

# Project Abstract: Ganesh Finance Limited - Loan Management Microservices System

## 1. Objective

The goal of this project is to develop an automated Loan Management System for **Ganesh Finance Limited** using a microservices architecture. The system aims to streamline loan processing, reduce manual labor, minimize human errors, and enhance customer satisfaction by ensuring timely and efficient handling of loan applications. The focus is on automating the end-to-end loan lifecycle, including document processing, verification, loan approval, and repayment management.

## 2. Business Context

Ganesh Finance Limited offers a variety of loan products such as **auto loans, home loans, gold loans, and loans against property**. Currently, loan processing is done manually, leading to issues like misplaced documents, delayed approvals, and customer dissatisfaction. This has caused business losses, as clients opt for other financial institutions that offer faster services. The company plans to improve its processes by leveraging technology to automate and streamline loan management operations.

## 3. Challenges Faced by Ganesh Finance Limited

- **Manual Loan Processing:** High risk of document misplacement and mismanagement.
- **Long Waiting Time:** Customers experience significant delays, causing frustration and loss of business.
- **High Labor Costs:** Multiple employees are needed to manage documentation and process loans manually.
- **Customer Attrition:** Dissatisfied customers are moving to competitors due to inefficient service.

## 4. Proposed Solution: Microservices Architecture

To address the challenges, the proposed solution involves building a **Loan Management System** using microservices. This system will provide a robust, scalable, and secure platform for managing loans and customer data. Each major function of the loan process will be broken into separate microservices that can be independently developed, deployed, and scaled.

## 5. Microservices Overview

The solution will consist of the following microservices:

- **Customer Service:**
  - Manages customer profiles, loan history, and loan status.
  - Stores customer details such as identity, income proof, and banking information.
  - Facilitates KYC (Know Your Customer) compliance and customer verification.

- **Loan Application Service:**
  - Handles loan requests, including submission of documents, and verification.
  - Assigns loan agents to process applications based on predefined criteria.
  - Sends loan applications for review and approval.
- **Loan Approval Service:**
  - Reviews loan requests based on predefined business rules and criteria.
  - Automated or manual approval based on credit history, loan amount, and document verification.
  - Generates approval or rejection notifications for customers.
- **Payment Service:**
  - Manages disbursement of loans to the customer's bank account upon approval.
  - Tracks repayment schedules, monitors overdue payments, and calculates penalties.
  - Supports multiple payment methods (ECS, cheques, cash).
- **Notification Service:**
  - Sends SMS, email, and push notifications to customers for application status, approval, reminders, and due payments.
- **Reporting and Analytics Service:**
  - Generates reports on loan performance, customer insights, loan default trends, and employee efficiency.
  - Provides management dashboards to track business performance.

## 6. Technical Stack

- **Backend:** Java, Spring Boot (for each microservice)
- **Frontend:** Angular/React for customer portal and admin dashboard
- **Database:** MySQL/PostgreSQL for structured data (e.g., customer details, loan records), MongoDB for document storage
- **Communication:** REST APIs for inter-service communication,
- **Security:** OAuth2 for secure authentication and authorization, JWT tokens for API security

## 7. Key Features

- **Automated Loan Application Processing:** Customers can apply for loans online, upload necessary documents, and track application status.
- **Document Validation:** Automated checks ensure that all required documents are uploaded and valid, reducing errors in processing.
- **Loan Approval Workflow:** Configurable business rules to automate approval or trigger manual reviews.
- **Loan Disbursement:** Once approved, loans are automatically disbursed to the customer's bank account.
- **Repayment Management:** Supports multiple payment methods and provides reminders for due payments.
- **Customer Notifications:** Customers are regularly updated on their application status and payment due dates.
- **Scalability:** Microservices architecture enables easy scaling based on workload, ensuring efficient handling of increasing customer demands.

### 1. Customer Registration & Authentication

- **OJET Screens:**
    - Registration/Login (`oj-form-layout`, `oj-input-text`, `oj-password`, `oj-button`).
    - Role-based access (Customer, Loan Officer, Admin).
  - **APIs:** Customer Service → `/auth/register`, `/auth/login`.
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### 2. Loan Application (Customer Portal)

- **OJET Screens:**
    - Loan application form (`oj-input-text`, `oj-select-single` for loan type, `oj-file-picker` for document upload).
    - Application tracking with **oj-progress-circle** (Submitted → In Review → Approved → Disbursed).
  - **APIs:** Loan Application Service → `/loans/apply`, `/loans/status`.
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### 3. Loan Approval Workflow (Admin/Agent Portal)

- **OJET Screens:**
    - List of pending applications (`oj-table` with filters by loan type, amount, applicant).
    - Loan detail page with approve/reject buttons.
    - Workflow status visualized with **oj-timeline**.
  - **APIs:** Loan Approval Service → `/approvals/pending`, `/approvals/decision`.
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### 4. Loan Disbursement & Repayment

- **OJET Screens:**
    - Loan disbursement details in **oj-card** layout (amount, disbursed date, repayment plan).
    - Repayment schedule in **oj-table** with status (Paid / Pending / Overdue).
    - `oj-chart` (bar/line) for EMI payments over time.
  - **APIs:** Payment Service → `/payments/disburse`, `/payments/schedule`, `/payments/history`.
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### 5. Notifications & Alerts

- **OJET Screens:**

- Notification bell with dropdown (oj-messages).
    - Reminder banners for EMI due dates.
  - **APIs:** Notification Service → /notifications/list.
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## 6. Reporting & Analytics (Admin Dashboard)

- **OJET Screens:**
  - Business dashboard with charts:
    - Loan disbursement trends (oj-line-chart).
    - Loan default ratio (oj-pie-chart).
    - Agent performance (oj-bar-chart).
- **APIs:** Reporting Service → /reports/loans, /reports/analytics.