



Title: Customer Churn Analysis Using Power BI

Business Intelligence Case Study: Customer Churn Analysis

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Introduction

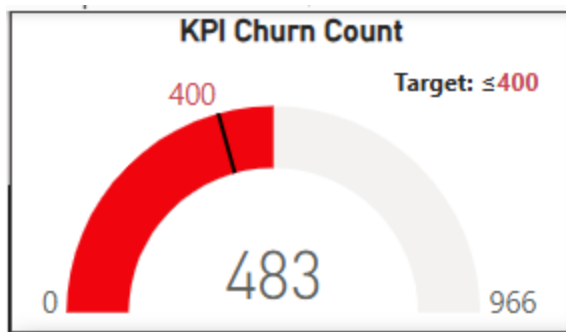
Customer churn defined as the rate at which customers stop doing business with a service provider is a critical performance indicator in telecom, finance, and SaaS industries. Understanding churn patterns and their influencing factors is essential for building customer retention strategies. This Power BI report aims to analyze customer churn data from 2020 to 2025 using visual analytics and DAX measures. The dashboard integrates key visuals such as KPI cards, bar charts, line plots, scatter plots, slicers, and a date table relationship to gain actionable insights into churn behavior, client distribution, service interaction impact, and billing patterns.

Analysis

1. Four Different Plots

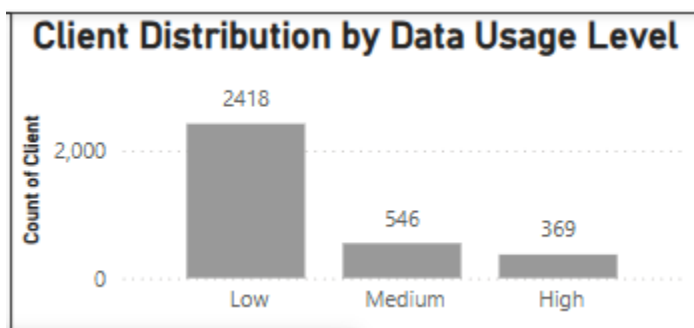
The report uses five distinct visualizations to represent churn-related metrics:

- **KPI Gauge Chart – Churn Count:**



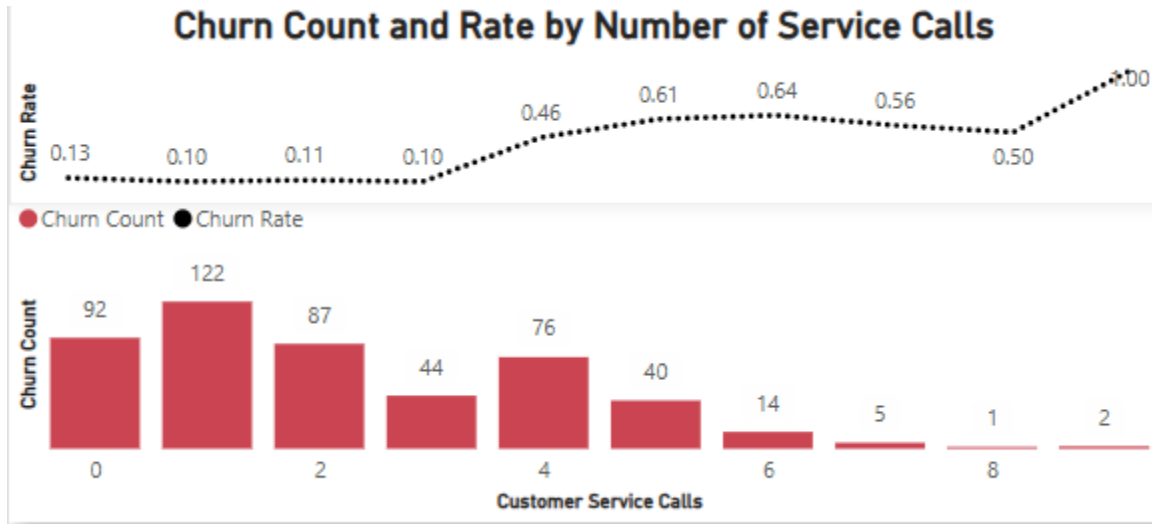
Displays total churned clients (483) out of a possible range of 966. This high value indicates significant attrition and a need for customer retention strategies.

- **Bar Chart – Client Distribution by Data Usage Level**



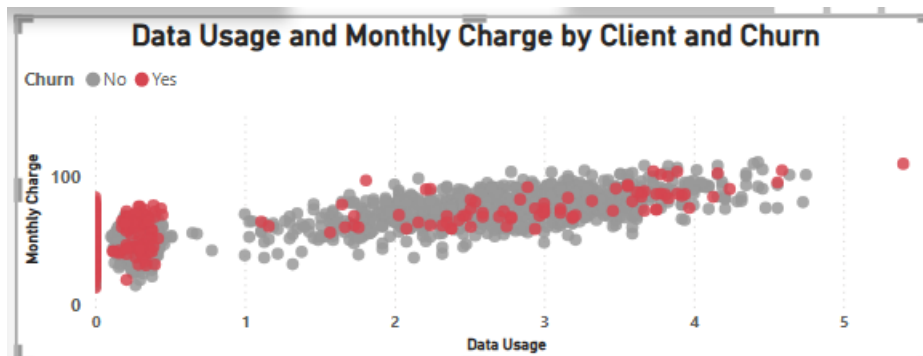
Reveals most clients fall into the "Low" usage category, indicating that low engagement with the service could correlate with higher churn likelihood.

- Combo Chart (Bar + Line) – Churn Count and Rate by Number of Service Calls



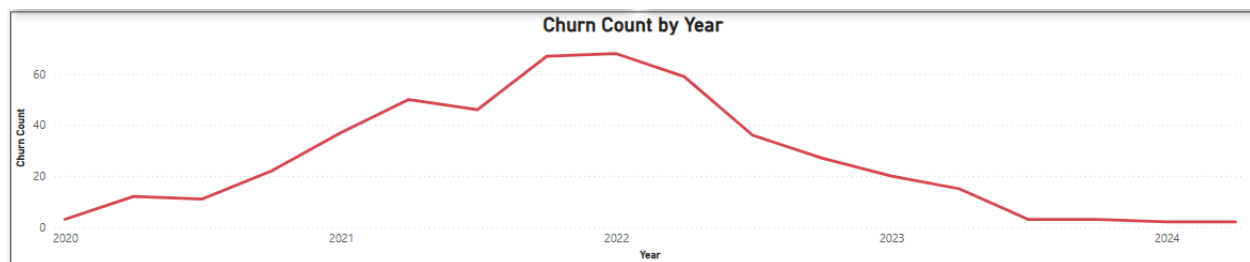
Shows that churn rate increases as the number of service calls rises. While churn count peaks at 1–2 service calls, the churn **rate** is highest for clients making 5 or more calls, suggesting dissatisfaction with service support.

- Scatter Plot – Data Usage vs Monthly Charge by Churn



Highlights the spread of churned (red) and retained (grey) clients across usage and charge. A significant portion of churned customers clusters in the lower usage and lower charge segment.

- Line Chart – Churn Count by Year



Shows an upward churn trend peaking in 2022 followed by a consistent decline. This suggests corrective strategies may have been implemented post-2022 to mitigate churn.

2. DAX Implementation

Churn Count

```
1 Churn Count = CALCULATE(COUNTROWS('Customer Churn'), 'Customer Churn'[Churn] = 1)
2
```

This measure counts how many customers churned (Churn = 1), and is used in the KPI visual and combo chart.

Churn Rate

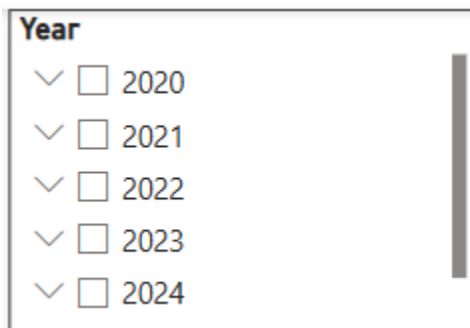
```
1 Churn Rate =
2 DIVIDE(
3     CALCULATE(COUNTROWS('Customer Churn'), 'Customer Churn'[Churn] = 1),
4     COUNTROWS('Customer Churn')
5 )
```

This computes the proportion of churned customers to the total customer base, shown in the combo chart as a line overlay.

These measures provide dynamic and accurate summaries of client attrition metrics, recalculated automatically based on filter or slicer selections.

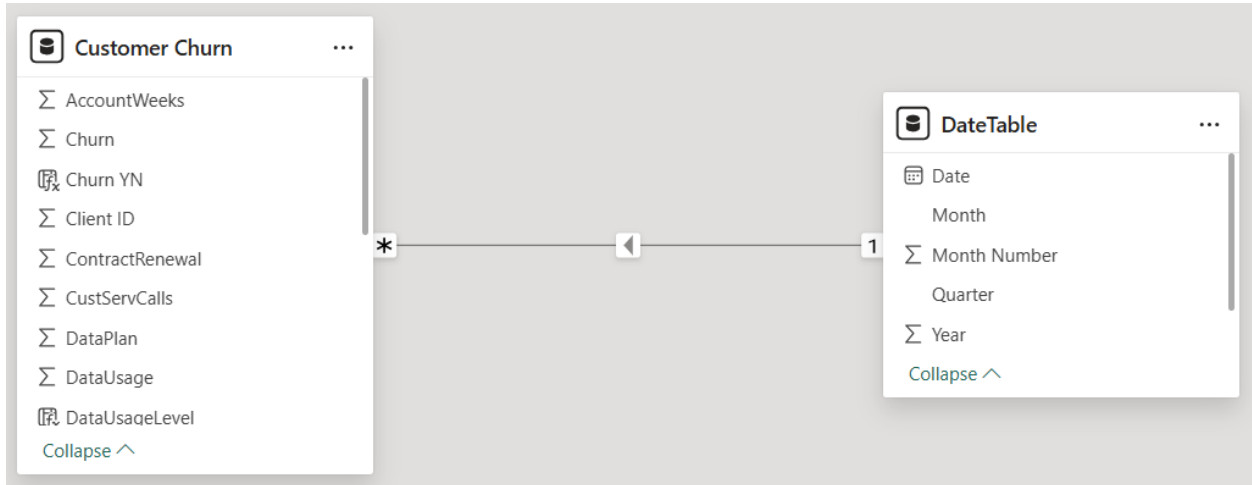
3. Slicer for Filtering

A slicer is used for filtering by Year (2020–2025). This dynamic filter allows users to isolate and examine churn behavior by specific timeframes, aiding time-series analysis.



4. Date Table and Relationship

A dedicated **DateTable** is created with fields such as Date, Month, Quarter, and Year. The screenshot confirms a valid **relationship** between the CustomerChurn table and the DateTable. This supports accurate time-based aggregation and enhances temporal analysis features (e.g., quarterly trends).



Conclusion

This Power BI analysis effectively explored customer churn patterns from 2020 to 2025, aligning with the objective of identifying key factors influencing client attrition. Through interactive visuals and DAX-based metrics, the report revealed that churn was particularly high among customers with low data usage, lower monthly charges, and those who had frequent service interactions. These insights suggest that limited engagement and potential dissatisfaction with support services are major drivers of churn.

The inclusion of a date table and slicer enhanced the temporal analysis, showing that churn rates peaked in 2022 before steadily declining, possibly due to improved customer experience initiatives. Overall, the dashboard served as a valuable decision-support tool, transforming complex churn data into actionable insights. These findings emphasize the importance of targeted customer retention strategies and the need for continuous monitoring to reduce churn and strengthen client relationships.

References

Microsoft Power BI Documentation. (n.d.). *Visualizations in Power BI*. Retrieved from <https://learn.microsoft.com/en-us/power-bi/>

Excelerator BI. (2021). *Measures vs Calculated Columns in DAX*. Retrieved from <https://exceleratorbi.com.au/>

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