**Credit Card Transaction Analysis Report**

**1. Business Problem**

The objective is to analyze customer demographics, credit card transactions, and financial performance to provide actionable insights that improve customer satisfaction, optimize revenue, and identify risk areas such as delinquent accounts. This analysis will help decision-makers better understand customer behavior, maximize profitability, and design targeted campaigns.

**2. Data Requirement**

* **Customer Database:**
  + Key Attributes: Client\_Num, Customer\_Age, Gender, Dependent\_Count, Education\_Level, Marital\_Status, Income, Cust\_Satisfaction\_Score.
  + Additional Details: State\_cd, Zipcode, Car\_Owner, House\_Owner, Personal\_loan, Customer\_Job.
* **Credit Card Database:**
  + Key Attributes: Client\_Num, Card\_Category, Annual\_Fees, Activation\_30\_Days, Credit\_Limit, Total\_Revolving\_Bal, Total\_Trans\_Amt, Total\_Trans\_Vol, Avg\_Utilization\_Ratio.
  + Financial Metrics: Interest\_Earned, Delinquent\_Acc, Customer\_Acq\_Cost.

**3. Data Collection and Understanding**

* **Source:**  
  Data provided is from customer and credit card databases in structured format.
* **Key Observations:**
  + Demographic insights: Age, gender, income distribution.
  + Financial activity: Spending patterns, transaction volume, credit utilization.
  + Risk insights: Delinquent accounts, low satisfaction scores.

**4. Data Validation**

* **Validation Steps:**
  + Ensure data completeness (no null values in critical columns like Client\_Num and Credit\_Limit).
  + Verify consistency in date fields (Week\_Start\_Date and Week\_Num).
  + Cross-check numerical ranges (e.g., Income, Cust\_Satisfaction\_Score).

**5. Data Cleaning and Exploratory Data Analysis (EDA)**

* **Data Cleaning:**
  + Handle missing values in non-critical fields.
  + Standardize categorical data (e.g., unify format for Education\_Level and Marital\_Status).
  + Remove duplicate rows based on Client\_Num.
* **EDA Insights:**
  + **Age Distribution:** Majority of customers are aged 25-40.
  + **Gender Representation:** Balanced male and female customer base.
  + **Transaction Trends:** Higher transaction volumes observed in Q4.
  + **Utilization Ratio:** Average utilization across customers is ~40%.

**6. Tools Selection**

* **Data Cleaning & Transformation:** Python (Pandas), SQL.
* **Visualization & Dashboarding:** Power BI for creating interactive reports.
* **EDA:** Python for statistical analysis (matplotlib, seaborn).

**7. Graphs and Charts**

* **Demographics:**
  + Donut Chart: Gender distribution.
  + Heatmap: State-wise customer count.
* **Financial Metrics:**
  + Line Chart: Weekly transaction volume.
  + Gauge Chart: Average utilization ratio.
* **Risk Analysis:**
  + Funnel Chart: Delinquent accounts by state.
  + Bar Chart: Satisfaction score vs. card category.

**8. Dashboard**

* **Structure:**
  + **Page 1:** Overview (Key KPIs like Total Customers, Total Revenue, and Average Satisfaction Score).
  + **Page 2:** Demographics (Age, Income, and State Distribution).
  + **Page 3:** Credit Card Utilization (Transactions and Utilization Ratio).
  + **Page 4:** Risk Analysis (Delinquent Accounts and Low Satisfaction Scores).
  + **Page 5:** Financial Performance (Interest Earned, Annual Fees).
* **Interactivity:**  
  Slicers for year, card category, and state to enable dynamic filtering.

**9. Storytelling and Business Impact**

* **Insights:**
  + Younger customers (aged 25-40) show higher transaction volumes but moderate credit utilization.
  + High satisfaction scores are linked to premium card categories, emphasizing the need for tailored rewards programs.
  + Delinquent accounts are concentrated in specific states, suggesting localized interventions.
* **Business Impact:**
  + Improved customer retention by addressing low satisfaction in specific card categories.
  + Revenue growth through targeted campaigns in high-transaction regions.
  + Reduced risk by proactively managing delinquent accounts with early alerts.