Design Diagrams Document

This document provides key UML diagrams for the Smart Informal Business Credit & Record App, based on the requirements and data model.

- ➢ **Use Case Diagram**: To outline actors and their interactions with the system.

- ➢ **Class Diagram**: To represent the static structure, building on the data model entities.

- ➢ **Sequence Diagrams**: For critical dynamic flows (e.g., transaction logging and credit score calculation), as these are required to illustrate interactions over time.

1. Use Case Diagram

Description

The Use Case Diagram identifies the main actors and their goals. Actors include:

- ➢ **Business Owner (User)**: Informal trader using the app for daily operations.

- ➢ **Admin**: Manages verifications and rules.

- ➢ **Lender/Cooperative (Partner)**: Views reports for credit decisions.

- ➢ **System**: Handles automated processes like syncing and scoring.

Key Use Cases:

- ➢ Log Transaction

- ➢ View Summaries and Insights

- ➢ Generate and Share Reports

- ➢ View Credit Score

- ➢ Verify Business

- ➢ Manage Scoring Rules

- ➢ Analyze Risks
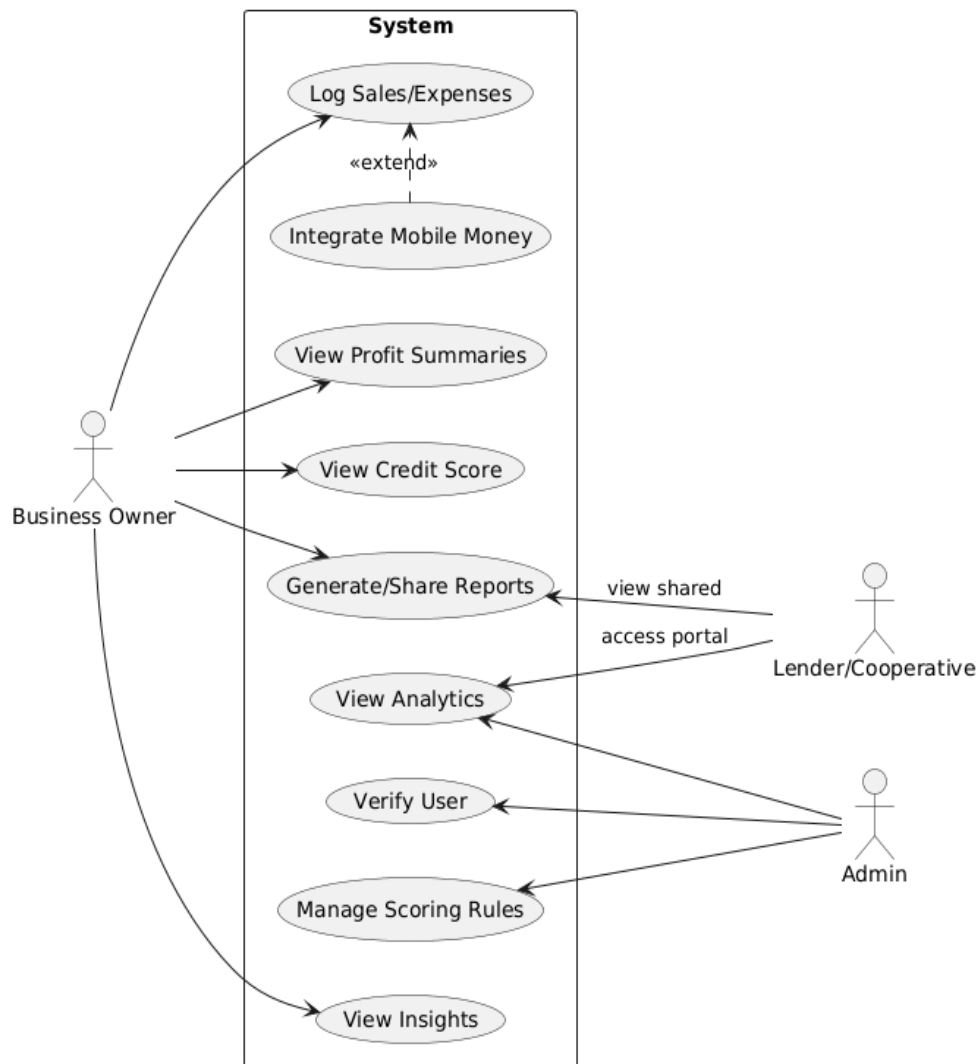
2. Class Diagram

Description

The Class Diagram shows the system's classes, attributes, methods, and relationships. It builds directly on the data model entities (e.g., Users, Transactions). Classes are grouped into packages like "User Management" and "Financial Core".

Key Classes:

- ➢ User: With roles and verification.

- ➢ Transaction: For logging sales/expenses.

- ➢ CreditScore: Computed scores.

- ➢ Report: Generated PDFs/shares.

- ➢ ScoringRule: Admin-configurable.

➢ Insight: Suggestions based on data.

➢ Relationships:

➢ Composition: User owns Transactions.

➢ Association: CreditScore depends on Transactions.

➢ Aggregation: Reports aggregate Transactions.
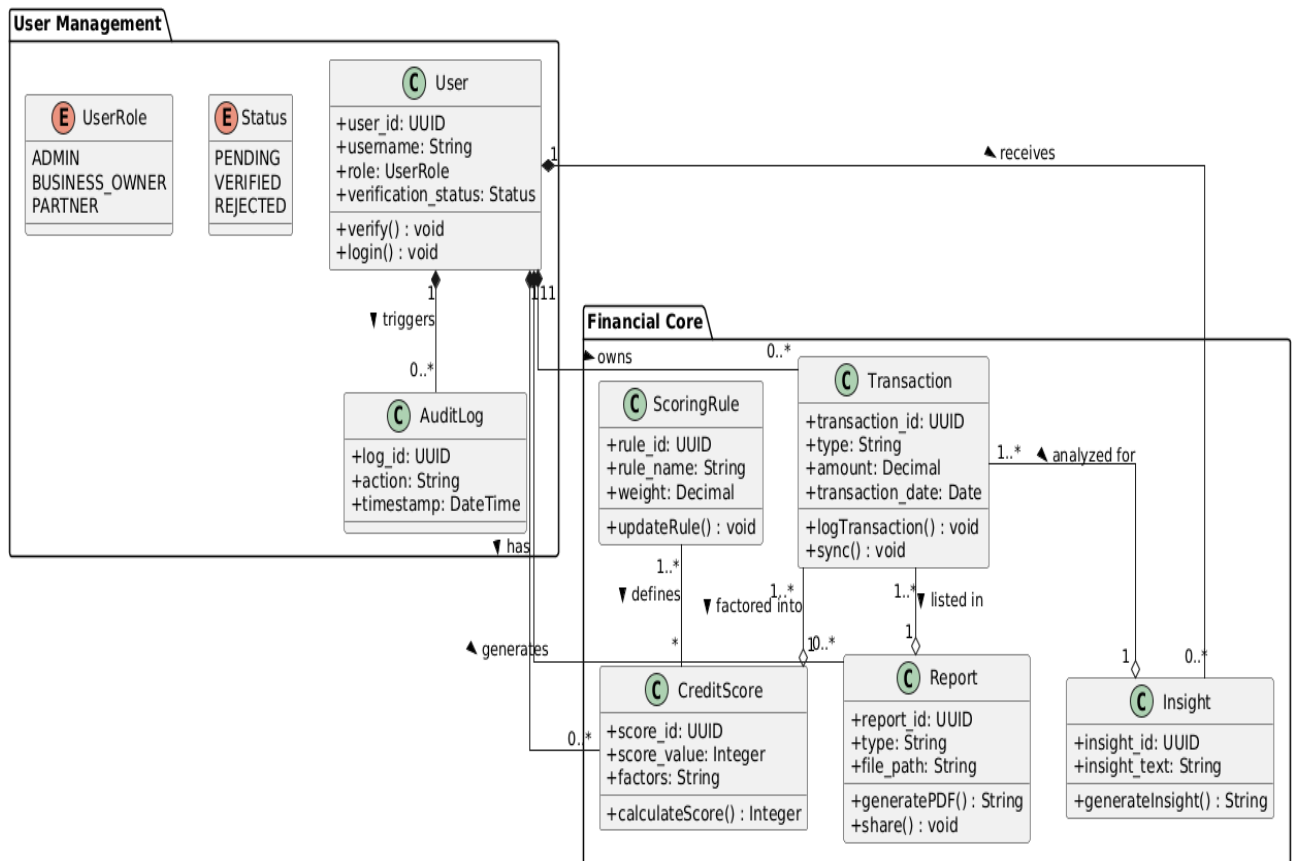
3. Sequence Diagrams

Sequence diagrams are included for two key scenarios, as they are required to show dynamic behaviour:

➢ Transaction Logging (with offline sync).

➢ Credit Score Calculation and Report Sharing.

3.1 Sequence Diagram: Log Transaction and Sync

Description

This shows a Business Owner logging a transaction offline, then syncing when online, updating the backend.
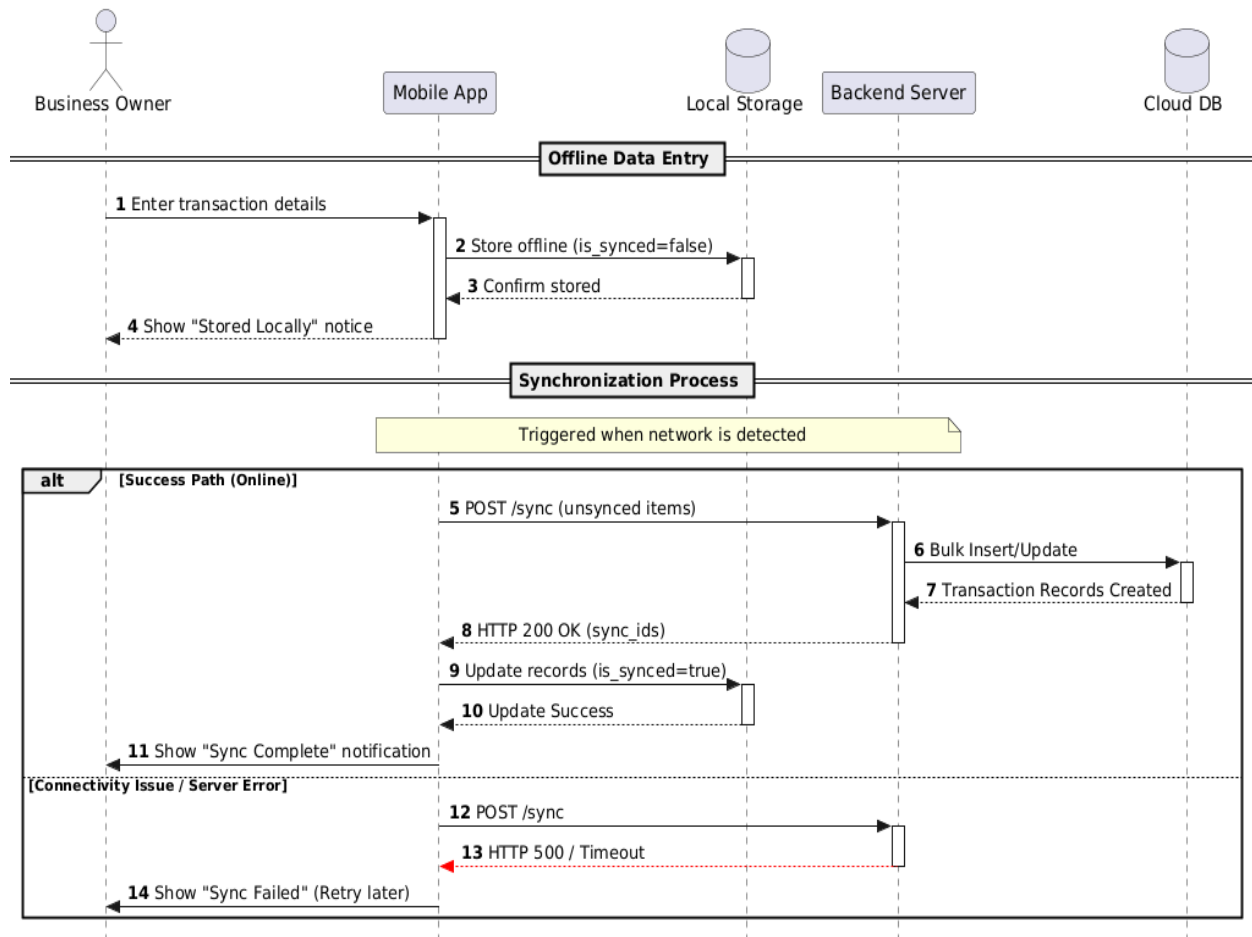
3.2 Sequence Diagram: Calculate Credit Score and Share Report

Description

This illustrates computing a score after new transactions, then generating and sharing a report with a Lender.

Credit Score Calculation

Business Owner | **Mobile App** | **Backend Server** | **Database** | **Lender/Partner**

Background Process (Post-Sync)

1 Query Transactions & ScoringRules
2 Raw Data & Weights
3 calculateScore(data, rules)
4 Save updated CreditScore
5 Success

Report Generation

6 Request Credit Report
7 GET /reports/generate
8 Aggregate Transaction & Score Summary
9 Data Set
10 Render PDF Template
11 Store Report Metadata
12 Return Report URL
13 Display Report Preview

Sharing with Partner

14 Select "Share with Lender"
15 POST /share (partner_id, report_id)
16 Create Access Token / Permissions
17 Send Notification (Email/Sms)
18 Share Confirmation
19 Show "Shared Successfully"
20 Access Portal via Link
21 Validate Token
22 Display Report Details