

## **Project Design Phase**

### **Problem – Solution Fit**

|               |  |
|---------------|--|
| Date          | 13 February 2026                                       |
| Team ID       | LTVIP2026TMIDS84813                                    |
| Project Name  | Online Payments Fraud Detection using Machine Learning |
| Maximum Marks | 2 Marks  |

Problem – Solution Fit Overview:

The Problem–Solution Fit validates that a real customer problem exists and that the proposed solution effectively addresses it. For this project, the fit is evaluated across online customers, banks/payment gateways, and financial institutions who face increasing risks due to evolving online payment fraud.

### **Target Customers**

- Online banking and digital payment users
- Banks and payment gateway companies
- Fraud detection analysts and risk managers
- Financial institutions handling high transaction volumes

### **Customer Problems (Key Pains)**

- Increasing online payment fraud and financial losses
- Delayed detection of fraudulent transactions
- High false positives affecting genuine customers
- Lack of intelligent, adaptive fraud detection systems
- Difficulty analyzing large-scale transaction data in real-time

### **Proposed Solution**

A Machine Learning–based Online Payment Fraud Detection System that provides:

- Real-time transaction monitoring and classification
- Behavioral pattern analysis using ML models
- Fraud probability scoring for each transaction
- Automated alerts for suspicious activities
- Dashboard for fraud trends and reporting

## Problem–Solution Fit Mapping

| Customer Problem          | Solution Feature  | Expected Impact                            |
|---------------------------|---|--|
| Delayed fraud detection   | Real-time ML-based transaction classification           | Faster fraud prevention and reduced losses |
| High false positives      | Behavior-based feature engineering & model optimization | Fewer genuine transaction blocks           |
| Large transaction volume  | Automated preprocessing & scalable architecture         | Efficient handling of high data load       |
| Evolving fraud techniques | Model retraining & adaptive learning                    | Improved detection accuracy over time      |

## Channels & Adoption

- Integration with bank/payment gateway systems
- Web-based fraud monitoring dashboard
- API-based integration for fintech platforms
- Pilot deployment within financial institutions

## Success Metrics

- Fraud detection accuracy (Precision, Recall, F1-score)
- Reduction in false positives
- Decrease in financial losses due to fraud
- System response time (<1 second per transaction)
- User satisfaction and analyst efficiency

## Future Improvements

- Deep Learning-based fraud detection models
- Real-time streaming data processing (Kafka integration)
- Mobile alert system for customers
- Cross-platform fraud intelligence sharing
- AI-based risk scoring for user profiles