Payment Failure & Settlement Insights Project

Overview

This project was developed to analyze and understand the end-to-end payment transaction lifecycle and operational monitoring required to ensure reliable payment processing. It simulates real-world digital payment flows including authorization, settlement timelines, reconciliation checks, and failure handling.

Objective

The objective of this project was to analyze payment transaction performance, identify failure patterns, monitor settlement timelines, and highlight reconciliation exceptions to support operational efficiency and improved payment success rates.

Process Flow Design

The process flow diagram was developed to illustrate the payment lifecycle. The flow outlines how payment requests are routed through different systems, authorized by the issuing bank, settled between financial institutions, and verified for accuracy.

Flow Summary:

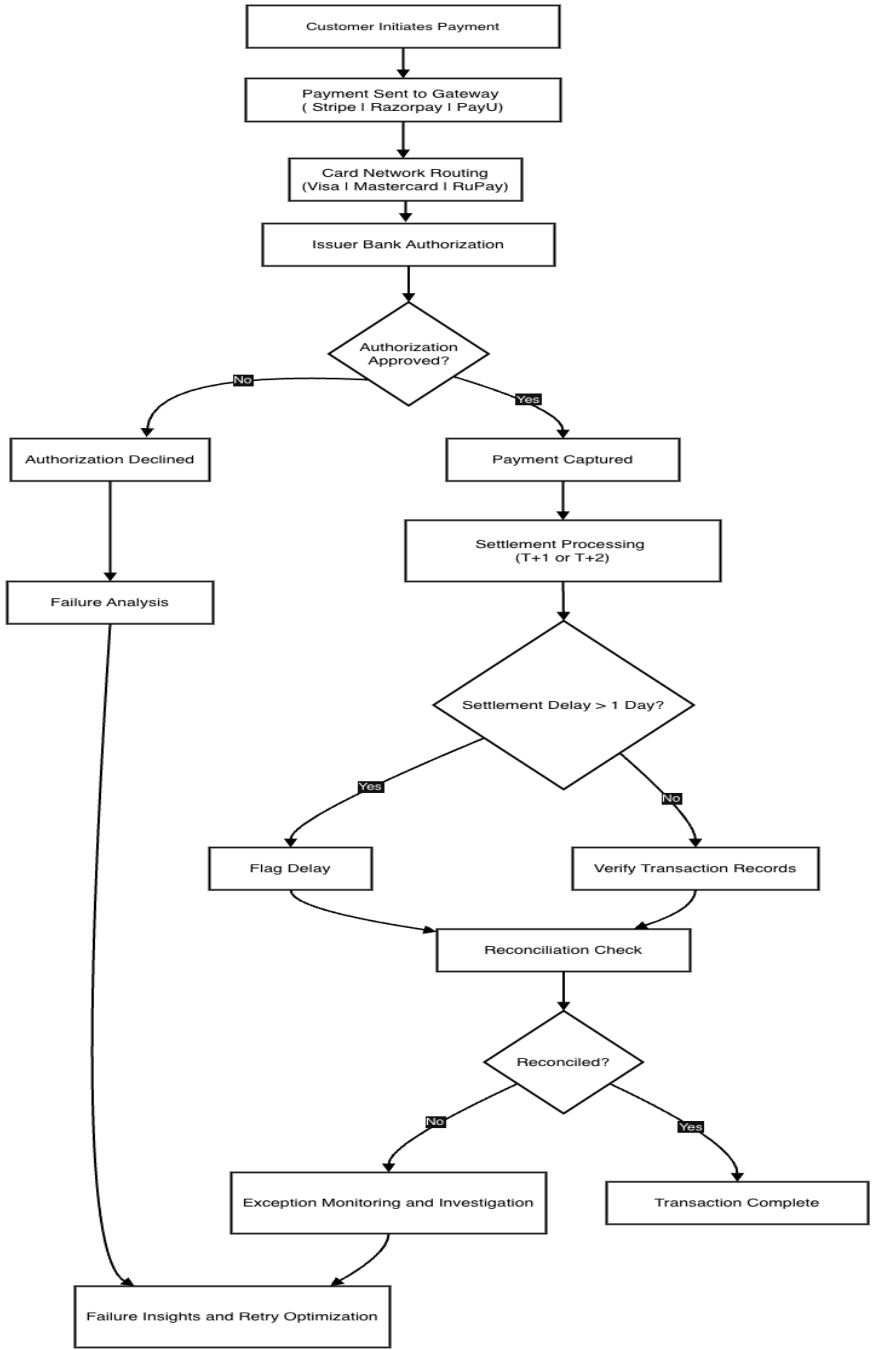
1. Customer initiates a payment.
2. Payment gateway securely routes the request.
3. Card network directs the transaction to the issuer bank.
4. Issuer bank approves or declines the transaction.
5. Approved transactions are captured and processed for settlement.
6. Funds are settled to the merchant within the settlement timeline (T+1/T+2).
7. Transaction records are verified to ensure accuracy and identify exceptions.

Actors Involved:

The payment lifecycle involves multiple participants:

1. Customer – initiates the payment transaction
2. Payment Gateway – securely transmits payment data for processing
3. Card Network (Visa/Mastercard/RuPay) – routes the transaction to the issuing bank
4. Issuer Bank – verifies funds and approves or declines the transaction
5. Merchant Bank (Acquirer) – receives funds on behalf of the merchant

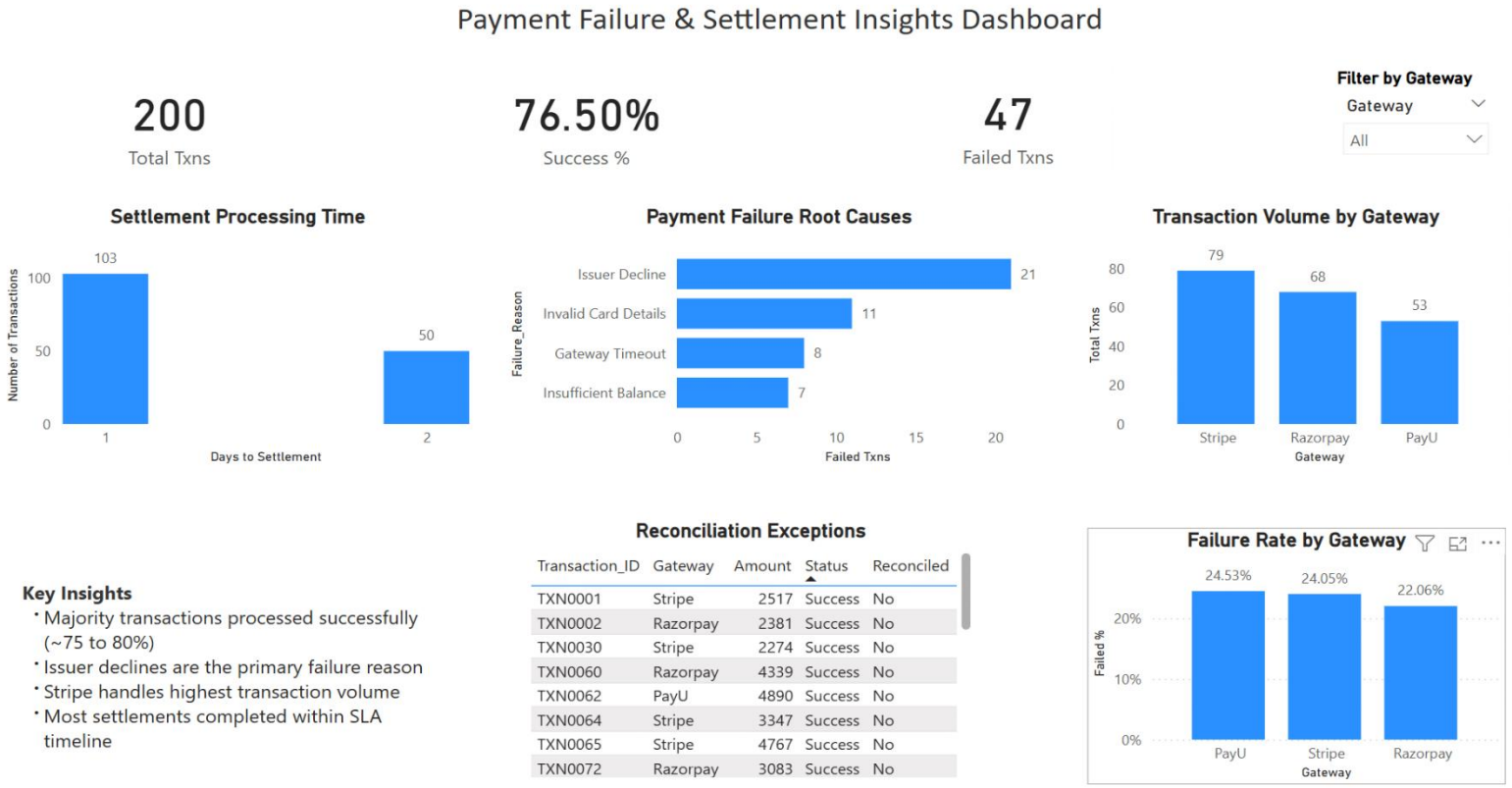
Payment Transaction & Settlement Flow



Data Analysis & Dashboard

A Power BI dashboard was built using simulated transaction data to monitor key operational metrics, including:

- Transaction success rate and failure volume
- Payment failure root causes
- Settlement processing timelines
- Gateway transaction volume and failure rates
- Transactions requiring reconciliation review



Key Insights

- Majority of transactions processed successfully (~75–80%)
- Issuer declines were the primary cause of payment failures
- Gateway performance varied across providers, highlighting differences in reliability.
- Most settlements were completed within expected timelines
- Exception monitoring supports financial accuracy and operational control

Tools & Technologies

- Power BI (data visualization & analytics)
- SQL (data analysis and pattern identification)
- Excel (data preparation and simulation)
- Process flow design for lifecycle visualization

Outcome

This project demonstrates practical knowledge of digital payment operations, transaction monitoring, and data-driven decision support used to improve payment reliability and operational efficiency.