**Automated Loan Approval & Risk Assessment System**

**Project Overview**

* Project Title: Automated Loan Approval & Risk Assessment System
* Project Manager Name
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* Date: 12-03-2025

**Purpose**:

This document defines the business needs and high-level requirements. It’s typically created at the start of the project to understand the objectives.

# 1. Background:

The current loan approval process is largely manual, requiring loan officers to review and assess customer applications based on limited criteria. This approach is time-consuming, prone to human error, and lacks the scalability needed to handle increasing loan applications. The proposed Automated Loan Approval & Risk Assessment System aims to streamline this process by automating key tasks such as data collection, risk assessment, and decision-making, thereby improving efficiency, accuracy, and decision quality.

# 2. Objectives:

* Automate the loan approval process to reduce manual intervention.
* Implement a robust risk assessment model using financial data (credit score, income levels, etc.).
* Ensure quick and accurate loan decisions, reducing loan processing time.
* Flag high-risk applications for manual review by loan officers.
* Provide actionable insights and reporting for stakeholders.

# 3. Scope:

## 3.1 In-Scope:

* + Automation of loan application intake, risk scoring, and decision-making.
  + Integration with external credit scoring agencies and internal financial data systems.
  + Notification system for customers regarding approval/rejection.
  + Dashboard for reporting loan approval statistics and risk assessments.

## 3.2 Out-of-Scope:

* + Any manual processes that cannot be automated with the current data.
  + Post-loan servicing or collection processes.

# 4. Documentation steps:

## 4.1 Stakeholders’ requirement gathering

### 4.1.1 Internal Stakeholders:

* Loan Officers: Review flagged loans and approve/reject.
* Risk Managers: Oversee risk assessment models and manual review process.
* IT Team: Implement the system integration and ensure data security.
* Compliance and Regulatory Teams: Ensure the system meets legal requirements for data privacy and security.

### 4.1.2 External Stakeholders:

* Customers: Apply for loans and receive approval/rejection notifications.
* Credit Bureaus/Agencies: Provide external credit scores and financial data.

### 4.1.3 Business Goals

* Speed: Reduce the loan approval time from [X] days to [Y] hours/minutes by automating data collection and decision-making.
* Accuracy: Improve risk assessment accuracy by leveraging financial data and predefined risk models.
* Scalability: Handle a higher volume of loan applications without adding manual labor.
* Compliance: Ensure all loan decisions comply with financial regulations and standards.

### 4.1.4 High-Level Requirements

#### 4.1.4.1 Data Collection and Integration:

* + The system must integrate with external credit agencies to pull credit scores.
  + The system must gather and verify customer financial data (income, debt-to-income ratio, employment status, etc.).

#### 4.1.4.2 Risk Assessment:

* + The system should automatically evaluate the applicant’s eligibility based on predefined rules (e.g., credit score, debt-to-income ratio, and other financial criteria).
  + The system should categorize applicants as low, medium, or high risk.

#### 4.1.4.3 Approval and Rejection Logic:

* + The system should automatically approve loans for low-risk applicants based on predefined criteria.
  + The system should automatically reject loans for high-risk applicants based on risk thresholds.
  + Loans flagged as medium risk should be sent for manual review by the loan officer.

#### 4.1.4.4 Notification System:

* + The system should notify applicants of the approval/rejection status of their loan applications.
  + The system should notify loan officers of flagged medium-risk loans that require further review.

#### 4.1.4.5 Reporting and Dashboards:

* + The system should generate real-time reports on loan application statuses, approval rates, risk categories, etc.
  + Stakeholders should have access to dashboards showing key metrics like loan approval rates, loan defaults, and loan processing times.

#### 4.1.4.6 Security and Compliance:

* + The system must comply with data protection regulations (e.g., GDPR, CCPA).
  + The system must use encryption and secure authentication mechanisms for accessing sensitive financial data.

#### 4.1.4.7 Assumptions and Constraints

Assumptions:

* + Data from credit bureaus and external agencies will be readily available.
  + Predefined risk models and thresholds for loan approval will be provided by the risk management team.

Constraints:

* + The system must be developed and deployed within a [X]-month timeline.
  + The system must operate within the constraints of the bank’s existing IT infrastructure.
  + Budget limitations for purchasing third-party tools or software (if required).

#### 4.1.4.8 Success Criteria

The project will be considered successful if:

* The automated system can process loan applications within [X] minutes.
* The accuracy of loan approvals matches or exceeds manual review standards.
* Loan officers can handle flagged medium-risk cases effectively.
* Stakeholders have access to meaningful reports and dashboards.

#### 4.1.4.9 Timeline and Milestones

| Milestone | Target Date | Responsible |
| --- | --- | --- |
| Requirement Gathering Completed | [Date] | Business Analyst |
| Functional Specifications Review | [Date] | Development Team |
| System Development and Integration | [Date] | IT Team |
| Testing and QA | [Date] | QA Team |
| User Acceptance Testing (UAT) | [Date] | Business Analyst |
| System Deployment | [Date] | IT Team |

#### 4.1.4.10 Conclusion

This BRD outlines the key components of the Automated Loan Approval & Risk Assessment System project, highlighting the business goals, requirements, and the scope of work involved. The document serves as the foundation for gathering detailed functional requirements and designing the system architecture.

## 4.2 Functional Requirement Document (FRD)

### 4.2.1 Purpose:

The purpose of this document is to define the functional requirements for the Automated Loan Approval & Risk Assessment System. This system will automate the process of loan approval, risk assessment, and customer notifications, allowing financial institutions to improve efficiency and decision accuracy while reducing manual intervention.

### 4.2.2 Scope:

The FRD will cover the system’s functionality, including data collection, risk scoring, loan approval/rejection, notification generation, and reporting.

### 4.2.3 System Overview

The Automated Loan Approval & Risk Assessment System will function as follows:

* Loan Application Intake: Customer submits a loan application through the bank’s portal.
* Data Collection: The system collects customer financial information (e.g., credit score, income, debt-to-income ratio) and integrates with external credit bureaus for additional data.
* Risk Scoring: The system evaluates the risk of each application using predefined risk models and thresholds.
* Approval/Rejection Logic: The system automatically approves loans for low-risk applicants, rejects loans for high-risk applicants, and flags medium-risk applications for further review.
* Notifications: The system sends notifications to customers regarding the approval or rejection status and to loan officers for flagged cases.
* Reporting and Dashboards: The system generates real-time reports and visual dashboards for internal stakeholders.

### 4.2.4 Functional Requirements

#### 4.2.4.1 Data Collection and Integration

* Requirement 1: The system must allow customers to input their financial details (e.g., income, debt-to-income ratio, and credit score).
* Requirement 2: The system must integrate with external credit agencies (e.g., Experian, Equifax) to retrieve customer credit scores and additional financial data.
* Requirement 3: The system must store customer financial data securely in compliance with relevant data protection regulations (e.g., GDPR, CCPA).

#### 4.2.4.2 Risk Assessment

* Requirement 4: The system must evaluate loan eligibility based on customer financial data, including credit score, income, and debt-to-income ratio.
* Requirement 5: The system must use a predefined risk model to categorize applicants into one of three categories: low risk, medium risk, or high risk.
* Requirement 6: The system should use threshold values to determine risk levels (e.g., credit score > 700 = low risk, < 600 = high risk).

#### 4.2.4.3 Loan Approval and Rejection Logic

* Requirement 7: For low-risk applicants, the system must automatically approve the loan.
* Requirement 8: For high-risk applicants, the system must automatically reject the loan.
* Requirement 9: For medium-risk applicants, the system must flag the loan for manual review by a loan officer.

#### 4.2.4.4 Notifications

* Requirement 10: The system must notify customers of their loan approval or rejection status via email or SMS within [X] minutes of the decision.
* Requirement 11: The system must notify loan officers of flagged medium-risk loans requiring manual review.
* Requirement 12: The system must provide the option to send a follow-up email to customers with next steps or additional documentation requests if needed.

#### 4.2.4.5 Reporting and Dashboards

* Requirement 13: The system must generate real-time reports showing the total number of loan applications, approvals, rejections, and flagged applications.
* Requirement 14: The system must provide a dashboard with key metrics such as loan approval rate, average processing time, risk distribution (low, medium, high), and loan default rate.
* Requirement 15: Reports and dashboards must be accessible by internal stakeholders (e.g., loan officers, risk managers) via a secure portal.

#### 4.2.4.6 Security and Compliance

* Requirement 16: The system must comply with all relevant regulations, including data protection laws (GDPR, CCPA).
* Requirement 17: The system must encrypt sensitive customer data (e.g., credit score, income) both at rest and in transit.
* Requirement 18: The system must provide secure authentication mechanisms (e.g., two-factor authentication) for users accessing sensitive data.

### 4.2.5 Non-Functional Requirements

#### 4.2.5.1 Performance

* Requirement 19: The system must be capable of processing a minimum of 100 loan applications per minute without performance degradation.
* Requirement 20: The system must provide loan decisions (approval/rejection) within [X] minutes of receiving a complete application.

#### 4.2.5.2 Scalability

* Requirement 21: The system must be scalable to handle a growing number of loan applications as the bank expands its operations.
* Requirement 22: The system should support the addition of new external data sources (e.g., new credit bureaus) without significant changes to the underlying architecture.

#### 4.2.5.3 Reliability and Availability

* Requirement 23: The system must be available 99.9% of the time, with minimal downtime for maintenance.
* Requirement 24: The system must provide backup mechanisms to ensure data is not lost during unforeseen events (e.g., power failure, network outages).

### 4.2.6 Assumptions

* Assumption 1: External data sources (credit bureaus) will be available and responsive.
* Assumption 2: The system will be deployed on the bank’s existing IT infrastructure without the need for significant hardware upgrades.
* Assumption 3: The predefined risk models and thresholds will be provided by the risk management team.

### 4.2.7 Constraints

* Constraint 1: The project must be developed and deployed within [X] months to meet business timelines.
* Constraint 2: The budget for third-party software integration (e.g., credit bureaus) is limited to [X amount].

### 4.2.8 User Acceptance Testing (UAT) Plan

To ensure the system meets business requirements and is ready for production, the following tests will be conducted:

* Test Case 1: Verify the system correctly approves low-risk loan applications based on predefined criteria.
* Test Case 2: Verify the system correctly flags medium-risk applications for manual review.
* Test Case 3: Verify that rejected loans are accurately identified as high-risk based on risk thresholds.
* Test Case 4: Verify that customers receive timely notifications regarding loan approval or rejection.

### 4.2.9 Conclusion

This Functional Requirement Document (FRD) outlines the necessary functional components of the Automated Loan Approval & Risk Assessment System, ensuring all requirements are clear and actionable for the development and testing teams.

## 4.3 Test Cases

Purpose:

Test the system to ensure it meets business requirements before deployment.

Example Test Cases:

### 4.3.1 Test Case ID: TC\_001

Test Case Name: Loan Application Submission  
Test Objective: Verify that customers can successfully submit a loan application with all required financial information.  
Preconditions:

* The customer is logged into the loan application portal.
* The loan application form is available for submission.

Test Steps:

1. Navigate to the loan application page.
2. Fill in all required fields (e.g., income, credit score, debt-to-income ratio).
3. Submit the application.

Expected Result:

* The application is successfully submitted, and the customer receives a confirmation message.

Postconditions:

* Loan application data is stored in the system for further processing.

### 4.3.2 Test Case ID: TC\_002

Test Case Name: Credit Score Retrieval from External Data Source  
Test Objective: Verify that the system retrieves the customer’s credit score from external credit agencies correctly.  
Preconditions:

* The system is integrated with external credit agencies (e.g., Experian, Equifax).
* Customer has submitted financial details.

Test Steps:

1. Submit the loan application with customer details.
2. Trigger the process to retrieve the credit score from the external credit agency.

Expected Result:

* The system successfully retrieves and stores the customer’s credit score from the external credit agency.

Postconditions:

* The credit score is stored in the system and used in the risk assessment process.

### 4.3.3 Test Case ID: TC\_003

Test Case Name: Risk Assessment – Low Risk Loan  
Test Objective: Verify that the system correctly categorizes a low-risk loan application.  
Preconditions:

* The loan application includes a credit score > 700.
* The loan application includes an acceptable debt-to-income ratio.

Test Steps:

1. Submit a loan application with financial details indicating a low-risk profile (credit score > 700, acceptable income, and debt ratio).
2. Allow the system to run the risk assessment.

Expected Result:

* The system categorizes the loan as Low Risk and automatically approves the application.

Postconditions:

* The loan application is approved and sent for processing.

### 4.3.4 Test Case ID: TC\_004

Test Case Name: Risk Assessment – High Risk Loan  
Test Objective: Verify that the system correctly categorizes a high-risk loan application.  
Preconditions:

* The loan application includes a credit score < 600.
* The loan application includes an unacceptable debt-to-income ratio.

Test Steps:

1. Submit a loan application with financial details indicating a high-risk profile (credit score < 600, high debt-to-income ratio).
2. Allow the system to run the risk assessment.

Expected Result:

* The system categorizes the loan as High Risk and automatically rejects the application.

Postconditions:

* The loan application is rejected, and the customer receives notification.

### 4.3.5 Test Case ID: TC\_005

Test Case Name: Risk Assessment – Medium Risk Loan (Manual Review)  
Test Objective: Verify that the system flags medium-risk loans for manual review.  
Preconditions:

* The loan application includes a credit score between 600 and 700.
* The loan application includes an acceptable debt-to-income ratio.

Test Steps:

1. Submit a loan application with financial details indicating a medium-risk profile (credit score between 600 and 700).
2. Allow the system to run the risk assessment.

Expected Result:

* The system categorizes the loan as Medium Risk and flags it for manual review by a loan officer.

Postconditions:

* The loan officer receives a notification to review the medium-risk loan.

## 4.4 user stories

Example User Stories:

* As a loan officer, I want to view detailed customer credit history so I can make informed decisions about loan approval.
* As a customer, I want to receive an automatic notification if my loan is approved or rejected, so I know the outcome immediately.
* As a risk manager, I want the system to flag high-risk loan applications for manual review so that I can mitigate potential loan defaults.

## 4.5 use cases

Example Use Case:

Use Case: Process Loan Application

* Actor: Loan Officer
* Preconditions: The applicant has submitted a loan application.
* Flow of Events:
  1. The loan officer logs into the system.
  2. The officer inputs customer details (name, income, etc.).
  3. The system evaluates the application based on predefined criteria.
  4. The system approves/rejects the application or flags it for manual review.
  5. The system notifies the customer of the decision.
* Postconditions: The loan application is processed and recorded.

## 4.6 Release notes

### Development Phase:

The public developer is responsible for writing and developing the code according to the project requirements.

### User Acceptance Testing (UAT):

Once development is complete, the code is migrated to the UAT environment, where rigorous testing is conducted to ensure functionality, performance, and compliance with business requirements.

### Production Deployment:

Upon successful UAT approval, the code is released into the production environment, making it accessible for end users and customers.