Software Requirements Specification

For

Automated Banking System

Version 1.0 Approved

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Of the requirements of

Software Engineering(Agile Methodology)

Table of Contents

1. Abstract

The Automated Banking System (ABS) is a software application designed to manage banking operations efficiently, securely, and accurately. Traditional banking relies heavily on manual processing, leading to delays, errors, and inefficiencies in handling transactions, account management, and customer service. With the rapid growth of digital banking, there is a need for an automated solution that ensures fast and accurate banking services.

This system allows customers to perform banking operations such as account creation, balance enquiry, deposit, withdrawal, fund transfer, and mini-statement generation. Administrators can manage customer accounts, monitor transactions, generate reports, and maintain security protocols. The system is designed to reduce human errors, improve transaction speed, and provide 24/7 accessibility to banking services.

The Automated Banking System is developed using the **Agile methodology**, which divides development into iterative sprints. This ensures early delivery of functional modules, continuous testing, and incorporation of user feedback at every stage. Security and data integrity are prioritized, ensuring confidential information such as account details, passwords, and transactions are protected.

By implementing this system, banks can enhance operational efficiency, reduce paperwork, and provide better customer satisfaction. Future enhancements may include mobile banking integration, biometric authentication, and AI-based fraud detection. This project demonstrates how Agile practices can help develop a secure, reliable, and user-friendly banking solution.

2. Introduction

The **Automated Banking System (ABS)** is a software application designed to digitize banking operations, including account management, transactions, and reporting. Traditional banking relies on manual processes, which are time-consuming, error-prone, and inefficient. With the rise of digital banking, there is a need for a system that automates core banking tasks while ensuring security, accuracy, and real-time access for customers and administrators.

The ABS enables customers to manage their accounts, perform transactions, and access banking services online. Administrators can manage accounts, monitor transactions, and generate reports efficiently. By using Agile methodology, the system is developed in iterative sprints, ensuring early delivery of modules, continuous testing, and incorporation of user feedback.

2.1 Introduction

Banking operations involve handling large volumes of customer data, managing financial transactions, and maintaining accurate account information. Manual management of these processes is inefficient and increases the risk of errors.

The Automated Banking System provides a **centralized, digital platform** where:

- Customers can register, log in, view account details, deposit and withdraw funds, transfer money, and generate mini-statements.
- Administrators can manage customers, monitor transactions, and generate reports.

This system reduces dependency on physical branch visits and allows **24/7 access** to banking operations.

2.2 Problem Identification

Key problems in traditional banking include:

- Long queues for simple transactions such as deposits or withdrawals.
- Manual record-keeping, which may cause errors in balances or transaction history.
- Difficulty in generating accurate financial reports quickly.
- Time-consuming fund transfers between accounts.
- Limited access to banking services outside business hours.

2.3 Need of the Project

The Automated Banking System is needed to:

- **Automate banking operations** such as account management, transactions, and reporting.
- **Reduce errors** in financial transactions and account balances.
- **Provide customers with 24/7 access** to their accounts and services.
- **Improve efficiency** in administrative and operational tasks.
- **Enhance security** by providing user authentication and controlled access.

2.4 Project Scheduling

The project follows the **Agile methodology** and is divided into multiple **sprints** to ensure iterative development:

Sprint No.	Sprint Name	Activities	Duration
1	Requirement Analysis	Requirement gathering, backlog preparation	1 Week
2	System Design	Database design, ER diagram, DFD, UI design	1 Week
3	Customer Module Development	Registration, login, balance enquiry	1 Week
4	Transaction Module	Deposit, withdrawal, fund transfer, mini-statement	2 Weeks
5	Admin Module	Manage accounts, monitor transactions, generate reports	1 Week
6	Testing & Deployment	Integration testing, bug fixing, deployment	1 Week

2.5 Objectives

- To develop a secure and efficient Automated Banking System.
- To allow customers to manage accounts and transactions online.
- To reduce manual errors and improve operational efficiency.
- To enable administrators to monitor accounts and generate reports.
- To provide real-time balance updates and transaction confirmations.
- To implement the system using **Agile methodology** for iterative and flexible development.

3. Software Requirement Specification (SRS)

The Software Requirement Specification defines the functional and non-functional requirements of the Automated Banking System. It serves as a reference for developers, testers, and stakeholders to ensure the system meets the banking operations requirements efficiently and securely.

3.1 Purpose

The purpose of this SRS is to clearly define the requirements of the Automated Banking System (ABS) to ensure:

- Customers can perform banking operations such as deposits, withdrawals, fund transfers, balance enquiry, and mini-statement generation.
- Administrators can manage accounts, monitor transactions, and generate reports efficiently.
- The system ensures data security, accuracy, and integrity.
- Agile methodology is followed to allow iterative development and continuous improvement based on user feedback.

The document also helps in testing, deployment, and future maintenance of the system.

3.2 Scope

The scope of the Automated Banking System includes:

- **Customer Module:**
  - Registration and login
  - View account details
  - Deposit and withdraw funds
  - Fund transfers between accounts
  - Mini-statement generation
- **Admin Module:**
  - Manage customer accounts (add, update, delete)
  - Monitor transactions
  - Generate daily, monthly, and annual reports
  - Ensure system security and user authentication
- **Security:**
  - Password protection for accounts
  - Restricted access for administrators
  - Data validation for transactions
- **System Benefits:**
  - Reduces manual workload
  - Provides 24/7 online access
  - Ensures accurate and up-to-date banking data

3.3 Hardware Requirement / Software Requirement (Minimum)

Hardware Requirements:

Component	Specification
Processor	Intel i3 or higher
RAM	4 GB or higher
Hard Disk	20 GB free space
Monitor	15-inch or higher
Internet	Required for online access

Software Requirements:

Software	Specification
Operating System	Windows 10 / Linux
Database	MySQL
Backend Language	Java / Node.js
Frontend	HTML, CSS, JavaScript
IDE	Eclipse / VS Code
Browser	Chrome / Firefox

3.4 Tools

The following tools are used for the development of the Automated Banking System:

- **Frontend Development:** HTML, CSS, JavaScript
- **Backend Development:** Java / Node.js
- **Database Management:** MySQL
- **IDE:** Eclipse or Visual Studio Code
- **Version Control:** Git (for source code management)
- **Server (if web-based):** Apache / Tomcat

These tools ensure the system is **secure, scalable, maintainable, and user-friendly**.

4. System Design

System design defines the structure, components, and workflow of the Automated Banking System. Proper design ensures the system is efficient, scalable, and secure while providing all banking functionalities.

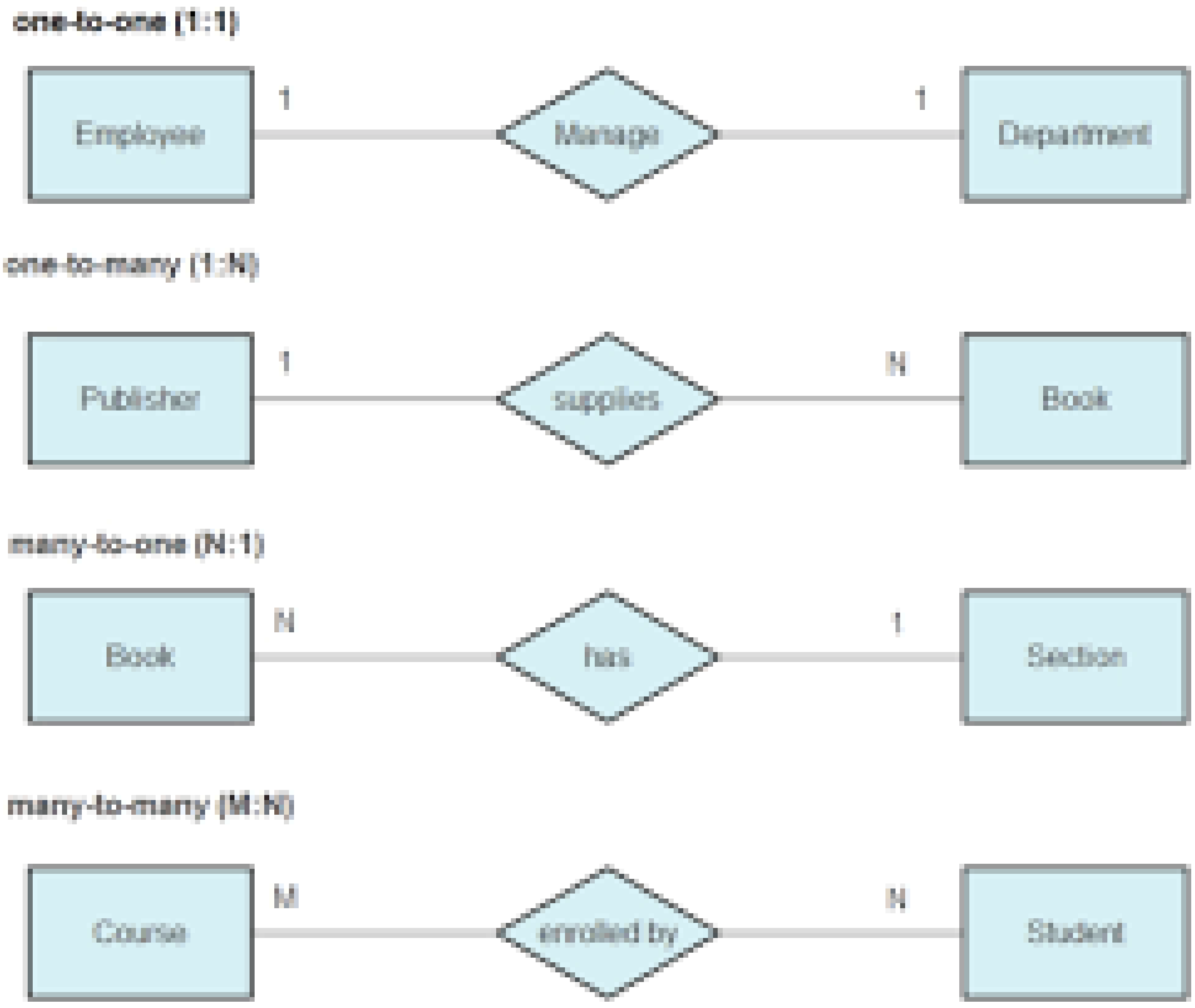
4.1 Data Dictionary

The Data Dictionary lists all major entities and their attributes used in the system:

Entity	Attribute	Description
Customer	customer_id	Unique ID for each customer
	name	Full name of customer
	email	Email used for login and communication
	password	Login password for security
	account_no	Bank account number
	balance	Current account balance
Account	account_no	Unique account number
	customer_id	ID of the account holder
	account_type	Savings / Current / Other
Transaction	transaction_id	Unique ID of each transaction
	account_no	Account involved in transaction
	type	Deposit / Withdrawal / Fund Transfer
	amount	Amount of transaction
	date	Date of transaction
Admin	admin_id	Unique ID of administrator
	name	Name of admin
	email	Admin email
	password	Admin login password

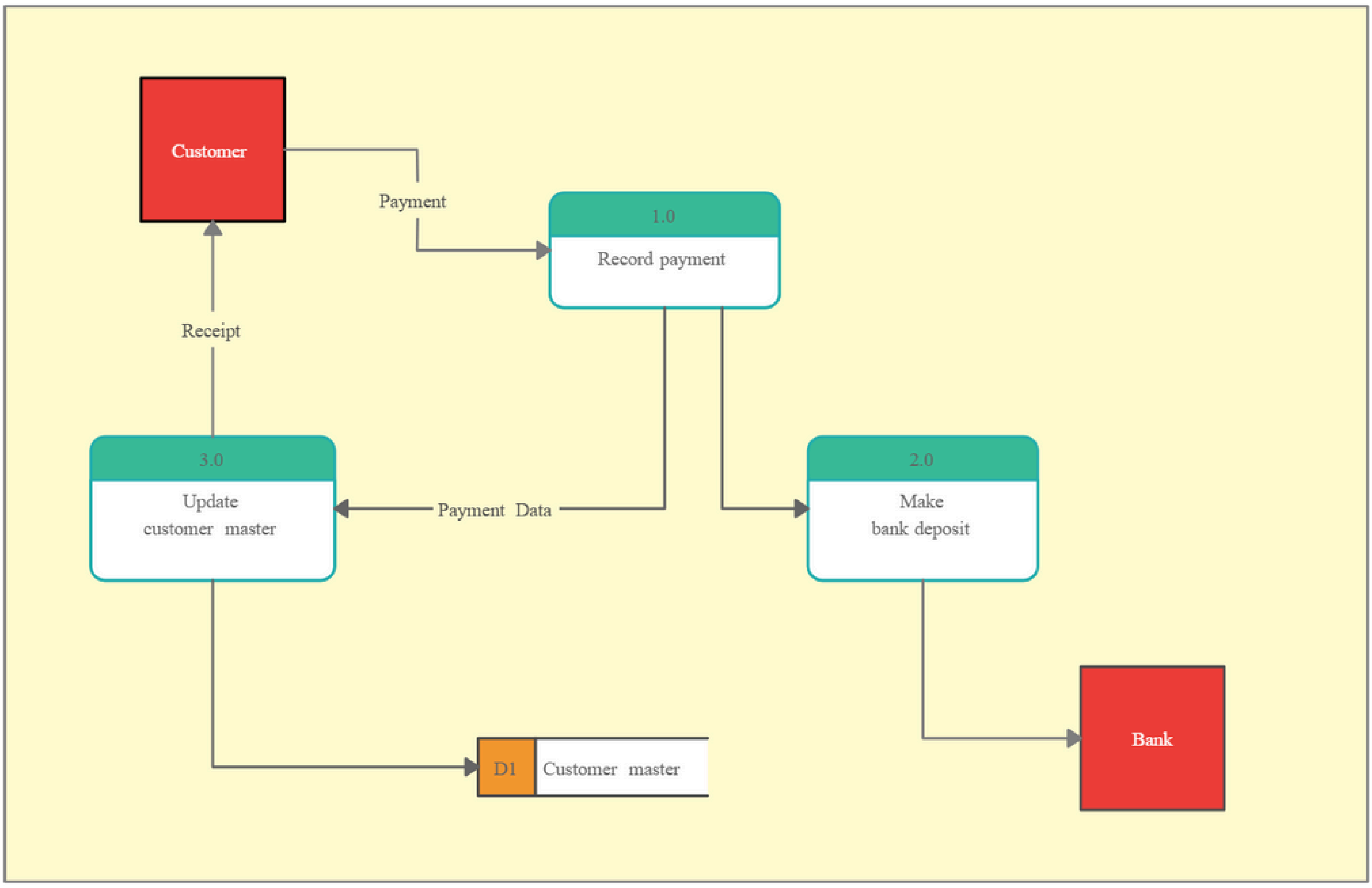
4.2 ER Diagram (Entity-Relationship Diagram)

The **ER Diagram** shows relationships between the main entities in the system:



4.3 Data Flow Diagram (DFD)

The **DFD** represents how data flows between users and the Automated Banking System:



5. Implementation

Implementation is the phase where the **system design is transformed into a working software application**. In the Automated Banking System, each module—such as customer management, transaction processing, account management, and admin operations—is developed using **Java** (backend) and **HTML/CSS/JavaScript** (frontend). The system is modular, user-friendly, and secure.

5.1 Program Code (Sample)

Customer Class (Java)

```
public class Customer {

    private int customerId;

    private String name;

    private String email;

    private String password;

    private double balance;


    public Customer(int customerId, String name, String email, String password, double balance) {

        this.customerId = customerId;
        this.name = name;

        this.email = email;

        this.password = password;

        this.balance = balance;

    }


    public void displayCustomerDetails() {

        System.out.println("Customer ID: " + customerId);

        System.out.println("Name: " + name);

        System.out.println("Email: " + email);

        System.out.println("Balance: " + balance);

    }


    public void deposit(double amount) {

        balance += amount;

        System.out.println("Deposited: " + amount + " | New Balance: " + balance);

    }


    public void withdraw(double amount) {

        if(amount <= balance) {

            balance -= amount;

            System.out.println("Withdrawn: " + amount + " | New Balance: " + balance);

        } else {

            System.out.println("Insufficient balance!");

        }

    }

}
```

Transaction Class (Java)

```
public class Transaction {
    private int transactionId;
    private int accountNo;
    private String type;
    private double amount;
    private String date;

    public Transaction(int transactionId, int accountNo, String type, double amount, String date) {
        this.transactionId = transactionId;
        this.accountNo = accountNo;
        this.type = type;
        this.amount = amount;
        this.date = date;
    }

    public void displayTransaction() {
        System.out.println("Transaction ID: " + transactionId);
        System.out.println("Account No: " + accountNo);
        System.out.println("Type: " + type);
        System.out.println("Amount: " + amount);
        System.out.println("Date: " + date);
    }
}
```

Note: Full implementation includes **database connectivity** for account info and transaction records, as well as a **web interface** for user interaction.

5.2 Output Screens

The Automated Banking System has several key screens:

Screen	Description
Login Screen	Input email and password for customers or admin. Provides secure authentication.
Registration Screen	New users provide details to create a bank account.
Customer Dashboard	Displays account info, balance, and available operations (deposit, withdraw, transfer).
Deposit / Withdrawal	Input amount to deposit or withdraw. Displays confirmation and updated balance.
Fund Transfer	Transfer money between accounts with confirmation and updated balances.
Transaction History / Mini-Statement	Displays last few transactions for the customer account.
Admin Dashboard	Allows admins to manage users, view transactions, and generate reports.

6. Testing

Testing ensures that the **Automated Banking System (ABS)** works correctly, meets the functional requirements, and provides secure, reliable banking services. Both **functional testing** (checking modules like login, registration, and transactions) and **non-functional testing** (security, performance, usability) are performed.

The testing phase helps identify and correct errors, verify system accuracy, and ensure smooth operation.

6.1 Test Data

The following test data is used to validate different modules of the system:

Test Case ID	Module	Input Data	Expected Output
TC01	Customer Registration	Name, Email, Password	Registration successful
TC02	Customer Registration	Missing Email	Error: Email required
TC03	Login	Valid Email & Password	Login successful
TC04	Login	Invalid Email / Password	Error: Invalid credentials
TC05	Deposit	Account No, Amount	Deposit successful, new balance displayed
TC06	Withdrawal	Account No, Amount ≤ Balance	Withdrawal successful, new balance displayed
TC07	Withdrawal	Account No, Amount > Balance	Error: Insufficient balance
TC08	Fund Transfer	Sender & Receiver Account No, Amount	Transfer successful, balances updated
TC09	Fund Transfer	Amount > Sender Balance	Error: Insufficient balance
TC10	Transaction History	Account No	Display last 5–10 transactions
TC11	Admin Login	Admin Email & Password	Login successful
TC12	Admin Module	Add / Update / Delete Customer	Operation successful, confirmation displayed
TC13	Admin Module	Generate Report	Report generated correctly

6.2 Test Results

After executing all test cases, the observed results are summarized below:

Module	**Test Case ID**	**Result**	**Remarks**
Customer Registration	TC01, TC02	Pass	Validation working correctly
Login	TC03, TC04	Pass	Authentication successful
Deposit	TC05	Pass	Balance updated correctly
Withdrawal	TC06, TC07	Pass	Insufficient balance error displayed correctly
Fund Transfer	TC08, TC09	Pass	Fund transfer validation correct
Transaction History	TC10	Pass	Last transactions displayed correctly
Admin Module	TC11, TC12, TC13	Pass	Admin operations and reporting working

7. User Manual

The **User Manual** provides detailed instructions for using the Automated Banking System (ABS). It helps **customers**, **admins**, and bank staff to navigate the system effectively, perform banking operations, and access features without errors.

7.1 How to Use Project Guidelines

Step-by-Step Instructions for Users:

1. **Launching the System**

    - Open the Automated Banking System in a web browser or application interface.
    - Ensure you have internet access if the system is online.
2. **User Registration (New Customers)**
    - Click on “Register” or “Sign Up.”
    - Enter your **name, email, password, and contact information**.
    - Click **Submit** to create your account.
    - You will receive a confirmation message after successful registration.
3. **Login**
    - Registered users enter their **email** and **password** on the login page.
    - Admins have separate login credentials.
    - Click **Login** to access the dashboard.
4. **Customer Dashboard**
    - **View Account Details:** Check account number, balance, and account type.
    - **Deposit Money:** Enter the amount to deposit. Confirm transaction.
    - **Withdraw Money:** Enter the amount to withdraw. Confirm transaction.
    - **Fund Transfer:** Enter sender and receiver account numbers, amount, and confirm.
    - **Transaction History / Mini-Statement:** View last few transactions.
5. **Admin Dashboard**
    - Manage customer accounts: Add, update, delete accounts.
    - Monitor all transactions.
    - Generate reports: Daily, monthly, yearly summaries.
    - Ensure system security and verify operations.
6. **Logout**
    - Always log out after completing operations to maintain account security.

7.2 Screen Layouts and Description

Screen	Description
Login Screen	Input fields for email and password. Buttons for login and registration.
Registration Screen	Fields to enter new user information: name, email, password, contact number.
Customer Dashboard	Displays account information, balance, and available operations.
Deposit / Withdrawal	Input field for amount. Shows transaction confirmation and updated balance.
Fund Transfer	Enter sender and receiver account details and amount. Displays success message.
Transaction History	Displays last few transactions including date, type, and amount.
Admin Dashboard	Allows admin to add/update/delete customers, view transactions, generate reports.
Reports Screen	Admin can generate daily, monthly, or yearly transaction and account reports.

8. Project Applications and Limitations

Applications

The **Automated Banking System (ABS)** has multiple applications in the banking and financial sector:

- **Banks and Financial Institutions:**
  Automates customer account management, deposits, withdrawals, fund transfers, and transaction history.
- **Corporate Banking:**
  Provides employees and clients with secure access to financial accounts and transactions.
- **Small Banks or Credit Unions:**
  Enables digitization of banking operations, reducing paperwork and manual errors.
- **Customer Convenience:**
  Provides 24/7 access to banking services, mini-statements, and fund transfers.

- **Administrative Use:**
  Admins can monitor all transactions, generate reports, and manage accounts efficiently.

Benefits:

- Reduces dependency on manual operations.
- Increases speed and accuracy of banking operations.
- Improves customer satisfaction and transparency.
- Enhances security and reduces fraud risks.

Limitations

Despite its advantages, the system has some limitations:

- **Internet Dependency:** Requires stable internet for online operations.
- **Feature Limitations:** Advanced features like mobile banking, biometric authentication, and AI-based fraud detection are not included in this version.
- **Scalability:** Performance may decrease under extremely high user load without server optimization.
- **User Input Dependence:** Incorrect inputs can lead to errors in transactions.
- **Security Limitations:** Advanced encryption and multi-factor authentication are not implemented in the basic version.

9. Conclusion and Future Enhancement

Conclusion

The **Automated Banking System** provides a secure, reliable, and efficient platform to handle banking operations digitally. The system automates customer account management, transactions, and administrative tasks, reducing manual effort and errors.

By following the **Agile methodology**, the system was developed iteratively with continuous feedback and testing, ensuring each module works correctly before integration. The ABS is **user-friendly, secure, and scalable**, and allows customers to access their banking services 24/7 while enabling admins to monitor accounts and transactions effectively.

Future Enhancements

Future versions of the system may include:

- **Mobile Banking App:** Android/iOS application for better accessibility.
- **Biometric Authentication:** Fingerprint or facial recognition for secure login.
- **AI-based Fraud Detection:** Automatically detect suspicious transactions.
- **Multi-Currency Support:** Allow international transfers and foreign currency accounts.
- **Notifications & Alerts:** SMS/email alerts for transactions and account updates.
- **Enhanced Reporting:** Advanced analytics and dashboards for admins.

These enhancements will improve **security, convenience, and system efficiency**, making it a fully modern banking solution.

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