

# Software Requirements Specification

## Bank Transaction and Loan Processing System

Version 1.0 approved

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## Revision History

Name	Date	Reason For Changes	Version

# 1. Introduction

## 1.1 Purpose

The purpose of this document is to provide the software requirements for the Bank Transaction and Loan Processing system for Bank A. This System Requirement Specification addresses all functional, non-functional, and quality requirements for the Bank Transaction and Loan Processing system. The Bank Transaction and Loan Processing system will include bank branch management, internal fund transfers, loan processing features, and basic reporting capabilities.

This document serves as a vital communication tool, promoting comprehension of the goals and capabilities of the software system among stakeholders, including developers, project managers, regulatory bodies, and QA testers.

## Document Conventions

- **Bold text** for important terms and concepts.
- *Italics* are used for references to other documents and sections of this document.
- Bulleted lists for organized information

## 1.2 Intended Audience and Reading Suggestions

This document is intended for the following audience.

- **Developers**  
Developers should read the entire document to understand the scope, quality and functionality of the system since they are responsible for designing, implementing, testing and maintaining the Bank Transaction and Loan Processing system
- **Bank Employees**  
Bank employees are responsible for using and interacting with the system. They must read the sections of this document that describe the tasks that you will be able to perform with this BTS.
  - Scope of the project (section 1.3)
  - product functions (section 2.2)
  - user documentation (section 2.6)

- **Project Managers**

The project managers are responsible for planning, coordinating, monitoring, and controlling the system. They should read the entire document to understand the scope, quality, and functionality of the system.

- **Customers**

The customers (account holders) of the bank should read the sections that provide knowledge about the scope of the project (section 1.3), product functions (section 2.2), and user documentation (section 2.6).

## 1.3 Product Scope

The proposed Bank Transaction and Loan Processing System (BTS) will be a web-based application that allows the following features.

- The BTS will use a relational database to store information about bank accounts, loans, and transactions.
- The BTS will have a user interface that will be designed for both bank employees and customers.
- The BTS will be able to perform the following tasks:
  - **Open and manage bank accounts**
  - **Transfer funds between accounts**
  - **Apply for loans**
  - **Track loan payments**
  - **Generate reports**

## 1.4 References

*IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications.*

*IEEE Computer Society, 1998.*

## **2. Overall Description**

### **2.1 Product Perspective**

The planned Core Banking System (CBS) for Bank A is intended to streamline and modernize the bank's operations in order to be in compliance with the rules and regulations set forth by the Seychelles financial authorities and to enhance customer service. This software is intended to replace the existing outdated DOS based banking system which was used for decades. This Core Banking system plays a pivotal point in the bank's operations, such as Internal Fund transfers, and Loan Requests and other processes .

### **2.2 Product Functions**

#### **2.2.1 Customer Account Management**

- Customers can independently open an account of their preferred checking or savings type at any branch of their choice.
- Each account is affiliated with the branch the customer chooses.
- Provides real time status of a given account.
- Accessing and maintaining the transaction history and records for a given account.
- Calculates the interest rates depending on the type of the account , the age of the customer .
- Enables customers to receive notifications when there is an activity on a given account.

#### **2.2.2 Fixed Deposit Management**

- Customers can create fixed deposit accounts that are linked to their savings accounts of this bank.
- Calculates the interest rates for the fixed deposit account depending on the duration of the deposit

#### **2.2.3 Transaction Management**

- Providing customers with the option to start transactions through ATMs spread throughout our branch network or through our secure online portal, which will make it easier for them to complete financial transactions smoothly, resulting in a more convenient and effective banking experience.
- Customers will be allowed to perform Intra-Bank transfers through our secure online portal with no additional fees.

## 2.2.4 Loan Services

- After a Customer request a Loan, an employee can make a request by filling the standard loan application .This application will be confirmed after the approval of the bank manager
- For Customers that already have a Fixed deposit in this bank can use the **online loan system** which they can use to self apply and receive the loan instantly (without any approvals)
- Calculating the loan installment set

## 2.2.5 Additional Services

- **Branch-wise Total Transaction Report:** This report offers a comprehensive overview of all transactions made at specific branches, enabling in-depth examination of financial operations at the branch level.
- **The branch-late late loan installment report:** which is only available to branch managers, provides insightful information on loan installment payments by emphasizing any instances of past-due payments inside each branch.

These features greatly improve the customers overall banking experience, making it incredibly convenient and user-friendly. This will provide customers with greater control over their financial matters by simplifying complicated processes and providing a variety of solutions, eventually enhancing their financial wellbeing and peace of mind.

## 2.3 User Classes and Characteristics

### 1) Bank Customer

- Characteristics: These are the end users ,and can include both individual account holders and organizational customers (NGOs , companies, etc)
- Frequency of use: Daily occasional interactions
- Technical Expertise: Can range from beginner/basic to Advanced
- Privilege levels: Limited access only to their accounts and transactions
- Education Level: Diverse education levels, from minimum to highly educated
- Experience: Can be new users or experienced users

## **2) Bank Employees**

- Characteristics: A team of professionals employed by the bank to assist and guide customers with their transactions and other banking matters
- Frequency of use: Using the system daily
- Technical Expertise: A basic level of understanding and use of computers and the internet.
- Privilege levels: Intermediate level of access is given depending on the job role
- Educational level: Should possess minimum required educational certification depending on the job role
- Experience: Can vary from beginner to experienced

## **3) Online Portal Users**

- Characteristics: Customers who engaged in banking activity throughout the online portal
- Frequency of use: daily, occasional interactions
- Technical Expertise: Should have a basic skills for online portal access
- Privilege levels: Limited access only to their accounts and transactions
- Educational level: Education level can vary
- Experience: Can vary from new users to highly experienced users

## **4) Branch Manager**

- Characteristics: The person in charge of a branch
- Frequency of use: regular monitoring and managing
- Technical Expertise: An intermediate level of computer use needed
- Privilege levels: High level of access is given including loan approvals
- Educational level: Should possess minimum required educational certification for a branch manager
- Experience: Need to have experience in the banking system and branch management

## **5) Systems Administrators**

- Characteristics: The IT professional responsible for maintaining and configuring the core banking system
- Frequency of use: As needed for maintenance, updates, and troubleshooting
- Technical Expertise: High level of expertise in system administration
- Privilege levels: Access to system settings and configurations
- Educational level: Should possess technical and IT qualifications
- Experience: Should be experienced in the field of system administrators



## 2.4 Operating Environment

The Core Banking System (CBS) is intended to function in an environment that takes the following factors into account:

### 1) Hardware Platform

- This Core Banking System Database will be deployed and hosted on cloud based dedicated servers such as AWS , Microsoft Azure or Oracle

Supported Hardware platform

- x86\_64 Architecture
- Minimum 4GB RAM
- Minimum 50 GB of available storage

### 2) Operating System and Version

The Web server hosting the Core Banking System will be equipped and optimized to be compatible with the Debian 12 GNU/Linux operating system as this OS offers stability and it aligns with the industry standards.

### 3) Database Management System

The core banking system is made to interface with a highly reliable, scalable and robust Database Management System called MySQL to manage, process and store data. Security measures such as access control and encryption are implemented within MySQL to protect sensitive data from unauthorized access.

### 4) Browser Compatibility

The Online portal that is included in the CBS is designed to operate seamlessly on a range of modern web browsers . Compatibility of these browsers are ensured on the latest versions

Google Chrome (116.0.5845.140 or later)  
Mozilla Firefox (116.0.3 or later )  
Microsoft Edge (116.0.1938.62 or later)  
Apple Safari (5.1.10 or later)

In Addition to the Desktop Browsers the Core Banking System (CBS) online portal is designed to be responsive and accessible on mobile devices on there mobile browsers.

## **2.5 Design and Implementation Constraints**

The Design and Implementation of the Core Banking System (CBS) is subject to a number of constraints that affect how it is designed and operated.

### **Regulatory Compliance**

- Specific guidelines for data protection, reporting, and compliance to banking rules have been imposed by the Seychelles finance authorities. The design and deployment of safety measures, audit records, and data collection abilities within the Core Banking System (CBS) are affected by these limitations.

### **Hardware Limitations**

- The Core Banking System (CBS) is constrained by known hardware constraints, such as timing requirements and memory needs. The system must be developed to operate effectively within the limitations of the hardware available, ensuring excellent performance even under heavy workloads.

### **Interface Dependencies**

- Integration with other applications has restrictions on data interchange formats, communication protocols, and compatibility. The Core Banking System (CBS) is designed to ensure easy compatibility, data flow and to perfectly match these interfaces.

### **Language Requirements**

- The system must handle several languages in order to serve a wide range of customers. For things like user interfaces, documentation, and customer contacts, this involves making sure that the system can be utilized effortlessly in several languages.

### **Communications Protocols**

- In order to ensure safe data transfer between branches, ATMs, and online portals, the CBS depends on a set of communication protocols. The integrity and security of transmitted data must be maintained by strict compliance to these procedures.

### **Security Considerations**

- Strict security measures have been implemented, including robust encryption techniques, access limits, means to confirm user identities, and thorough audit records. These security measures are essential for preventing unwanted access to and breaches of client financial data.

## **Programming Standards**

- Following the launch of the Core Banking System (CBS), it is the bank's vital duty to manage and maintain the application. This continual commitment includes maintaining the system's reliability, increasing its security features, and maximizing its performance for effective day-to-day operation. Programming standards must be followed carefully throughout this phase so that the bank's IT staff can easily implement upgrades, improvements, and problem repairs.

## **2.6 User Documentation**

The following components will be included in the user documentation bundle that comes with the software:

### **User Manual**

- A comprehensive user manual for customers and employees will be provided with the software to effectively utilize the Core Banking System. These manuals will cover on seamlessly working with the Core Banking System

### **Online Help System**

- Users will be able to get immediate support via an interactive online help system embedded into the CBS. Within the application's user interface, it will offer relevant assistance and responses to frequently asked questions.

### **Tutorials**

- Tutorial videos will be provided with the software for both customers and bank employees to make the software more familiar to them. Users will be guided through in these tutorials, enabling them to comfortably operate the system.

### **Frequently Asked Question (FAQ) section**

- Common questions and concerns will be addressed in a separate FAQ area, which will offer prompt responses and fixes for frequent user problems.

## **Formats and Standards**

- To guarantee clarity, accessibility, and usability, user documentation will be created in keeping with best practices and industry standards. This will ensure that users can easily access and understand the information provided, thereby improving their experience with the Core Banking System (CBS)

## **2.7 Assumptions and Dependencies**

### **Assumptions**

#### **1) Third Party Components**

- It is expected that the effective integration of third-party components or libraries, including the MySQL Database Management System (DBMS) and communication protocols, would go off without any issues.

#### **2) Regulatory Stability**

- The regulatory environment and regulations established by the Seychelles financial authorities relies on being mostly steady during the project's development. The system's requirements for compliance might be impacted by any substantial changes to the rules.

#### **3) Hardware Infrastructure**

- We believe that the bank's current hardware infrastructure, including its servers and network connectivity, meets performance and reliability requirements set by the industry. System performance may be impacted by any unexpected hardware limitations or breakdowns.

#### **4) Data Privacy**

- To protect consumer and financial data within the Core Banking System (CBS), it is believed that the bank would adopt strong data privacy safeguards, such as encryption, access controls, and secure storage. To safeguard the security and integrity of sensitive

information, these measures must adhere to applicable data protection laws as well as industry standards.

## **Dependencies**

### **1) External APIs**

- For access to financial data and cross-bank transactions, the CBS depends on external APIs. These APIs must be compatible, available, reliable, secure, and provide timely support for the best experience. For the Core Banking System's banking processes to run well, several dependencies are necessary.

### **2) Network Infrastructure**

- A reliable and secure network infrastructure that connects branches to the main office is essential to the functioning of the CBS. Unexpected network interruptions or outages may affect the system's ability to conduct transactions and access real-time data.

### **3) User Feedback and Testing**

- User testing and feedback are crucial for the CBS's development and enhancement. Users are anticipated to actively contribute by reporting problems, offering input, and taking part in testing phases to improve system operation making them dependable.

### **4) Budget and Resource Allocation**

- The availability of sufficient budget and necessary resources is a need for the successful deployment of the CBS. The bank has to allocate the resources required to support the development, execution, and continuing maintenance of the project. Therefore, commitment to a proper budget and resource allocation is essential for the Core Banking System's dependable operation.

### **5) Maintenance Commitment**

- After deployment, it is believed that the bank will continue to manage and maintain the CBS. Long-term support and upgrades may be impacted by a change in the bank's maintenance commitment.

## 3. External Interface Requirements

### 3.1 User Interfaces

- **Login Page**

The login page is responsible for secure user authentication and according to user type, redirect them to relevant dashboards

- **Dashboard**

There are several dashboard types for user types. According to user relevant dashboards will be displayed. Mainly every dashboard will contain common components like recent actions, recent transactions etc.

- **Actions**

- **Accounts**

- **Open Account**

- Open Account page for creating new accounts in different types (Savings, Checking, FD etc). All the settings relevant to account will be displayed in this page.

- **Close Account**

- Close Account page for closing opened account

- **Loan**

- **Apply for a Loan**

- Apply for a Loan page for the apply to load in given categories (business or Personal) and Self application

- **Approve Loan**

- This page is Only displayed for branch managers to approve load requests

- **Fund Transfer**

- This page is for fund transfer facility and it will consist of relevant settings for fund transfer

- **Reports**

- **Transaction Report**

- This transaction report for total transactions branchwise

- **Late Loan Installment Report**

- The late loan installment report branchwise only for branch managers

## 3.2 Hardware Interfaces

The Core Banking Solution will require the following hardware interfaces:

- **Servers:** The system will be hosted on servers located at the head office of Bank A. These servers will be connected to the existing leased line network to ensure connectivity with all branches. The server should have sufficient memory, storage, processing power, and bandwidth to store and retrieve the data of the system. To guarantee the availability and integrity of the data in the event of a system breakdown or disaster, the database server should also contain a backup storage device and a recovery mechanism.
- **Branch Computers:** Each bank branch will have computers connected to the leased line network, providing access to the Core Banking System (CBS) for branch employees.
- **ATMs:** The system will support ATM usage, allowing customers to withdraw money and perform transactions. The ATMs will be connected to the CBS through the network.
- **Online Portal:** The system will have an online portal accessible to customers, enabling them to perform transactions, apply for loans, and manage their accounts. The online portal will be accessible through internet-connected devices such as computers and mobile devices. The client-side applications will be web-based applications that can be accessed from any computer with a web browser.

## 3.3 Software Interfaces

The Core Banking Solution will require the following software interfaces:

- **Database Management System (DBMS):** The system will use a DBMS to manage customer data, account information, transaction logs, and other critical data. The DBMS should be secure, reliable, and scalable.
- **Payment Gateway:** The system will integrate with a payment gateway to facilitate online transactions. The payment gateway should be secure, reliable, and compliant with industry standards.
- **Loan Processing System:** The system will have a loan processing feature that will require integration with a loan processing system. The loan processing system should be secure, reliable, and scalable.

- **Email Notification System:** The system will have an email notification feature that will require integration with an email notification system. The email notification system should be secure, reliable, and scalable.

### 3.4 Communication Interfaces

The Core Banking Solution will require the following communications interfaces:

- **Leased Line Network:** The leased line network will provide secure communication between the servers at the head office and the computers at each branch. The network should be reliable, secure, and scalable.
- **Internet:** The online portal and payment gateway will require internet connectivity to enable customers to perform transactions online. The internet connection should be reliable, secure, and scalable.
- **Email Server:** The email notification feature will require an email server to send notifications to customers. The email server should be reliable, secure, and scalable.

The communications interfaces mentioned above are essential for the successful implementation and operation of the Core Banking Solution. They will facilitate secure communication between the branches, servers, ATMs, online portal, DBMS, payment gateway, loan processing system, email notification system, and other external systems, ensuring seamless access to banking services for both customers and employees.



## 4. System Features

### 4.1 Customer Account Management

#### 4.1.1 Description and Priority

Customers can easily open, manage, and maintain a variety of accounts with the bank, such as savings, checking, and fixed deposit accounts, through this Core Banking System (CBS) . This feature is of High Priority since it directly affects the user experience and essential functioning.

#### 4.1.2 Stimulus/Response Sequences

**Stimulus:** Opening a new account

**Response:** The system will provide application that the customer can then fill to open an account type of their liking (Savings account or checking account)

**Stimulus :** Account Closure

**Response:** The system will provide a step by step in detail guide on how the customer can make an account closure

#### 4.1.3 Functional Requirements

**REQ-1:** Customers will be able to independently open the chosen form of account (savings, checking, or fixed deposit) at any branch or online using the core banking system (CBS).

**REQ-2:** Customers will be able to easily update and modify the information associated with their accounts, including important details like their name, email address, and contact information. This feature ensures that customers can keep their personal information up-to-date

**REQ-3 :** The System will compute and apply interest rates for savings, checking and Fixed Deposit accounts according to their chosen plan.

**REQ-4 :** Customers will be able to check their bank balance of any of their accounts very easily using the online portal or by visiting a nearby branch

**REQ-5 :** Enforces Withdrawal limitations depending on the customers Transaction history

**REQ-6 :** Using the User interface customers will be able to easily check their bank balances and other transaction details including reports of their respective accounts in the bank.

## 4.2 Fixed Deposit Management

### 4.2.1 Description and Priority

The essential feature enables users to conveniently set up and manage Fixed Deposit (FD) accounts inside the banking system. Customers may personalize their investments to match their financial objectives by choosing the deposit amount, timeframe, and interest rate with this tool. And this feature is of high priority

### 4.2.2 Stimulus/Response Sequences

**Stimulus :** Customers can start a Fixed Deposit Account

**Response :** The System will give an Application for the customer to fill which will decide which interest rate the customer will receive for the FD.

### 4.2.3 Functional Requirements

**REQ-1:** Customers will be able to set up Fixed Deposit accounts that are connected to their Savings accounts using the system.

**REQ-2:** The Customer shall decide on the precise amount and duration of the Fixed deposit they wish to commit so that the system will indicate which fixed deposit plans are suitable for them .

**REQ-3:** The Core Banking System will automatically calculate the interest for the Fixed deposit account and will automatically deposit it to the customer's linked savings account. These details are presented to the customer when applying for the Fixed deposit

**REQ-4:** After opening the Fixed Deposit, customers can easily check for details such as maturity dates and interest earnings, through the online portal easily anytime they wish on the dedicated dashboard for Fixed deposits.

**REQ-5:** In case of a Premature withdrawals, the system will identify such incidents and will obey the banks terms and regulations

## 4.3 Transaction Management

### 4.3.1 Description and Priority

The Transaction Management feature allows customers to perform transactions such as deposits, withdrawals, and fund transfers between accounts. It is a high-priority feature.

### 4.3.2 Stimulus/Response Sequences

**Stimulus** - customer selects the “Transaction” option on the online portal or at ATM.

**Response** - The system allows the user to choose the type of transaction. System validates and update the transaction details.

### 4.3.3 Functional Requirements

**REQ-1:** The system shall allow customers to perform deposits by entering the deposit amount and selecting the account to deposit into.

**REQ-2:** The system shall allow customers to perform withdrawals by entering the withdrawal amount and selecting the account to withdraw from.

**REQ-3:** The system shall allow customers to perform fund transfers between their own accounts by entering the transfer amount and selecting the source and destination accounts.

**REQ-4:** The system shall validate transaction details such as account numbers and available balance before processing the transaction.

**REQ-5:** The system shall update the relevant account balances and transaction logs after processing a transaction.

**REQ-6:** In case of a Premature withdrawals, the system will identify such incidents and will obey the banks terms and regulations

**REQ-7:** The system shall handle error conditions such as invalid inputs or insufficient funds by displaying an error message to the user.

## 4.4 Loan Services

### 4.4.1 Description and Priority

The Loan Services feature is of high priority and allows customers to apply for loans and manage their loan accounts.

### 4.4.2 Stimulus/Response Sequences

**Stimulus** - The user selects the "Apply for Loan" option on the online portal or at a bank branch.

**Response**- System prompts the user to fill out a loan application form with details such as loan amount, repayment term, and collateral. System calculate the applicable interest rate and confirm the loan application.

### 4.4.3 Functional Requirements

**REQ-1:** The system shall allow customers to apply for loans by filling out a loan application form with details such as loan amount, repayment term, and collateral.

**REQ-2:** The system shall validate loan application details such as loan amount, repayment term, and collateral before processing the application.

**REQ-3:** The system shall calculate the applicable interest rate based on the loan term, amount, and collateral.

**REQ-4:** The system shall process the loan application and send a notification to the user via email or SMS confirming the loan approval or rejection.

**REQ-5:** The system shall allow customers to view their loan account details such as outstanding balance, repayment schedule, and payment history.

**REQ-6:** The system shall update the relevant loan account balances and transaction logs after processing a loan payment.

## 4.5 Security and User Authentication

### 4.5.1 Description and Priority

The Core Banking System's (CBS) security and integrity depend on this functionality. Since it plays such an essential role in protecting consumer data and financial activities, it is of the highest priority.

### 4.5.2 Stimulus/Response Sequences

Stimulus: The user attempts to Log in to the system

Response: The user's credentials are verified by the system. If the credentials are valid the system will allow access for the user to log in

### 4.5.3 Functional Requirements

**REQ-1:** Users must enter a valid password and username in order to be authenticated by the system.

**REQ-2:** The system has to enforce password regulations, such as those requiring a minimum length, special character requirements and an expiration date for the password.

**REQ-3:** The system must temporarily freeze the user's account after a certain number of unsuccessful login attempts in order to prevent unauthorized access.

**REQ-4:** Security notifications will be generated by the system for any unusual or suspicious activity, such as several unsuccessful login attempts or large fund transfers.

**REQ-5:** The system must securely manage user sessions, automatically logging out users after a certain amount of inactivity.

**REQ-6:** For users who forget their passwords, the system will provide a safe password recovery mechanism.

**REQ-7:** The system will send account verification links or codes to the registered email address or phone number when users register or make significant modifications to their accounts (such as updating their email addresses).

## 4.6 Branch-wise Reportings

### 4.6.1 Description and Priority

This tool allows you to create and examine branch-wise reports, giving you information about various banking operations at distinct branches. It enables data analysis but may not be as urgent when compared to transactional aspects, making it of Medium priority.

### 4.6.2 Stimulus/Response Sequences

**Stimulus:** A user with appropriate privilege requests a branch wise report

**Response:** The system generates and displays the report

### 4.6.3 Functional Requirements

**REQ-1:** Users with the required privileges will have the option to view multiple branch-specific reports, such as transaction summaries, account balances, and demographic information about customers.

**REQ-2:** The system must retrieve and handle relevant information from the database in response to a request.

**REQ-3:** The system shall present report data in a user-friendly format including graphs, tables and other graphical representations

**REQ-4:** Users must be able to send branch-specific reports through email or internal messaging to approved coworkers

**REQ-5:** The system must keep track of all branch-specific reports that have been created, so users may go back to earlier reports as needed.

## **5. Other Nonfunctional Requirements**

### **5.1 Performance Requirements**

#### **1. Response Time**

##### **1.1. Response Time for Standard Transactions:**

The system shall provide response times of less than 2 seconds for standard transactions, including but not limited to balance inquiries. This ensures that customers experience swift and efficient service for routine banking operations.

##### **1.2. Loan Approval Response Time:**

For loan approval processes, the system shall have response times of less than 5 minutes for initial assessments. This ensures timely processing of loan applications, enhancing customer satisfaction.

#### **2. Throughput**

##### **2.1. Concurrent User Sessions:**

The system shall support a minimum of 500 concurrent user sessions during peak hours. This ensures that a large number of users can access the system simultaneously without experiencing significant delays.

##### **2.2. Transaction Processing:**

The system shall process a minimum of 1,000 transactions per minute during peak loads without queuing. This ensures efficient transaction handling during periods of high demand.

#### **3. Scalability**

##### **3.1. Scalability Support:**

The system architecture shall support horizontal and vertical scaling to accommodate a 20% increase in transaction volume annually. This allows the system to grow in capacity and handle increasing workloads over time.

#### **4. Availability**

##### **4.1. Uptime:**

The system shall maintain an uptime of at least 99.9% on a 24/7 basis, with scheduled downtime limited to off-peak hours and communicated to users in

advance. This ensures that the system is available for customers whenever they need it.

## **5. Data Processing Speed**

### **5.1. Loan Processing Speed:**

Loan application processing shall be completed within 24 hours for standard loan products. This ensures that loan applicants receive timely responses regarding their applications.

## **6. Audit Trails**

### **6.1. Audit Logging:**

The system shall generate and store audit logs for all transactions and loan processing activities without impacting response times by more than 5%. This ensures that comprehensive audit trails are maintained for compliance and security purposes.

## **7. Resource Utilization**

### **7.1. Resource Optimization:**

The system shall optimize resource utilization to ensure CPU, memory, storage, and network bandwidth are used efficiently, with resource usage below 80% during peak loads. This prevents resource bottlenecks and ensures consistent performance.

## **8. Compliance**

### **8.1. Regulatory Adherence:**

The system shall adhere to regulatory requirements and standards relevant to the banking industry and specific regional jurisdictions. This ensures compliance with legal and industry-specific regulations.

## **9. Latency Tolerance**

### **9.1. ATM Transaction Latency:**

ATM cash withdrawals shall have latency of less than 500 milliseconds, ensuring quick and efficient ATM transactions.

### **9.2. Loan Approval Latency:**

Loan approval processes may tolerate latency of up to 10 minutes for complex assessments, balancing the need for thorough evaluation with reasonable processing times.



## **10. Concurrency Control**

### **10.1. Data Consistency:**

The system shall implement concurrency control mechanisms to prevent data conflicts and maintain data consistency in multi-user environments. This ensures data integrity in scenarios with simultaneous access.

## **5.2 Safety Requirements**

### **1. Access Control**

#### **1.1. Role-Based Access Control:**

The system shall implement role-based access control (RBAC) to manage user permissions. Users will only have access to system functions and data that are relevant to their roles within the organization.

#### **1.2. Password Policies:**

The system shall enforce strong password policies, including password complexity requirements and periodic password changes, to enhance security.

### **2. Data Privacy**

#### **2.1. Compliance with Data Protection Regulations:**

The system shall comply with relevant data protection regulations, such as the General Data Protection Regulation (GDPR), the Health Insurance Portability and Accountability Act (HIPAA), or regional banking privacy laws.

#### **2.2. Secure Handling of Customer Data:**

Personally identifiable information (PII) and sensitive financial data shall be securely stored and processed, with strict access controls and encryption.

### **3. Backup and Disaster Recovery**

#### **3.1. Data Backup:**

Critical data, including transaction records and customer information, shall be regularly backed up. Backup copies shall be securely stored.

### **3.2. Disaster Recovery Plan:**

A comprehensive disaster recovery plan shall be developed and tested to ensure business continuity in case of data loss or system failures.

## **5.3 Security Requirements**

### **5.3.1. Low-Latency Security:**

The system shall use encryption and authentication mechanisms that do not introduce more than 100 milliseconds of latency per transaction. This ensures that security measures do not significantly impact response times.

### **5.3.2. Authorization Efficiency:**

Authorization checks shall not exceed 50 milliseconds per transaction. This ensures that access to sensitive data and operations is both secure and efficient.

## **5.4 Software Quality Attributes**

- It should perform consistently and with no error hence should be reliable.
- It should provide service at any time with no flaws or interruption at any time. meaning that it should be accessible and operational at all times without any downtime or interruption.
- The maintenance cost should be minimal and it should be easy to maintain as it would be used for a long time. Hence it should be well structured with the default format used globally.
- It should be able to be easily used by the customer hence having an easy and understandable interface and with the help of instructions.
- It should be able to run in any platforms or in any browser hence it should be compatible across any devices

## **5.5 Business Rules**

### **Know Your Customer :**

Before opening an account or processing a loan application, the bank must verify the customer's identity, address, and financial history according to regulatory requirements.

### **Anti-Money Laundering (AML) Rules:**

Banks must have procedures in place to detect and report suspicious transactions to prevent money laundering activities.

### **Credit Risk Assessment:**

Banks use specific criteria and credit scoring models to assess the creditworthiness of loan applicants, determining their ability to repay the loan.

### **Customer Privacy Rules:**

Ensures that customer information is kept confidential and that data protection laws and regulations are followed.

### **Regulatory Compliance:**

Ensures that the bank adheres to all relevant financial regulations, such as those set forth by the central bank, government agencies, and international bodies like Basel III.

## 6. Other Requirements

- Highly secure and reliable system
- Multiple layers of security (user authentication, data encryption, and access control)
- Scalable to handle a large number of transactions and users
- Easily maintainable and upgradeable
- User-friendly interface for bank employees and customers
- Accessibility considerations for people with disabilities

### 6.1. Database Requirements

#### **Database Schema:**

Specify the structure of the database, including tables, fields, and relationships between them.

#### **Data Security:**

Define access controls and encryption mechanisms to protect sensitive customer and financial data.

#### **Scalability:**

Describe how the system will handle a growing volume of transaction and loan data over time.

#### **Data Backup and Recovery:**

Outline procedures for regular data backups and disaster recovery plans to ensure data integrity.

## 6.2. Internationalization Requirements

### **Multi-language Support:**

Specify the languages the system should support, and ensure that user interfaces and documents can be displayed in these languages.

### **Currency Conversion:**

If the system deals with international transactions, provide support for currency conversion and exchange rate updates.

### **Localization:**

Consider local regulatory and legal requirements for banking and loan processing in different countries or regions.

## 6.3. User Documentation

### **User Manuals:**

Provide comprehensive user manuals and documentation to assist both bank staff and customers in using the system effectively.

### **Training Requirements:**

Identify training needs for bank employees and system administrators.

## 6.4. Maintenance and Support

### **Maintenance Procedures:**

Define procedures for ongoing system maintenance, including bug fixes, updates, and enhancements.

### **Customer Support:**

Outline the process for handling customer inquiries and support requests

## **Appendix : Glossary**

- Authentication: The process of verifying the identity of a user.
- Basel III: A set of international banking regulations that were developed in response to the global financial crisis of 2008.
- Business rule: A rule that governs how a business operates.
- Customer privacy: The right of a customer to have their personal information kept confidential.
- Data protection: The process of protecting personal information from unauthorized access, use, disclosure, disruption, modification, or destruction.
- Database: A collection of data that is organized so that it can be easily accessed and managed.
- Internationalization: The process of making a product or service available to users in multiple languages and cultures.
- Loan application: A document that is used to apply for a loan.
- Maintenance cost: The cost of keeping a product or service in good working condition.
- Money laundering: The process of making illegally obtained money appear to have come from a legitimate source.
- Regulatory compliance: The process of meeting the requirements of applicable laws and regulations.
- Security: The state of being protected from harm or danger.
- Software quality attribute: A characteristic of software that affects its overall quality.
- Transaction: An exchange of goods or services between two parties.
- Latency: The time it takes for a signal to travel from one point to another.