

Bank Management System Requirements Specification

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Executive Summary

Project Overview

This project involves the development of a comprehensive Bank Management Software designed to enhance the efficiency of banking operations and improve customer experience. The product serves a wide range of users, including customers, bank staff, and administrators.

The software is intended to support critical banking processes such as account management, transaction handling and loan approvals. By integrating with existing infrastructure and providing robust security measures, the system seeks to deliver reliable banking services.

Product/Service Description

Product Context

This bank management software integrates seamlessly with a variety of related systems, forming part of a broader ecosystem of financial products and services.

Relationships to Other Systems:

1. Core Banking System: Interfaces to retrieve account details, transaction history, and customer information.
2. Mobile Applications: Provides access to retail and commercial customers for banking services on the go.
1. ATM Network: Synchronizes account and transaction data for real-time updates.
2. Third-Party Payment Gateways: Facilitates online payments and fund transfers.
3. Regulatory Reporting Systems: Sends periodic compliance and financial data to meet statutory requirements.

User Characteristics

Internal Users:

- **System Administrators** – Responsible for managing employee profiles, role assignments, and permissions. They ensure compliance with access control policies and security guidelines.
- **Bank Employees** – Includes tellers, managers, and loan officers who handle customer requests such as account creation, transactions, fund transfers, and loan approvals.
- **Auditors & Compliance Officers** – Review system logs, transactions, and fraud analytics to ensure regulatory compliance.

External Users:

- **Customers** – Use online banking to manage personal or business accounts, perform transactions, apply for loans, and access customer services.

Assumptions

- Customers and employees will have stable internet access to use online banking features.
- The bank will keep the system updated with evolving regulatory requirements.
- The bank will provide secure hosting, firewalls, and encryption measures.

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- Payment gateways, financial networks, and identity verification services will be available and functional.
- The data backup systems are reliable to ensure continuity during outages.

Constraints and Dependencies

- The system must operate alongside existing legacy banking systems until full migration is complete.
- **User Management** module must be completed before access to any other banking functionalities.
- **Funds Management, Transaction Management, and Fraud Detection** modules must be implemented before account-related transactions can be processed.

Requirements

Functional Requirements

User Management

BR_UM_01: The system administrator shall be able to maintain system profiles for bank employees. *(Priority 1)*

- I. The system administrator shall be able to create a new employee profile by providing the following employee information: full name, employee ID, date of birth, SSN, phone number, email, address, and employment start date.
- II. The system shall allow the assignment of roles such as teller, manager, and loan officer.
- III. The system shall grant permissions based on the assigned role.
- IV. The system administrator shall be able to modify employee profiles to update personal details, change roles, or update permissions.
- V. The system administrator shall be able to delete employee profiles when an employee leaves the organization.

BR_UM_02: The system shall allow employees to log into the system. *(Priority 1)*

- I. The system shall enforce security measures such as biometric or multi-factor authentication prior to login.
- II. The system shall temporarily lockout the account after four failed login attempts.
- III. Unauthorized login attempts shall be reported to the system administrator.

BR_UM_03: Customers shall be able to access selected bank services using their online account. using the same personal information they provided to bank employees. *(Priority 2)*

- I. Customers can create an online account by providing the following information: full name, SSN, phone number, email address, and password.
- II. The system shall send a verification email or SMS before activating the account.
- III. Customers shall be able to log into their user account by providing their email and password.
- IV. The system shall enforce security measures such as account lockout after five failed login attempts.
- V. Customers shall be able to reset or recover their online user account password by receiving an email with a reset link that expires after a predefined duration.

Funds Management

BR_FM_01: Bank managers/administrators shall be able to view and manage the bank's funds. *(Priority 1)*

- I. Bank managers shall be able to view incoming and outgoing funds: deposits, withdrawals, and transfers across various accounts and financial units.
- II. The system shall allow bank managers to register funds allocation to accounts, branches, and ATMs.
- III. The system shall send alerts to bank managers when liquidity falls below a predefined threshold.

Account Management

BR_AM_01: Bank employees shall be able to open a new bank account for a customer by selecting the account type, currency, and by providing the customer's personal information. *(Priority 1)*

- I. The system shall support the creation of the following account types: savings, checking, fixed deposit, business, joint.
- II. The system shall provide the following currency options: Lek, Euro, U.S. Dollars.
- III. The system shall require provision of the following customer information: full name, SSN, phone number, email, address, signature.

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- IV. The system shall generate a unique account number for each customer.
- V. The system shall assign an interest rate based on the account type.
- VI. Bank employees and customers shall be able to view bank account information and transaction history.

BR_AM_02: Bank employees shall be able to close an existing bank account upon customer request. *(Priority 1)*

- I. The system shall check for any pending transactions, fees, or loan obligations before allowing account closure.
- II. The system shall automatically transfer the remaining balance to another customer-designated account or issue a check.
- III. The system shall generate a closure confirmation document for the customer.
- IV. The system shall deactivate linked debit/credit cards upon account closure.

BR_AM_03: Bank employees shall be able to make changes to a bank account by updating customer or account information, changing applicable interest rate, account currency. *(Priority 1)*

- I. The system shall allow changes to the account owner's phone number, email, and address.
- II. The system shall allow addition/removal of authorized users.
- III. The system shall allow changes to the account's interest rate or conversion of balance to a different currency.
- IV. The system shall send an automated confirmation notification to the customer upon any account information updates.

BR_AM_04: The system shall apply interest at regular intervals (monthly, annually). *(Priority 1)*

- I. The system shall calculate interest based on account balance and associated interest rate.
- II. The system shall update account balance upon application of interest.
- III. The system shall reflect applied interest in the account's transaction history and audit logs.

BR_AM_05: The system shall enforce minimum balance requirements subject to bank policies. *(Priority 1)*

- I. The system shall send an automated notification to the customer if balance falls below the minimum requirement.
- II. The system shall automatically apply penalties or maintenance fees when balance falls below the threshold.
- III. Penalties and maintenance fees shall be displayed in the account's transaction history and audit logs.

Transaction Management

BR_TM_01: The system shall allow customers to deposit money into their accounts upon bank teller approval. *(Priority 1)*

- I. The system shall update account balance immediately after a deposit is approved.
- II. The system shall generate a deposit receipt, available in digital or printed form.
- III. The system shall send an automated confirmation notification to the customer upon deposit.
- IV. Deposits shall be reflected in the account's transaction history and audit logs.

BR_TM_02: The system shall allow customers to withdraw money, subject to balance availability and withdrawal amount limits, with applicable penalties for certain account types (fixed deposit, savings). *(Priority 1)*

- I. The system shall verify account balance before processing a withdrawal request.
- II. The system shall enforce withdrawal limits based on the account type.
- III. For withdrawal amounts exceeding bank policy limits, the system shall require bank employee approval.
- IV. The system shall apply penalties for early withdrawals from fixed deposit accounts.

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- V. The system shall generate a withdrawal confirmation receipt, available in digital or printed form.
- VI. Withdrawals shall be reflected in the account's transaction history and audit logs.

BR_TM_03: The system shall allow internal fund transfers between accounts of the same bank. *(Priority 1)*

- I. The system shall require provision of transfer amount and account details of the recipient.
- II. The system shall verify sufficient balance before processing the transfer.
- III. The system shall generate a transfer confirmation receipt, available in digital or printed form.
- IV. Internal transfers shall be reflected in the account's transaction history and audit logs.

BR_TM_04: The system shall support external transfers to accounts of other banks via wire transfer. *(Priority 1)*

- I. The system shall require provision of transfer amount and recipient details, including account number (IBAN) and bank name.
- II. The system shall charge applicable transfer fees based on the transfer amount and destination bank.
- III. The system shall process wire transfers within the standard banking timeframes.
- IV. The system shall generate a transfer confirmation receipt, available in digital or printed form.
- V. External transfers shall be reflected in the account's transaction history and audit logs.

BR_TM_05: The system shall allow customers to set up recurring transfers and payments. *(Priority 1)*

- I. Customers shall be able to specify payment frequency (weekly, monthly, annually), start date, and end date.
- II. The system shall notify customers before processing each scheduled payment.
- III. The system shall allow customers to modify or cancel scheduled payments.
- IV. Recurring transfers and payments shall be reflected in the account's transaction history.

BR_TM_06: The system shall support check-related transactions. *(Priority 1)*

- I. The system shall allow customers to request checkbooks through online banking or at a branch.
- II. The system shall verify check authenticity and available funds before processing.
- III. The system shall notify customers of successful check transactions and expected clearing times.
- IV. The system shall enable customers to place stop-payment requests on issued checks.

Loan Management

BR_LM_01: Customers shall be able to apply for and be granted loans. *(Priority 1)*

- I. Customers shall be able to apply for the following types of loans: personal, student, auto, home, payday, business.
- II. Customers shall be able to select loan terms, including repayment period and monthly installment amount.
- III. The system shall require customers to submit personal information and financial documents to support their application.
- IV. The system shall allow bank employees to view loan applications.
- V. The system shall allow bank employees to approve or reject loan applications, along with justification.
- VI. The system shall generate a loan confirmation document.
- VII. After approval, customers shall have access to an overview of their loan repayment plan, including due dates, amounts, and remaining balance.

BR_LM_02: The system shall allow customers to repay their loans while keeping track of repayment schedules, outstanding balances, and penalties. *(Priority 1)*

- I. The system shall support loan repayment via bank transfer, debit/credit card, or cash deposit.

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- II. The system shall provide customers with an option to set up recurring payments for loan repayment.
- III. The system shall allow customers to partially or fully repay the loan before the maturity date with recalculated interest.
- IV. The system shall notify customers of upcoming due dates via email/SMS.
- V. The system shall automatically calculate and apply penalties for overdue payments as per bank policy.
- VI. The system shall generate a digital receipt upon every successful loan payment.

Card Management

BR_CM_01: Customers shall be able to apply for cards for their bank account online. *(Priority 1)*

- I. The system shall allow customers to select from available card types: debit or credit cards.
- II. The system shall require provision of personal information to verify customer identity.
- III. Bank employees shall be able to reject or approve a card application.
- IV. The system shall generate a unique card number, security code, and expiration date for approved cards.
- V. The system shall allow customers to select a delivery method (e.g., pickup from branch, mail delivery)
- VI. Customers shall receive a notification once the card is issued.

BR_CM_02: Customers shall be able to report lost or stolen cards. *(Priority 1)*

- I. The system shall block lost or stolen cards immediately upon report.
- II. Customers shall have the option to request a replacement card.
- III. Bank employees shall be able to reject or approve a replacement card application.
- IV. The system shall generate a unique card number, security code, and expiration date for approved cards.
- V. The system shall allow customers to select a delivery method (e.g., pickup from branch, mail delivery)
- VI. Customers shall receive a notification once the replacement card is issued.

BR_CM_03: Customers shall be able to set spending limits on their cards. *(Priority 2)*

- I. The system shall allow customers to define daily, weekly, or monthly spending limits based on transaction types (online, in-store, ATM).
- II. The system shall block transactions exceeding the set limit.
- III. Customers shall be able to update their spending limits online.

BR_CM_04: Customers shall be able to temporarily freeze or unfreeze their cards. *(Priority 1)*

- I. The system shall temporarily disable card transactions.
- II. Bank employees shall be able to approve reactivation of frozen cards.
- III. The system shall send an automated notification to the customer confirming the freeze/unfreeze action.

Fraud Detection

BR_FD_01: The system shall provide a handling mechanism for suspicious transactions and account access. *(Priority 1)*

- I. The system shall detect transaction anomalies based on transaction amount, location, and frequency.
- II. The system shall automatically flag transactions that exceed predefined thresholds.
- III. The system shall trigger an alert to the customer and bank security team for suspicious transactions.
- IV. The system shall temporarily suspend flagged transactions until bank employee verification.
- V. The system shall allow bank employees to manually review flagged transactions.

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- VI. In case of fraudulent activity, bank employees shall be able to cancel the transaction or temporarily suspend account access.
- VII. The system shall maintain a fraud detection history.

BR_FD_02: Customers shall have access to a fraud reporting feature within online banking. *(Priority 1)*

- I. Customers shall be able to report suspected fraudulent transactions.
- II. The system shall provide an immediate response confirming receipt of a fraud report.
- III. The system shall temporarily disable affected accounts or cards until the issue is resolved.
- IV. Customers shall be notified of the outcome of their fraud reports.

Customer Services

BR_CS_01: Customers shall be able to access information about ATMs and branches, including interactive maps, working hours, and contact details. *(Priority 3)*

- I. The system shall integrate with map services to provide real-time ATM and branch locations.
- II. The system shall allow customers to filter ATMs and branches based on location.
- III. The system shall display branch contact details, operating hours, and available services.
- IV. The system shall inform customers of temporary branch closures or service disruptions.

BR_CS_02: Customers shall be able to schedule in-branch appointments online. *(Priority 3)*

- I. The system shall display available appointment slots for different banking services in different branches.
- II. Customers shall receive appointment reminders via SMS/email.
- III. Customers shall be able to reschedule or cancel appointments through the online portal.
- IV. Bank employees shall have access to an appointment management dashboard.

BR_CS_03: The system shall provide a feedback and complaint management system. *(Priority 3)*

- I. Customers shall be able to submit feedback and complaints online.
- II. The system shall generate a tracking number for each complaint.
- III. Bank employees shall be able to view and respond to customer complaints.
- IV. Customers shall receive updates on complaint resolution progress.

BR_CS_04: Customers shall be able to request account-related documents online. *(Priority 2)*

- I. The system shall allow customers to readily download account statements.
- II. Customers shall be able to request official bank letters (e.g., account verification, loan payoff).
- III. Bank employees shall be able to approve document requests.
- IV. The system shall notify customers when their requested documents are ready for download.

Audit & Reporting

BR_AR_01: Auditors shall have access to audit trails of the bank. *(Priority 1)*

- I. The system shall record all transactions and employee actions in the audit trail.
- II. The system shall allow auditors to filter audit trails by date range, period, and user.
- III. The system shall ensure that audit logs are immutable and cannot be altered.

BR_RA_02: The system shall provide customer analytics to both managers and customers. *(Priority 2)*

- I. Managers shall be able to filter customer analytics by date range, customer type, account type, transaction type and frequency.
- II. The system shall generate reports on deposits, transfers, withdrawals, and account balances
- III. The system shall allow customers to visualize their financial data with graphs and charts.

BR_RA_05: Managers shall be provided with fraud detection analytics and reporting. *(Priority 1)*

- I. Managers shall be able to view and filter fraud analytics according to period, location, customer category.
- II. The system shall generate reports on logged fraud attempts and suspicious activities.

Non-Functional Requirements

1. Usability Requirements

- 1.1. The system shall have a user-friendly interface.
- 1.2. The system shall support multilingual interfaces (Albanian, English).
- 1.3. The user documentation and help shall be comprehensive and easy to understand.

2. Performance Requirements

- 2.1. The system shall support at least 50,000 active online banking users at any given time.
- 2.2. The system shall support up to 300 concurrent bank employees.
- 2.3. 95% of transactions shall be processed within 1 second.
- 2.4. 99.9% of transactions shall be processed within 3 seconds, even under peak load.
- 2.5. The system shall sustain peak loads of 10 times the normal transaction volume without downtime or performance degradation.

3. Availability Requirements

- 3.1. Critical banking operations (e.g., transactions, account management) shall be available 24/7, except during scheduled maintenance windows.
- 3.2. Mobile and online banking services must be available to customers in all regions with internet access.
- 3.3. Downtime exceeding 15 minutes during business hours shall trigger an automatic failover to a backup server.
- 3.4. Scheduled maintenance shall be conducted between 12 AM - 4 AM to minimize user impact.
- 3.5. The maximum number of failures shall not exceed 1 per 10,000 transactions.
- 3.6. Automated failover mechanisms must be in place to switch to backup infrastructure in case of failures.
- 3.7. The system shall have an MTBF (Mean Time Between Failures) of at least 10,000 hours.

4. Security Requirements

- 4.1. The system shall maintain logs of all user actions for at least 5 years.
- 4.2. Only authorized modules shall have access to sensitive banking functions.
- 4.3. Logs shall be immutable and protected from unauthorized modifications.
- 4.4. All failed login attempts shall trigger alerts.
- 4.5. Database consistency checks shall be conducted daily and any anomalies shall trigger alerts.

5. Organizational Requirements

- 5.1. All software must be developed following bank-approved coding and security guidelines.
- 5.2. The system shall support biometric authentication (fingerprint) and multi-factor authentication.
- 5.3. The system shall be accessible on Windows and macOS for employees.
- 5.4. The system shall have role-based access control (RBAC) to restrict functions based on user roles.

6. External Requirements

- 6.1. The system must adhere to Basel III and Anti-Money Laundering (AML) regulations to prevent fraud and financial crimes.
- 6.2. The system must comply with GDPR to protect customer data.
- 6.3. The system must be PCI-DSS compliant to secure transactions and prevent credit card fraud.
- 6.4. The user interface must follow WCAG accessibility guidelines to ensure usability for people with disabilities.

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- 6.5. The system must support secure API integration with payment processors (Visa, MasterCard, PayPal) and fraud detection systems.
- 6.6. Customers must be able to access the system via web, mobile apps (Android, iOS), and ATMs.