Credit Card Fraud Risk Analysis

Business Problem Document

1. Problem Statement

Financial institutions process thousands of credit card transactions daily. A small percentage of these transactions are fraudulent, which leads to financial losses and reduced customer trust. The organization lacks a centralized analytics system to monitor fraud trends and risks effectively.

2. Business Objectives

- Detect fraudulent transactions early
- Measure total fraud losses
- Identify high-risk customers and merchants
- Track fraud trends over time
- Provide an interactive monitoring dashboard
- Enable faster data-driven decisions

3. Key Business Questions

- What is the overall fraud rate?
- How much money is lost due to fraud?
- Which time of day has higher fraud activity?
- Which merchants or customers are risky?
- Which countries show higher fraud?
- Are high-value transactions more vulnerable?

4. Proposed Solution

- Data Cleaning and preprocessing using Python (Pandas)
- Feature engineering for fraud detection
- SQL-based KPI and trend analysis
- Power BI dashboard for visualization and insights

5. Technical Approach

Stage	Tool	Purpose
Cleaning	Python (Pandas)	Data preprocessing and feature engineering
Storage	CSV	Cleaned dataset
Analysis	SQL	KPI calculations and aggregations
Visualization	Power BI	Interactive dashboards and insights

6. KPIs Defined

- Total Transactions
- Fraud Transactions
- Fraud Rate (%)
- Total Fraud Loss
- Average Detection Time
- Fraud by Hour
- Fraud by Merchant
- Fraud by Country
- High Value Transaction Risk

7. Expected Business Impact

- Reduce fraud losses
- Identify suspicious behavior early
- Improve fraud monitoring
- Support faster investigations
- Enable proactive decision-making
- Increase customer trust

8. Outcome

An end-to-end fraud analytics solution was developed using Python, SQL, and Power BI. The system transforms raw transaction data into actionable insights and provides a foundation for future predictive fraud models.