



LOAN MANAGEMENT SYSTEM

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PROJECT OVERVIEW

Objective:

To design and develop a secure, role-based Loan Management System that enables online loan application, approval, EMI calculation, repayment tracking, and loan status monitoring.

- **Challenges in Traditional Loan Processing:**
Manual loan processing lacks transparency, efficiency, and proper tracking

Technology Stack:

- Backend: ASP.NET Core Web API
- Frontend: Angular
- Database: SQL Server

Duration:

- 7 days

PROBLEM STATEMENT

- Loan processing is largely manual or semi-automated.
- Lack of transparency in loan status and approvals.
- Difficulty in tracking EMIs, repayments, and outstanding balances.
- Higher chances of errors and processing delays.
- Limited security and role-based access control.
- Inefficient reporting and monitoring mechanisms.

This creates the need for a secure and automated Loan Management System.



SOLUTION:

Developed a secure, web-based Loan Management System:

- Automated the complete loan lifecycle from application to closure.
- Provided role-based access for Admin, Loan Officer, and Customer.
- Ensured secure authentication using JWT.
- Centralized loan, EMI, and repayment data for easy tracking.
- Provided mock payment gateways for seamless repayment of loans.



KEY FEATURES

- Secure user registration and login with role-based access (Admin, Loan Officer, Customer).
- Customers can apply for loans, track application status, view EMI schedules, pay EMIs via payment gateway, and view receipts.
- Loan Officers register after admin approval, view active/closed/pending loans, review applications, add remarks, and approve or reject loans.
- Admin can manage users, approve loan officers, assign roles, and create or delete users.
- Admin can manage loan types including interest rates, loan limits, and maximum tenure.
- Automated EMI calculation with centralized loan and repayment tracking.
- Dashboards for real-time monitoring and improved transparency.

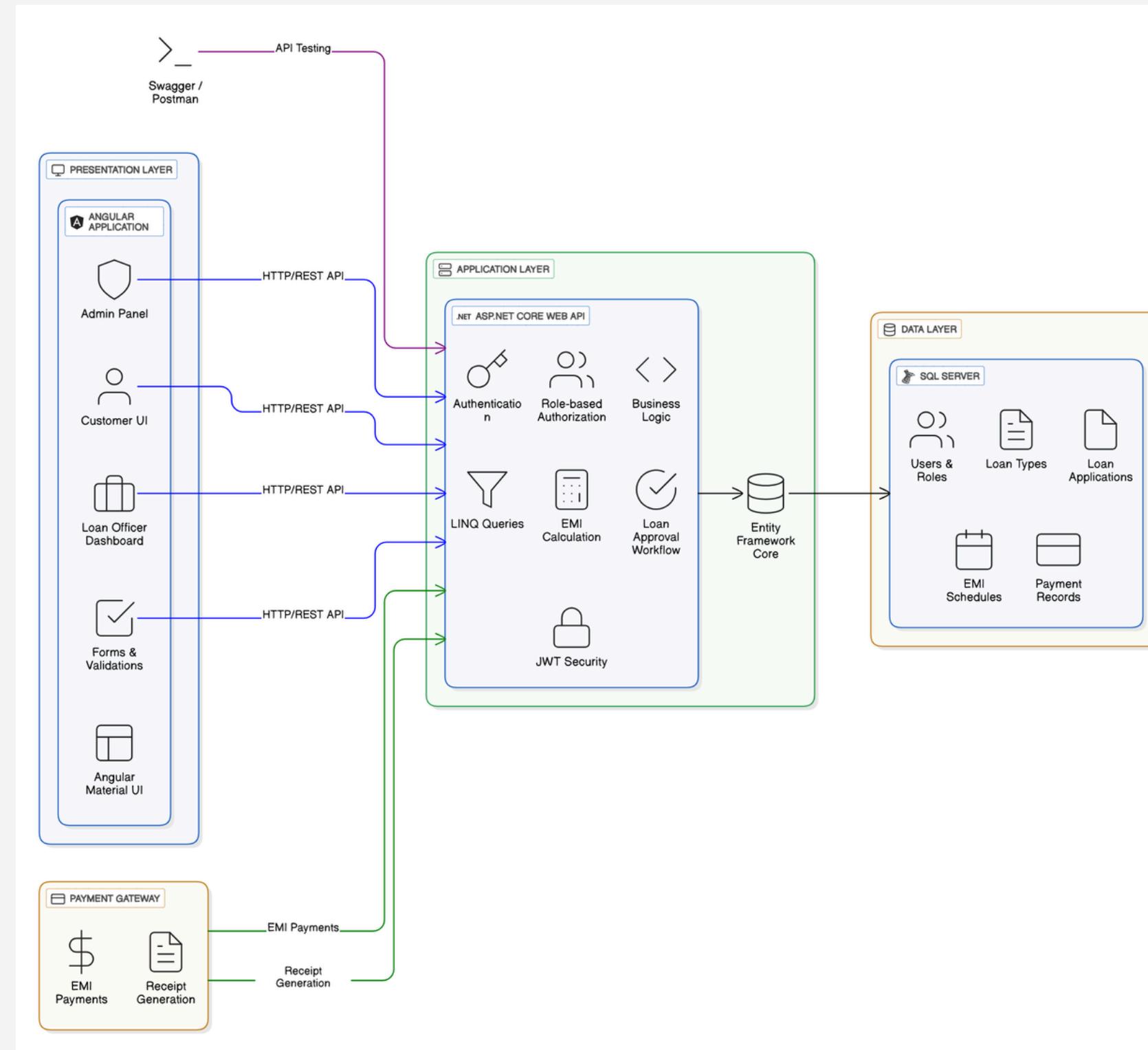
LoanBox

**Providing the best future
for your **best living.****

Manage your loans securely, transparently, and efficiently.

[Get Started](#)

ARCHITECTURE DIAGRAM



KEY FEATURES FOR ADMIN:

01 ADMIN

- View total number of active users in the system
- Approve or reject loan officer registration requests
- Manage users (customers and loan officers)
- Assign roles, create new users, or delete existing users
- Manage loan types by updating interest rates, minimum and maximum loan amounts, and maximum tenure

The image shows a mobile application interface for an admin dashboard. On the left is a sidebar with a blue header containing the text "SanBox" and "Admin Portal". Below the header are five menu items: "Dashboard", "Manage Users", "Manage Loan Types", and "Logout". The main content area has a white header with the text "Hi, Admin" and two small icons. Below the header is a section titled "Admin Dashboard" with the subtitle "System overview and administrative controls". This section contains two cards: one for "Total Users" (12) and one for "Approved Users" (6). At the bottom is a table titled "Loan Types" with columns for ID, Name, Interest, and Max Tenure. Two rows of data are visible: one for a Personal Loan with 10.5% interest and 36 months tenure, and another for a Home Loan with 8.5% interest and 240 months tenure.

ID	Name	Interest	Max Tenure
1	Personal Loan	10.5%	36 months
2	Home Loan	8.5%	240 months

ADMIN WORKFLOW:

ADMIN LOGS IN TO THE SYSTEM SECURELY AND VIEWS DASHBOARD SHOWING ACTIVE USERS AND PENDING APPROVALS

LoanBox
Admin Portal

- Dashboard**
- Manage Users**
- Manage Loan Types**
- Logout**

Hi, Admin 🙌 🔔

Admin Dashboard

System overview and administrative controls

Total Users
12

Approved Users
6

Pending Approvals
1

Loan Types

ID	Name	Interest	Max Tenure	Min Amount	Max Amount
1	Personal Loan	10.5%	36 months	₹ 5,000	₹ 500,000
2	Home Loan	8.5%	240 months	₹ 500,000	₹ 5,000,000

ADMIN WORKFLOW:

REVIEWS AND APPROVES LOAN OFFICER REGISTRATION REQUESTS.
MANAGES USERS BY CREATING, DELETING, AND ASSIGNING ROLES (CUSTOMER / LOAN OFFICER)

LoanBox
Admin Portal

- Dashboard**
- Manage Users**
- Manage Loan Types**

Logout

User Management

+ Add User

Loan Officer Approval Requests

Email	Requested Role	Status	Assign
asd@lms.com	LoanOfficer	Pending	Update

All Users

Email	Role	Assigned Role	Status	Update	Delete
sanjana@a.com	Customer	Customer	Approved	Update	

ADMIN WORKFLOW:

MANAGES LOAN TYPES BY UPDATING INTEREST RATES, LOAN AMOUNT LIMITS, AND MAXIMUM TENURE
MONITORS OVERALL SYSTEM ACTIVITY FOR SMOOTH LOAN OPERATIONS

LoanBox
Admin Portal

- Dashboard
- Manage Users
- Manage Loan Types**
- Logout

Manage Loan Types

Update available loans

Loan Types

ID	Loan Type	Interest	Min Amount	Max Amount	Max Tenure	Action
1	Personal Loan	10.5%	₹ 5,000	₹ 500,000	36 months	Edit
2	Home Loan	8.5%	₹ 500,000	₹ 5,000,000	240 months	Edit
3	Vehicle Loan	9.25%	₹ 100,000	₹ 1,500,000	60 months	Edit
4	Education Loan	7.6%	₹ 100,000	₹ 3,000,000	120 months	Edit

KEY FEATURES FOR LOAN OFFICER:

02 LOAN OFFICER

- Loan officers can register and wait for admin approval before login access.
- View dashboard showing number of active, closed, and pending loans.
- Pending loans include customer applications not yet reviewed.
- View complete loan application details of customers.
- Add remarks and approve or reject loan applications.
- View the EMI report of the approved loans.

The image displays two side-by-side screenshots of a loan management system. On the left is a registration portal titled 'anBox' with options for 'Dashboard', 'Review Applications', and 'Logout'. On the right is the 'Loan Officer Dashboard' which greets the user with 'Hi, Officer' and shows statistics for 'Active Loans' (3) and 'Closed Loans' (2). It also includes a 'Processed Loan Applications' section with a filter dropdown and a table header for 'Loan ID', 'Customer ID', 'Loan Type', 'Amount', and 'Applied'.

LOAN OFFICER WORKFLOW:

AFTER APPROVAL BY THE ADMIN, OFFICER LOGS IN TO THE SYSTEM AND VIEWS DASHBOARD WITH ACTIVE, CLOSED, AND PENDING LOANS

The screenshot shows the 'LoanBox Officer Portal' dashboard. On the left sidebar, there are three main menu items: 'Dashboard' (selected), 'Review Applications', and 'Logout'. The main content area is titled 'Loan Officer Dashboard' with the subtitle 'Monitor and manage customer loan applications'. It features three summary cards: 'Active Loans' (3, represented by a checkmark icon), 'Closed Loans' (2, represented by a lock icon), and 'Pending Loans' (1, represented by a document icon). Below these cards is a section titled 'Processed Loan Applications' with a 'Filter by Loan Type' dropdown. At the bottom, there is a table header with columns: Loan ID, Customer ID, Loan Type, Amount, Applied On, Status, and Action.

Loan ID	Customer ID	Loan Type	Amount	Applied On	Status	Action
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LOAN OFFICER WORKFLOW:

REVIEWS PENDING LOAN APPLICATIONS SUBMITTED BY CUSTOMERS

The screenshot shows the LoanBox Officer Portal interface. On the left, a sidebar has a blue header with 'LoanBox' and 'Officer Portal'. Below it are three menu items: 'Dashboard' (with a bar chart icon), 'Review Applications' (with a document icon, currently selected), and 'Logout' (with a user icon). The main content area has a light gray header with 'Hi, Officer' and a waving hand emoji. Below it is a section titled 'Pending Loan Applications' with the subtitle 'Loans awaiting officer review'. A table lists one application: Loan ID 13, Home Loan type, ₹ 600,000 amount, applied on Jan 5, 2026. The status is 'Applied' (in a yellow button) and there is a 'Review' button. The background of the main content area is light gray.

Loan ID	Loan Type	Amount	Applied On	Status
13	Home Loan	₹ 600,000	Jan 5, 2026	Applied

Review

LOAN OFFICER WORKFLOW:

CHECKS COMPLETE CUSTOMER AND LOAN DETAILS AND ADDS REMARKS AND APPROVES OR REJECTS LOAN APPLICATIONS

LoanBox
Officer Portal

- Dashboard
- Review Applications
- Logout

Loan Review

Loan ID: 13 Applied

👤	Customer: Sanjana Sinha (ID: 4)	📅	Loan Type: Home Loan
₹	Amount: ₹ 600000	⌚	Tenure: 24 months
%	Interest: 8.5%	🏛️	Annual Income: ₹ 1000000
📅	Applied On: Jan 5, 2026	Officer Remarks	

Under Review Approve Reject

LOAN OFFICER WORKFLOW:

SYSTEM UPDATES LOAN STATUS AND GENERATES EMI SCHEDULE UPON APPROVAL WHICH CAN BE VIEWED BY THE OFFICER

LoanBox
Officer Portal

 Dashboard

 Review Applications

 Logout

Loan Status:
Approved

Loan ID: 5

Account Summary

Total Loan Amount ₹ 5000000	Outstanding Amount ₹ 4628042.96
Paid EMIs 6	Pending EMIs 114

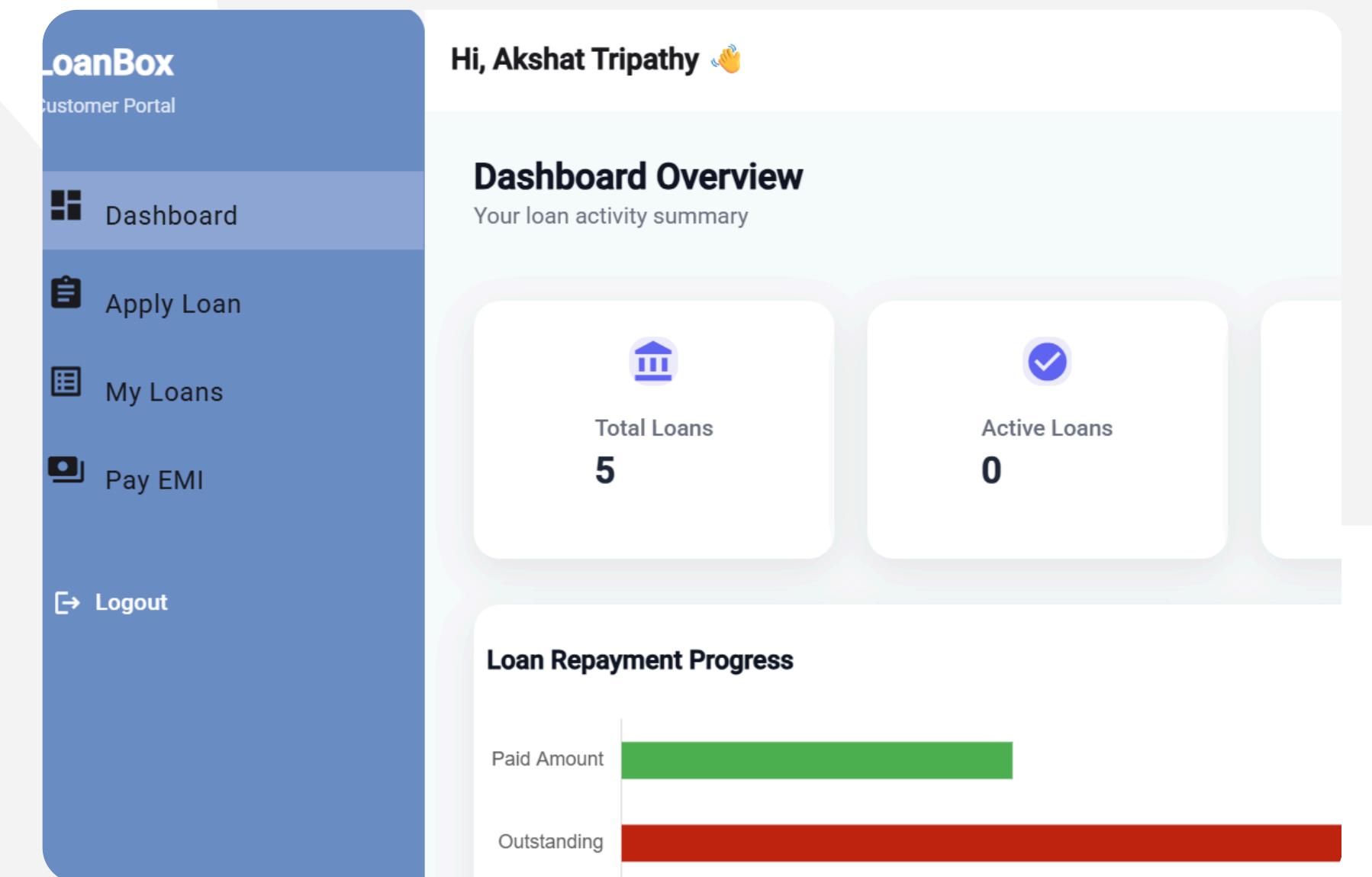
EMI Schedule

EMI No	Due Date	Amount	Status
1	Feb 4, 2026	₹ 61992.84	Paid

KEY FEATURES FOR CUSTOMER:

03 CUSTOMER

- Customers can register and log in to their account securely.
- Apply for various loan types available in the system.
- View real-time status of their loan applications.
- After loan approval, view detailed EMI schedule and repayment report.
- Pay EMIs through an integrated payment gateway.
- View payment receipts after successful EMI payment.



CUSTOMER WORKFLOW:

CUSTOMER REGISTERS AND LOGS IN TO THE SYSTEM AND VIEWS THE ACTIVE V/S CLOSED LOANS ON THE DASHBOARD

The screenshot shows the LoanBox Customer Portal interface. On the left, a sidebar menu lists 'Dashboard', 'Apply Loan', 'My Loans', 'Pay EMI', and 'Logout'. The main dashboard area greets the user with 'Hi, Sanjana Sinha' and a hand icon. It features a 'Dashboard Overview' section with a summary of loan activity: 'Total Loans 4', 'Active Loans 2', 'Rejected Loans 1', and 'Closed Loans 0'. Below this is a 'Loan Repayment Progress' section showing a green bar for 'Paid Amount' and a long red bar for 'Outstanding'.

LoanBox
Customer Portal

Hi, Sanjana Sinha 🙌

Dashboard Overview
Your loan activity summary

Total Loans	Active Loans	Rejected Loans	Closed Loans
4	2	1	0

Loan Repayment Progress

Paid Amount

Outstanding

CUSTOMER WORKFLOW:

APPLIES FOR AVAILABLE LOAN TYPES BY ENTERING REQUIRED DETAILS

The diagram illustrates the customer workflow for applying for a loan through the LoanBox Customer Portal. It shows the initial dashboard, the selection of a loan type (Home Loan), and the application process for that specific loan.

LoanBox Customer Portal Dashboard:

- Dashboard
- Apply Loan (selected)
- My Loans
- Pay EMI
- Logout

Select Loan Type:

Home Loan is selected and highlighted with a purple border. Other options include:

- Personal Loan:** Interest: 10.5%, Max Tenure: 36 months, Amount: ₹ 5000 – ₹ 500000
- Vehicle Loan:** Interest: 9.25%, Max Tenure: 60 months, Amount: ₹ 100000 – ₹ 1500000
- Education Loan:** Interest: 7.6%, Max Tenure: 120 months, Amount: ₹ 100000 – ₹ 3000000

Apply for Home Loan:

Loan Type: Home Loan

Loan Amount*

CUSTOMER WORKFLOW:

TRACKS REAL-TIME STATUS OF LOAN APPLICATIONS

LoanBox
Customer Portal

- Dashboard
- Apply Loan
- My Loans
- Pay EMI
- Logout

My Loans

Manage your loan applications

Loan ID or Status

Loan Type ▾

Loan ID	Loan Type	Amount	Tenure	Status	Applied On	Action
5	Home Loan	₹ 5,000,000	120 months	Approved	Jan 4, 2026	View Details
6	Personal Loan	₹ 200,000	40 months	Rejected	Jan 4, 2026	—
7	Vehicle Loan	₹ 1,200,000	24 months	Approved	Jan 5, 2026	View Details
13	Home Loan	₹ 600,000	24 months	Applied	Jan 5, 2026	View Details

CUSTOMER WORKFLOW:

VIEWS EMI SCHEDULE AFTER LOAN APPROVAL

LoanBox
Customer Portal

- Dashboard
- Apply Loan
- My Loans
- Pay EMI

Logout

₹ Total Loan **₹ 1200000**

Outstanding **₹ 1090081.12**

Paid EMIs **2**

Pending EMIs **22**

EMI Schedule

EMI	Due Date	Amount	Status
#1	Feb 5, 2026	₹ 54959.44	Paid
#2	Mar 5, 2026	₹ 54959.44	Paid
#3	Apr 5, 2026	₹ 54959.44	Pay Now
#4	May 5, 2026	₹ 54959.44	Pay Now

CUSTOMER WORKFLOW:

PAYS EMIS THROUGH THE INTEGRATED PAYMENT GATEWAY

The screenshot illustrates the customer workflow for paying EMI's through the integrated payment gateway. On the left, a sidebar titled "LoanBox Customer Portal" lists navigation options: Dashboard, Apply Loan, My Loans, Pay EMI (which is highlighted), and Logout. The main area is titled "Pay EMI" and includes the sub-instruction "Secure loan repayment". A text input field labeled "Loan ID*" contains the value "7". Below this is a button labeled "Fetch Loan Details". Further down, two radio buttons are shown: one selected (filled blue) for "Pay Next EMI" and one unselected (outline blue) for "Pay Full Outstanding". A summary box displays "Installment No: 3" and "Amount: ₹ 54959.44". At the bottom, a section titled "Choose Payment Method" offers three options: "UPI" (selected), "Debit Card", and "Credit Card". A final "Pay Now" button is located at the bottom center.

LoanBox
Customer Portal

Dashboard

Apply Loan

My Loans

Pay EMI

Logout

Pay EMI
Secure loan repayment

Loan ID* 7

Fetch Loan Details

Pay Next EMI Pay Full Outstanding

Installment No: 3

Amount: ₹ 54959.44

Choose Payment Method

UPI Debit Card Credit Card

Pay Now

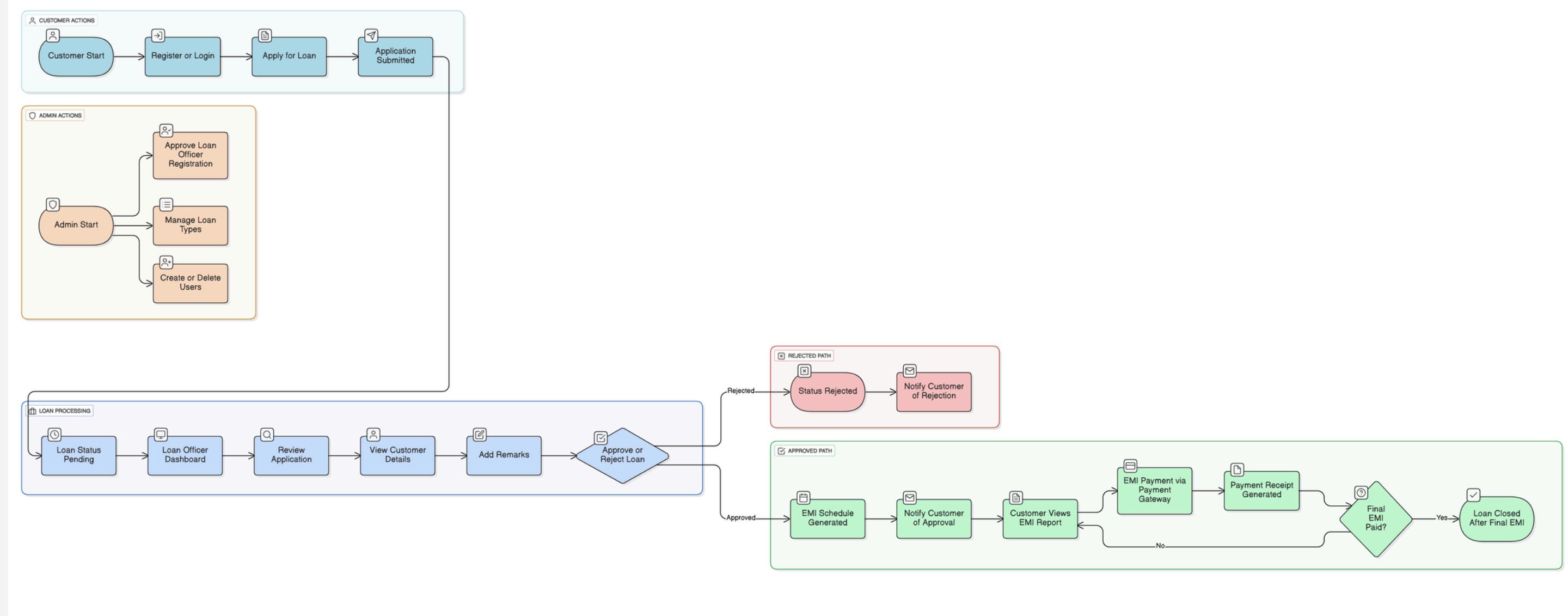
CUSTOMER WORKFLOW:

RECEIVES PAYMENT RECEIPT AFTER SUCCESSFUL TRANSACTION

The screenshot shows the LoanBox Customer Portal interface. On the left, a sidebar menu lists: Dashboard, Apply Loan, My Loans, Pay EMI (which is highlighted in blue), and Logout. The main content area has a form for entering a Loan ID, followed by a button to Fetch Loan Details. A green success message states "EMI paid successfully". Below this, a "Payment Receipt" summary table is displayed.

Payment Receipt	
Loan ID	7
Payment Type	EMI
EMI No	3
Amount Paid	₹ 54959.44
Payment Method	UPI
Payment Date	Jan 6, 2026, 1:13:42PM

WORKFLOW DIAGRAM



QUALITY ASSURANCE AND TESTING

- **Unit Testing:**

Core business logic and API methods are tested using unit tests to ensure correctness and reliability.

- **API Testing:**

Swagger is used for API documentation and quick endpoint testing during development.

- **Postman Testing:**

Postman is used to test all APIs including authentication, role-based access, loan workflows, and error scenarios.

- **Security Testing:**

JWT authentication and role-based authorization are verified to prevent unauthorized access.

- **Outcome:**

Ensures stable, secure, and bug-free application behavior across all modules.

LIVE DEMO