

# **BANK ACCOUNT MANAGEMENT SYSTEM**

**A PROJECT REPORT**

**for**

**Mini Project (KCA353)**

**Session (2023-24)**

**Submitted by**

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**Submitted in partial fulfillment of the  
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## **MASTER OF COMPUTER APPLICATION**

**Under the Supervision of**

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**Submitted to**

**DEPARTMENT OF COMPUTER APPLICATIONS**

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**(FEBRUARY -2024)**

## **CERTIFICATE**

Certified that **Shivani Sharma (2200290140147)** has carried out the project work having **“Bank Account Management System” (Mini Project-KCA353)** for **Master of Computer Application** from Dr. A.P.J. Abdul Kalam Technical University (AKTU) (formerly UPTU), Lucknow under my supervision. The project report embodies original work, and studies are carried out by the student herself and the contents of the project report do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

**Date: 26-FEB-2024**

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This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

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**ABSTRACT**

The Bank Account Management System is an application for maintaining a person's account in a bank. In this project I tried to show the working of a banking account system and cover the basic functionality of a Bank Account Management System. To develop a project for solving financial applications of a customer in banking environment in order to nurture the needs of an end banking user by providing various ways to perform banking tasks. Also, to enable the user's work space to have additional functionalities which are not provided under a conventional banking project.

The Bank Account Management System undertaken as a project is based on relevant technologies. The main aim of this project is to develop software for Bank Account Management System. This project has been developed to carry out the processes easily and quickly, which is not possible with the manual systems, which are overcome by this software. This project is developed using Java language. Creating and managing requirements is a challenge of IT, systems and product development projects or indeed for any activity where you have to manage a contractual relationship. Organization need to effectively define and manage requirements to ensure they are meeting needs of the customer, while proving compliance and staying on the schedule and within budget.

The impact of a poorly expressed requirement can bring a business out of compliance or even cause injury or death. Requirements definition and management is an activity that can deliver a high, fast return on investment. The project analyzes the system requirements and then comes up with the requirements specifications. It studies other related systems and then come up with system specifications. The system is then designed in accordance with specifications to satisfy the requirements. The system design is then implemented with Java. The system is designed as an interactive and content management system. The content management system deals with data entry, validation confirm and updating whiles the interactive system deals with system interaction with the administration and users.

## **ACKNOWLEDGEMENT**

Success in life is never attained single-handedly. My deepest gratitude goes to my project supervisor, **Dr. Shashank Bhardwaj** for his guidance, help, and encouragement throughout my project work. Their enlightening ideas, comments, and suggestions.

Words are not enough to express my gratitude to Dr. Arun Kumar Tripathi, Professor and Head, Department of Computer Applications, for his insightful comments and administrative help on various occasions.

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**SHIVANI SHARMA**

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## LIST OF ABBREVIATIONS

1.	AC	Account
2.	ACC	Account Control Centre
3.	ATM	Automated Teller Machine
4.	AVM	Account Verification Mechanism
5.	BAM	Bank Account Management
6.	PIN	Personal Identification Number
7.	WDR	Withdrawal
8.	FD	Fixed Deposit
9.	CIF	Customer Information File
10.	AOF	Account Opening Form

# CHAPTER 1

## 1.1 INTRODUCTION

The “Bank Account Management System” project is a model Internet Banking Site. This site enables the customers to perform the basic banking transactions by sitting at their office or at homes through PC or laptop. The system provides the access to the customer to create an account, deposit/withdraw the cash from his account, also to view reports of all accounts present. The customers can access the banks website for viewing their Account details and perform the transactions on account as per their requirements. With Internet Banking, the brick and mortar structure of the traditional banking gets converted into a click and portal model, thereby giving a concept of virtual banking a real shape. Thus, today's banking is no longer confined to branches. E-banking facilitates banking transactions by customers round the clock globally.

The primary aim of this “Bank Account Management System” is to provide an improved design methodology, which envisages the future expansion, and modification, which is necessary for a core sector like banking. This necessitates the design to be expandable and modifiable and so a modular approach is used in developing the application software.

Anybody who is an Account holder in this bank can become a member of Bank Management System. He has to fill a form with his personal details and Account Number. Bank is the place where customers feel the sense of safety for their property. In the bank, customers deposit and withdraw their money. Transaction of money also is a part where customer takes shelter of the bank. Now to keep the belief and trust of customers, there is the positive need for management of the bank, which can handle all this with comfort and ease. Smooth and efficient management affects the satisfaction of the customers and staff members, indirectly. And of course, it encourages management committee in taking some needed decision for future enhancement of the bank.

Now a day's, managing a bank is tedious job up to certain limit. So software that reduces the work is essential. Also, today's world is a genuine computer world and is getting faster and faster day-by-day. Thus, considering above necessities, the software for bank management has become necessary which would be useful in managing the bank more efficiently.

All transactions are carried out online by transferring from accounts in the same Bank or international bank. The software is meant to overcome the drawbacks of the manual system.

## 1.2 PURPOSE

The Traditional way of maintaining details of a user in a bank was to enter the details and record them. Every time the user needs to perform some transactions he has to go to bank and perform the necessary actions, which may not be so feasible all the time. It may be a hard-hitting task for the users and the bankers too. The project gives real life understanding of Online Banking System and activities performed by various roles in the supply chain. Here, we provide automation for banking system through Internet. Online Banking System project captures activities performed by different roles in real life banking which provides enhanced techniques for maintaining the required information up-to-date, which results in efficiency. The project gives real life understanding of Online Banking System and activities performed by various roles in the supply chain

### Main Goal

**1. Motto-** Our motto is to develop a software program for managing the entire bank process related to Administration accounts customer accounts and to keep each every track about their property and their various transaction processes efficiently.

Hereby, our main objective is the customer's satisfaction considering today's faster in the world.

**2. Customer Satisfaction:** Client can do his operations comfortably without any risk or losing of his privacy. Our software will perform and fulfill all the tasks that any customer would desire.

**3. Saving Customer Time:** Client doesn't need to go to the bank to do small operation.

**4. Protecting the Customer:** It helps the customer to be satisfied and comfortable in his choices, this protection contains customer's account, money and his privacy.

**5. Transferring Money:** Help client transferring money to/or another bank or country.



## 1.3 METHODS

- We need to be able to generate an account number
- Account types: Savings or Current Account
- Maintain/update Balance
- Open/Close Account
- Withdraw/Deposit

## 1.4 ADMINISTRATIVE MODULES

Here in my project there are two types of modules. This module is the main module which performs all the main operations in the system. The major operations in the system are:

### **Admin Module:**

Admin can access this project there is an authorization process. If you login as an Admin then you will be redirected to the Admin Home Page and if you are a simple user you will be redirected to your Account Home Page. This performs the following functions: Create Individual Accounts, manage existing accounts, view all transactions, Balance enquiry, Delete/close account etc.

- 1- Admin login
- 2- Add/delete/update account
- 3- Withdrawal/deposit/statements transaction
- 4- Account Information
- 5- User details list
- 6- Active/Inactive account
- 7- View transaction histories

### **User Module:**

A simple user can access their account and can deposit/withdraw money from their account. User can also transfer money from their account to any other bank account. User can see their transaction report and balance enquiry too.

- 1- User login, use PIN system
- 2- Creating/open new account registration
- 3- Funds transfer (local/international/domestic)
- 4- View statements transaction
- 5- User account details

### **1.4.1 ADMINISTRATIVE MODULES**

#### **Banks terms:**

1. All requests received from customers are logged for backend fulfillment and are effective from the time they are recorded at the branch.
2. Rules and regulations applicable to normal banking transactions in India will be applicable mutatis mutandis for the transactions executed through this site.
3. The BAMS Bank service cannot be claimed as a right. The bank may also convert this into a discretionary service anytime.
4. Dispute between the customer and the Bank in this service is subject to the jurisdiction of the courts in the Republic of India and governed by the laws prevailing in India.
5. The Bank reserves the right to modify the services offered or the Terms of service of BAMS Bank. The changes will be notified to the customers through a notification on the Site.

#### **Customer's obligations:**

- 1.The customer has an obligation to maintain secrecy in regard to Username & Password registered with the Bank. The bank presupposes that login using valid Username and Password is a valid session initiated by none other than the customer.
- 2.Transaction executed through a valid session will be construed by RR to have emanated from the registered customer and will be binding on him/her.
- 3.The customer will not attempt or permit others to attempt accessing the BAMS Bank through any unlawful means.

## **1.5 BENEFITS OF ONLINE BANKING**

Many of us lead busy lives. Some of us are up before the crack of dawn, getting ourselves prepared so we can in turn get our families ready for the day. We rush to work, rush to get the kids to school, and at the end of the day we rush home only to brace ourselves for the next day. After a hectic day, the last thing you want to do is spend time waiting in line at the bank, or even the post office. That's where Online Banking comes in. Many of the benefits of doing our banking online are obvious:

- 1- You don't have to wait in line.
- 2- You don't have to plan your day around the bank's hours.
- 3- You can look at your balance whenever you want, not just when you get a statement.

There are some hidden benefits too. As a young bank customer, you're just learning how to manage your money and observe your spending patterns.

Online banking allows you to watch your money on a daily basis if you want to. By keeping close tabs on your funds, you will always be aware of what's happening in your bank account.

For those experienced spenders, this option is far more appealing than the sudden discovery that you're broke!

It's also helpful to watch how much interest you're gathering on investments and savings or what service charges you have incurred.

### **Most available benefits**

1. Online banking with key bank is fast, secure, convenient and free.
2. Quick, simple, authenticated access to accounts via the web application.
3. Simply scalable to grow with changing system requirement.
4. Global enterprise wide access to information.
5. Improved data security, restricting unauthorized access.
6. Minimize Storage Space.

## 1.6 FUTURE LOOK

The project scope for Bank Management System entails the development and deployment of a comprehensive and management website. Users will have the ability to register and create individual accounts, ensuring a personalized experience within the website. Robust authentication mechanisms will be implemented to safeguard user data and maintain the security of the platform.

A central feature of the website is the creation and a management of expenses groups. Users can effortlessly initiate and oversee financial collaborations related to shared activities, such as household bills, group outings, or collaborative projects. Each expense group will provide a dedicated space for participants, enabling transparent communication and coordination.

The website will boast an intuitive interface for detailed expense tracking. Users can input and categorize various expenses, including relevant details such as the nature of the cost, date and involved participants. The features aim to streamline record-keeping and facilitate a comprehensive understanding of the financial dynamics within each group.

To further enhance efficiency, the website will automate the process of splitting bills among participants. This functionality eliminates the need for manual calculations, ensuring accurate and fair distribution of expenses. Real-time updates on financial contributions will be provided, fostering a sense of accountability and collaboration within each expense group.

Overall, the Bank Management System will offer a seamless and user-friendly solution for managing shared finances, promoting transparency, accuracy, and ease of use for individuals navigating shared financial responsibilities.

Automation will be a key feature, particularly in the process of splitting bills among participants. The website will employ algorithms to calculate and distribute expenses automatically, eliminating the need for manual calculations and minimizing the potential for errors. Real-time updates on financial contributions will be integrated to keep participants informed, fostering a sense of accountability and collaboration within each group.

## **1.7 CONCLUSION**

This project is developed to nurture the needs of a user in a banking sector by embedding all the tasks of transactions taking place in a bank. Future version of this project will still be much enhanced than the current version. Writing and depositing checks are perhaps the most fundamental ways to move money in and out of a checking account, but advancements in technology have added ATM and debit card transactions. All banks have rules about how long it takes to access your deposits, how many debit card transactions you're allowed in a day, and how much cash you can withdraw from an ATM. Access to the balance in your checking account can also be limited by businesses that place holds on your funds.

Banks are providing internet banking services also so that the customers can be attracted. By asking the bank employs we came to know that maximum numbers of internet bank account holders are youth and business man. Online banking is an innovative tool that is fast becoming a necessity. It is a successful strategic weapon for banks to remain profitable in a volatile and competitive marketplace of today. If proper training should be given to customer by the bank employs to open an account will be beneficial secondly the website should be made friendlier from where the customers can directly make and access their accounts.

## **1.8 METHODOLOGY**

The methodology to complete this project is as follows:

1. I explored net beans, concepts of swings and applets.
2. For further and a deeper understanding, I even referred to some articles, books, journals, websites and news articles.

Below are the important concepts on which the work has been done and with the support of these I was able to work on my project.

### **NET BEANS-**

NetBeans is a Java-based integrated development environment (IDE). NetBeans enables the creation of applications using a set of modular software components known as modules. NetBeans is compatible with Windows, Mac OS X, Linux, and Solaris. It also allows other programming languages to be extended. In addition to Java programming, Third-party developers can expand NetBeans-based applications, including the NetBeans IDE.

### **JAVA-**

High-level, Object-Oriented programming language which help programmers to run their applications efficiently. JAVA is the programming language which comes into our minds when we talk about android application. By using JAVA as a programming language, programmer can develop any type of android application easily. JAVA also provides many libraries which also helps in making efficient android application. Swing is a Java GUI

widget toolkit. It's part of Oracle's Java Foundation Classes (JFC), which provides an API for creating graphical-user-interfaces for Java programs.

## **SWING-**

Swing is a Java GUI widget toolkit. It's part of Oracle's Java Foundation Classes (JFC), which provides an API for creating-graphical-user-interfaces for Java programs. Swing was created to give a more advanced collection of graphical user interface components than the previous Abstract Window Toolkit (AWT). Swing offers a pluggable look and feel that allows applications to have a look & feel that is unconnected to the underlying platform, as well as a look & feel that emulates the look & feel of numerous platforms.

## **SQL-**

SQL (Structured Query Language) is a computer language that is used to manage data in a relational database management system (RDBMS) or for stream processing in a relational data stream management system (RDSMS). It's especially beneficial for dealing with structured data, or data that has relationships between entities and variables.

## **CHAPTER 2**

### **FEASABILITY STUDY**

#### **2.1 INTRODUCTION**

The feasibility study Bank Account Management System for the is a critical initial phase in the project lifecycle, aiming to assess the viability and practicality of implementing the proposed management solution. This study encompasses a comprehensive analysis of various aspects, including technical, economic, legal, operational, and scheduling considerations.

In an era characterized by dynamic financial interactions and collaborative living, the concept of managing has become increasingly complex. Recognizing the need for a streamlined solution, the Bank Account Management System is envisioned as a comprehensive tool to alleviate the challenges associated with dividing and managing shared financial responsibilities.

This feasibility study is undertaken to evaluate the practicality and potential success of developing and implementing the Bank Account management system.

The primary objective of the feasibility study is to provide a thorough examination of the technical, economic, legal, and operational aspects involved in bringing the Patient management system to fruition. By conducting this study, we aim to gain insights into the project's viability, potential challenges, and anticipated benefits. The study will serve as a foundation for informed decision-making throughout the development lifecycle.

## **2.2 KEY OBJECTIVES**

### **Technical Feasibility:**

- Assess the technical requirements and challenges associated with developing the Bank Account Management System.
- Evaluate the availability of necessary technologies and expertise to implement the proposed features.

### **Economic Feasibility:**

- Examine the cost implications of developing and maintaining the Bank Account Management System.
- Project the Return on Investment (ROI) and assess the financial viability of the project.

### **Operational Feasibility:**

- Analyze how the Bank Account Management System will integrate into existing operational processes.
- Evaluate the website's usability and acceptance by potential users.

### **Scheduling Feasibility:**

- Develop a realistic project timeline, considering the development, testing, and deployment phases.
- Identify potential bottlenecks and risks that may impact the project schedule.



## 2.3 TECHNICAL FEASIBILITY

### Infrastructure Requirements:

- **Server Infrastructure:** Assess the capacity and scalability of cloud-based servers (e.g., AWS, Azure) to accommodate potential user growth and ensure seamless performance.
- **Database Management:** Evaluate the suitability of database systems (e.g., MySQL, SQL) for efficient storage and retrieval of user data.

### Software Development:

- **Programming Languages:** Choose website backend (e.g., Python, Node.js) and frontend (e.g., React, Angular) technologies based on developer expertise and project requirements.
- **Framework Selection:** Select a web website framework (e.g., Django, Flask) to streamline development and enhance maintainability.

### Security Measures:

- **Authentication Protocols:** Implement secure authentication mechanisms (e.g., OAuth, JWT) to protect user accounts and ensure data security.

### User Interface (UI) Design:

- **Responsive Design:** Optimize the website's UI for various devices (smartphones, tablets, web browsers) to provide a consistent and user-friendly experience.

### Deployment and Monitoring:

- **Docker:** Implement containerization using Docker for efficient deployment, scalability, and consistency across different environments.

## 2.4 OPERATIONAL FEASIBILITY

The operational feasibility analysis is a crucial aspect of determining whether the Bank Account Management System can seamlessly integrate into existing processes and effectively meet the needs of its users.

This assessment involves evaluating usability, acceptance, and overall practicality from an operational standpoint.

### User Acceptance:

- **User Feedback Surveys:** Conduct surveys or gather feedback from potential users to gauge their acceptance of the Bank Account Management System. Understand user preferences and expectations.

### Usability Testing:

- **User Interface (UI) Testing:** Evaluate the user interface for intuitiveness and ease of use. Conduct usability testing to identify any potential issues in navigation or functionality.

### User Engagement Strategies:

- **Communication Plans:** Develop communication strategies to keep users informed about new features, updates, and any changes in the website. Foster ongoing engagement.

### Operational Impact Analysis:

- **Operational Workflow Analysis:** Assess how the Bank Account Management System will fit into users' daily workflows. Identify potential impacts on existing operational processes.

### Change Management Strategies:

- **Change Management Plans:** Develop strategies to manage organizational and user-level changes resulting from the introduction of the Bank Account Management System. Address any potential resistance.

### Legal and Compliance Considerations:

- **Compliance Analysis:** Ensure that the website complies with relevant legal and regulatory requirements related to financial transactions, data protection, and user privacy.

## **2.5 SCHEDULE FEASIBILITY**

The schedule feasibility analysis for the Bank Account Management System is integral to the project's success, aiming to assess the practicality and achievability of the proposed timeline.

A meticulously planned project timeline delineates key milestones, deliverables, and deadlines across the development, testing, and deployment phases. Each stage, including development, testing, and iterative cycles, undergoes detailed task breakdowns to ensure accurate time allocation for coding, testing, and refinement.

Testing and quality assurance constitute critical phases, demanding ample time for comprehensive testing, debugging, and issue resolution. Incorporating iterative development cycles and feedback loops allows for continuous refinement based on testing outcomes and user feedback. The availability of human resources, including developers and testers, is carefully considered to ascertain that team members can commit the necessary time to their respective roles.

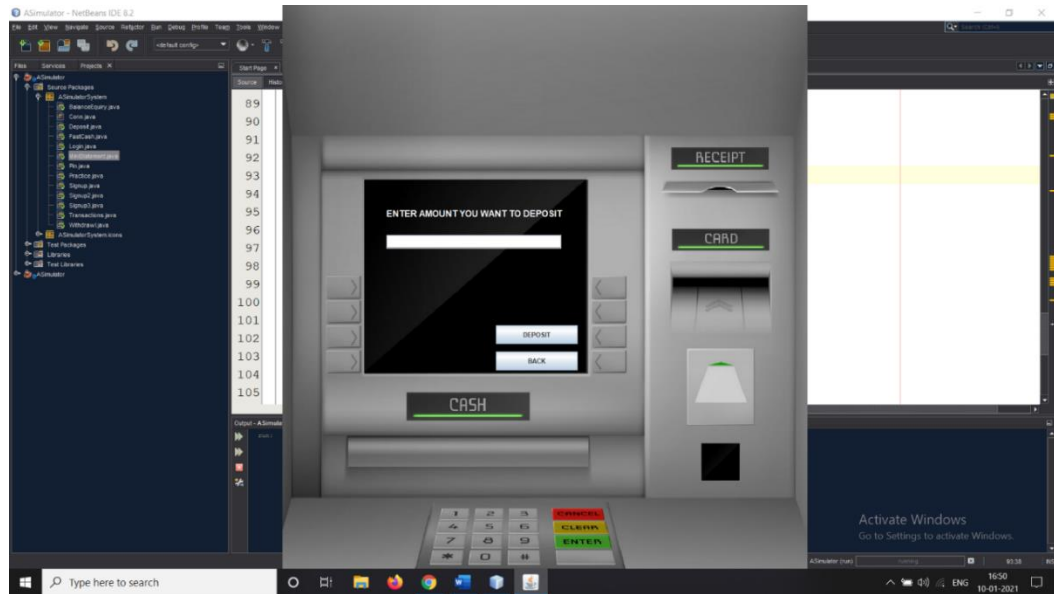
In anticipating potential risks, the schedule feasibility analysis identifies technical challenges, resource constraints, and unforeseen issues, accompanied by mitigation strategies to minimize their impact. Exploring parallel development opportunities and incorporating contingency buffers in the schedule further fortifies the project against unexpected delays.

Finally, the schedule feasibility analysis recognizes the iterative nature of development, allowing for the integration of user feedback into the process. This iterative website ensures that the Bank Account Management System aligns closely with user expectations, resulting in a well-executed project within the stipulated timeframe.

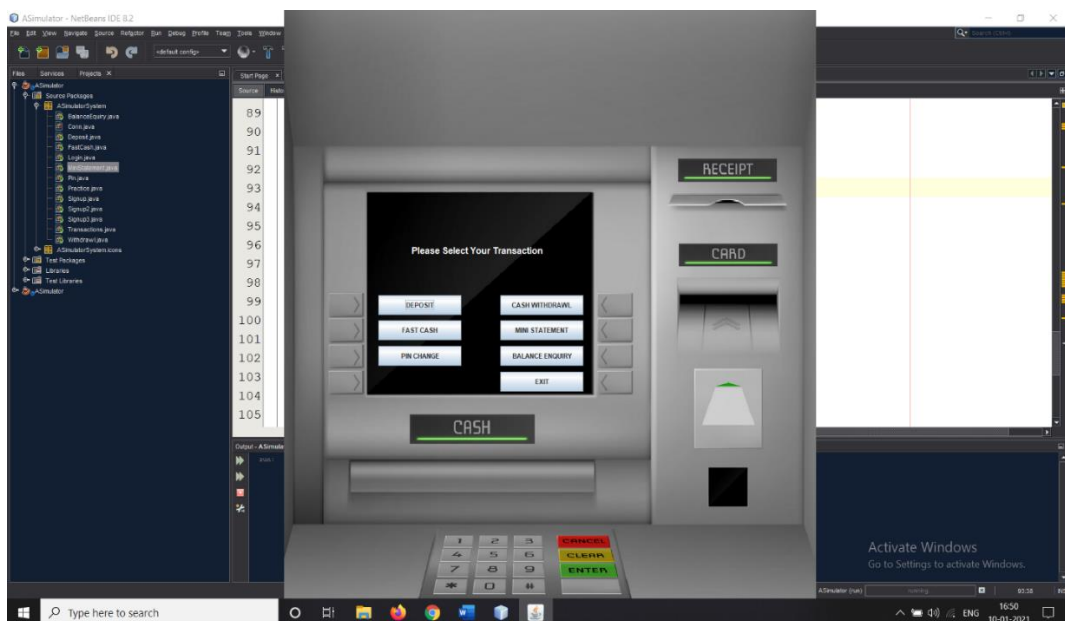
# CHAPTER 3

## 3.1 SCREENSHOTS

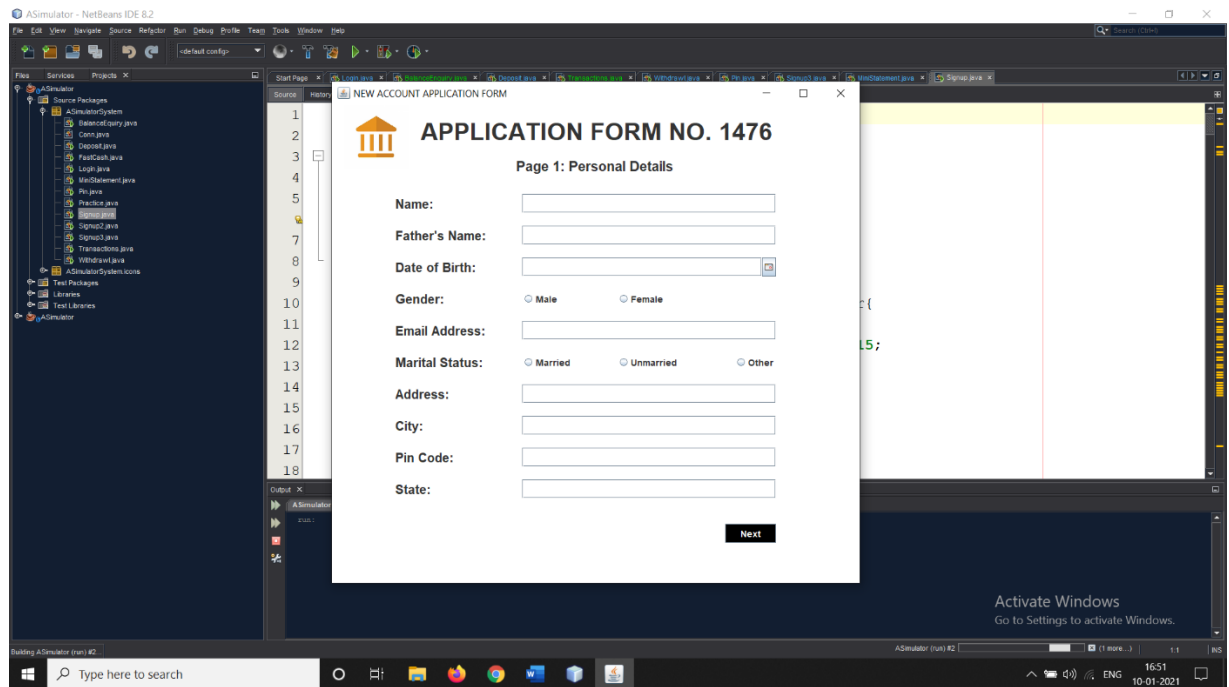
### 3.1.1 Deposit



### 3.1.2 Transaction



### 3.1.3 Signup page



## CHAPTER 4

### DATABASE DESIGN

#### 3.1 INTRODUCTION

The database design for the Bank Account Management System is a foundational element that a pivotal role in organizing and managing data efficiently. A well-structured database is essential for facilitating seamless interactions between the website and its users, ensuring robust data storage, retrieval and manipulation. The introduction outlines the fundamental principles guiding the database design process and emphasizes the importance of creating a scalable and secure data architecture to support the diverse needs of expense management within collaborative settings.

#### 3.2 DATABASE TABLES

Creating a comprehensive database table for the Bank Account Management System involves considering the key entities and their attributes. In a simplified example, let's focus on two main entities: Users and Expenses. Here's a basic representation:

##### 3.2.1 Login Table:

The table holds login details of user for authentication and authorization of bank details for security purpose.

Form No.	Card No.	Pin
6748	5040935931683630	7432

Table 3.1 Login's Table

### 3.2.2 Signup Table:

The first signup of user which holds user details for maintenance of transactions of their bank account.

Form no	name	Father name	dob	gender	email	Marital status	address	city	pincode	state
5166	Shivani	Ashok Kumar	03-Jun-2002	F	shivanisharma2033@gmail.com	Unmarried	delhi	<u>delhi</u>	20120	UP
6748	Shivani	Ashok Kumar	03-Jun-2002	F	shivani.2224mca1155@kiet.edu	Unmarried	noida	<u>noida</u>	20120	UP
5080	Vanshi	Jatin Mohan	27-Nov-2004	F	vanshikash@gmail.com	Unmarried	Delhi	Delhi	1234	Delhi

Table 3.2.1 Signup's Table

### 3.2.3 Signup2 Table:

These contains additional information of bank accounts of users.

Form no	Existing acc	religion	category	income	education	occupation	pan	aadhar	Senior citizen
125	No	Hindu	General	<1,50,000	Post-Graduate	Salaried	123	123	No
674	No	Hindu	General	<2,50,000	Post-Graduate	Salaried	123456789	987654321	No
508	No	Hindu	General	Null	Graduate	Student	987654321	123456789	No

Table 3.2.2 Signup2's Table

### 3.2.4 Signup3 Table:

The signup3 holds the details of all the transaction details of user.

Form_no	Account_type	Card_no	pin	facility
6748	Recurring Deposit Account	5040935931683630	7432	Mobile Banking

Table 3.2.3 Signup3's Table

### 3.2.5 Bank Table:

The overall details of user with any deposit, withdrawal, statements, etc is stored in the bank table under the bank management system database.

<u>pin</u>	<u>date</u>	<u>type</u>	<u>amount</u>
7432	Fri Dec 29 23:05:29 IST 2023	Deposit	85000
7432	Fri Dec 29 23:07:00 IST 2023	Deposit	20



### **3.3 FLOWCHART**

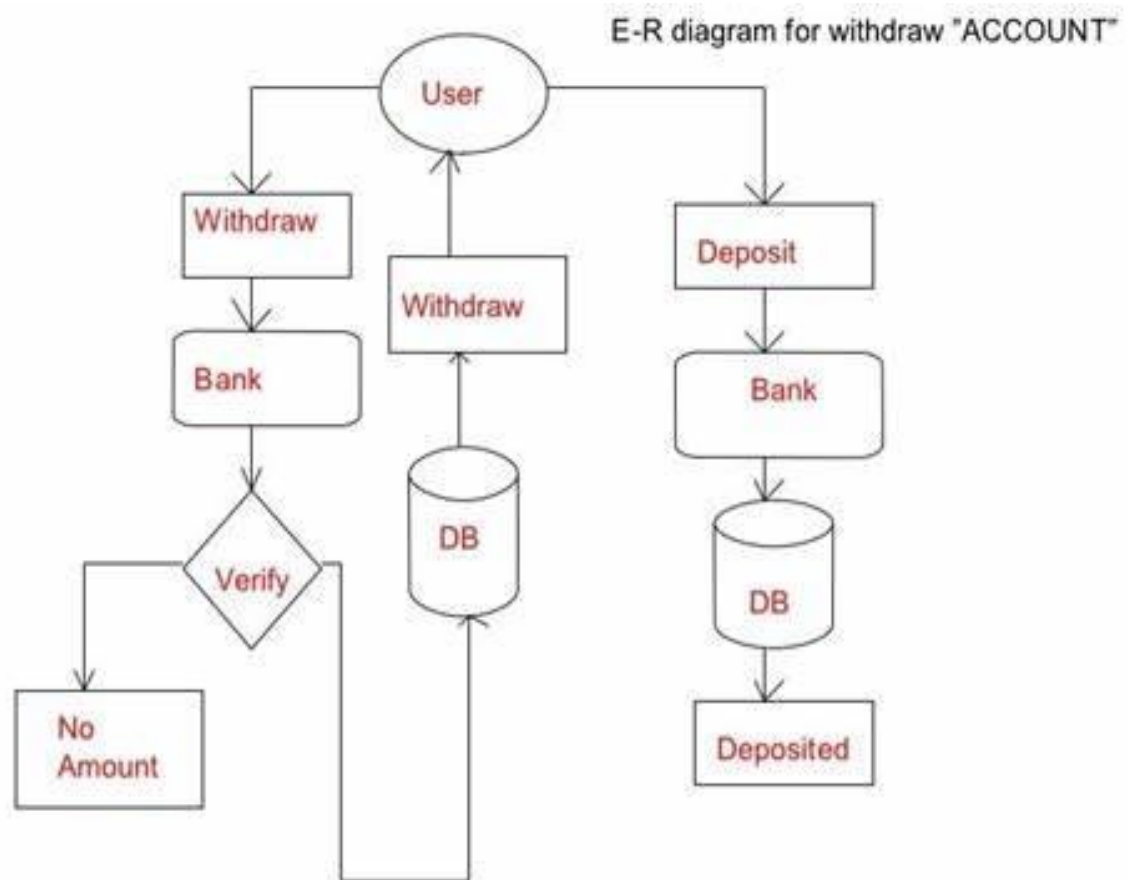
The flowchart for the Bank Account management system encapsulates the intricate system in sequence of actions and decision points involved in its operation, providing a visual view for understanding the systematic flow of activities. At its core, the flowchart delineates the stepwise processes initiated by user interactions, the validation and categorization of expense data, communication with the database, and the subsequent generation and presentation of expense reports.

Commencing with the entry point, often represented by the user's interaction, the flowchart systematically guides through essential processes such as user registration, login, expense entry, and report generation. Decision points within the flowchart capture instances where the system evaluates conditions, such as validating user data or verifying login credentials, influencing the subsequent course of actions. Key processes, depicted in distinct shapes and connected by arrows, convey the logical flow from one operation to another.

For instance, the flowchart delineates how the Bank Account management system communicates with the database for tasks like storing and retrieving user and expense data. Decision diamonds illustrate branches in the logic, signifying points where the system evaluates conditions and proceeds accordingly.

This visual representation not only aids developers in understanding the operational logic but also serves as a valuable tool for stakeholders to grasp the intricacies functionality. The flowchart serves as a blueprint, guiding the development team through the systematic execution of tasks, ensuring that the website functions cohesively and efficiently. Ultimately, the Bank Account management system flowchart is a pivotal resource in comprehending, communicating, and refining the logical sequence of processes within the system.

## Flowchart:



### 3.4 USE CASE DIAGRAM

1. Actors:

- Customer
- Bank Staff
- Manager

2. Use Cases:

- Customer:
  - View Account Balance
  - Withdraw Money
  - Deposit Money
  - Transfer Money
  - View Transaction History
  - Change Password
- Bank Staff:
  - Verify Customer Information
  - Open Account
  - Close Account
  - Process Loan Application
  - Generate Monthly Statements
  - Update Customer Information
  - Handle Customer Complaints
- Manager:
  - Monitor Transactions
  - Generate Reports
  - Manage Staff
  - Approve Loan Applications
  - Set System Parameters

- Review Performance Metrics

3. Associations:

- Customer interacts with View Account Balance, Withdraw Money, Deposit Money, Transfer Money, View Transaction History, and Change Password.
- Bank Staff interacts with Verify Customer Information, Open Account, Close Account, Process Loan Application, Generate Monthly Statements, Update Customer Information, and Handle Customer Complaints.
- Manager interacts with Monitor Transactions, Generate Reports, Manage Staff, Approve Loan Applications, Set System Parameters, and Review Performance Metrics.

4. System Boundary:

- Represent the Bank Management System as a boundary that encapsulates all the use cases.

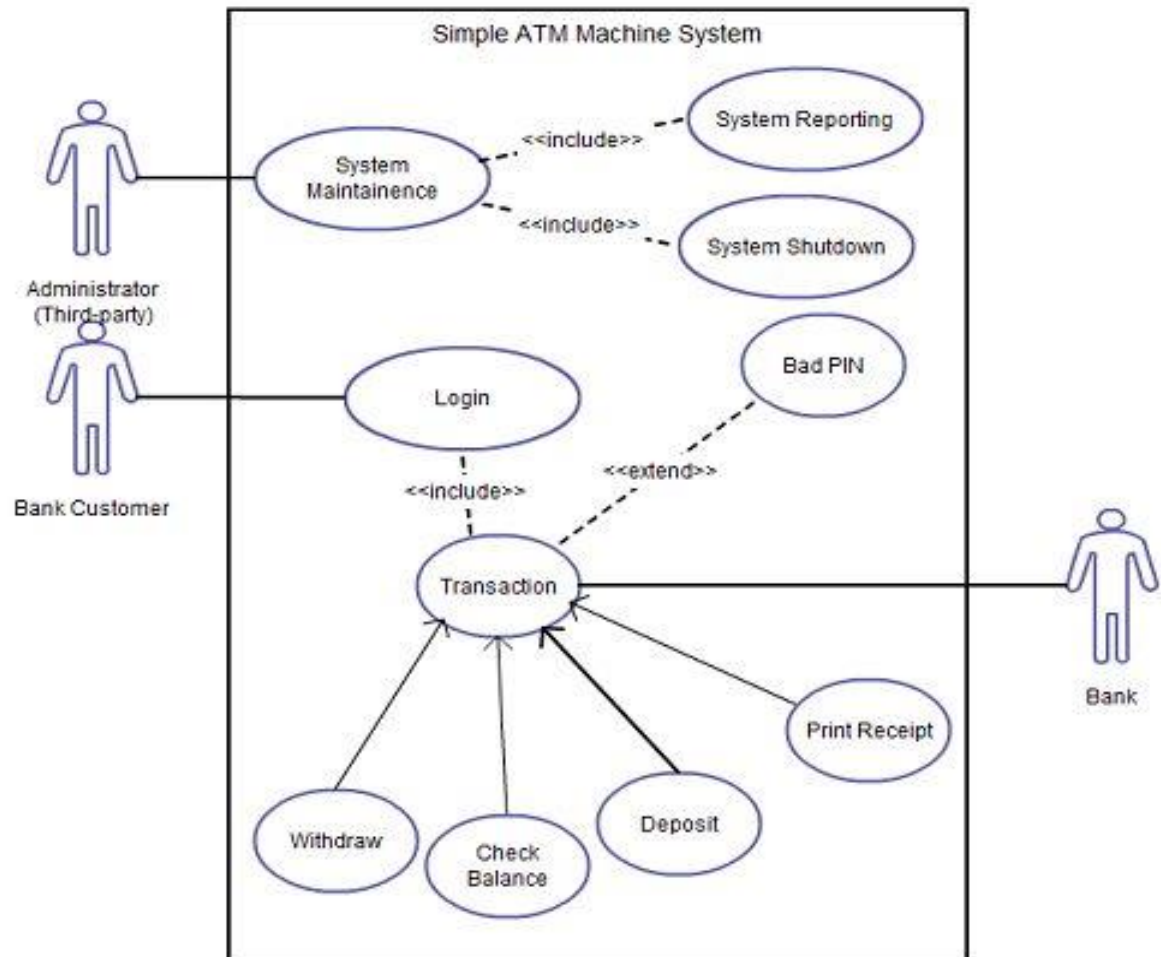
5. Include Relationships:

- Use association lines to connect actors with their respective use cases.
- Use generalization relationships if there are specific roles or types of actors (e.g., Senior Bank Staff, Junior Bank Staff).

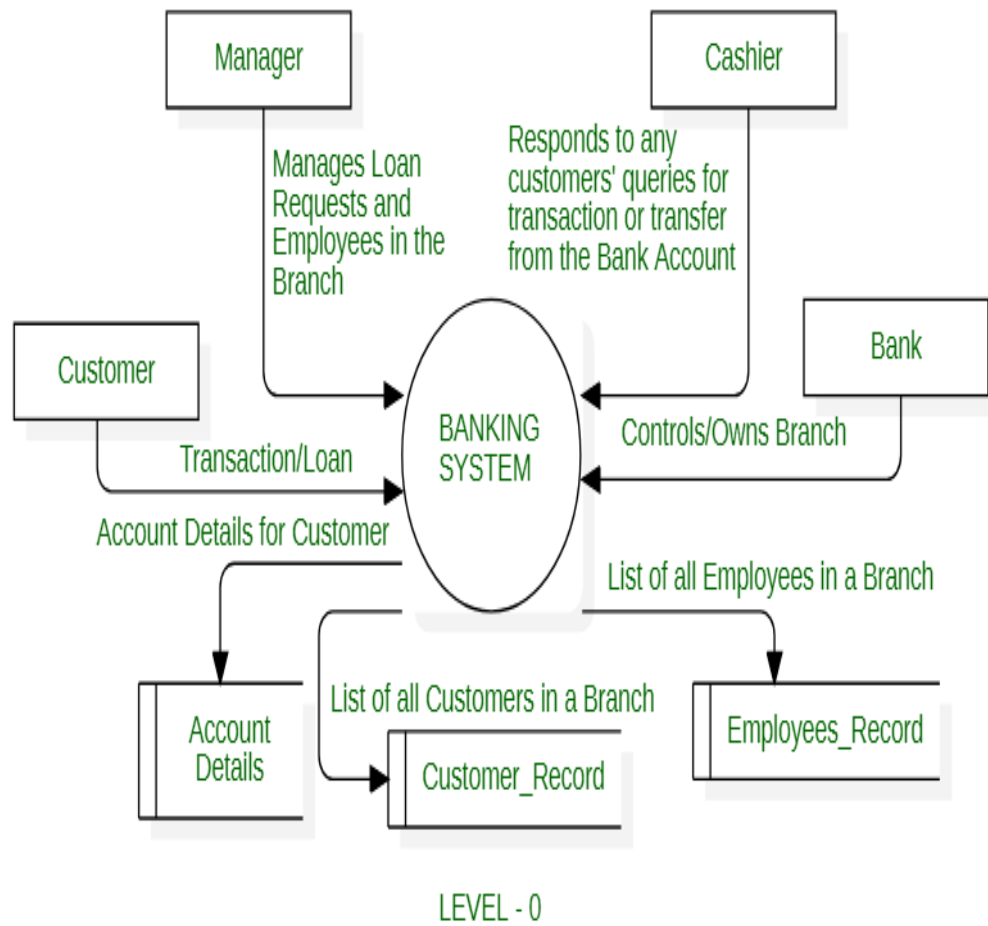
6. Include Extension Points:

- For complex use cases, you can include extension points that represent additional functionalities within a use case.

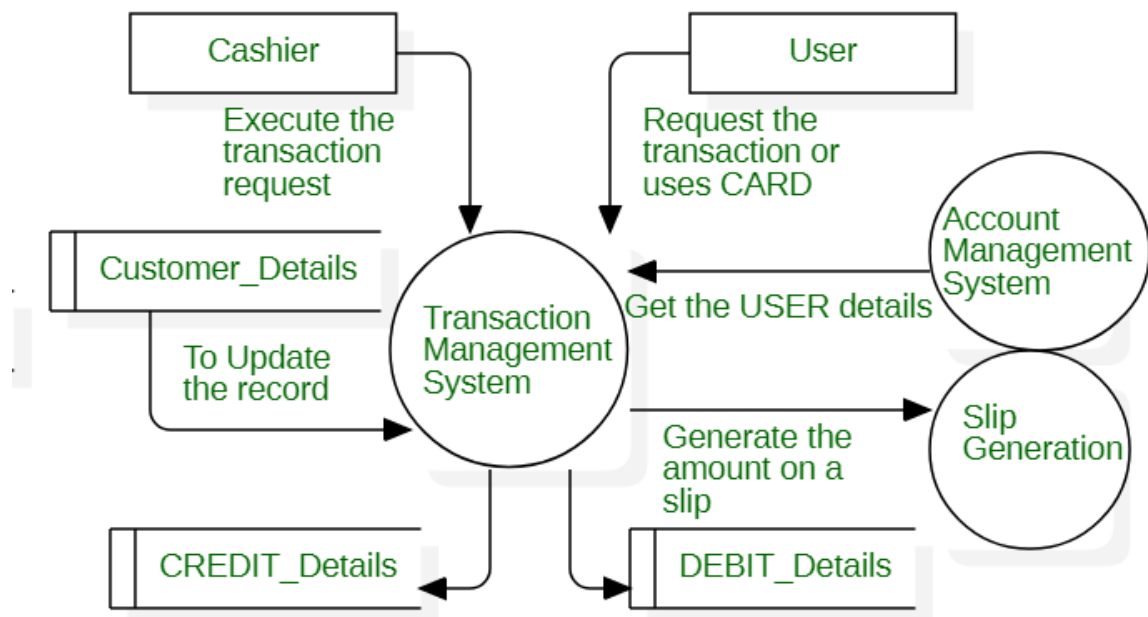
## USE CASE DIAGRAM



### 3.5 DATA FLOW DIAGRAM

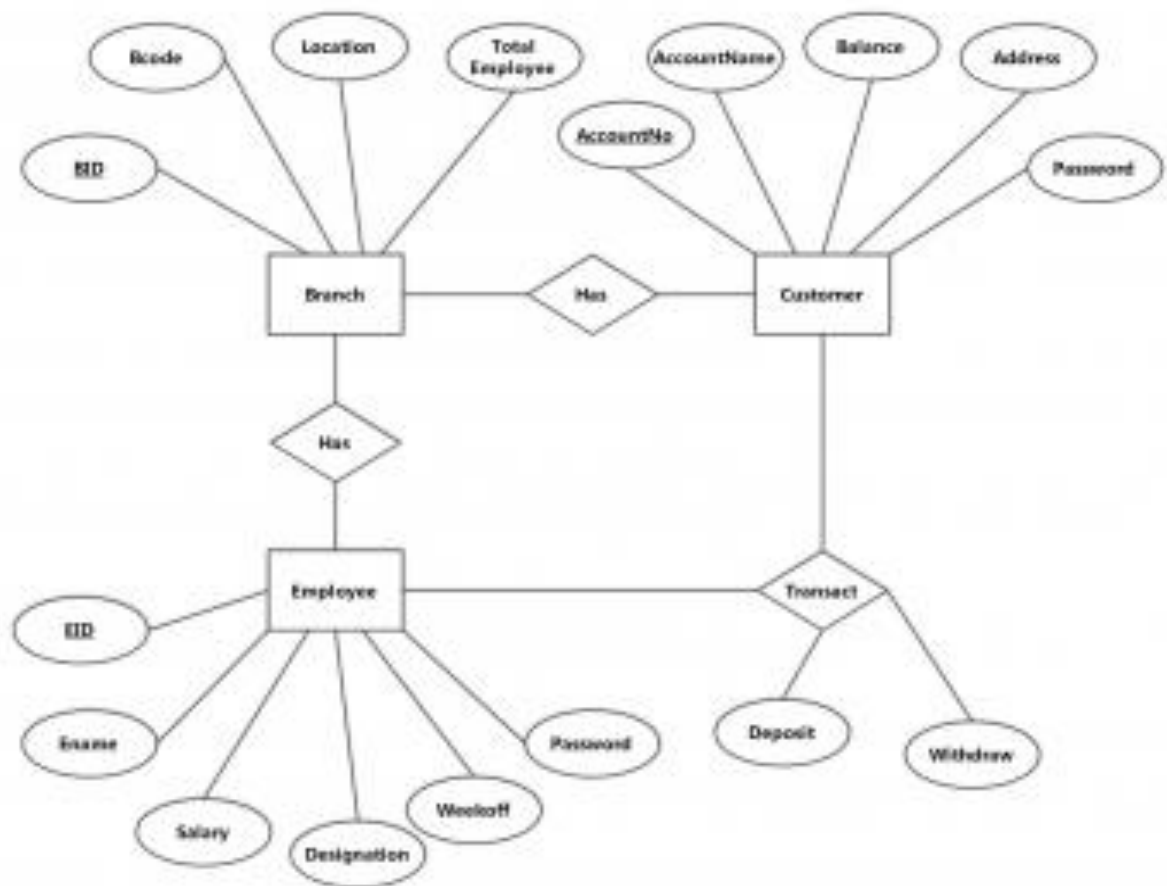


### 3.5 DATA FLOW DIAGRAM



#### 2. Transaction Management System

### 3.6 ER DIAGRAM:





# CHAPTER 5

## TESTING

Testing a bank account management system is a critical process to ensure that the system functions correctly, securely, and efficiently. Below are some key aspects and types of testing that can be conducted for a bank account management system:

1. Unit Testing:

- Verify individual components, such as functions, classes, or methods, to ensure they operate as expected.
- Test boundary cases for input validation.
- Check if calculations related to interest, fees, and other financial transactions are accurate.

2. Integration Testing:

- Validate the interaction between different modules or systems within the bank management system.
- Ensure that data is correctly shared between components.
- Confirm that third-party integrations (if any) work seamlessly.

3. Functional Testing:

- Validate all the functionalities of the bank account management system.
- Test account creation, closure, and modification processes.
- Verify transaction processing, including deposits, withdrawals, and fund transfers.
- Check if interest calculations and fee assessments are accurate.

4. Security Testing:

- Conduct penetration testing to identify vulnerabilities in the system.
- Ensure that user authentication and authorization mechanisms are robust.
- Test against SQL injection, cross-site scripting (XSS), and other security threats.

5. Performance Testing:

- Assess the system's responsiveness and stability under normal and peak loads.
- Monitor database performance during high transaction volumes.
- Evaluate response times for critical functionalities.

6. Usability Testing:

- Check the user interface for intuitiveness and user-friendliness.
- Verify that users can easily navigate through the system.
- Test the accessibility of the application for users with disabilities.

7. Regression Testing:

- Ensure that new updates or bug fixes do not negatively impact existing functionalities.
- Re-run previous test cases to confirm that the system still behaves as expected.

8. Compatibility Testing:

- Test the bank account management system on different browsers and devices.
- Ensure compatibility with various operating systems.

9. Data Integrity Testing:

- Confirm that data entered into the system is accurately stored and retrieved.
- Validate the backup and recovery mechanisms to prevent data loss.

10. Compliance Testing:

- Ensure that the system adheres to banking regulations and compliance standards.
- Verify that customer data privacy and confidentiality are maintained.

11. User Acceptance Testing (UAT):

- Involve actual users or representatives from the bank to validate the system against real-world scenarios.
- Confirm that the system meets the user's expectations and requirements.

12. Disaster Recovery Testing:

- Simulate scenarios such as data loss or system failure to test the effectiveness of the disaster recovery plan.

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  - An online article that provides an overview of bank account management systems and their functionalities.
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