Credit Card Insights Dashboard

Power BI Report Documentation

Executive Summary

This project presents an analytical dashboard solution built using Power BI to evaluate credit card portfolio performance, customer behavior, and churn-risk exposure across the United States. The dashboard consolidates customer and transaction-level data sources and provides both high-level portfolio KPIs and granular insights through dynamic filtering and drill-based interactions.

The dashboard enables the following:

- Weekly tracking of revenue, transactions, and interest performance
- Segmentation of customers by demographics, profitability tier, and churn-risk
- Geographic analysis of customer concentration and state-level performance
- Interactive exploration using slicers, page navigation buttons, tooltips, and dynamic trend toggles using field parameters
- Identification of at-risk customer segments based on utilization, delinquency, and revenue contribution behavior

The result is a unified visual analytics environment designed to support portfolio monitoring, identify trends, and enable data-driven decision-making.

Data Architecture

Two core datasets form the basis of the analysis:

The report is built using two structured datasets:

- **Customer dataset:** customer demographics, income tier, job, etc.
- **Credit card transaction dataset:** weekly transaction amounts, utilization ratio, delinquency status, payment method, etc.

Before building the dashboard, the raw files were first imported into a MySQL database instead of being connected directly from CSV. This allowed the data to be organized more cleanly and structured into relational tables. Setting it up this way also ensures consistency in data types, relationships, and future data handling.

After the database was created, Power BI was connected directly to the MySQL source. This setup means the dashboard doesn't rely on static files, so that if new customer or transaction data is added to the database, the Power BI model can refresh and automatically reflect the latest information without any redesign or manual updates.

The model is built using a **star-schema structure**, where the transaction table acts as the fact table and the customer table functions as a dimension. Additional calculated tables and mapped reference fields support enhanced analytics.

To support deeper insight generation, several analytical constructs were engineered:

- **Profitability tiers** to classify customers based on revenue contribution
- **Churn-risk scoring logic** using utilization ratio, delinquency status, and spending patterns
- **Customer personas** combining churn risk and profitability tiers for strategic grouping
- **Field parameters** enabling user-driven metric comparison on trend charts

Executive Dashboard

The Executive Dashboard focuses on revenue and transaction performance at the portfolio level. Weekly metrics highlight changes in customer spending behavior and card activity. The dashboard includes full portfolio KPIs such as total revenue, transaction amount, total transactions, and interest earned.
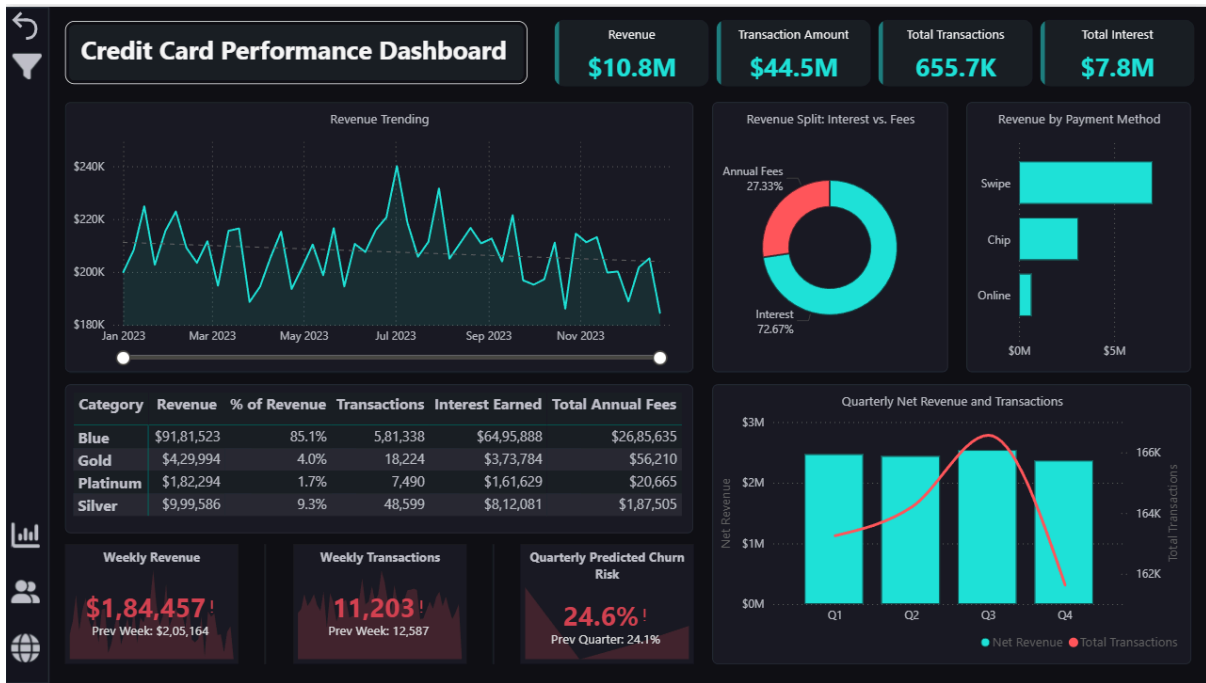
Figure 1: Executive Dashboard (Default View)

A revenue trend line allows users to observe seasonal variation and momentum over time. Supporting visuals show the split between interest and fee-based revenue, revenue distribution by payment method, and revenue contribution by card category.

Customer retention risk is tracked through a quarterly churn-risk measure. This KPI calculates the percentage of customers classified in risk status for the current quarter using utilisation, delinquency, and revenue contribution, and compares it with the previous quarter.
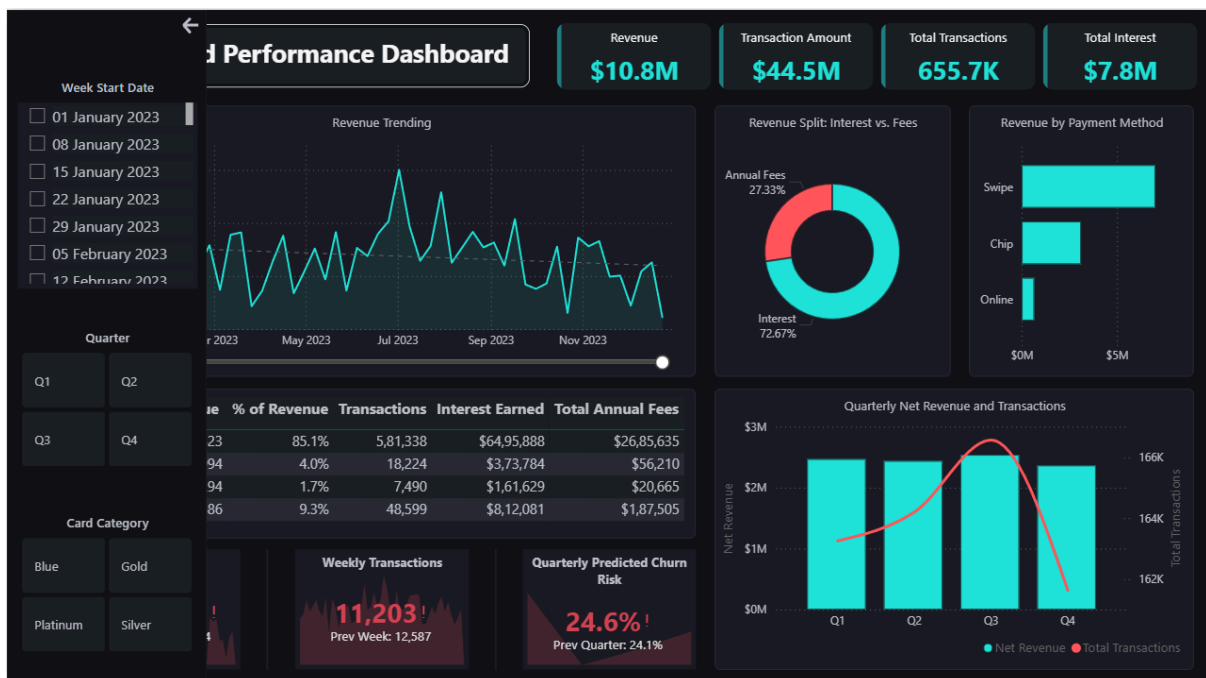

Figure 2: Executive Dashboard (With Slicer Panel Expanded)

A **collapsible slicer panel** enables filtering by time periods and card types while preserving canvas space. Additional tooltips provide expanded context including average utilisation, total customers, and average transaction value for the selected period.
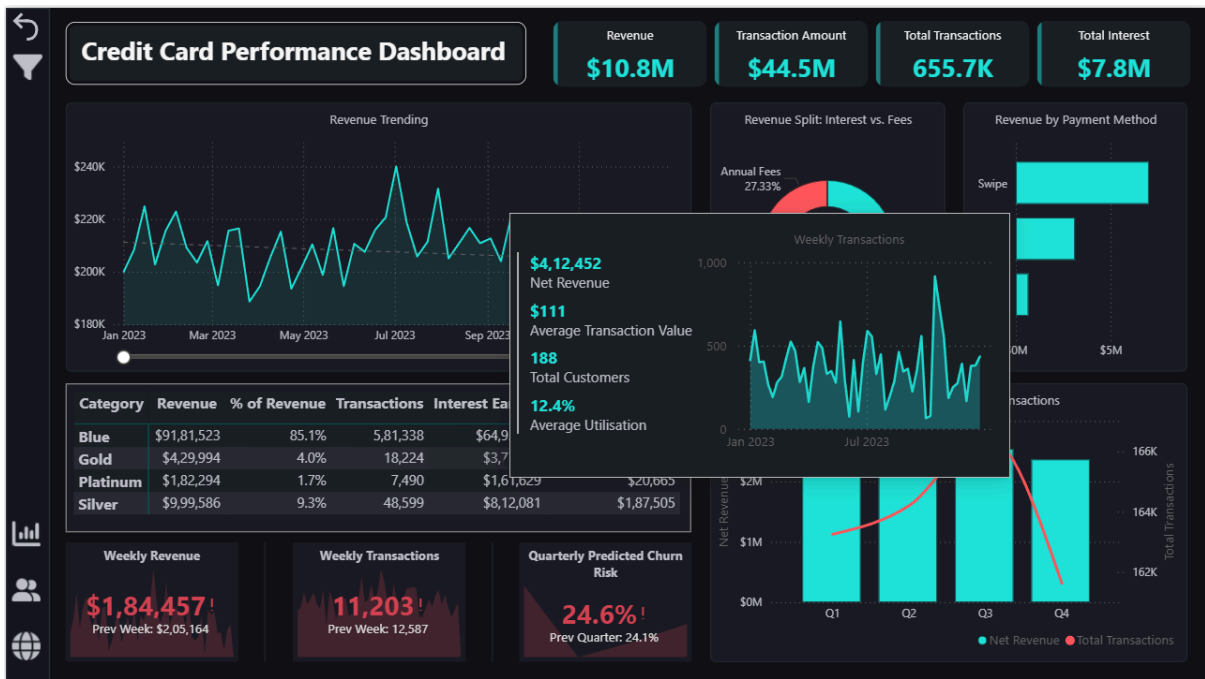

Figure 3: Custom Tooltip Snapshot

A **custom tooltip** is used for the Card Category Matrix. Hovering over the visual reveals a tooltip containing Net Revenue, Average Transaction Value, Total Customers and Average Utilisation for the selected week, together with a small trend chart. This design surfaces rich context without occupying permanent space on the canvas.

Customer Insights Dashboard

The Customer Insights Dashboard shifts focus from the portfolio level to individual customer behavior. The page includes demographic and behavioral segmentation to understand where revenue is generated and how customer characteristics relate to spending and engagement levels.

Revenue contribution is analyzed across job types and income tiers. Gender distinctions are represented through color coding, allowing comparison within each category. A line graph tracks revenue per customer over time and can be switched to other key behavioral metrics such as Customer Acquisition Cost (CAC) per customer, satisfaction score, and utilisation using a field parameter toggle.
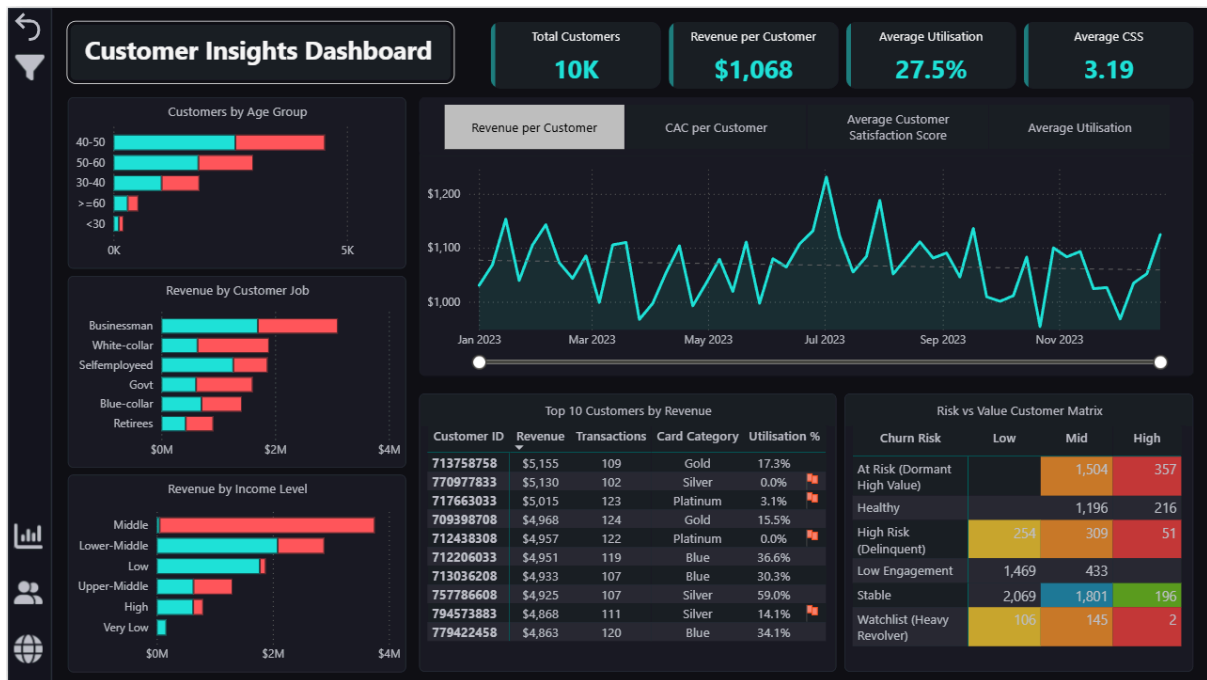
Figure 4: Customer Insights Dashboard (Default View)

The table highlights top customers by revenue and displays utilisation-based icons for potential financial stress or inactivity. A risk-versus-value heatmap shows how customers are distributed across profitability tiers and churn-risk classifications. This matrix helps identify priority action segments, such as high-value customers at elevated risk.
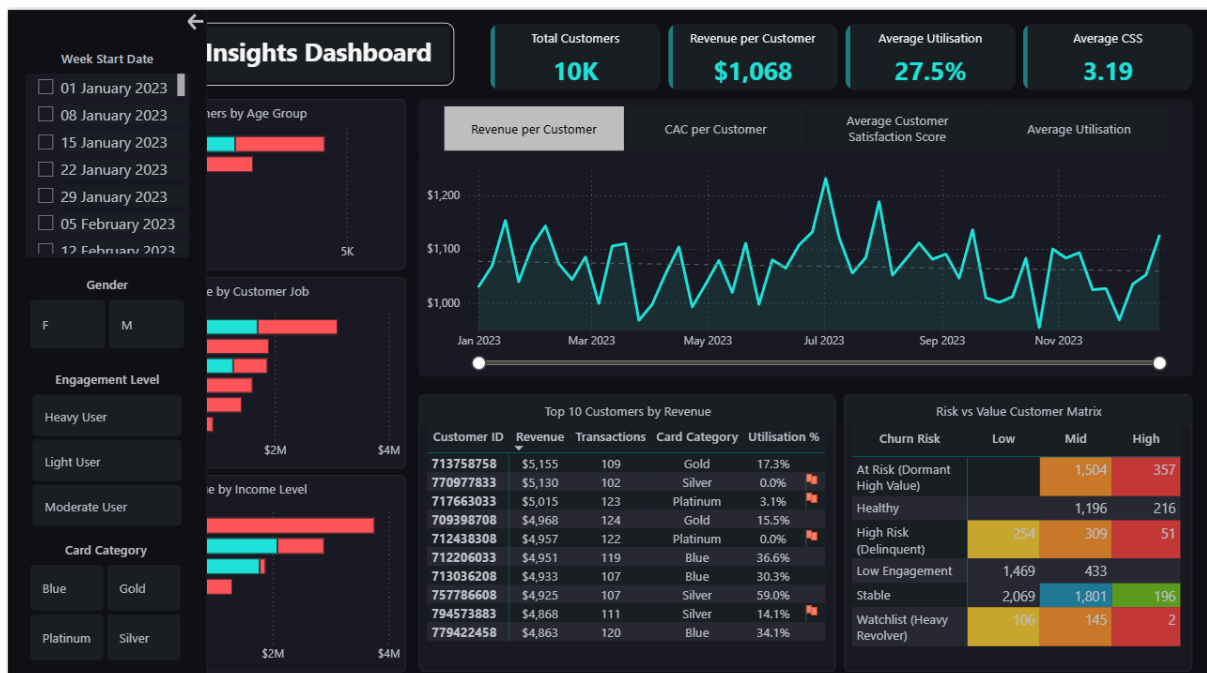

Figure 5: Customer Insights Dashboard (With Slicer Panel Expanded)

A collapsible slicer panel provides filtering by demographic characteristics, engagement levels, and card category to support targeted analysis.

Geographic View

The Map View visualizes geographic concentration of customers across U.S. states. Bubble sizing represents total customers,

A state slicer supports focused geographic analysis. Tooltips include state name, total customers, revenue contribution, utilisation behavior, and average satisfaction score, helping identify regional customer performance differences.

This page provides insight into geographic clusters with high contribution, emerging risk, or engagement opportunity.
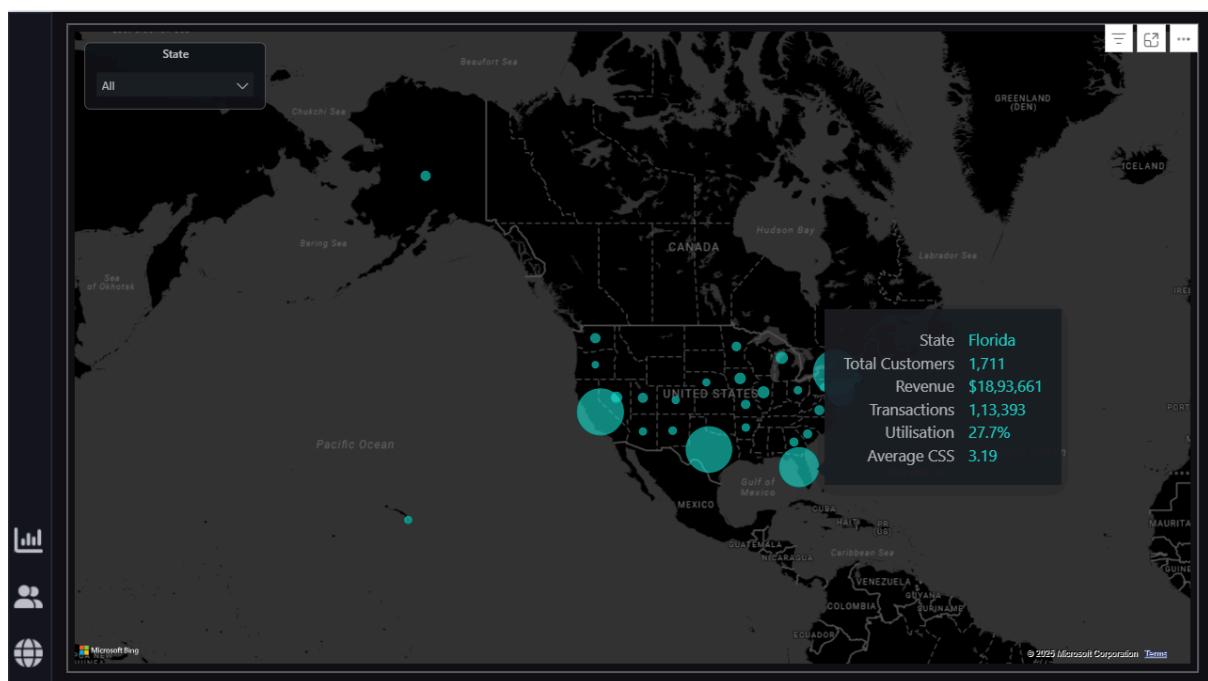

Figure 6: Geographic View

Actionable Insights

- **Blue cards represent the core of portfolio performance, generating 85% of total revenue ($9.18M)** with the highest transaction volume and fee contribution. This heavy concentration suggests strong market fit, but also a dependency risk. Expanding benefits or targeted campaigns for Gold and Platinum tiers could help diversify revenue sources and improve product balance.

- **Customer satisfaction improved significantly over the year, rising from around 2.1 in early January to consistently above 4.1 from July onward.** This upward shift suggests that customers experienced a noticeable improvement in service, product value, or card benefits during the mid-year period.

- **Business owners and self-employed customers generate the highest revenue, with female business users alone contributing ~$1.7M.** This suggests the presence of a highly engaged entrepreneurial segment.

- **Weekly revenue remains broadly stable with short-term fluctuations, typically ranging between ~$188K and ~$240K throughout the year.** While revenue does not show dramatic volatility, some recurring drops occur after high weeks.

- **A large portion of customers fall into passive or low-value behavioral segments, with Stable (4,066 customers) and Low Engagement (1,902) being the most populated categories.** While stable users aren't at immediate churn risk, low-engagement groups represent lost revenue potential.

- **A meaningful segment of profitable customers fall into risk categories, including 357 High-Value users labeled "At Risk (Dormant High Value)."** These customers represent the highest priority for retention, win-back offers or personalized outreach may help prevent high-value attrition.

- **Heavy revolvers are relatively rare, with only 2 high-value users classified under the "Watchlist (Heavy Revolver)" category.** While small in volume, this group can pose credit risk. Monitoring utilization trends and delinquency signals may help prevent loss exposure.

- **California, Texas, and New York clearly lead the portfolio, each generating roughly $2.47M–$2.49M in revenue and maintaining high customer volumes.** These three states form the core of the portfolio footprint and show similar utilization patterns (~27-28%) and satisfaction scores (~3.18-3.20), suggesting consistent customer behavior across high-volume regions.

- **Smaller states such as Nebraska (37.6% utilization) and Oregon (45.7%) show unusually high utilization despite low customer count.** While the sample size is small, these pockets may represent early product-market traction and could be explored for expansion through localized acquisition campaigns.

Technical Appendix - Some Key Measures & Calculated Columns (with DAX)

```
Total Customers =
COALESCE(DISTINCTCOUNT('ccdb customer'[Client_Num]), 0)
```

```
Total Revenue =
SUM('ccdb credit_card'[Annual_Fees]) + SUM('ccdb
credit_card'[Interest_Earned])
```

```
Churn Risk =
VAR Util = 'ccdb credit_card'[Avg_Utilization_Ratio]
VAR Delinq = 'ccdb credit_card'[Delinquent_Acc]
VAR Rev = [Revenue per Customer]
RETURN
SWITCH(
TRUE(),

-- 1) High Credit & Churn Risk
Delinq > 0, "High Risk (Delinquent)",

-- 2) High Value but LOW usage → True churn warning
Util < 0.10 && Rev > MEDIANX(ALL('ccdb credit_card'),[Revenue per
Customer]),
"At Risk (Dormant High Value)",

-- 3) Over-leveraged but not delinquent yet
Util > 0.85,
"Watchlist (Heavy Revolver)",

-- 4) Low usage + low revenue
Util < 0.10 && Rev <= MEDIANX(ALL('ccdb credit_card'),[Revenue per
Customer]),
"Low Engagement",

-- 5) Good revenue + medium utilisation → healthy
Util >= 0.20 && Util <= 0.60 && Rev > MEDIANX(ALL('ccdb
credit_card'),[Revenue per Customer]),
"Healthy",

-- 6) Everything else
"Stable"
)
```

```
Previous Week Revenue :=
CALCULATE(
    [Total Revenue],
    DATEADD(Calender_Table[Week_Start_Date], -7, DAY)
)
```

```
Revenue (Rolling 4 Week Avg) :=
AVERAGEX(
    DATESINPERIOD(
        Calender_Table[Week_Start_Date],
        MAX(Calender_Table[Week_Start_Date]),
        -28,
        DAY
    ),
    [Total Revenue]
)
```

```
Churn percent by Category :=
DIVIDE(
    CALCULATE(
        [Total Customers],
        'ccdb credit_card'[Churn Risk] IN {
            "High Risk (Delinquent)",
            "At Risk (Dormant High Value)"
        }
    ),
    [Total Customers]
)
```