Technical Report

Project Document Scope

Project: The Bank Management System

The main goal of this project is to create an integrated Bank Management System for a financial institution. This system will manage core banking operations, handle customer information, and process various types of financial transactions. The bank contains different departments, such as Customer Service, a Credit Department, and Transaction Processing, and must ensure secure and efficient collaboration between them to serve its clients.

The process is typically triggered when a new customer submits an Account Application to the bank's online portal or in person. The application is then registered in the system with the date of receipt and a newly assigned customerID. This customerID is used to track all of the customer's activities and accounts within the system.

In the next step, the Customer Service department verifies whether the application contains sufficient and correct information, such as the customer's personal data, proof of identity, and the desired account type (e.g., Savings, Checking). If the verification fails, a rejection notice is sent to the applicant, and the application is closed. Otherwise, an account confirmation will be sent to the customer, and the newly created account is passed to the relevant departments for activation and further management.

The system then checks the customer's profile to determine their client tier, which could be "Standard," "Premium," or "Business." This classification is important because the bank has different policies, benefits, and fee structures for different types of customers. For instance, if the customer applies for a loan, their tier might influence the interest rates offered and the required credit score. For certain services, like large fund transfers, an additional security verification must be passed. If this check fails, the transaction is rejected, and the customer is notified.

The account details are passed back to the Customer Service department after the tier classification and any initial security checks are successful. According to the customer's tier, the system applies the corresponding fee structure and benefits to the account, such as waived monthly fees for premium clients or specialized services for business accounts.

The next step is to handle daily financial transactions. The Transaction Processing department manages all incoming and outgoing funds. Based on the transaction requests (e.g., deposits, withdrawals, transfers), the system reserves or moves funds between accounts. The system must verify the availability of funds for every withdrawal or transfer, taking into consideration account balances and any overdraft protection plans.

Besides daily transactions, the system must also process loan applications. The loan information (amount, purpose, and term) is needed by the Credit Department to assess the application. The Credit Department is responsible for evaluating the customer's creditworthiness, which may involve checking their financial history and income. The department then approves or denies the loan based on the bank's lending criteria.

Lastly, the approved loan amount and the customer's account balance will be finalized and updated by the system. The customer will be informed of the loan approval and the updated account details. The system is then responsible for scheduling the loan repayment plan and notifying the customer of the due dates. The banking process for this specific request ends here.

Stakeholder Identification

Category	Stakeholder Examples	Relationship to Bank	Main Interests in the System
Internal – Operational Stakeholders	· Tellers /Cashiers · Customer service · Loan Officers · Account managers	Employees who *directly operate* the BMS	· Fast, accurate transaction handling · Easy customer lookup · Error reduction · Stable connection to central database
Internal – Executive Stakeholders	· Branch managers · Chief Financial Officer (CFO)	Internal decision-makers and system owners	· Access to performance dashboards · Cost control · Security and compliance · Staff productivity metrics

Category	Stakeholder Examples	Relationship to Bank	Main Interests in the System
External – Operational Stakeholders	· Bank customers · Third-party payment gateways · External auditors	Individuals or organizations *outside* the bank who *use* the system	· Real-time account access · Transaction reliability · Data privacy · Convenient user interface · Integration with external apps
External – Executive Stakeholders	· Central Bank · Shareholders · Strategic partners · Insurance collaborators	External authorities and partners who *oversee or depend on* the bank's performance	· Compliance and reporting accuracy · Financial transparency · Return on investment · Reputation and market growth

Functional Requirements

1. Authentication & Authorization

FR-1.1: The system shall allow users to log in using their username and password.
FR-1.2: The system shall authenticate users and assign them one of two roles: Admin, or Customer.
FR-1.3: The system shall restrict access to features based on user roles (role-based access control).
FR-1.4: The system shall allow users to log out of the system securely.
FR-1.5: The system shall lock user accounts after 3 consecutive failed login attempts.
FR-1.6: The system shall maintain user session information during active use.

2. Customer Management

FR-2.1: The system shall allow Admin users to view customer details including associated accounts.
FR-2.2: The system shall allow Admin users to update customer information (name, email, phone).

FR-2.3: The system shall allow Admin users to deactivate customer accounts.
FR-2.4: The system shall prevent duplicate customer email addresses in the system.
FR-2.5: The system shall allow Admin users to search for customers by name, email, or customer ID.
FR-2.6: The system shall display a list of all registered customers to Admin users.

3. Account Management

FR-3.1: The system shall allow Admin users to create new bank accounts for customers.
FR-3.2: The system shall generate unique account numbers automatically for each new account.
FR-3.3: The system shall support multiple account types: Savings, Checking, and Fixed Deposit.
FR-3.4: The system shall allow customers to have multiple accounts.
FR-3.5: The system shall display account details including account number, type, balance, and status.
FR-3.6: The system shall allow Admin users to change account status (Active, Inactive, Closed).
FR-3.7: The system shall allow users to view all accounts associated with a specific customer.
FR-3.8: The system shall maintain an initial balance of zero for newly created accounts.
FR-3.9: The system shall prevent deletion of accounts with non-zero balances.
FR-3.10: The system shall display real-time account balance information.

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4. Transaction Processing

FR-4.1: The system shall allow Admin users to deposit money into customer accounts.
FR-4.2: The system shall allow Admin users to withdraw money from customer accounts.
FR-4.3: The system shall allow Customer users to deposit money into their own accounts.
FR-4.4: The system shall allow Customer users to withdraw money from their own accounts.
FR-4.5: The system shall allow Customer users to transfer funds between their own accounts.
FR-4.6: The system shall validate sufficient balance before processing withdrawal transactions.
FR-4.7: The system shall update account balances immediately after transaction completion.
FR-4.8: The system shall accept only positive amounts for transactions.
FR-4.9: The system shall allow users to add optional descriptions to transactions.
FR-4.10: The system shall automatically record transaction date and time.
FR-4.11: The system shall calculate and store the balance after each transaction.
FR-4.12: The system shall support decimal precision up to 2 decimal places for monetary amounts.
FR-4.13: The system shall rollback transactions if any error occurs during processing.

5. Transaction History & Statements

FR-5.1: The system shall maintain a complete history of all transactions for each account.
FR-5.2: The system shall allow users to view transaction history for specific accounts.
FR-5.3: The system shall display transaction details including date, type, amount, and description.
FR-5.4: The system shall display the balance after each transaction in the history.
FR-5.5: The system shall sort transactions by date in descending order (most recent first).
FR-5.6: The system shall allow Customer users to view only their own transaction history.
FR-5.7: The system shall allow Admin users to view transaction history for any account.
FR-5.8: The system shall allow users to filter transactions by type (Deposit, Withdrawal, Transfer).
FR-5.9: The system shall allow users to filter transactions by date range.
FR-5.10: The system shall generate account statements showing all transactions for a specified period.

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6. Loan Management

FR-6.1: The system shall allow Customer users to apply for loans by specifying amount and loan type.
FR-6.2: The system shall support multiple loan types: Personal, Home, Auto, and Business.
FR-6.3: The system shall allow Admin users to submit loan applications on behalf of customers.
FR-6.4: The system shall automatically set loan status to "Pending" upon submission.
FR-6.5: The system shall record the loan request date automatically.
FR-6.6: The system shall allow Admin users to approve pending loan applications.
FR-6.7: The system shall allow Admin users to reject pending loan applications.
FR-6.8: The system shall record the approval/rejection date when Admin processes a loan.
FR-6.9: The system shall display all loan applications with their current status.
FR-6.10: The system shall allow Customer users to view only their own loan applications.
FR-6.11: The system shall allow Admin users to view all loan applications in the system.
FR-6.12: The system shall allow filtering of loans by status (Pending, Approved, Rejected).
FR-6.13: The system shall allow customers to have multiple loan applications.
FR-6.14: The system shall track loan amounts with decimal precision up to 2 decimal places.
FR-6.15: The system shall prevent modification of loan amount after submission.

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7. Dashboard & Reporting

FR-7.1: The system shall display a dashboard with key statistics upon login.
FR-7.2: The system shall display total balance across all accounts to Admin users.
FR-7.3: The system shall display total number of active accounts to Admin users.
FR-7.4: The system shall display total number of registered customers to Admin users.
FR-7.5: The system shall display Customer users' account balances on their dashboard.
FR-7.6: The system shall display recent transactions (last 5-10) on the dashboard.
FR-7.7: The system shall display pending loan applications count to Admin users.
FR-7.8: The system shall generate summary reports for Admin users showing:

- Total deposits and withdrawals for a time period
- Number of new accounts opened
- Total loan amounts disbursed
- Number of active customers
  FR-7.9: The system shall allow Admin users to export reports in common formats.
  FR-7.10: The system shall display real-time data updates without requiring page refresh.

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8. Data Validation & Integrity

FR-8.1: The system shall validate all user inputs before processing.
FR-8.2: The system shall prevent duplicate usernames in the system.
FR-8.3: The system shall prevent duplicate account numbers in the system.
FR-8.4: The system shall validate email format for customer records.
FR-8.5: The system shall ensure all monetary amounts are non-negative.
FR-8.6: The system shall maintain referential integrity between customers and accounts.
FR-8.7: The system shall maintain referential integrity between accounts and transactions.
FR-8.8: The system shall ensure transaction atomicity (all-or-nothing execution).
FR-8.9: The system shall prevent concurrent modifications to the same account balance.
FR-8.10: The system shall validate that account exists before processing transactions.

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9. Error Handling & Notifications

FR-9.1: The system shall display clear error messages when operations fail.
FR-9.2: The system shall display success messages when operations complete successfully.
FR-9.3: The system shall notify users of insufficient balance during withdrawal attempts.
FR-9.4: The system shall notify users when account is not found.
FR-9.5: The system shall notify Admin users when a new loan application is submitted.
FR-9.6: The system shall log all errors for administrative review.
FR-9.7: The system shall provide user-friendly error messages without exposing system details.

10. Search & Filter Capabilities

FR-10.1: The system shall allow users to search for accounts by account number.
FR-10.2: The system shall allow users to search for customers by name or email.
FR-10.3: The system shall allow filtering of transactions by date range.
FR-10.4: The system shall allow filtering of transactions by type.
FR-10.5: The system shall allow filtering of loans by status.
FR-10.6: The system shall allow filtering of accounts by account type.
FR-10.7: The system shall display search results in a clear, organized format.

Interview Agendas

Interview Agenda 1 — Internal Operational Stakeholder (Bank Teller)

Stakeholder Role: Bank Teller
Purpose: To understand how tellers with different experience levels use the current banking system in their daily operations, and to identify usability issues or gaps.

Date: 25/10/2025
Duration: 45 minutes
Interviewer: Hamdy Mady

Agenda Structure

1. Introduction – purpose of the meeting and confidentiality (5 min)

2. Discussion of current workflow and tools used (15 min)

3. Identification of problems, inefficiencies, and workarounds (15 min)

4. Desired improvements and feature expectations for the new BMS (10 min)

Interview Questions

A. General Context

1. Can you walk me through a typical day of handling customer transactions?
2. How do you manage customer transactions?
3. How do you handle account opening, deposits, withdrawals, and transfers?

B. Problems and Limitations
4. What difficulties do you face while using the bank system?
5. How often do you need to double-check transactions or correct errors?
6. Are there specific reports or data you wish were easier to access?

C. Feature Expectations

7. What improvements or features would you like to add to make the current system easier to use?
8. What kind of alerts, shortcuts, or automation would help you most?
9. How do you think customers could be served more efficiently?

Interview Agenda 2 — Internal Executive Stakeholder (Branch Manager)

Stakeholder Role: Branch Manager / Operations Director
Purpose: To collect insights from management about the performance, limitations, and improvement opportunities of the current banking system.
Date: 25/10/2025
Duration: 45 minutes
Interviewer: Youssef Ashoush

Agenda Structure

1. Introduction – project overview and interview purpose (5 min)
2. Discussion of managerial responsibilities and system usage (10 min)
3. Review of data and reporting needs (15 min)
4. Discussion on performance metrics, controls, and future goals (10 min)
5. Wrap-up and scheduling of follow-up session (5 min)

Interview Questions

1. How does this new system support the organization's strategic plan and maximize Stakeholder ROI?
2. What are the top three anticipated business benefits of this system, specifically focusing on measurable results like decreasing costs or increasing revenue?
3. What external factors (e.g., legislative changes, regulatory reporting for the SEC or IRS) are driving the necessity of this project?
4. What are the critical reliability requirements for this system, particularly concerning 24/7 availability and error detection/recovery?
5. What security methods (e.g., authentication, access controls) are mandated organization-wide, and which user groups (e.g., privileged users) require specific authorization levels?
6. Will the system primarily be accessed via a browser-based interface (flexible, versatile) or a specific smartphone/tablet application (potentially faster)?
7. How will this new system integrate with or synchronize data with our existing financial reporting or ledger systems?
8. If costs or schedules slip, which system capabilities (use cases or features) are prioritized as "nice to display" rather than "must have"?

Questionnaire:

Section 1: Your Role

1. What is your primary role?

- Bank Teller
- Personal Banker
- Loan Officer
- Branch Manager / Supervisor
- Back-Office Operations
- Other (Please specify): __

2. How long have you been in this role?

- 0–1 year
- 1–3 years
- 3–5 years
- 5+ years

3. On a typical day, how much time do you spend actively using the current banking system?

- 0–2 hours (light use)
- 2–4 hours (moderate use)
- 4–6 hours (heavy use)
- 6+ hours (constant use)

Section 2: Current System Usage & Satisfaction

Please rate how frequently you perform the following tasks and your satisfaction with the system.

> **Frequency Scale:** 1 = Never, 2 = Monthly, 3 = Weekly, 4 = Daily, 5 = Many times per day
> **Satisfaction Scale:** 1 = Very Dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very Satisfied

Task	Frequency (1–5)	Satisfaction (1–5)
Looking up a customer's profile		
Processing a cash deposit		
Processing a check deposit		

Task	Frequency (1–5)	Satisfaction (1–5)
Processing a withdrawal		
Performing a transfer between customer accounts		
Issuing a cashier's check or bank draft		
Looking up a specific transaction history		
Opening a new customer account		
Updating customer contact information		
Placing a stop payment on a check		

Section 3: Pain Points & Priorities for New System

Current System Feedback

> **Scale:** 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Statement	Rating (1–5)
The system is fast and responsive.	
It is easy to find the information I need.	
The system rarely crashes or freezes.	
I can complete common tasks with minimal clicks.	
The user interface is modern and easy to navigate.	
The process for end-of-day balancing is simple.	

New System Priorities

> **Scale:** 1 = Not Important, 2 = Slightly Important, 3 = Moderately Important, 4 = Very Important, 5 = Essential

Feature	Importance (1–5)
A "single-view" customer dashboard (all accounts, history, and contact info on one screen).	
Fewer clicks to complete common tasks (e.g., deposits, transfers).	

Feature	Importance (1–5)
A powerful search function (e.g., search by name, phone number, or partial account number).	
Faster system speed and load times.	
Automated alerts for compliance (e.g., large cash transactions, suspicious activity).	
A simpler, more modern interface that requires less training.	
Integration with a document scanner for IDs and forms.	
A more streamlined process for opening new accounts.	

Section 4: Open-Ended Feedback

1. What is the single most frustrating or time-consuming task you perform with the current system?
(Please describe the task and why it's frustrating)

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2. If you could add one new feature to the banking system to make your job easier, what would it be?

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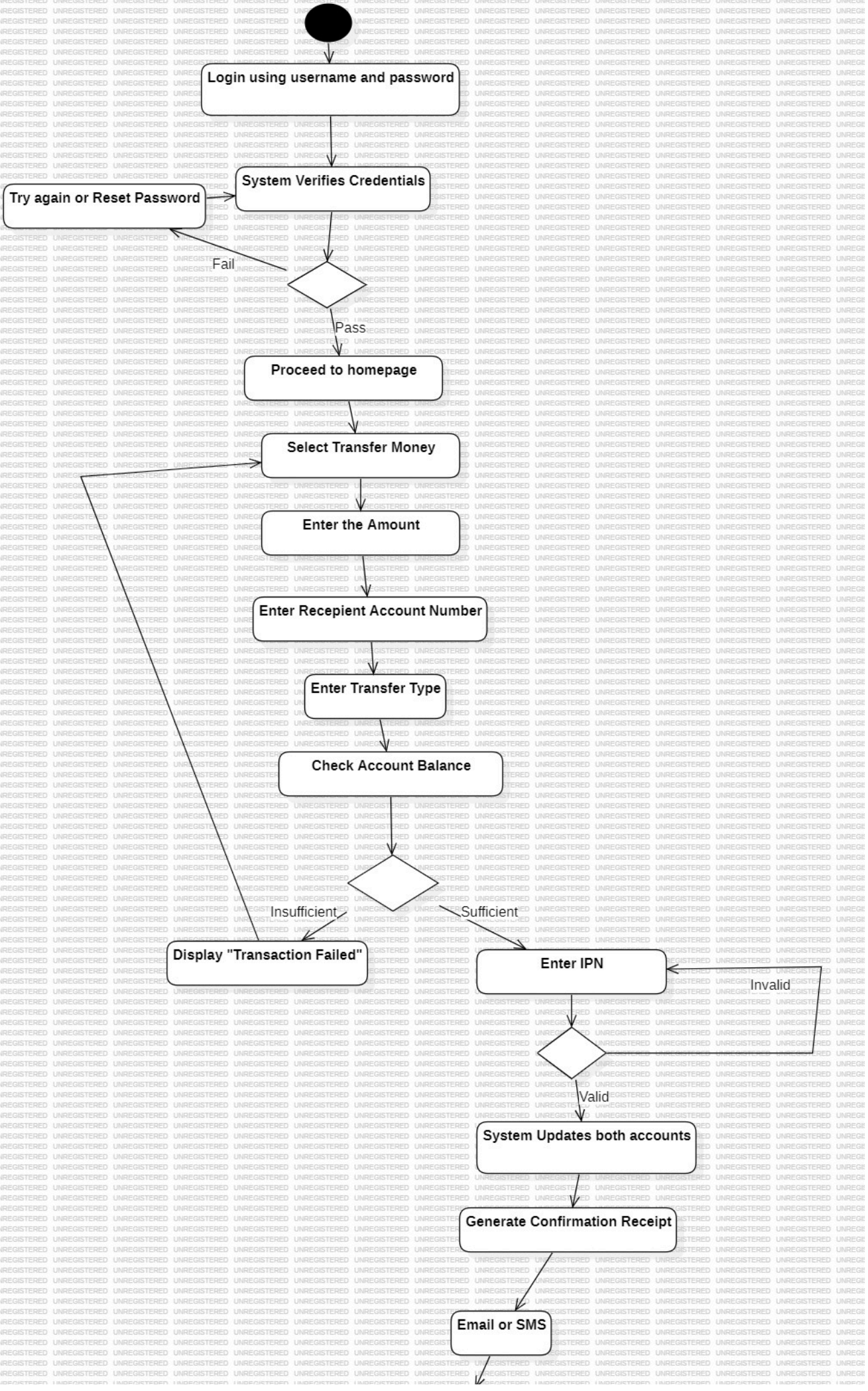
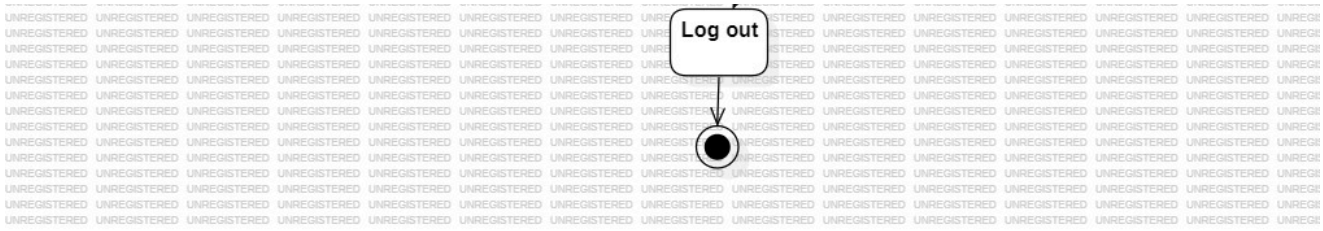
3. Do you have any other comments or suggestions for the new system?

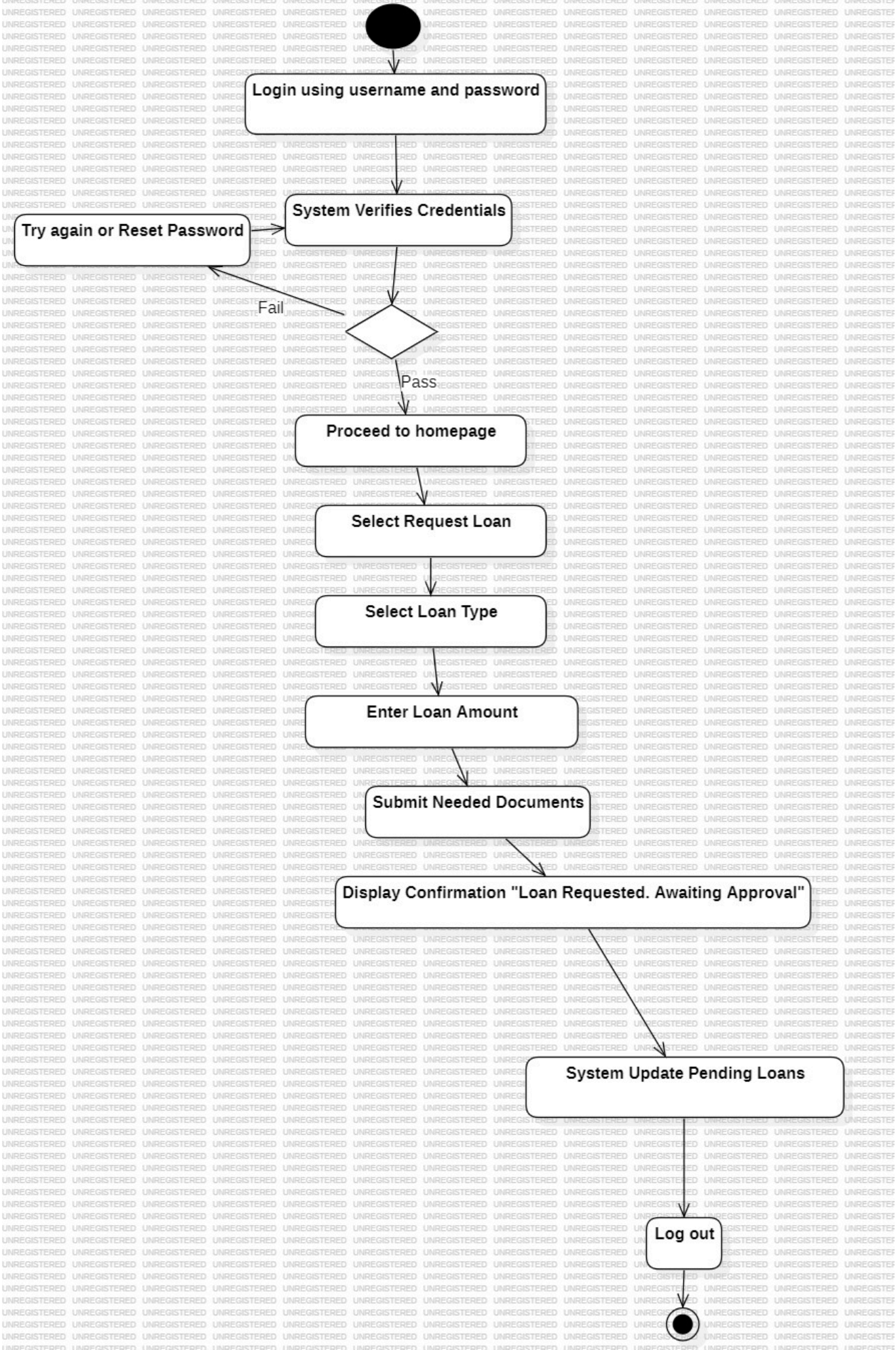
Workflow Documentation

Business Scenario 1: Transferring Money to Another Account

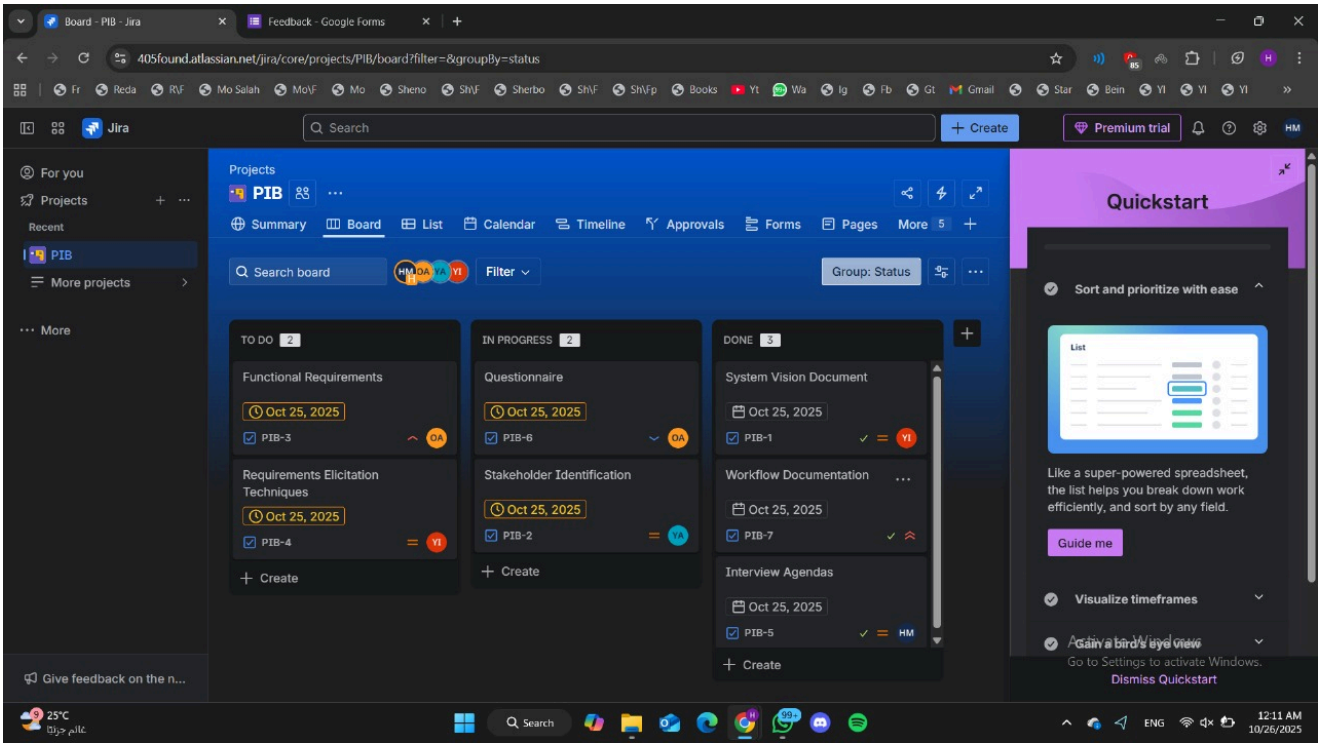

Login using username and password
System Verifies Credentials
Try again or Reset Password
Fail
Pass
Proceed to homepage
Select Transfer Money
Enter the Amount
Enter Recepient Account Number
Enter Transfer Type
Check Account Balance
Insufficient
Sufficient
Display "Transaction Failed"
Enter IPN
Invalid
Valid
System Updates both accounts
Generate Confirmation Receipt
Email or SMS


Log out

Business Scenario 2: Requesting a Loan


Login using username and password
System Verifies Credentials
Try again or Reset Password
Fail
Pass
Proceed to homepage
Select Request Loan
Select Loan Type
Enter Loan Amount
Submit Needed Documents
Display Confirmation "Loan Requested. Awaiting Approval"
System Update Pending Loans
Log out

Jira



Jira was used to manage the Bank Management System project with clear task stages: *To Do*, *In Progress*, and *Done*. Each task was assigned to team members with due dates to ensure accountability and progress tracking. This setup streamlined collaboration, requirement documentation, and milestone completion throughout the project.

Github

Github Repo Link: https://github.com/YoussefEMS/BankManagementSystem