Optimizing Payment Method Selection and User Risk Profiling in P2P Crypto-Fiat Transactions

A Proposal report for the BDM capstone Project

Submitted by

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Contents

Declaration Statement

I am working on a Project Title “Optimizing Payment Method Selection and User Risk Profiling in P2P Crypto-Fiat Transactions”. I extend my appreciation to **Stanfler Tech LLP**, for providing the necessary resources that enabled me to conduct my project.

I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered through primary sources and carefully analyzed to assure its reliability.

Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

I am dedicated to adhering to the information of academic honesty and integrity, and I am receptive to any additional examination or validation of the data contained in this project report.

I understand that the execution of this project is intended for individual completion and is not to be undertaken collectively. I thus affirm that I am not engaged in any form of collaboration with other individuals, and that all the work undertaken has been solely conducted by me. In the event that plagiarism is detected in the report at any stage of the project's completion, I am fully aware and prepared to accept disciplinary measures imposed by the relevant authority.

I agree that all the recommendations are business-specific and limited to this project exclusively, and cannot be utilized for any other purpose with an IIT Madras tag. I understand that IIT Madras does not endorse this.

Signature of Candidate: (**Digital Signature**)

Name: Rishi Anand

Date: 13-07-2025

1. Executive Summary and Title

Stanfler Tech LLP is an IT and services company specializing in building automation tools for cryptocurrency trading, including P2P trading bots, payment verification systems like Razorpay webhooks, and secure APIs.

The company faces two key challenges in its P2P crypto-fiat transaction flow: First, users often select inefficient or high-failure payment methods, leading to transaction delays and customer dissatisfaction. Second, the platform occasionally encounters fraudulent or third-party transactions, which pose compliance and financial risks.

This project aims to address both challenges through data-driven insights. It will analyze historical P2P trade data and transaction logs obtained via Binance APIs and internal systems to identify which payment methods yield the highest success rate and lowest dispute time. Additionally, it will build a user risk profiling model that flags suspicious patterns using supervised learning and clustering techniques. Python will be the primary tool for data cleaning, analysis, and modeling, supported by libraries like pandas, scikit-learn, and matplotlib.

The expected outcome is twofold: optimized payment method recommendations tailored by region/time, and a dynamic risk profiling system to proactively reduce fraud. Together, these solutions will help Stanfler Tech streamline operations, improve transaction efficiency, and enhance user trust in its trading platform.

2. Organization Background

The company I am working with is **Stanfler Tech LLP**, a small, for-profit IT and services startup founded in 2024. The firm focuses on building automation tools in the cryptocurrency space, particularly for peer-to-peer (P2P) trading on platforms like Binance. Its core offerings include custom trading bots, payment verification systems using popular payment service providers (PSPs) such as Paytm, PhonePe, and BharatPe, as well as lightweight secure APIs (SAPIs) to support end-to-end automation.

As a growing startup, Stanfler Tech LLP operates with a lean team of developers and generalists who manage multiple roles across product

development and operations. The company primarily serves retail crypto traders and small-scale businesses that rely on automation for efficient P2P crypto-fiat transactions. Although still in its early stages, the company maintains access to detailed trade and payment data, allowing it to experiment with data science approaches for process optimization, fraud detection, and improving user experience.

3. Problem Statement

3.1 Problem Statement 1:

Users frequently select payment methods that lead to failed or delayed P2P crypto-fiat transactions, resulting in poor user experience and reduced platform trust. The goal is to identify optimal payment methods based on transaction history.

3.2 Problem Statement 2:

There is no automated risk profiling mechanism to detect high-risk users or suspicious behaviour in real-time. The objective is to develop a data-driven model to classify and flag risky users based on trade and transaction patterns.

3.3 Problem Statement 3:

Manual analysis of transaction outcomes and user behaviours is inefficient and unscalable. This project aims to automate the analysis process using Python-based tools to enable proactive decision-making and real-time fraud detection.

4. Background of the Problem

With the rise of peer-to-peer (P2P) crypto-fiat trading, platforms face increasing complexity in managing transaction reliability and user security. Stanfler Tech LLP, a startup operating in this domain, allows users to buy and sell cryptocurrency using various payment methods such as UPI, Paytm, PhonePe, and BharatPe. However, many transactions fail or are delayed due to mismatched payment method selection, third-party involvement, or lack of payment confirmation mechanisms. This results in poor user experience and operational inefficiency.

Internally, the company lacks a structured dataset that links payment method performance with time, region, and user behaviour. There is also no built-in

system to flag risky users who repeatedly fail transactions or initiate chargebacks. As a small startup, it does not yet have advanced fraud detection systems in place.

Externally, the P2P environment is vulnerable to scams, third-party payments, and regulatory risks. Users often exploit the system by using non-compliant payment methods or coordinating off-platform, making it difficult to verify transactions or user identity in real time.

These challenges create a need for a data-driven solution that can optimize payment method selection and automatically profile high-risk users to safeguard the platform's integrity while improving transaction success rates and user trust.

5.Problem Solving Approach

To address the challenges of suboptimal payment method selection and lack of automated user risk profiling in P2P crypto-fiat transactions, a structured data science approach will be applied. The objective is to extract actionable insights from historical transaction data and build predictive models that can be integrated into Stanfler Tech LLP's platform.

Step 1: Problem Identification and Data Understanding. The first step involves understanding the structure of available data, which includes P2P trade logs, timestamps, payment methods used, transaction success/failure status, duration, and user profiles. These data points will be extracted primarily via Binance APIs and internal logs from the payment verification system. Data will be explored to identify missing values, outliers, and patterns relevant to the objectives.

Step 2: Data Cleaning and Feature Engineering. Python, along with pandas and NumPy, will be used to clean and transform the data. Features like transaction time (in seconds), success rate by payment method, and user dispute history will be engineered. Label encoding and normalization techniques will be applied to prepare the data for machine learning models.

Step 3: Payment Method Optimization Analysis. Exploratory Data Analysis (EDA) will be conducted to understand trends in payment methods by success rate, region, time of day, and transaction value. Visualization libraries such as matplotlib and seaborn will be used. Classification or clustering models like K-Means or Decision Trees will be applied to recommend the most efficient payment method in different contexts.

Step 4: User Risk Profiling Model. A supervised learning model (e.g., Random Forest or XGBoost) will be developed to classify users as high, medium, or low risk based on behavioural attributes such as failed transaction frequency, use of unverified payment methods, and dispute count. In parallel, unsupervised learning techniques such as DBSCAN or K-Means may be used to discover hidden patterns or anomaly clusters.

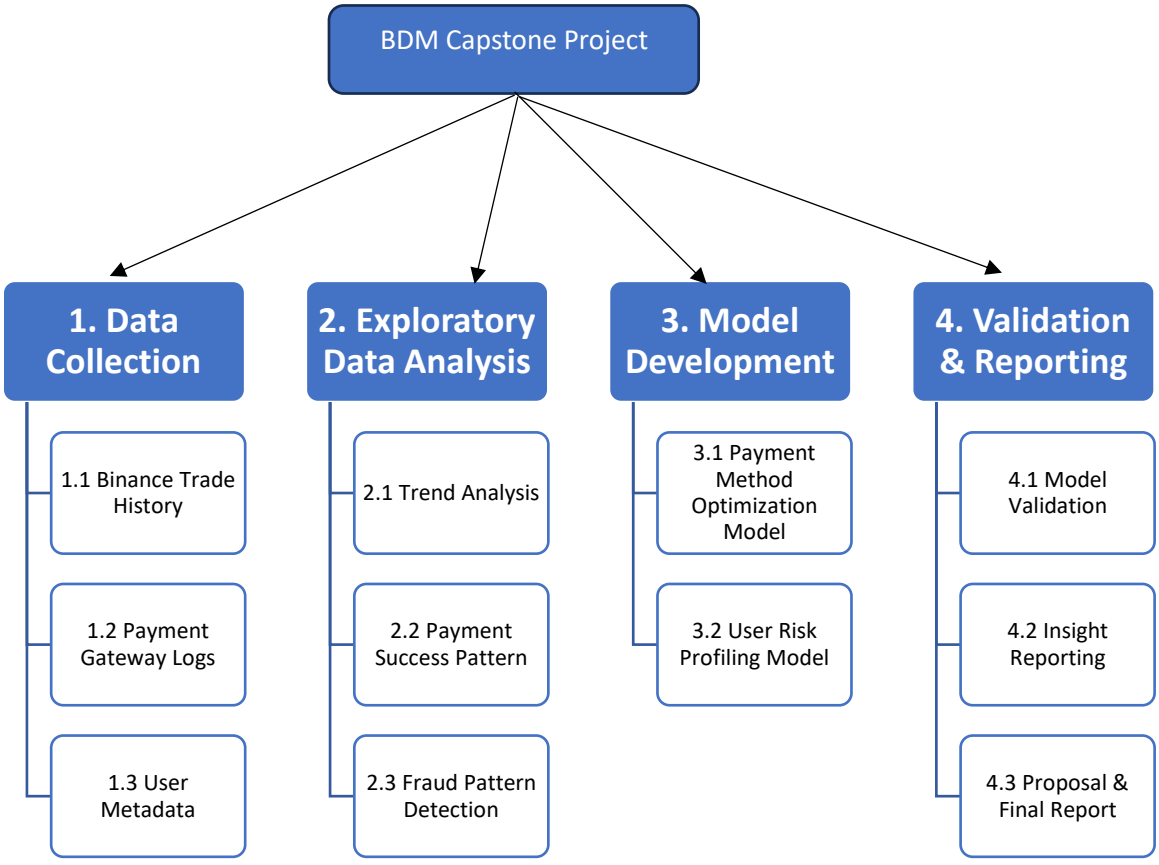
Step 5: Evaluation and Model Validation. Cross-validation techniques will be used to assess model accuracy, precision, recall, and F1-score. Confusion matrices and ROC-AUC curves will help evaluate the effectiveness of the risk classification and payment recommendation systems.

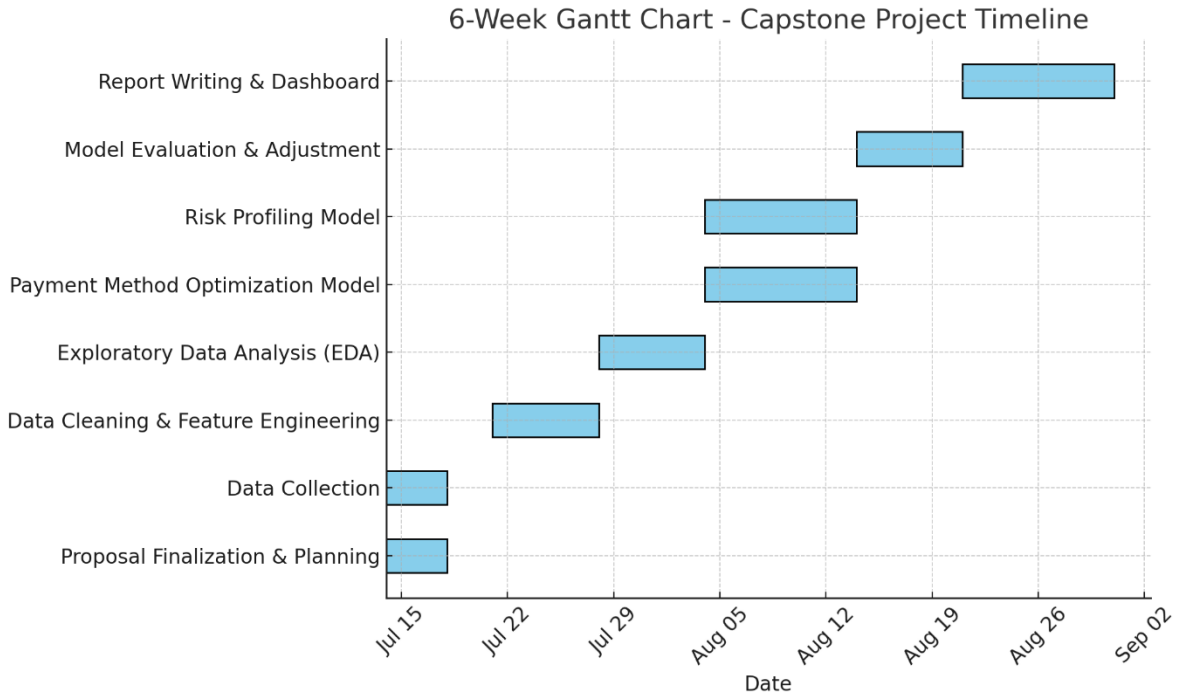
Step 6: Recommendation and Automation Plan. The final step includes designing a strategy to integrate these insights into the platform's backend. Risk scores and payment method recommendations can be triggered through APIs for real-time feedback to the user during the transaction process.

This approach is expected to increase transaction success rate, minimize fraud, and streamline user experience in a scalable manner.

7. Expected Timeline

Word Breakdown Structure (WBS):





8. Expected Outcome

The expected outcome of this project is to provide actionable insights and intelligent automation to enhance P2P crypto-fiat transaction systems. One of the key deliverables is a payment method optimization model that helps dynamically select the most reliable and successful payment channel (e.g., Paytm, PhonePe, UPI) based on time of day, transaction size, and user history. This can significantly increase transaction success rates and reduce payment failures or delays that negatively impact the user experience.

Secondly, the project aims to generate a risk profiling model for users based on behavioural, transactional, and device-level data. This will enable the platform to assign risk scores to users in real-time and prevent third-party payments, fraud rings, or policy violations. Such profiling helps reduce financial risk and improves the trustworthiness of the platform.

Additionally, by analyzing trade success patterns, PSP response trends, and fraud attempts, the company can build more resilient automation systems and improve compliance workflows. Overall, the results from this study will not only streamline P2P transactions but also contribute toward building secure, efficient, and data-driven fintech infrastructure for the firm.