Ideation Phase

Brainstorm & Idea Prioritization Template

Date	
Team ID	LTVIP2026TMIDS40243
Project Name	Online Payments Fraud Detection System
Maximum Marks	4 Marks

INTRODUCTION – Online Payments Fraud Detection System

- In today's digital era, online transactions have become an essential part of daily life. With the rapid growth of digital payment platforms, the risk of fraudulent transactions has also increased significantly.
- Financial institutions and online payment platforms face major challenges in detecting fraud due to the extremely large volume of transactions and the highly imbalanced nature of fraud data.
- This project aims to develop a Machine Learning–based Online Payments Fraud Detection System that can accurately identify fraudulent transactions in real-time. By analyzing transaction features such as amount, transaction type, and account balances, the system predicts whether a transaction is fraudulent or legitimate.
- The final solution integrates:
- Exploratory Data Analysis (EDA)
- Multiple Machine Learning model comparisons
- Selection of the best-performing model
- Deployment using a Flask web application

Step-1: Team Gathering, Collaboration & Problem Statement Selection

- Our team discussed the rapid growth of online payment systems and the increasing risk of fraudulent transactions.
- We analyzed the limitations of traditional rule-based systems and identified the need for a machine learning solution.

Step-2: Brainstorming, Idea Listing & Logical Grouping

- We explored the Kaggle online payments dataset and performed exploratory data analysis to understand patterns and class imbalance.
- Key features such as transaction type, amount, and account balances were identified as important for fraud detection.

Step-3: Idea Prioritization & Final Model Selection

- After training and evaluating multiple models using accuracy, precision, recall, and F1-score, we compared their performances.
- Based on overall balance and performance, Decision Tree was selected as the final model for implementation.

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Fraud Detection

- With the rapid increase in online payments,
- fraudulent transactions are rising significantly.
- Traditional rule-based systems fail to spot stop these frauds.
- We will build an **ML-powered system to automatically detect if a transaction is "Fraud" or "Not Fraud".**

Add ideas to the board
Discuss and refine the problem statement
Agree on the best problem to solve

Step-2: Brainstorm, Idea Listing and Grouping

Brainstorm & Group Ideas — Add new ideas...

Problem	Dataset & EDA	Features	Model Exploration	Evaluation Metrics
• Increase in online payment fraud	• Dataset from Kaggle 6.8M records)	• step • amount	• Decision Tree	• Accuracy
• Need real-time fraud detection	• Severe class Fraud < 1%	• oldbalanceOrg • newbalanceOrig	• Random Forest	• Confusion Matrix
• Financial loss risk	• Fraud mostly in • TRANSFER • CASH_OUT	• oldbalanceDest • newbalanceDest	• Support Vector Machine (SVM) • Extra Trees Classifier • XGBoost Classifier	• Precision • Recall • F1-Score

Dump ideas onto sticky notes
Drag and drop to logical groups
Organize, refine and prioritize ideas

Step-3: Idea Prioritization & Final Model Selection

After comparison models:

Model	Decision Tree	Selected
	High Accuracy	Fast
Performance	Fast & interpretable	Fast
Ranam-forest	Slighity Higher	Slower
SVM	Good	Slower
Extra Trees	Similar to RF	Slower