Requirements Analysis

Data Flow & User Stories Report

Date	14 February 2026
Team ID	LTVIP2026TMIDS54062
Project Name	Online Payments Fraud Detection using Machine Learning

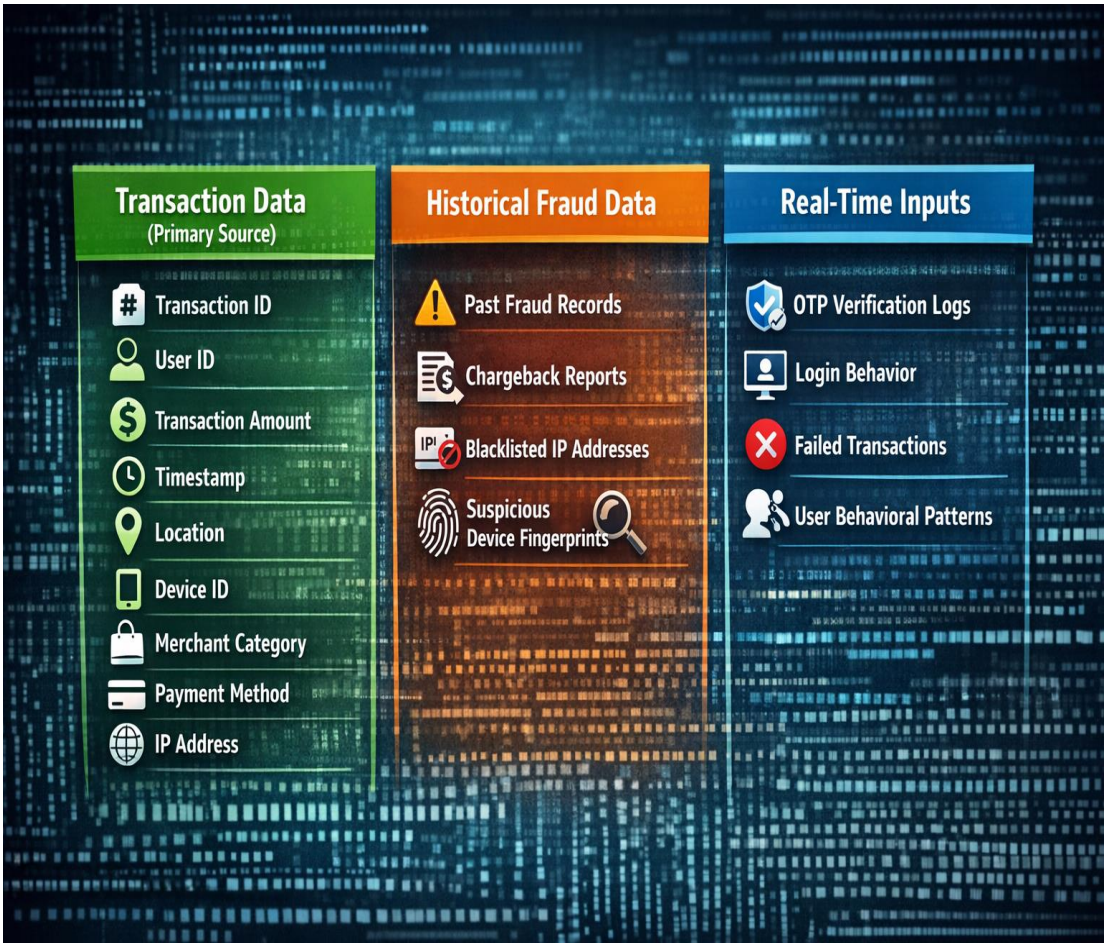
Data Sources

Raw CSV File: transactions_data.csv – includes customer transaction details such as transaction ID, user ID, amount, timestamp, merchant category, location, device information, IP address, and transaction status.

Raw CSV File: historical_fraud_data.csv – contains past fraudulent transaction records, chargeback history, fraud labels (0 = Legitimate, 1 = Fraud), blacklisted IP addresses, and high-risk merchant details.

Manual Inputs (optional):

- Customer fraud complaints
- Card block requests
- OTP verification logs
- Customer support reports
- Risk analyst review feedback



System Data Flow

Step 1: Transaction Initiation

User initiates payment via mobile app / website.

Step 2: Data Collection

System captures:

- Transaction details
- Device & location information
- User behavior signals

Step 3: Fraud Detection Engine

- Machine Learning model analyzes risk score
- Compares with historical fraud patterns
- Applies rule-based checks

Step 4: Risk Classification

Transaction categorized as:

- ✅ Low Risk
- ⚠ Medium Risk
- 🚨 High Risk

Step 5: Action Taken

- Low Risk → Auto-approved
- Medium Risk → OTP verification
- High Risk → Block transaction & send alert

Step 6: Notification & Resolution

- User receives alert
- Confirms or reports fraud
- Refund process initiated

Key Modules in Fraud Detection System

🔹 **Transaction Monitoring Dashboard**

- Real-time transaction tracking
- Suspicious activity alerts
- Risk score visualization

🔹 **Fraud Analytics Dashboard**

- Fraud rate trends
- High-risk regions/devices
- Merchant risk profiling

🔹 **Risk-Based Prediction Module**

- Machine learning risk scoring
- Behavioral anomaly detection
- Customer risk segmentation

🔹 **Alert & Response System**

- SMS / Email fraud alerts
- One-click card block
- Automated refund initiation

USER STORIES

Persona: Digital Banking Customer

- **As a customer,**
  I want to receive instant fraud alerts,
  So that I can immediately stop unauthorized transactions.
- **As a customer,**

I want a simple way to verify suspicious transactions,
So that I don’t experience payment interruptions unnecessarily.

- **As a customer,**
  I want quick refunds for fraudulent payments,
  So that my financial loss is minimized.

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Persona: Fraud Analyst

- **As a fraud analyst**,
  I want to monitor real-time fraud dashboards,
  So that I can detect emerging fraud patterns quickly.
- **As a fraud analyst**,
  I want risk segmentation of transactions,
  So that I can prioritize high-risk cases.

Persona: Bank Administrator

As a bank administrator,
I want to track overall fraud rate trends,
So that I can improve fraud prevention strategies.
As a bank administrator,
I want automated fraud detection models,
So that operational costs are reduced while improving security.