NHẬP MÔN CÔNG NGHỆ PHẦN MỀM

PHÂN TÍCH YÊU CẦU

Yêu cầu nhóm sinh viên hoàn thành tài liệu phân tích yêu cầu cho đồ án đã được giao theo biểu mẫu đính kèm.

MỤC LỤC

PHÂN TÍCH YÊU CẦU

Các nội dung chính

Mục tiêu tài liệu tập trung vào các chủ đề:

- ✓ Tạo ra tài liệu phân tích yêu cầu
- ✓ Hoàn chỉnh tài liệu phân tích yêu cầu với các nội dung:
    - ▪ Mô tả phát biểu bài toán
    - ▪ Tổng quan về các yêu cầu (chức năng và phi chức năng), Stakeholders.
    - ▪ Mô hình use case
    - ▪ Đặc tả use case
    - ▪ Vẽ mô hình prototype, mockups giao diện của hệ thống
- ✓ Đọc hiểu tài liệu phân tích yêu cầu.

1 Bảng đánh giá thành viên

MSSV	Họ Tên	% đóng góp (tối đa 100%)	Chữ ký
22127060	Lê Hoàng Đạt	25	Đạt
22127088	Phạm Quang Duy	25	Duy
22127270	Nguyễn Quang Minh	25	Minh
22127389	Nguyễn Phúc Thành	25	Thành

2 Mô tả bài toán

In the rapidly evolving financial sector, driven by technological advancements, the demand for efficient and secure banking solutions has never been higher. Recognizing this need, our focus has shifted towards developing a modern Savings Account Management System (SAMS) specifically tailored for bank staff. This system is engineered to streamline operations, enhance security measures, and provide comprehensive data analytics, thereby revolutionizing the way banks manage savings accounts.

2.1. System Architecture

2.1.1. Single-Module Functionality for Bank Staff

– The Savings Account Management System (SAMS) is meticulously crafted exclusively for the bank's staff, presenting a comprehensive platform that centralizes the entirety of savings account management operations. This back-office module is endowed with an array of tools that streamline the handling of customer accounts, transaction processing, and customer inquiries. By optimizing these core processes, the system effectively reduces the administrative workload and significantly minimizes the likelihood of operational errors.

2.1.2. Functional Requirements of the Back-Office Module

– The module is equipped with several key functionalities to enhance the efficiency of bank staff, including:

  + **Open Savings Accounts:** Staff can initiate the creation of new savings accounts, setting up customer profiles and account details as required.

  + **Deposit Money:** This feature allows staff to process deposits into customer savings accounts, ensuring that transactions are recorded accurately and funds are credited promptly.

  + **Withdraw Money:** The system facilitates the handling of withdrawal requests, allowing staff to verify and process transactions securely.

  + **Account Management**: Provides tools for updating account information, managing customer data, and adjusting account settings as necessary.

+ **Transaction History:** Staff can access detailed transaction records for each account, enabling them to track and monitor account activities and ensure transparency.

+ **Interest Calculation:** Automates the calculation of interest based on the bank's policies and account terms, ensuring accurate interest crediting to customer accounts.

+ **Reporting and Analytics:** Generates comprehensive reports on account activities, transaction volumes, and other relevant metrics to aid in decision-making and strategic planning.

2.2. Technical Specifications

2.2.1. Backend Development

− The system's backend is developed using Python with the Flask framework, chosen for its simplicity, flexibility, and capability to handle complex business logic securely. Flask's lightweight structure is ideal for creating scalable applications that can handle the demands of a large banking institution. Python's extensive libraries and frameworks ensure robust security features and seamless integration with other banking systems.

2.2.2. Frontend and User Interface

− The user interface, designed for internal use by bank staff, is built using HTML5, CSS3, and JavaScript. These technologies provide a responsive and intuitive interface that supports a wide range of banking functions on various devices, from desktop computers to tablets used within the bank. The interface prioritizes functionality and ease of use to facilitate quick access to necessary features and ensure efficient task completion.

2.2.3. Database Management

− MySQL is utilized for its high reliability and performance, crucial for managing the complex data relationships in banking operations. It supports extensive data integrity and transactional features essential for accurate and consistent handling of financial information.

2.2.4. Security Implementation

− Security is a paramount concern in banking applications. SAMS incorporates advanced security protocols including HTTPS, data encryption, and comprehensive access controls that restrict system access to authorized personnel only. Regular security audits are conducted to ensure compliance with the latest financial security standards and regulations.

2.2.5. Scalability and Performance

- SAMS is designed to be highly scalable, allowing for increased workload and user base without compromising performance. This scalability is achieved through efficient backend architecture, optimized database operations, and potential future enhancements like distributed computing or cloud-based solutions.

2.2.6. Data Analytics and Reporting

- The system features advanced data analytics capabilities, enabling bank staff to generate insightful reports on customer saving trends, account activities, and transaction histories. These analytics help in making informed decisions, optimizing financial products, and enhancing customer satisfaction.

2.2.7. Design and Deployment Constraints

- The user interface is designed to be straightforward and functional, catering exclusively to the needs of bank employees. It supports cross-platform compatibility ensuring consistent performance across various hardware used in bank branches.
- As the system handles sensitive financial data, robust measures are in place to prevent data breaches and ensure data integrity during transactions.

3. Tổng quan yêu cầu

3.1. Danh sách các stakeholder

| STT	Stakeholder	Mô tả
1	*Bank staff*	Bank staff are the primary users of the system. They interact with the system daily to manage customer accounts, process transactions, and respond to customer inquiries. Their feedback is crucial for refining system features and usability. Their efficiency and effectiveness in using the system directly influence overall customer service quality and operational productivity.
2	IT department	The IT department is pivotal in the system's lifecycle. They are involved in the system's design, development, implementation, and ongoing maintenance. The department works to ensure that the system's architecture supports scalability, reliability, and integration with other banking systems. They address technical challenges and provide solutions to keep the system running smoothly.
3	Technology Vendors and Service Providers	Vendors provide the necessary hardware, software, or specialized services such as cloud hosting or security solutions. Their products and services must integrate seamlessly with the bank's systems, and they must provide timely support and updates.(Cloud, CPU, Server,...)
4	Bank Management	Bank management sets the strategic direction for the Savings Account Management System, prioritizing monthly and daily reports to monitor customer accounts.
5	Customer	Customers use the system to create accounts, deposit funds, and withdraw money, managing their financial transactions efficiently and securely.
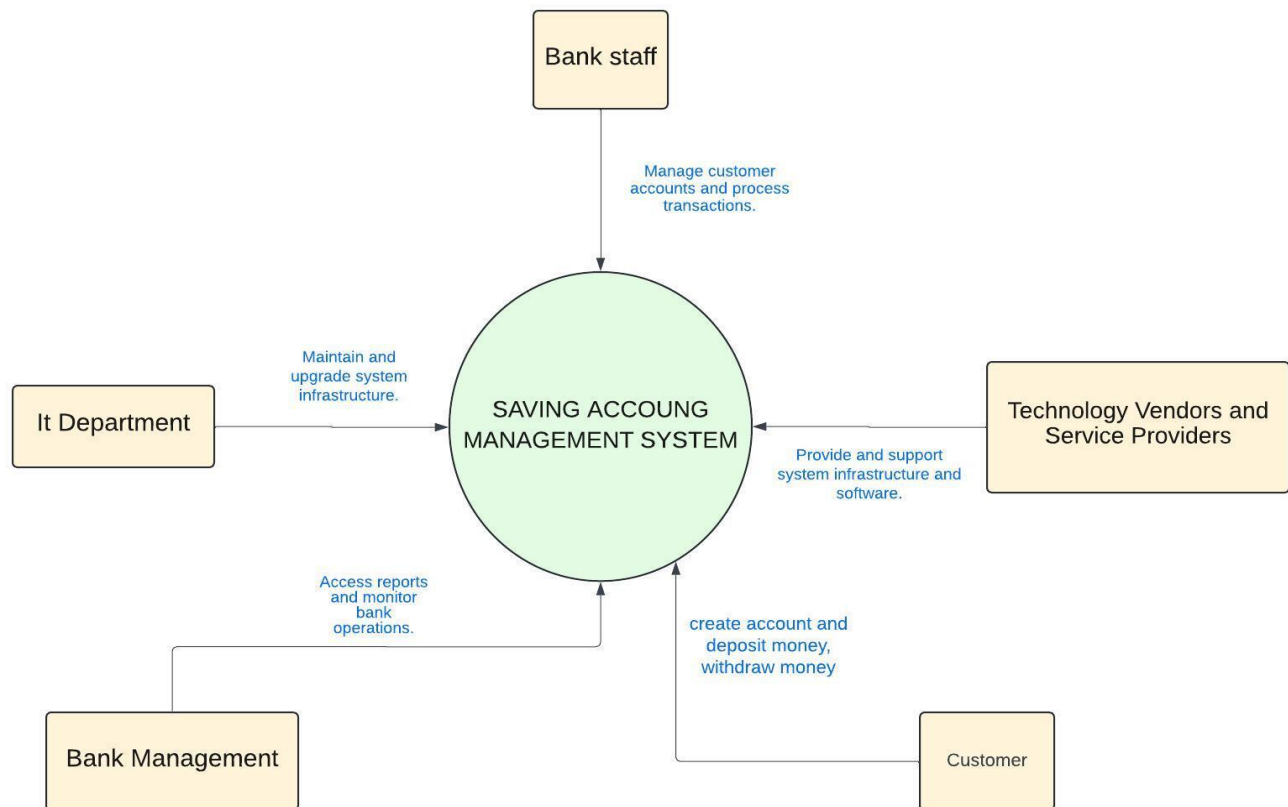
3.2. Danh sách yêu cầu

3.2.1. Đặc tả yêu cầu chức năng

1. Open Savings Accounts:

- **Description:** Bank employees can open savings accounts for customers.
- **Requirements:**
  - + Savings Types: On-demand, 3-month, 6-month.
  - + Minimum Deposit: 100,000 VND.
- **Development Levels**:
  - + STEP 1: Employee collects customer details including name, identification number, address, and contact information.
  - + STEP 2: Employee selects the term and enters the initial deposit amount.
  - + STEP 3: Employee submits the request to open the account.
  - + STEP 4: System processes the request and confirms the account opening, displaying the account details to the employee.
- **Diagram:**
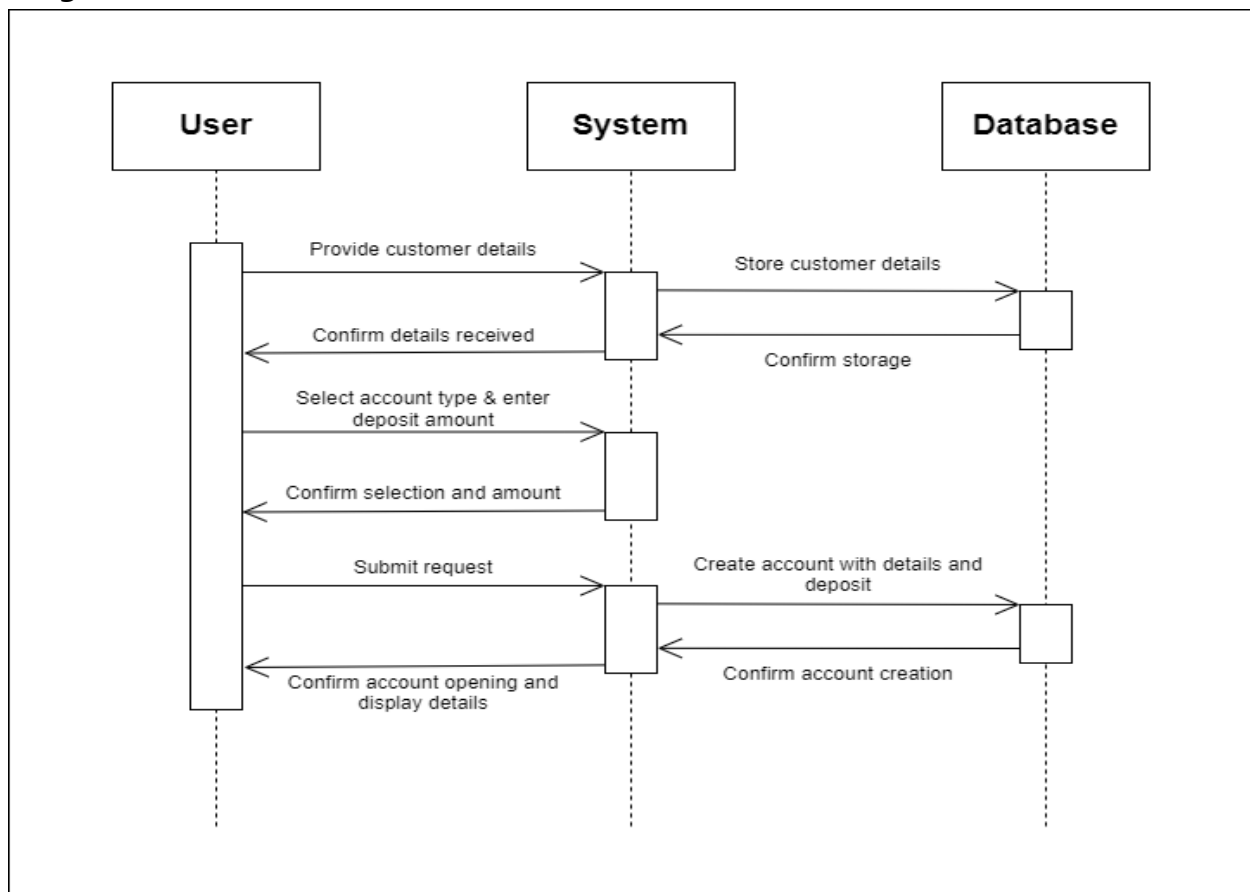
2. Record Deposits:

- **Description:** Bank employees record the amount of money customers deposit into their savings accounts.
- **Requirements:**
  + Additional Deposits: Allowed for on-demand savings accounts.
  + Minimum Additional Deposit: 100,000 VND.
- **Development Levels:**
  + STEP 1: Employee selects the customer's account and enters the deposit amount.
  + STEP 2: Employee submits the deposit transaction.
  + STEP 3: System processes the deposit and updates the account balance.
  + STEP 4: System provides a confirmation receipt of the transaction to the employee.
- **Diagram:**
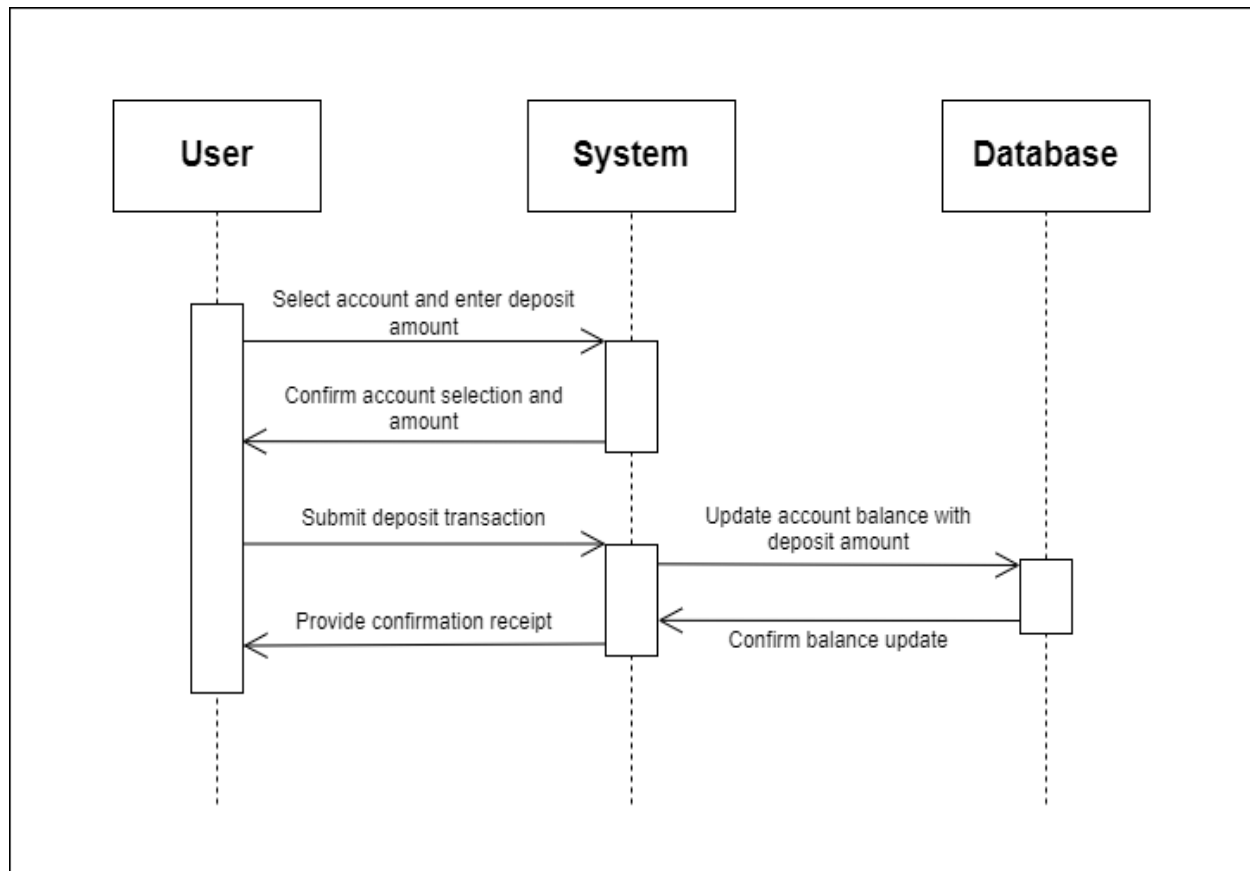
3. Record Withdrawls:

− **Description:** Bank employees record the amount of money customers withdraw from their savings accounts.

− **Requirements:**
  + Withdrawal Conditions: Allowed if the account has been open for at least 15 days.
  + Fixed-Term Withdrawals: Withdraw at maturity, entire amount; interest depends on account type.
  + On-Demand Withdrawals: Withdraw within available balance; interest rate of 0.15% for deposits of 1 month or more.

− **Development Levels:**
  + STEP 1: Employee verifies the account eligibility for withdrawal.
  + STEP 2: Employee enters the withdrawal amount and submits the transaction.
  + STEP 3: System checks the withdrawal conditions and processes the transaction.
  + STEP 4: System updates the account balance and provides a confirmation receipt of the transaction to the employee.

− **Diagram:**
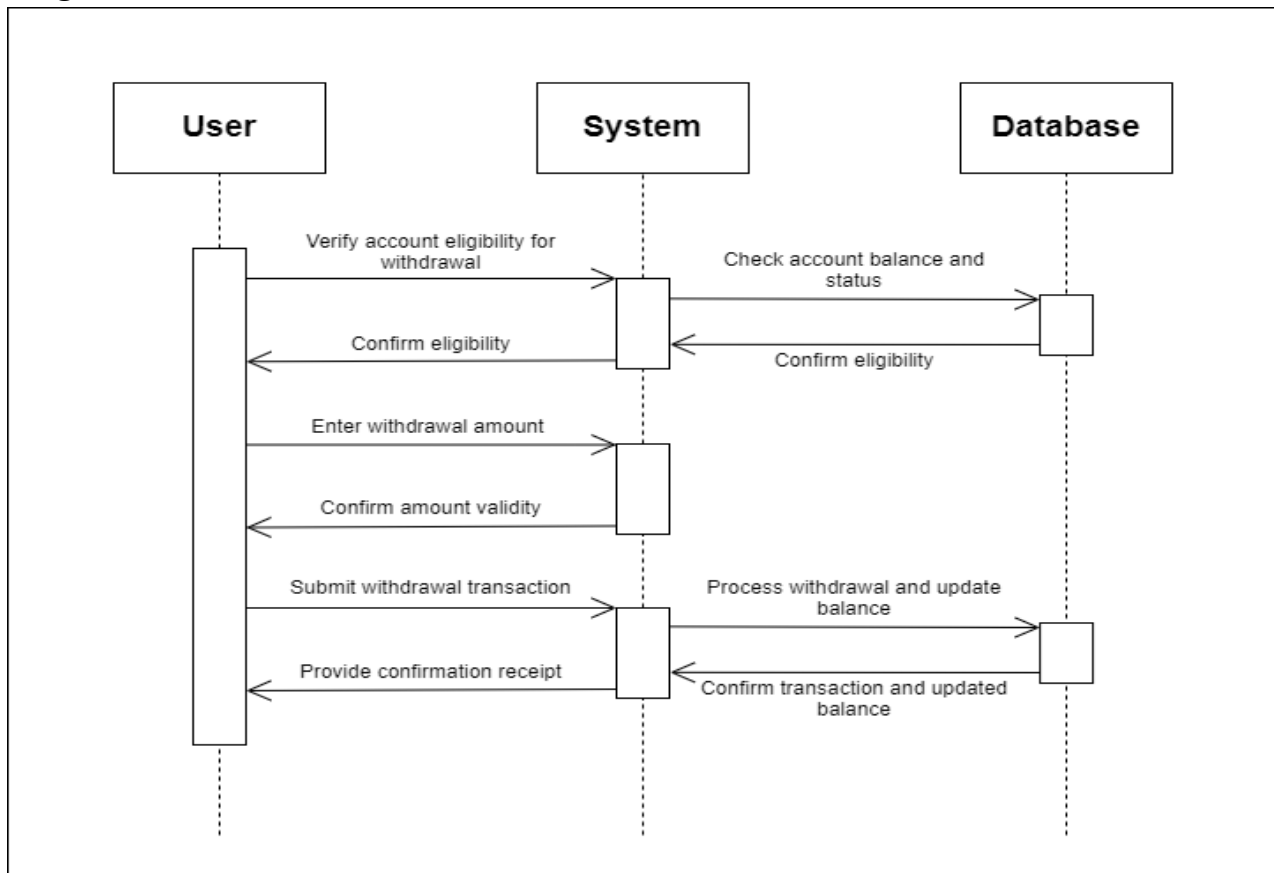
4. Account Inquiry:

- **Description:** Both staff and customers can query detailed information about savings accounts.
- **Requirements:**
    + Information Display: Display account details including balance, transaction history, account type, and interest rates.
    + Search Functionality: Search by account number, customer name, or identification number.
- **Development Levels:**
    + STEP 1: User enters search criteria (e.g., account number, customer name).
    + STEP 2: User submits the search request.
    + STEP 3: System processes the request and fetches the relevant account information.
    + STEP 4: System displays the account details to the user.
- **Diagram:**
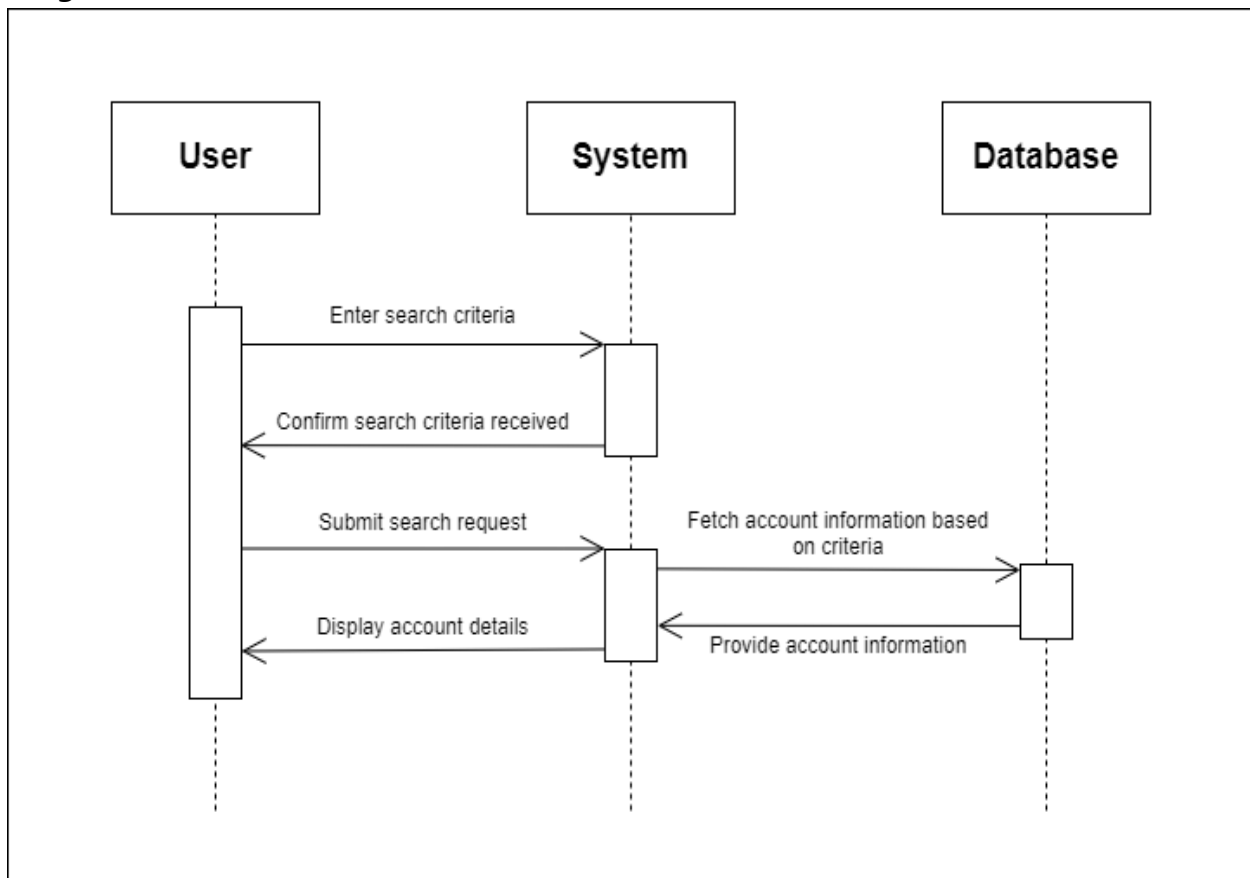
5. Monthly Reporting:

- **Description:** Bank managers can generate and review reports on savings accounts.
- **Requirements:**
  + Daily Sales Report: Details daily transactions including total deposits and withdrawals.
  + Monthly Account Activity Report: Summarizes the number of accounts opened/closed, total deposits/withdrawals.
- **Development Levels:**
  + STEP 1: Manager selects the report type and specifies the date range.
  + STEP 2: Manager submits the report generation request.
  + STEP 3: System processes the request and compiles the report.
  + STEP 4: System generates the report and provides it for download in various formats (PDF, Excel, CSV).
- **Diagram:**
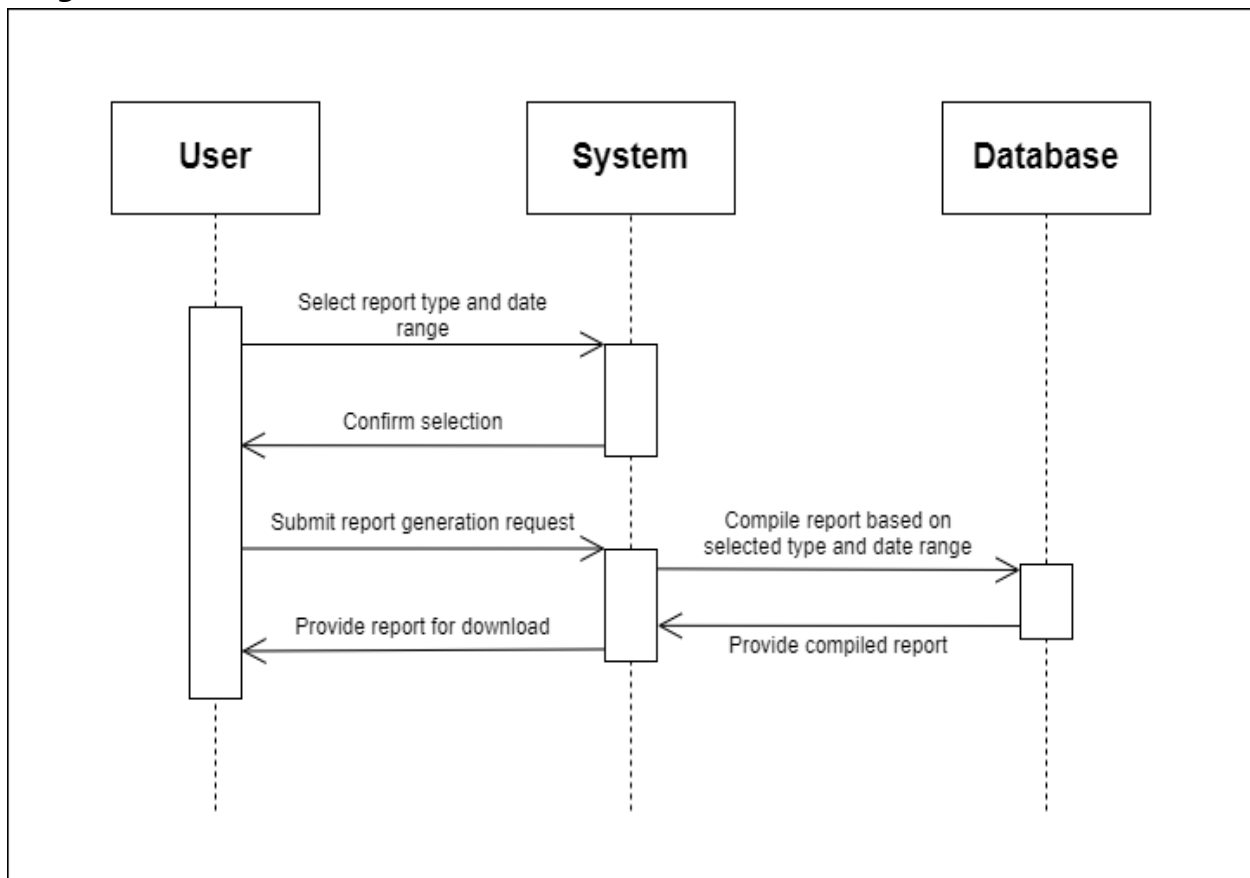
6. Adjust Regulation:

− **Description:** Bank employees can adjust settings related to interest rates, deposit terms, and minimum deposit periods.

− **Requirements:**

  + Regulation Adjustment: Allow changes to deposit terms, minimum deposit amounts, and interest rates.

− **Development Levels:**

  + STEP 1: Authorized user selects the regulation to adjust.

  + STEP 2: User makes the necessary changes to the regulation settings.

  + STEP 3: User submits the changes for approval.

  + STEP 4: System processes the changes, updates the settings, and logs the changes for audit purposes.

− **Diagram:**
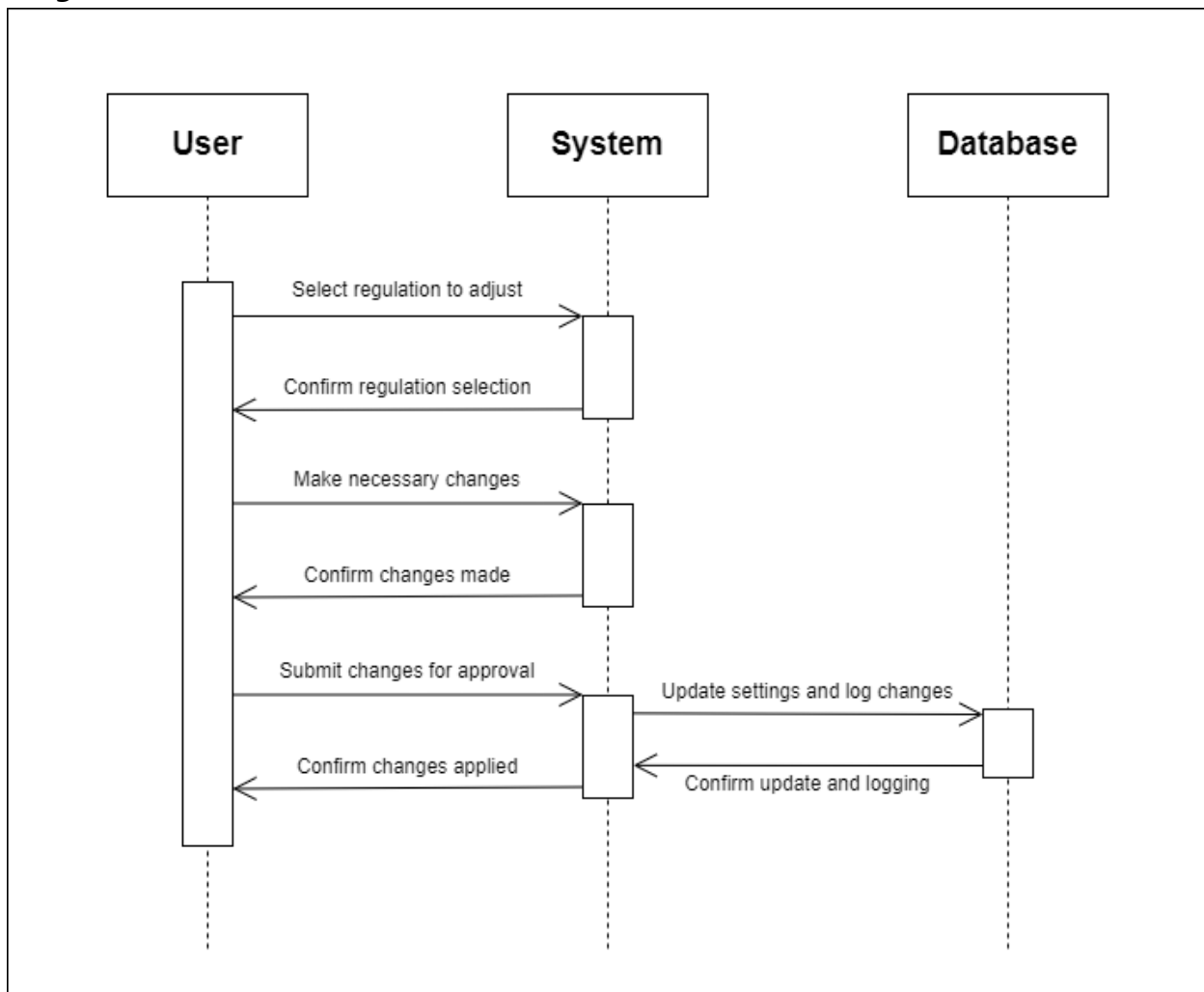
Summary

Function	Development Levels
Open Savings Accounts	STEP 1: Collect customer details. STEP 2: Select account type and enter deposit amount. STEP 3: Submit request. STEP 4: Confirm account opening and display details.
Record Deposits	STEP 1: Select customer's account and enter deposit amount. STEP 2: Submit deposit transaction. STEP 3: Update account balance. STEP 4: Provide confirmation receipt.
Record Withdrawals	STEP 1: Verify account eligibility for withdrawal. STEP 2: Enter withdrawal amount and submit transaction. STEP 3: Process transaction. STEP 4: Update account balance and provide confirmation receipt.
Account Inquiry	STEP 1: Enter search criteria. STEP 2: Submit search request. STEP 3: Fetch account information. STEP 4: Display account details.
Monthly Reporting	STEP 1: Select report type and date range. STEP 2: Submit report generation request. STEP 3: Compile report. STEP 4: Provide report for download.
Adjust Regulations	STEP 1: Select regulation to adjust. STEP 2: Make necessary changes. STEP 3: Submit changes for approval. STEP 4: Update settings and log changes.

3.2.2. Đặc tả yêu cầu phi chức năng

1. Customer Information Security:

− **Description:** Ensure all customer information is stored securely to prevent unauthorized access.
− **Requirements:**
  + Data Encryption: Encrypt all customer data both at rest and in transit.
  + Access Control: Implement role-based access control.
  + Audit Logging: Log all access and changes to customer data.

2. System Performance:

− **Description:** Handle high volumes of transactions efficiently.
− **Requirements:**
  + Transaction Throughput: Process a minimum of 100 transactions per second.
  + Response Time: Ensure transaction response time does not exceed 2 seconds.
  + Scalability: Support increasing numbers of users and transactions.

3. Reliability and Availability:

– **Description:** Ensure system reliability and availability.
– **Requirements:**
  + Uptime: Achieve an uptime of at least 99.9%.
  + Fault Tolerance: Handle and recover from failures gracefully.
  + Backup and Recovery: Perform regular backups and provide data recovery mechanisms.

4. User Interface and Usability:

– **Description:** Provide an intuitive and accessible user interface.
– **Requirements:**
  + Ease of Use: Ensure the interface is easy to navigate.
  + Accessibility: Comply with accessibility standards.
  + Multilingual Support: Support multiple languages.

5. Compatibility:

– **Description:** Ensure compatibility with various devices and platforms.
– **Requirements:**
  + Browser Compatibility: Support modern web browsers that support HTML5 and CSS3.
  + Device Compatibility: Function correctly on both desktop and mobile devices.

6. Data Accuracy and Integrity:

– **Description:** Ensure data accuracy and consistency.
– **Requirements:**
  + Data Validation: Perform validation checks to ensure data accuracy.
  + Data Consistency: Maintain data consistency across all modules.
  + Historical Data: Preserve accurate historical data for reporting and analysis.

4. Đặc tả yêu cầu

4.1. Sơ đồ Use Case
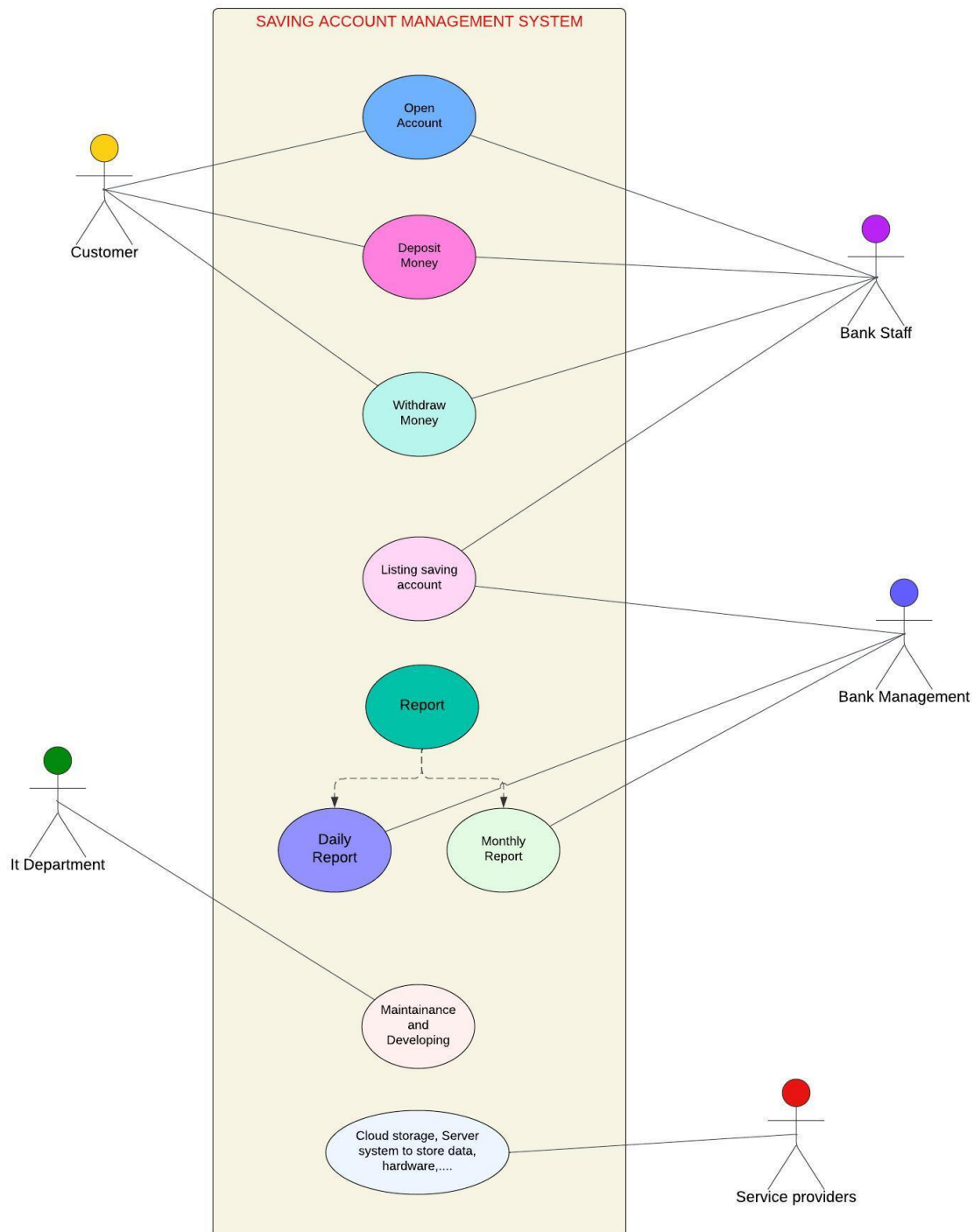
4.2. Đặc tả Use Case

4.2.1. Đặc tả Use Case 1

Use case ID	U001
Use Case Name	Open Savings Accounts
Summary	Bank employees can open savings accounts for customers.
Actors	Bank Employee
Preconditions	Employee must be logged into the system and authorized to open accounts.
Outcome	A new savings account is created for the customer with the details entered.
Main Scenario	STEP 1: Employee collects customer details including name, identification number, address, and contact information. STEP 2: Employee selects the type of savings account and enters the initial deposit amount. STEP 3: Employee submits the request to open the account. STEP 4: System processes the request and confirms the account opening, displaying the account details to the employee.
Alternative Scenario	1a. If the employee enters invalid customer details, the system prompts for correction. 2a. If the initial deposit amount is less than the minimum required, the system prompts for a valid amount.
Non-functional Constraints	Must ensure data security and validate data entry.

4.2.2. Đặc tả Use Case 2

Use case ID	U002
Use Case Name	Record Deposits
Summary	Bank employees record the amount of money customers deposit into their savings accounts.
Actors	Bank Employee
Preconditions	Employee must be logged into the system and authorized to record deposits.
Outcome	The customer's account balance is updated with the new deposit amount.
Main Scenario	STEP 1: Employee selects the customer's account and enters the deposit amount.
	STEP 2: Employee submits the deposit transaction.
	STEP 3: System processes the deposit and updates the account balance.
	STEP 4: System provides a confirmation receipt of the transaction to the employee.
Alternative Scenario	1a. If the account number is invalid, the system prompts for a correct account number.
	2a. If the deposit amount is less than the minimum required, the system prompts for a valid amount.
Non-functional Constraints	Must ensure transaction security and real-time balance updates.

4.2.3. Đặc tả Use Case 3

Use case ID	U003
Use Case Name	Record Withdrawals
Summary	Bank employees record the amount of money customers deposit into their savings accounts.
Actors	Bank Employee
Preconditions	The savings account has been open for at least 15 days.
Outcome	The withdrawal transaction is processed, and the account balance is updated. A confirmation receipt is provided to the employee.
Main Scenario	STEP 1: Employee verifies the account eligibility for withdrawal. STEP 2: Employee enters the withdrawal amount and submits. STEP 3: System checks the withdrawal conditions and processes the transaction. STEP 4: System updates the account balance and provides a confirmation receipt of the transaction to the employee.
Alternative Scenario	None specified
Non-functional Constraints	The system must handle transactions efficiently and provide real-time updates.

4.2.4. Đặc tả Use Case 4

Use case ID	U004
Use Case Name	Account Inquiry
Summary	Both staff and customers can query detailed information about savings accounts.
Actors	Staff, Customer
Preconditions	User must have valid credentials to access account information.
Outcome	The user receives detailed information about the savings account, including balance, transaction history, account type, and interest rates.
Main Scenario	STEP 1: User enters search criteria (e.g., account number, customer name) STEP 2: User submits the search request. STEP 3: System processes the request and fetches the relevant account information STEP 4: System displays the account details to the user.
Alternative Scenario	None specified
Non-functional Constraints	The system must provide quick and accurate retrieval of account information. The user interface must be user-friendly and responsive.

4.2.5. Đặc tả Use Case 5

Use case ID	U005
Use Case Name	Monthly Reporting
Summary	Bank managers can generate and review reports on savings accounts.
Actors	Bank Manager
Preconditions	Manager must have appropriate access rights to generate and view reports.
Outcome	The manager receives a report detailing daily transactions or monthly account activities, available for download in various formats (PDF, Excel, CSV).
Main Scenario	STEP 1: Manager selects the report type and specifies the date range. STEP 2: Manager submits the report generation request STEP 3: System processes the request and compiles the report STEP 4: System generates the report and provides it for download in various formats (PDF, Excel, CSV).
Alternative Scenario	None specified
Non-functional Constraints	The system must generate reports efficiently and accurately. Reports should be available for download in multiple formats. The user interface for report generation should be intuitive and easy to navigate.

4.2.6. Đặc tả Use Case 6

Use case ID	U006
Use Case Name	Adjust Regulations
Summary	Bank employees can adjust settings related to interest rates, deposit terms, and minimum deposit periods.
Actors	Authorized User (Bank Employee)
Preconditions	User must have appropriate authorization to adjust regulations.
Outcome	The regulation settings related to deposit terms, minimum deposit amounts, and interest rates are updated and logged for audit purposes.
Main Scenario	STEP 1: Authorized user selects the regulation to adjust STEP 2: User makes the necessary changes to the regulation settings. STEP 3: User submits the changes for approval. STEP 4: System processes the changes, updates the settings, and logs the changes for audit purposes.
Alternative Scenario	None specified
Non-functional Constraints	Changes must be processed securely and accurately. The system should maintain an audit trail of all regulation adjustments.

5. Bản mẫu (Prototype)
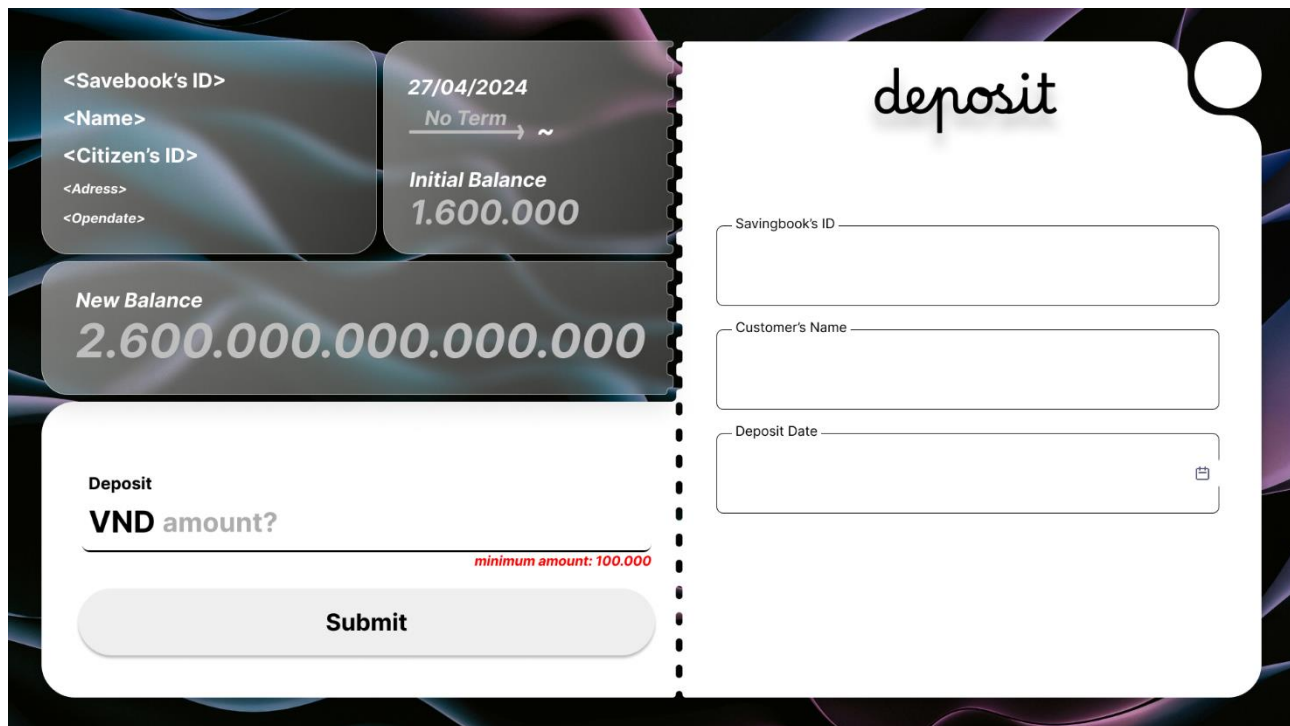
– **Main Menu:**
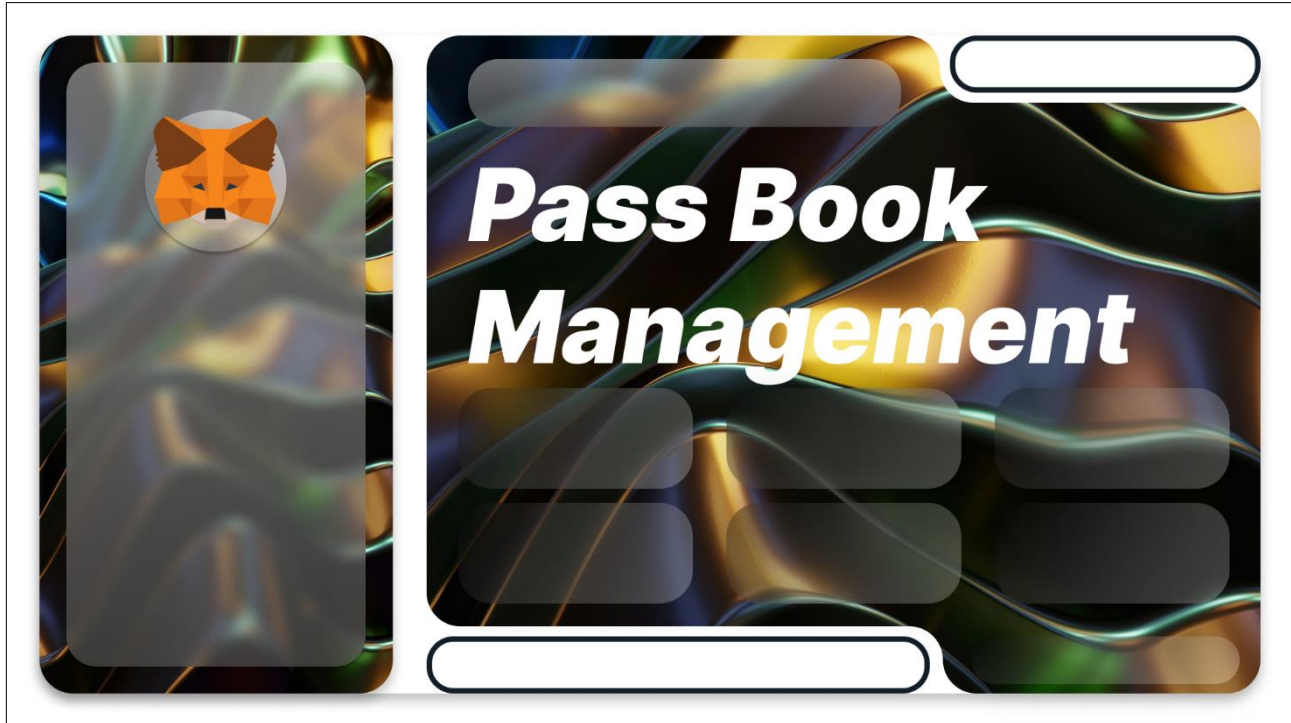
– **Open Saving Account Page:**

– **Deposits Page:**

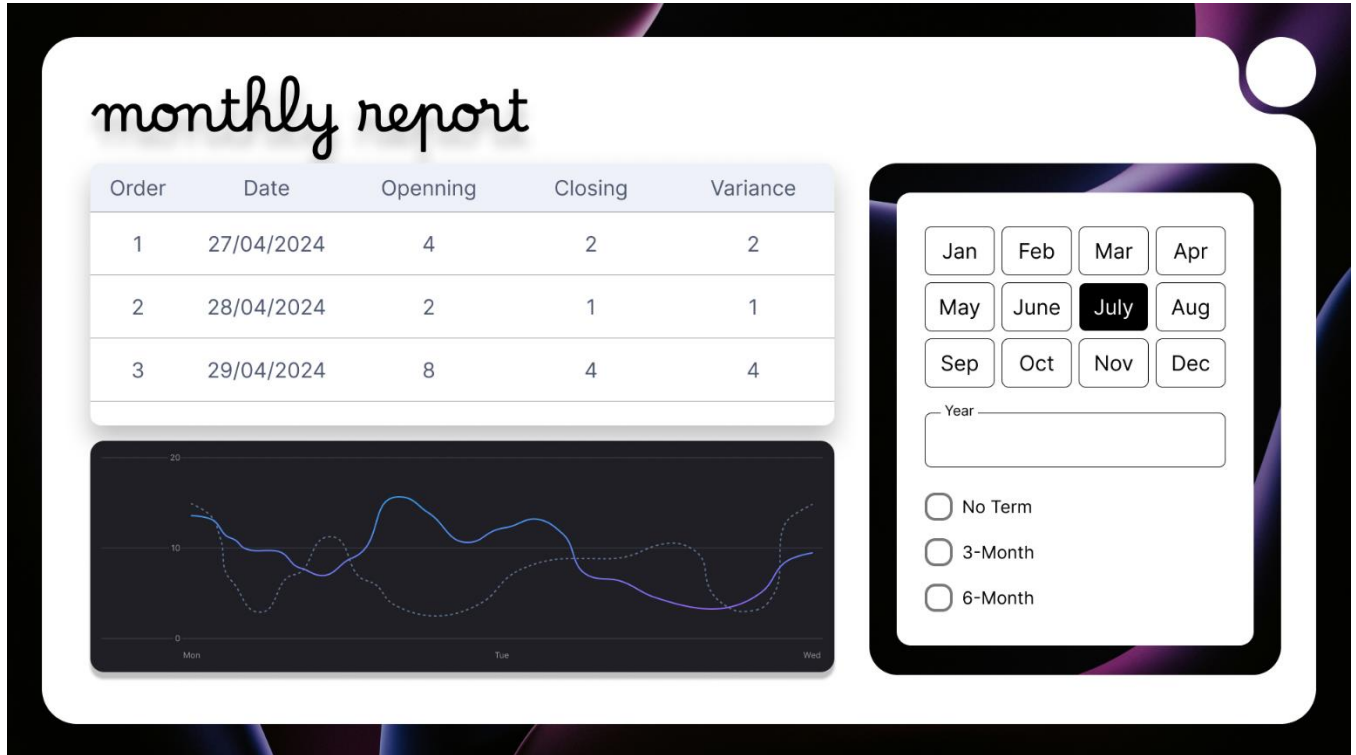– **Withdrawals Page:**

− **Report Pages:**

+ **Report Menu Page:**
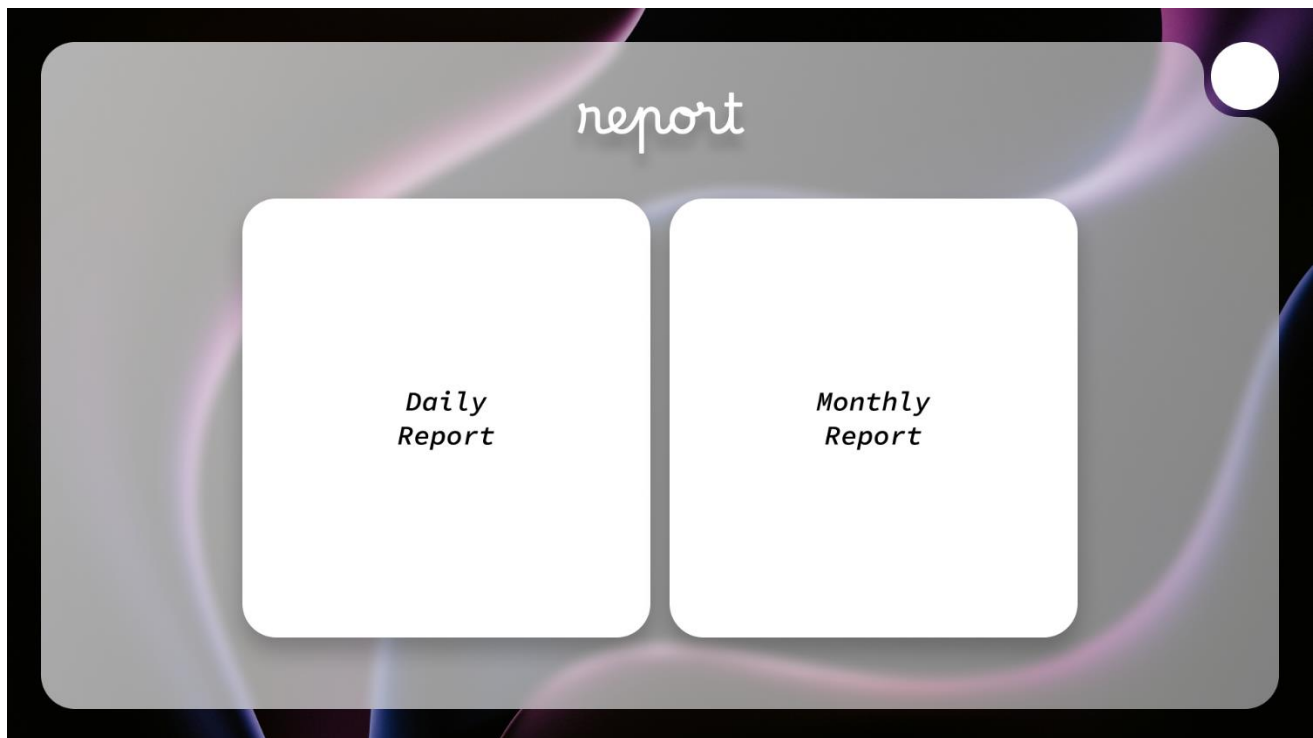
+ **Daily Report Page:**
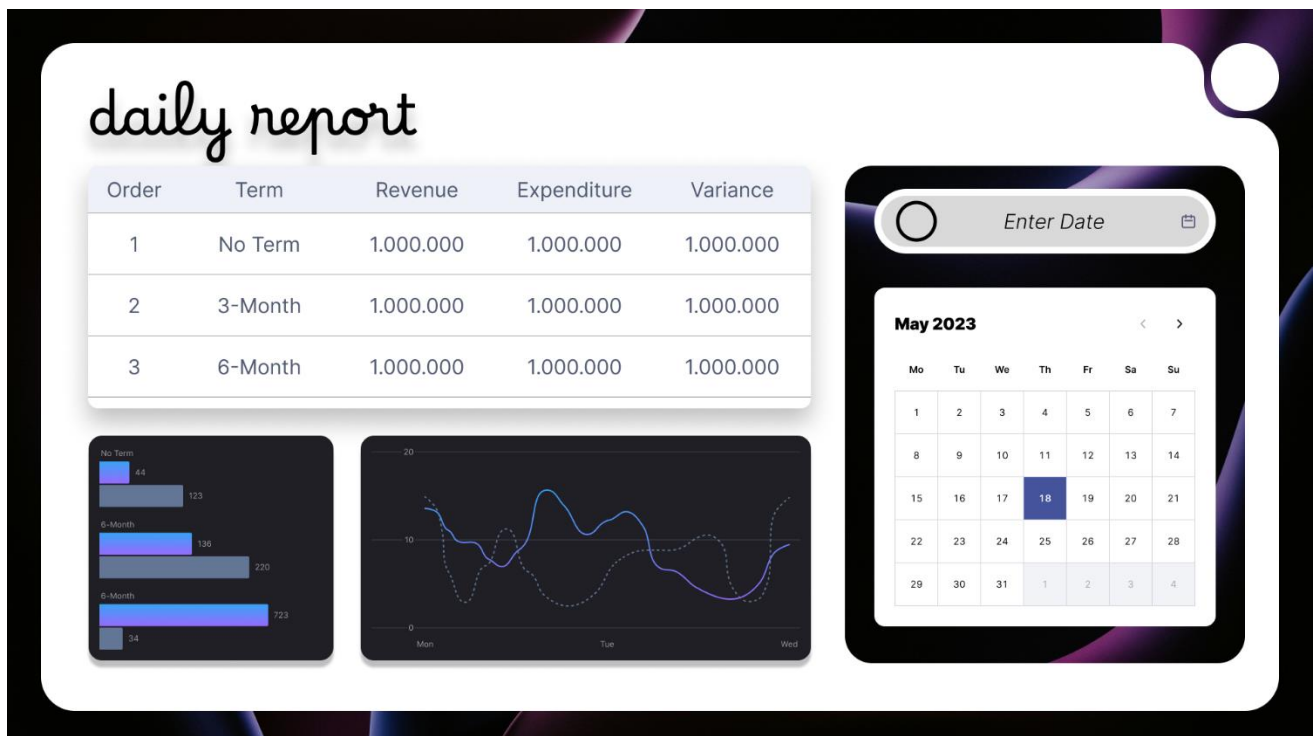
+   **Monthly Report Page:**
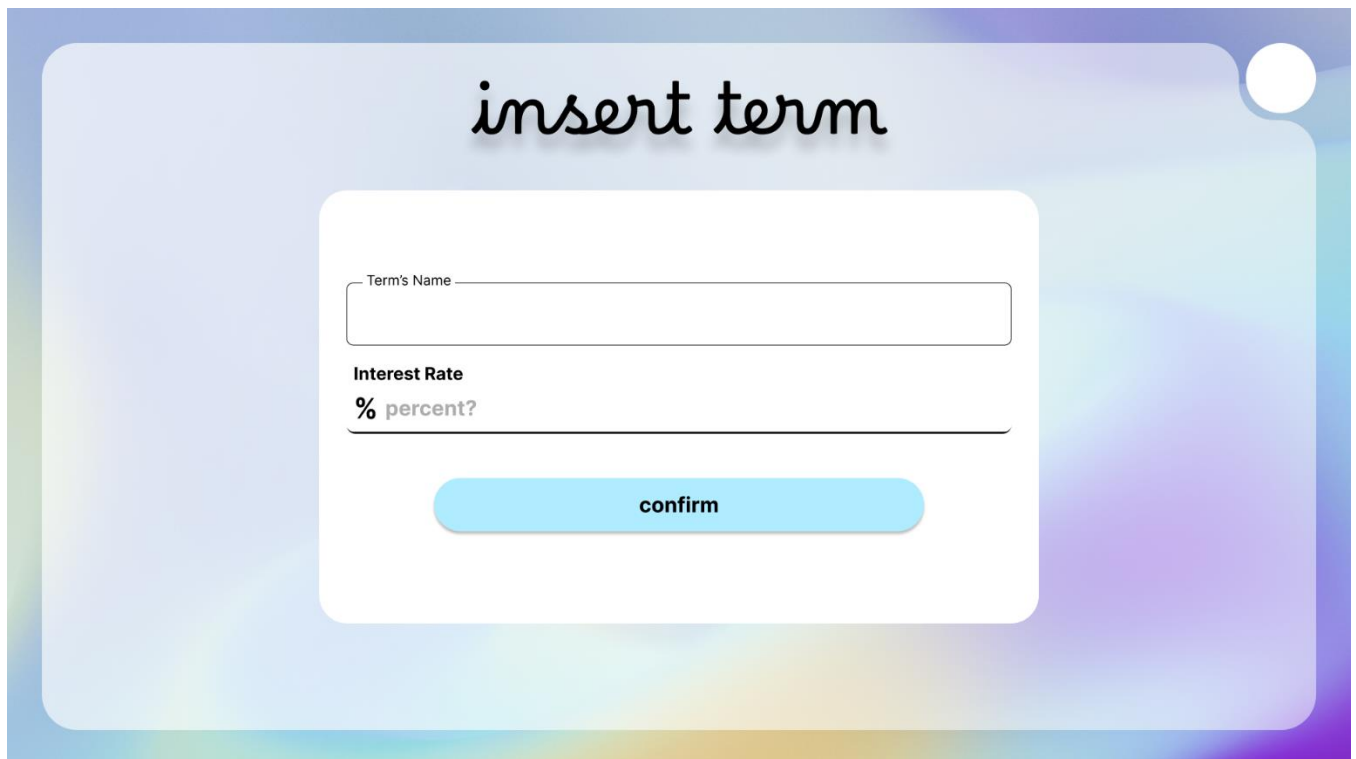
–   **Adjust Regulations Pages:**
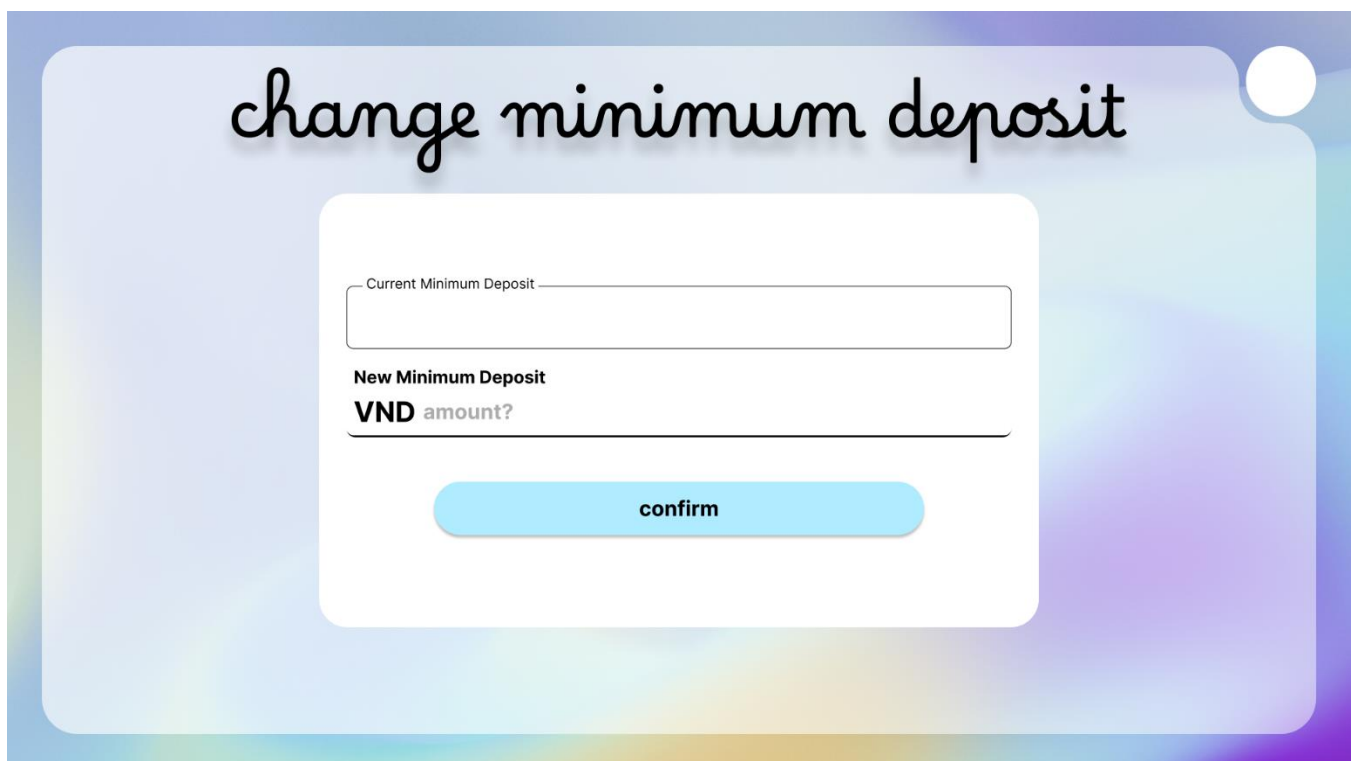+   **Report Menu Page:**

+ **Insert Page:**

+ **Change Minimum Deposit Page:**

+ **Change Minimum Withdraw Page:**

+ **Change Interest Rate Page:**