpha 1 | Aarfa   | 1234567890 |         2 |
```

OUTPUT SCREENSHOTS

```
Account Service Menu:
1. Add Account
2. Update Account
3. Delete Account
4. View All Accounts
5. Search Account by ID
6. Withdraw from Account
7. Deposit into Account
8. Check Account Balance
0. Exit
Enter your choice:
```

(Account)

```
Customer Service Menu:
1. Add Customer
2. Update Customer
3. Delete Customer
4. View All Customers
5. Search Customer by ID
Enter your choice: 1
Enter customer details:
First Name: Anjila
Last Name: choudhary
Customer ID: 3
Address: aplha1 greater noida
Mobile Numbers (comma-separated): 32423545
Hibernate: insert into Customer (address, bank_id, customerId, employee_id, firstName, lastName) values (?, ?, ?, ?, ?, ?)
Customer added successfully.
```

(Customer)

```
Branch Service
1. Add Branch
2. Update Branch
3. Delete Branch
4. View All Branches
5. View Branch by ID
Enter your choice: 4
Hibernate: select branch0_.id as id1_2_, branch0_.address as address2_2_, branch0_.bank_id as bank_id5_2_, branch0_.branchCode as branchco3_2_,
 branch0_.branchName as branchna4_2_ from Branch branch0_
********ALl Branches**************************
All Branches:
ID: 2, Name: ABC1, Code: 1023, Address: Noida
```

(Branch)

```
Select an action:

1. Retrieve bank details

2. Update bank details

3. Display all banks

4. Delete bank

Enter your choice: 1

Retrieved Bank Details:

Bank Name: ABC bank

Bank Code: SB001

City: Noida UP

Address: Noida sector 15
```

(Bank)

Conclusion

The conclusion of a bank management system emphasizes the significance of effective management practices in financial institutions to ensure smooth operations, customer satisfaction, and regulatory compliance.

A well-designed management system prioritizes customer service, offering seamless transactions, personalized experiences, and timely resolution of inquiries and issues. This fosters trust and loyalty among customers, driving business growth.

The conclusion may touch upon the future outlook for bank management systems, highlighting emerging trends such as digital transformation, artificial intelligence, blockchain technology, and the increasing importance of sustainability and ethical banking practices.

In summary, a bank management system plays a pivotal role in ensuring the efficient, secure, and compliant operation of financial institutions. Continuous improvement, innovation, and a customer-centric approach are essential for long-term success in the banking industry.