Project Design Phase
Proposed Solution Template

Date	04 February 2026
Team ID	LTVIP2026TMIDS90948
Project Name	Online Payments Fraud Detection using Machine Learning
Maximum Marks	2 Marks

Proposed Solution Template:

Project team shall fill the following information in the proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Traditional rule-based systems are reactive and unable to detect evolving fraud patterns in real-time. This leads to massive financial losses and a high volume of "false positives," where legitimate transactions are wrongly blocked.
2.	Idea / Solution description	We have developed an AI-driven detection engine using **XGBoost** and **Random Forest** algorithms. The system analyzes transaction features (amount, balance changes, type) and provides a risk-based verdict (Low/Medium/High) through a **Flask Web UI**, enabling instant prevention.
3.	Novelty / Uniqueness	Unlike standard models, our solution uses **SMOTE** to handle data imbalance and optimizes specifically for the **F1-Score (99%)**. It also incorporates "Error Balance" feature engineering to catch the mathematical discrepancies fraudsters often leave behind.
4.	Social Impact / Customer Satisfaction	The solution protects the financial well-being of individuals by stopping unauthorized withdrawals before they are finalized. It increases customer trust in digital banking by reducing the frequency of legitimate transactions being declined.
5.	Business Model (Revenue Model)	The system can be offered as **SaaS (Software as a Service)** to Fintech startups or as a licensed API for established banks. Revenue can be generated through a "Per-Transaction-Check" fee or a monthly subscription for enterprise-level fraud monitoring.
6.	Scalability of the Solution	The project is designed with a **Pickle-serialized model**, making it lightweight and fast. It can be deployed on cloud platforms like **IBM Cloud or AWS**, allowing it to scale and handle millions of concurrent transactions across global payment gateways.