

Capstone Project 2: Banking Loan & Financial Transaction Automation Testing (Updated)

Introduction

Banks and financial institutions manage customer accounts, loans, and transactions through online platforms. Any errors in these systems could lead to financial frauds, incorrect interest calculations, or compliance violations. This project focuses on automating loan management and transaction validation in a Banking Application.

Problem Statement

Manual verification of banking transactions, EMI schedules, and loan approvals is not scalable. A well-structured automation testing framework is required to validate loan applications, EMI generation, interest calculations, and fund transfers.

Objectives

- Automate loan application processing and EMI schedule validation.
- Perform data-driven testing for different loan types and customer profiles.
- Validate fund transfers and balance updates.
- Ensure cross-browser and mobile compatibility testing.
- Implement parallel execution and enhanced reporting using TestNG and Extent Reports.
- Integrate API-level testing for backend loan processing and EMI calculations.
- Validate system behavior with real-world data sets (loan amounts, CIBIL scores, customer profiles).

Scope

- Customer Authentication (Login, OTP simulation, session timeouts).
- Loan Application (Home, Personal, Education loans).
- Loan Approval/Rejection Flow (including negative testing for rejection scenarios).
- EMI Calculation & Payment Schedule (covering prepayment, varying interest rates).
- Fund Transfer between accounts (including account balance checks, transaction failures, and daily limits).
- Transaction History Verification with audit trail validation.
- Security Testing (OTP expiry, unauthorized access prevention).
- Data Integrity Validation (transaction history accuracy, account balance updates).

Tech Stack

- **Language:** Java
- **Automation Tool:** Selenium WebDriver
- **Testing Framework:** TestNG
- **Reporting:** TestNG Reports + Extent Report (with detailed financial logs)
- **API Testing:** Rest Assured / Postman automation
- **Data Source:** Excel / CSV (Loan details, customer profiles)
- **CI/CD:** Jenkins

Functionalities to Automate

1. **Login & Account Dashboard** – Validate login, OTP expiry, session timeout, and balance display.
2. **Loan Application Form** – Automate loan form submission for different loan products with edge cases.
3. **Loan Approval/Rejection Workflow** – Validate eligibility conditions like salary thresholds, CIBIL score ranges, and document verification.
4. **EMI Calculation Validation** – Ensure EMI schedule accuracy, prepayment scenarios, and varying interest rates.
5. **Fund Transfer** – Automate money transfer, validate updated balances, account balance checks, daily limits, and failed transactions.
6. **Transaction History** – Ensure transactions are recorded correctly with detailed audit trails.
7. **Cross-Browser & Mobile Responsiveness** – Validate workflows on different browsers and mobile devices.

Test Scenarios

1. Validate login with valid/invalid credentials and OTP expiry.
2. Apply for Home Loan with salary < threshold and verify rejection.
3. Apply for Personal Loan with valid details and verify approval.
4. Apply for Loan with low CIBIL score and verify rejection.
5. Validate EMI generation for different tenures and prepayment cases.
6. Perform fund transfer with sufficient and insufficient balance, validate limits.
7. Validate transaction history for correctness and audit logs.
8. Execute tests in parallel for loan workflow + fund transfer workflow.
9. Integrate API validation for loan processing and EMI calculations.
10. Generate detailed HTML/Extent Reports with financial transaction logs.

Expected Outcomes

- Automated suite covering complete loan lifecycle and financial transactions.
- Regression tests for EMI and loan approval/rejection conditions.
- Reduced errors in fund transfers, balance updates, and loan rejections.
- Detailed audit trail validation for compliance.
- Executable reports with detailed financial logs for stakeholders.

Financial / Banking Domain – Free Apps for Testing

1. **Parabank** (Highly Recommended)
 - URL: <http://parabank.parasoft.com/parabank/index.htm>
 - Simulates a complete banking system (Login, Loans, Fund Transfer, Transaction History).
2. **OrangeHRM** (Workflow Approvals – can simulate loan/insurance workflows)
 - URL: <https://opensource-demo.orangehrmlive.com>
3. **Demo Blaze / Sauce Demo** (E-commerce for Transactions)
 - URLs: <https://www.demoblaze.com/> | <https://www.saucedemo.com/>
4. **OpenCart Demo** (Payment Gateway Simulation)
 - URL: <https://demo.opencart.com/>

Recommendation

Use **Parabank** for the Banking Loan & Transaction Automation Project as it provides ready-to-use workflows for loan application, approvals, and fund transfers.