Project Title:

FinTech Analytics & Risk Dashboard

Prepared by:

Ismail Yousif Mohamed Ramadan

Role:

Data Analyst / ML Engineer

Tools Used:

Tableau and SQL

Date: October 2023

1. Executive Summary

Financial technology companies handle large volumes of customer transactions, revenues, and loan portfolios on a daily basis. Without proper analytics, it becomes difficult for decision-makers to understand business performance, customer behavior, and financial risk.

The main problem addressed in this project is the **lack of clear, unified visibility** into key fintech operations such as revenue trends, customer activity, and loan risk. Raw data alone does not support fast or effective decision-making, especially when it is messy, incomplete, or inconsistent.

To solve this problem, I built a **FinTech Analytics & Risk Dashboard** using Tableau. The project simulates a real-world fintech environment by using a large, realistic dataset (around 40,000 records) covering customers, transactions, revenues, and loans. The data was intentionally imperfect to reflect real business data and required cleaning, transformation, and modeling before analysis.

The final solution consists of **three interactive dashboards**:

1. Executive Overview Dashboard
2. Customer & Transaction Insights Dashboard
3. Loan Performance & Risk Dashboard

These dashboards provide clear KPIs, trends, and risk indicators that help business leaders monitor performance, identify issues early, and make informed strategic decisions.

This project demonstrates how data analytics can transform raw financial data into **actionable business insights** that improve operational efficiency, customer understanding, and risk management.

2. Problem Statement

FinTech companies often work with complex datasets coming from multiple sources such as customer systems, transaction platforms, and loan management tools. These datasets usually contain missing values, inconsistent formats, and unstandardized fields. Without proper analytics and visualization, stakeholders struggle to:

- Monitor overall business performance
- Understand customer behavior and revenue drivers
- Identify loan risk and delinquency trends

3. Objectives:

The main objectives of this project are:

- To clean and prepare large, messy fintech datasets for analysis
- To build meaningful KPIs such as revenue growth, ARPU, and NPL ratio
- To analyze customer transaction behavior and retention patterns
- To evaluate loan portfolio performance and financial risk
- To present insights through clear, interactive Tableau dashboards

4. Data Source

The dataset was **synthetically created** to simulate real fintech data rather than using public datasets such as Kaggle. This approach better reflects real industry environments.

Data Size

- Approximately **40,000 records**
- Multiple related tables (customers, transactions, loans, revenue)

Key Features

- Customer ID, Account Type, Region
- Transaction ID, Transaction Type, Channel, Amount
- Revenue, Fees
- Loan ID, Principal, Interest Rate, Loan Status
- Credit Score, Delinquency Days

Data Issues Identified

- Missing values in revenue, credit score, and transaction fields
- Inconsistent category names (e.g., account types, regions)
- Unstandardized date formats
- Imbalanced loan status distribution
- Duplicate and null records

These issues required proper cleaning and transformation before analysis.

5. Methodology

Data Cleaning

- Standardized categorical fields (Account Type, Region, Channel)
- Handled missing values using calculated fields and logical assumptions
- Created clean date fields for monthly and yearly analysis
- Removed duplicates and invalid records

Feature Engineering

- Created calculated fields such as:
    - Revenue per User (ARPU)
    - Non-Performing Loan (NPL) Ratio
    - Delinquency Buckets
    - Cohort Age for retention analysis
- Normalized values to enable fair comparisons

Analysis & Visualization

- Joined multiple tables in Tableau using logical relationships
- Built KPIs and trends for executive reporting
- Designed dashboards based on real business use cases

Tools Used & Reasoning

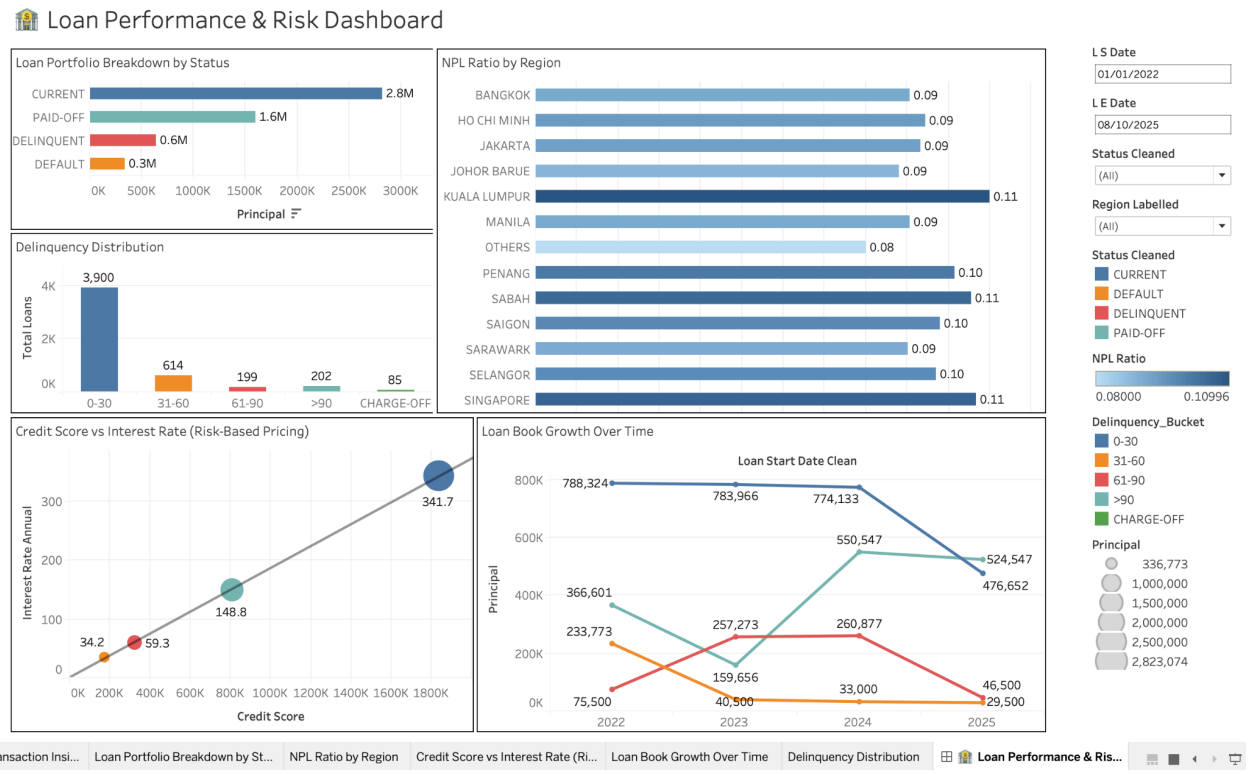
- **Tableau:** Interactive dashboards and visual analytics
- **SQL:** Logical joins and data understanding

These tools are commonly used in real fintech analytics teams.

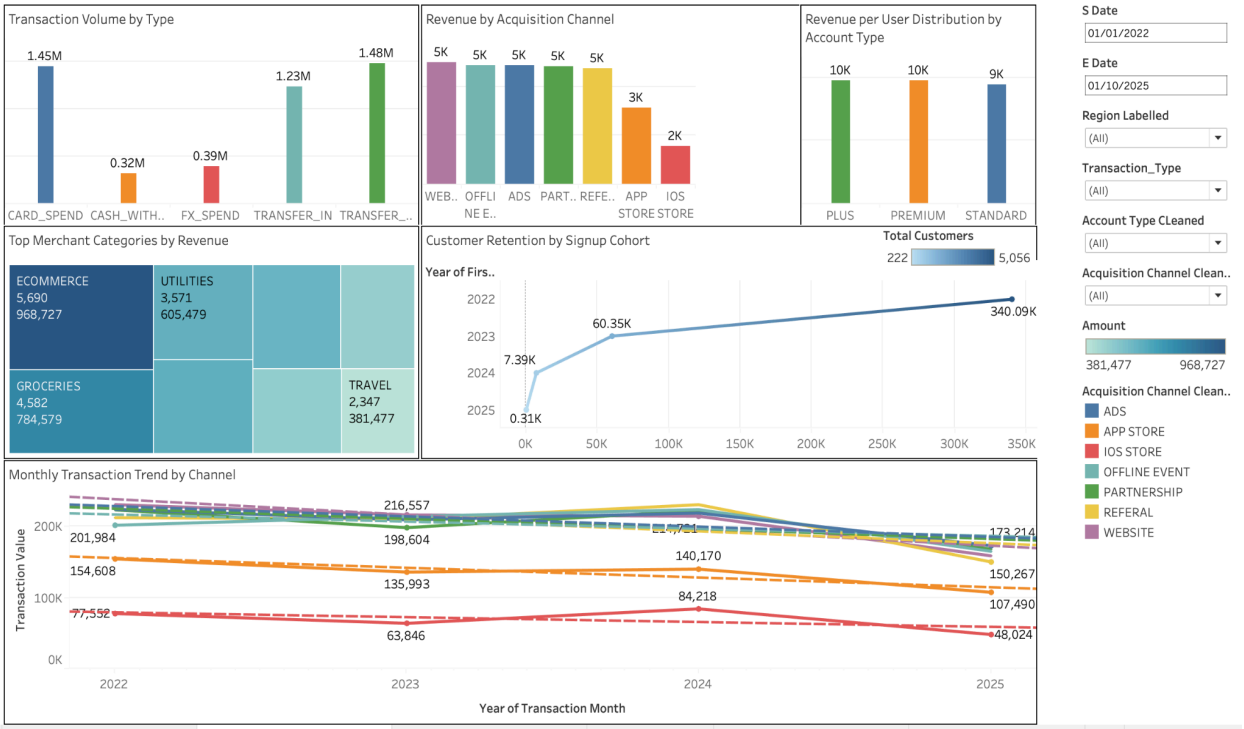
6. Results & Visualizations

Key outputs of the project include:

- Revenue and transaction trends over time
- Customer segmentation by account type and behavior
- Cohort-based retention analysis
- Loan status distribution and delinquency patterns
- Credit score vs interest rate risk analysis

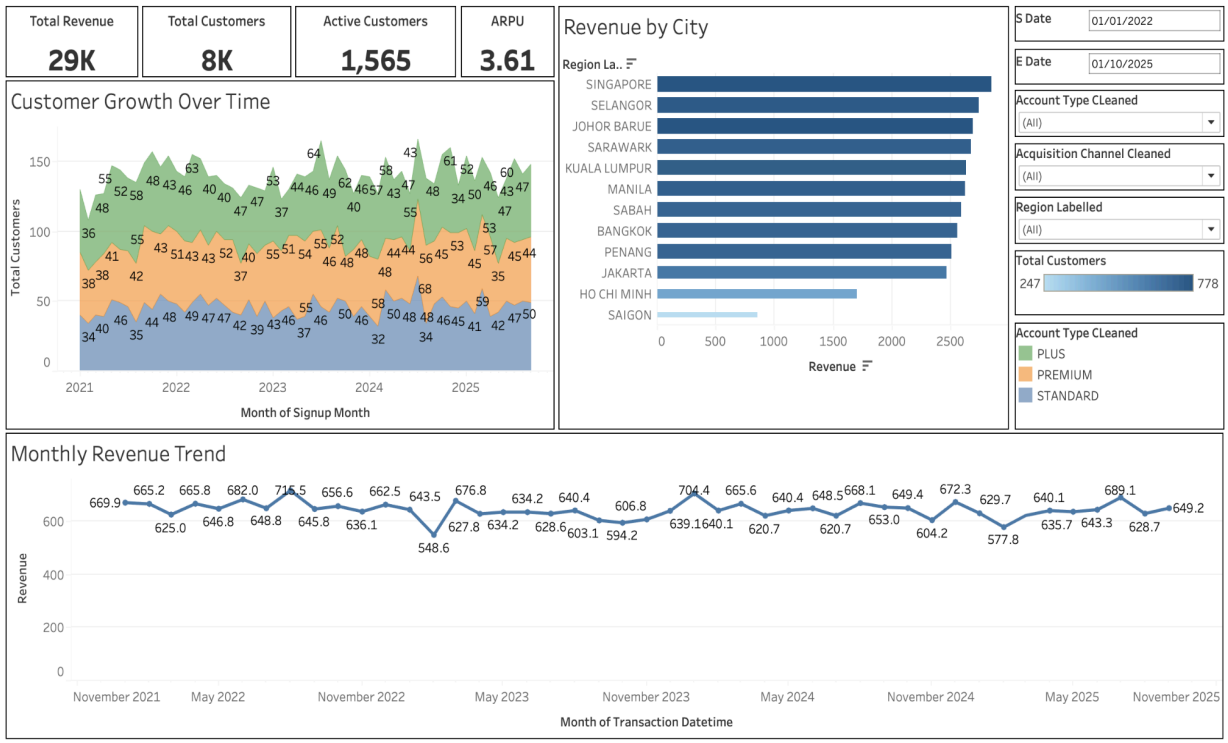


Customer & Transaction Insights



Top Merchant Categories by Re... | Customer & Transaction In... | Loan Portfolio Breakdown by St... | NPL Ratio by Region | Credit Score vs Interest Rate (Ri... | Loan Book Growth Over Time | Delinq

Dashboard – Executive Overview



nd | Customer Growth Over Time | Revenue by City | Revenue by Acquisition Channel | Dashboard – Executive Ove... | Transaction Volume by Type | Monthly Transaction Trend by C... | Customer Re

Key KPIs

- Total Revenue
- Total Transactions
- Average Revenue per User (ARPU
- Non-Performing Loan (NPL) Ratio
- Delinquency Distribution

These KPIs are presented across three dashboards designed for different stakeholders.

7. Insights & Business Impact

Key Insights

- Premium account holders generate higher ARPU compared to standard users
- Certain transaction channels drive higher revenue but lower volume
- Loan defaults are concentrated in specific regions and credit score ranges
- Higher interest rates are strongly associated with lower credit scores

Business Impact

- Executives can monitor performance in real time
- Risk teams can identify problematic loan segments early
- Marketing teams can target high-value customer groups
- Finance teams can optimize pricing and credit policies

This project shows how analytics directly supports **better decision-making** in fintech organizations.

8. Conclusion

This project demonstrates the complete data analytics lifecycle, from raw data preparation to business-focused dashboards. By transforming messy fintech data into clear insights, the project highlights the importance of analytics in improving financial performance, customer understanding, and risk management.

The FinTech Analytics & Risk Dashboard reflects real-world data analyst responsibilities and serves as a strong portfolio project for professional and academic applications.