Software Requirements Specification

Banking Management System

Version 1.0

Zakariya SABRI,Youssef AOUZAH

October 7, 2025

Contents

1 Introduction

1.1 Purpose

This document describes the requirements for a Banking Management System. The system provides secure banking operations, client management, transaction processing, currency conversion, and user access control.

1.2 Scope

The Banking Management System will:

- Manage client information and bank accounts

- Process financial transactions (deposits, withdrawals, transfers)

- Provide currency exchange capabilities

- Control user access with authentication and permission systems

- Maintain comprehensive audit trails and logging

1.3 Definitions, Acronyms, and Abbreviations

- **SRS**: Software Requirements Specification

- **FR**: Functional Requirement

- **NFR**: Non-Functional Requirement

- **UI**: User Interface

- **M**: Must Have (Critical requirement)

- **S**: Should Have (Important but not critical)

- **C**: Could Have (Optional)

1.4 References

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

- Course Materials: "Software Requirements Engineering"

- Banking Security Standards

2 Overall Description

2.1 Product Perspective

The Banking Management System is a console-based application with file-based data storage. It provides comprehensive banking operations with integrated currency exchange functionality.

2.2 Product Functions

- User Authentication and Access Control

- Client Account Management

- Financial Transaction Processing

- Currency Exchange Operations

- Comprehensive Logging and Audit Trails

- Security and Input Validation

2.3 User Characteristics

- **Bank Clients**: Users who perform deposits, withdrawals, and currency exchanges

- **Administrators**: Users with full system access for client and system management

2.4 Constraints

- Console-based interface

- File-based data storage (text files)

- Local operation only (no network connectivity)

- Must run on Windows with C++ compiler

3 Specific Requirements

3.1 Functional Requirements

3.1.1 Authentication and Access

FR-AUTH-001: User Login **Priority: M**

- System shall allow users to log into their bank accounts

- System shall validate username and password credentials

- System shall provide appropriate access based on user role

FR-AUTH-002: Admin Access Control **Priority: M**

- Admin users shall have full system access privileges

- Regular users shall have limited transaction capabilities

3.1.2 Client Management

FR-CLIENT-001: View Client List   **Priority: M**

- Admin shall be able to view the complete client list
- System shall display all client records in organized format

FR-CLIENT-002: Search Clients   **Priority: M**

- Admin shall be able to search for specific clients
- Search functionality shall support multiple criteria

FR-CLIENT-003: Delete Client Records   **Priority: M**

- Admin shall be able to delete client records
- System shall require confirmation before deletion

FR-CLIENT-004: Add New Clients   **Priority: M**

- Admin shall be able to add new clients with detailed profiles
- Required client information: account details, personal information, initial balance

3.1.3 Transaction Processing

FR-TRANS-001: Deposit Funds   **Priority: M**

- Signed-in users shall be able to deposit funds into accounts
- System shall update account balance accordingly

FR-TRANS-002: Withdraw Funds   **Priority: M**

- Signed-in users shall be able to withdraw funds from accounts
- System shall validate sufficient funds before withdrawal

FR-TRANS-003: Transfer Money   **Priority: M**

- Admin shall be able to transfer money between accounts
- System shall validate both source and destination accounts

3.1.4 Currency Exchange

FR-CURR-001: View Available Currencies   **Priority: S**

- Users shall be able to see available currencies
- System shall display current supported currency codes

FR-CURR-002: Find Currency Rates   **Priority: S**

- Users shall be able to find specific currency rates

- System shall display current exchange rates

FR-CURR-003: Calculate Currency Conversion　　　　**Priority: S**

- Users shall be able to calculate currency conversion

- System shall provide real-time conversion calculations

FR-CURR-004: Commit Currency Exchange　　　　**Priority: S**

- Signed-in users shall be able to commit currency exchange

- System shall update account balances after exchange transactions

3.2　Non-Functional Requirements

3.2.1　Security Requirements

NFR-SEC-001: Password Protected Access　　　　**Priority: M**

- System shall provide password protected access to all functionalities

- All sensitive operations shall require authentication

NFR-SEC-002: User Authentication System　　　　**Priority: M**

- System shall provide a user authentication and login system

- Credentials shall be securely stored and validated

NFR-SEC-003: Login Attempt Tracking　　　　**Priority: S**

- System shall keep track of failed login attempts

- System may implement account lockout after excessive failures

NFR-SEC-004: User Permission Management　　　　**Priority: M**

- System shall manage user permissions for different operations

- Role-based access control shall be implemented

3.2.2　Data Management Requirements

NFR-DATA-001: Transaction Tracking　　　　**Priority: M**

- System shall keep track of each transaction and the time it was done

- Complete audit trail for all financial operations

NFR-DATA-002: Input Validation　　　　**Priority: M**

- System shall provide user input validation and tracking

- Protection against data migration and incorrect data types

- Validation for all user inputs and financial amounts

NFR-DATA-003: User Activity Logging　　　　**Priority: S**

- System shall keep user activity logging

- All significant user actions shall be recorded

3.2.3 Currency Exchange Requirements

NFR-CURR-001: Periodic Rate Updates   **Priority: S**

- System shall update exchange rates periodically

- Automatic refresh of currency exchange rates

NFR-CURR-002: Multi-Currency Support   **Priority: S**

- System shall provide support for multiple currencies

- Handling of different currency codes and conversions

3.2.4 Reliability Requirements

NFR-REL-001: Data Integrity   **Priority: M**

- System shall maintain data consistency across all operations

- No data loss during transaction processing

NFR-REL-002: Error Handling   **Priority: S**

- System shall handle errors gracefully with appropriate messages

- No system crashes on invalid inputs or operations

4 System Features

4.1 Authentication and Security

- Secure user login with credential validation

- Role-based access control (Admin vs Regular User)

- Login attempt monitoring and tracking

- Session management for signed-in users

4.2 Client Management

- Comprehensive client profile management

- Client search and retrieval functionality

- Client record creation, viewing, and deletion

4.3 Financial Transactions

- Deposit and withdrawal processing

- Inter-account fund transfers

- Balance validation and update

- Transaction history recording

4.4 Currency Exchange

- Multi-currency account support

- Real-time exchange rate display

- Currency conversion calculations

- Exchange transaction execution

4.5 Audit and Logging

- Comprehensive transaction logging

- User activity monitoring

- System operation tracking

- Security event recording

5 Appendices

5.1 Data Storage Format

- **User Data**: username#——#password#——#permissions
- **Client Data**: AccountNumber#——#PinCode#——#Name#——#Phone#——#AccountBal
- **Transaction Logs**: Timestamp, User, Action, Details

5.2 User Roles and Permissions

- **Admin**: Full access to all system functions
- **Regular User**: Limited to personal transactions and currency exchange

5.3 Supported Currencies

- MAD (Moroccan Dirham) - Base currency

- USD (US Dollar)

- EUR (Euro)

- GBP (British Pound)

- CAD (Canadian Dollar)