

Peer2Loan

Course - CS6.302 - Software System Development

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1. Project Understanding

Problem Statement

Community lending groups (chit funds) rely on manual tracking, causing disputes and opacity.

Peer2Loan digitizes pooled monthly contributions where members contribute equally, and one member receives the entire pot each cycle based on predetermined turn order—**no auctions or dividends**.

Example: 12 members \times ₹10,000/month = ₹120,000 pot. Each month, one member receives ₹120,000. Over 12 months, everyone pays ₹120,000 and receives ₹120,000 once.

Core Objectives

- **Trust:** Immutable audit logs and transparent ledgers
 - **Flexibility:** Configurable rules (turn order, grace periods, late fees)
 - **Accountability:** Payment proofs, dispute tracking, member status visibility
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2. Personas Involved

Persona 1: Group Admin

- **Role:** Creates and manages lending pool
- **Goals:** Set up transparent circles, minimize disputes, track all transactions
- **Activities:** Create group, invite members, set rules, monitor contributions, approve payouts, handle exceptions
- **Success:** Zero disputes, 95%+ on-time payments, successful cycle completion

Persona 2: Contributing Member

- **Role:** Monthly contributor, awaiting his payout turn
- **Goals:** Clear visibility of turn date, easy payment submission, receive lump sum on time
- **Activities:** Join group, make monthly payments, upload proofs, track schedule, receive payout
- **Success:** Maintains payment streak, receives payout on time, zero late fees

Persona 3: Auditor (optional)

- **Role:** Ensures fair operation, resolves disputes
 - **Access:** Read-only view of ledgers and transaction history
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3. Solution Description

System Overview

Peer2Loan is a **web-based tracking platform** (no money custody) for community lending pools, providing group management, contribution tracking, automated workflows, and transparent reporting.

Core Modules

A. Group Management

- Define parameters: name, currency, monthly contribution (₹10,000), member count (12), duration (12 months)
- Set payment window (1st-7th each month) and turn-order policy (fixed/random/need-based)
- Configure penalty rules: late fee (₹200), grace period (2 days), default threshold

B. Contribution Tracking

- Payment recording: member logs amount, date, mode (UPI), reference number, uploads proof
- Status tracking: Paid → Confirmed → Pending → Late → Defaulted
- Automated reminders: 3 days before due, on due date, day after due
- Late fee auto-calculation: if paid after grace period, add ₹200 penalty

- Arrears ledger for cumulative missed payments

C. Payout Workflow

- **Readiness Check:** System verifies all (or quorum) contributions received
- **Turn Confirmation:** Display current beneficiary per turn order (e.g., Member B in Month 2)
- **Execution:** Admin transfers pot amount, uploads bank receipt/proof
- **Logging:** Record payout date, amount (₹120,000), transfer reference, mark cycle complete
- **Exception:** Skip turn if beneficiary defaulted; admin can override with justification

D. Dashboards

- **Group Dashboard:** Current month status, contribution heatmap (green=paid, red=pending), pot counter (₹110,000/₹120,000), next beneficiary, alerts
- **Member Dashboard:** Contribution history, upcoming turn (Feb 2026), net position (Contributed: ₹40,000 | Received: ₹0), payment streak (4 months), next deadline countdown
- **Ledgers:** Month-wise transactions, member-wise records, audit log with timestamps

E. Exception Handling

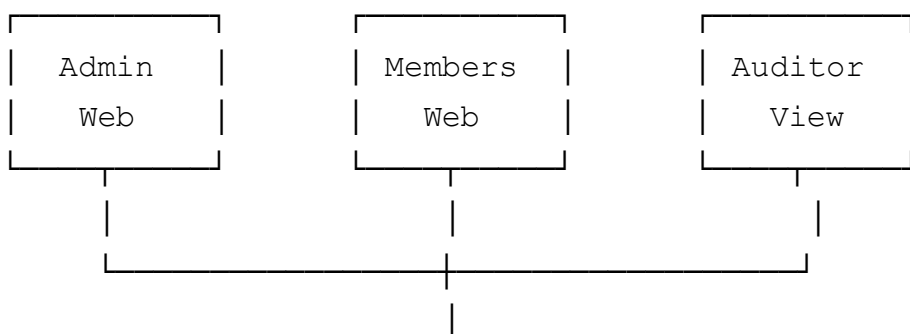
- **Late Payments:** Apply late fee after grace period, lock turn eligibility until cleared
- **Defaults:** Member misses 2+ payments → escalate to admin → options: grant extension, apply penalty, or remove member and redistribute turns
- **Disputes:** Members flag issues (payment not recorded) → admin reviews proofs → decision logged
- **Replacement:** Mid-cycle member exit → admin adds replacement → adjust schedule

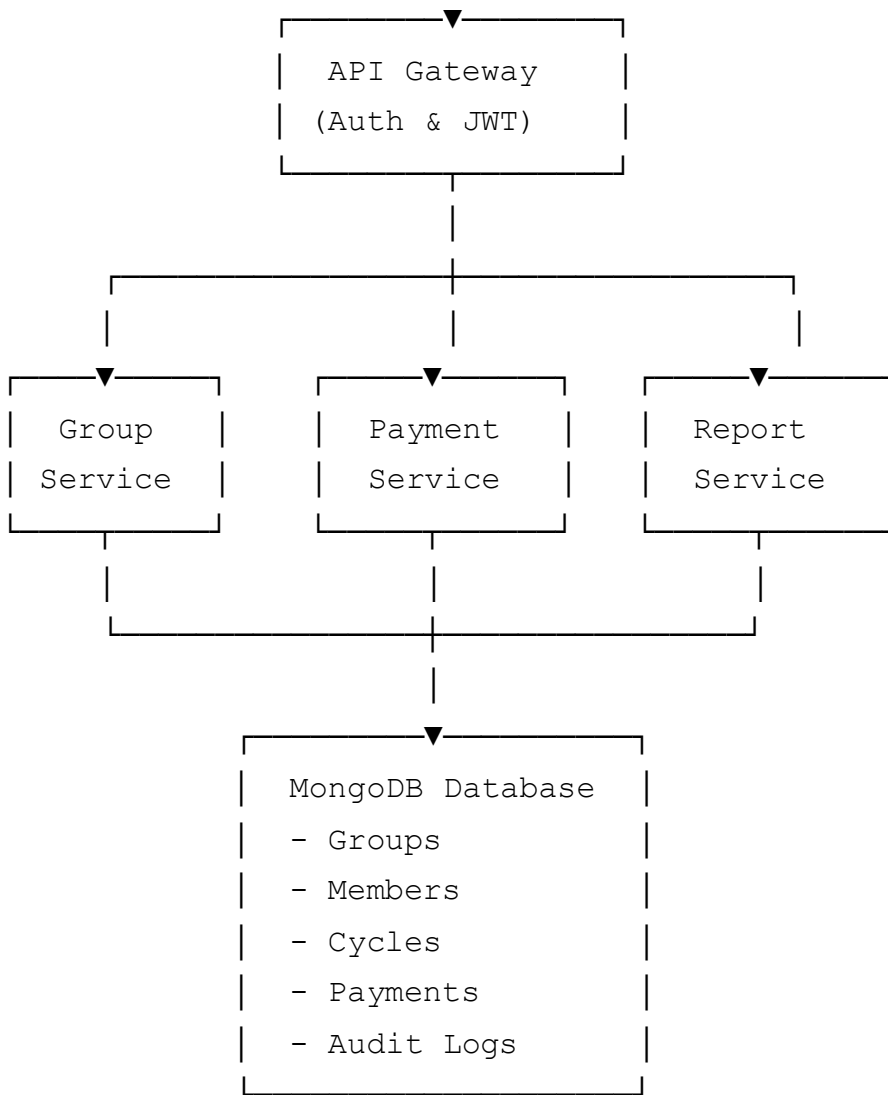
F. Reporting

- **Monthly Summary:** "Month 4: 11/12 paid; ₹110,000 collected; Payout to Rajesh delayed 2 days"
- **Exports:** CSV (all ledgers), PDF (audit pack)

4. Solution Diagram

System Architecture





5. Technology Stack

Frontend

- **Framework:** React.js (component-based UI, rich ecosystem)
- **UI Library:** Material-UI or Ant Design (pre-built components)
- **State Management:** Context API / Redux Toolkit
- **Charts:** Recharts / Chart.js (contribution heatmaps, timelines)

Backend

- **Runtime:** Node.js
- **Framework:** Express.js (lightweight REST APIs)
- **Authentication:** JWT (jsonwebtoken) + bcrypt (password hashing)
- **Notifications:** Nodemailer (emails), Twilio (SMS/WhatsApp)
- **File Upload:** Multer (payment proofs)

Database

- MongoDB, Mongoose, MongoDB Atlas
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6. Project Timeline (8 Weeks)

Phase 1: Foundation (Weeks 1-2)

- Database schema design, MongoDB setup
- Project scaffolding (React + Express)
- Authentication module (signup, login, JWT)
- Group creation module (admin forms, member invites)
- **Deliverable:** Working authentication + group setup

Phase 2: Core Features (Weeks 3-5)

- Payment recording module (forms, proof upload, status tracking)
- Turn-order logic (fixed, random, need-based)
- Cycle management (start/end dates, pot calculation)
- Payout workflow (beneficiary selection, confirmation, logging)
- Dashboards (group & member views, contribution heatmaps)
- Ledger views (month-wise, member-wise)
- **Deliverable:** End-to-end contribution → payout flow

Phase 3: Reporting & Polish (Weeks 6-8)

- Report generation (monthly summaries, CSV/PDF exports)
 - Productivity tracker (payment streaks, scores)
 - UI/UX refinements (responsive design, accessibility)
 - **Deliverable:** Polished platform with comprehensive reporting
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Conclusion

Peer2Loan transforms community lending by providing **transparency and trust** in pooled contributions. Our no-custody model minimizes regulatory burden while comprehensive audit trails build confidence. With a 12-week phased approach and cross-functional team, we'll deliver an MVP serving 100 groups, facilitating transparent community finance.