Project Report: Customer Churn Analysis

This report provides a comprehensive analysis of customer churn behavior using transactional and usage data. The goal is to identify key drivers of attrition, such as service friction and usage patterns, to guide strategic retention decisions.

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1. Project Overview & Data Summary

This project analyzes customer churn by examining account length, plan types, and detailed usage metrics across different area codes.

- **Dataset Scale**: The analysis includes data from multiple states, with a focus on high-churn regions like Texas (TX).

- **Key Features**: Customer demographics (State, Area Code), Plan types (International, Voice mail), and 24-hour usage metrics (Minutes, Calls, Charges).

- **Revenue Impact**: Total company revenue is **$158,260.84**.

  - **Retained Customers**: Contribute **84%** of total revenue.

  - **Churned Customers**: Contribute **16%** of total revenue.

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2. Exploratory Data Analysis

Data preparation and cleaning were performed using Pandas and NumPy to establish baseline metrics.

Metric	Account Length	24-Hour Minutes	24-Hour Calls
Mean	100 days	581.63	300.55
Min	1	0	0

Key Engineering Steps:

- **Binning**: Created an "account length group" to identify high-risk tenure windows.

- **Cost Analysis**: Calculated "charge per minute" and "charge per call" to compare costs between churned and retained segments.

- **Stability Metrics**: Developed "uneven usage" features by calculating the absolute difference between day and night minutes.

3. Business Insights

Structured queries were used to pinpoint service friction and usage patterns that lead to churn.

Service Interaction & Support

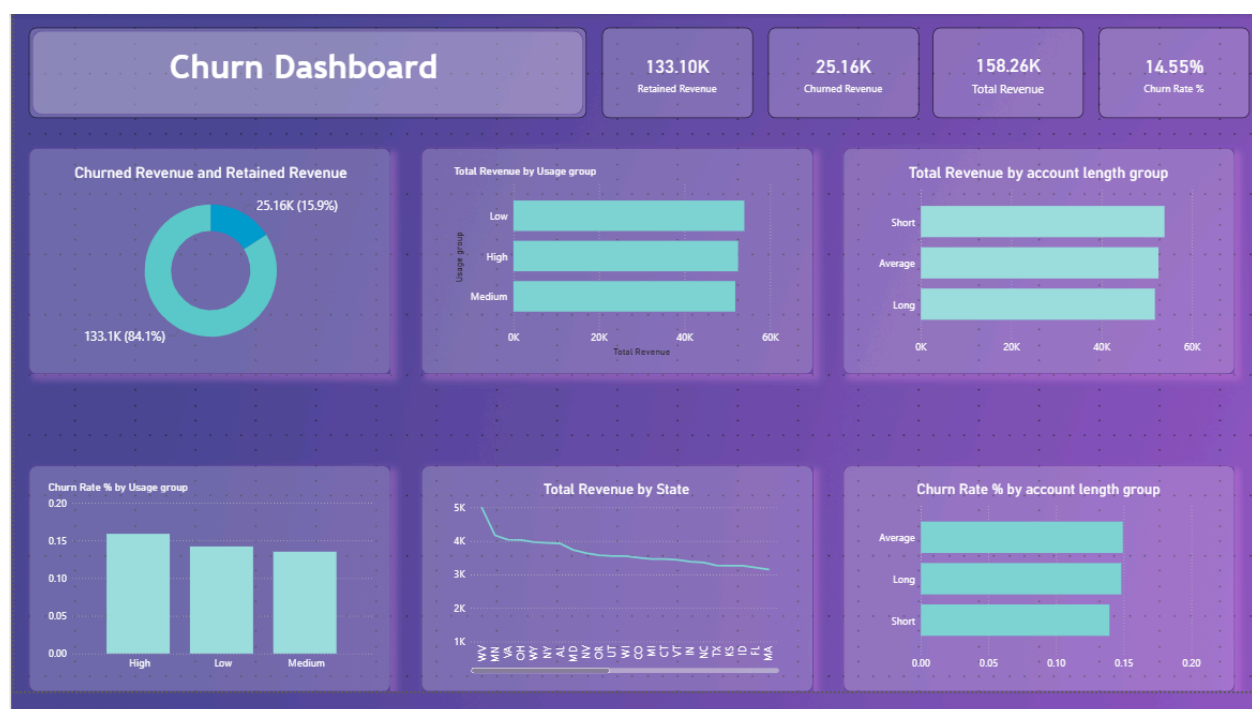There is a direct correlation between customer service friction and attrition.

- **Support Volume**: Churned customers contact support significantly more often than retained customers.

- **High-Risk Threshold**: Customers making **4 or more** service calls show a much higher likelihood of churning.

Usage Patterns & Area Code Data

Churn is more associated with **unstable usage patterns** rather than high usage volume.

Area Code	Intl. Plan Users	Voicemail Plan Users	Charge Per Call
408	58	177	$127.60
415	127	366	$252.28
510	85	190 (Area 190)	$128.00

4. PowerBI Dashboard:

5. Churn Risk Factors

- **Critical Tenure**: Customers with accounts between **84 to 118 days** are at the highest risk of churning.

- **Voicemail Plan**: Only **8.86%** of customers using the voicemail plan became churned, suggesting it may be a "sticky" feature.

- **International Usage**: Top 5% international users exhibit a churn rate of **17.78%**.

- **Cost Disparity**: Average cost per minute is higher for churned customers compared to those who are retained.

6. Strategic Recommendations

- **Proactive Support**: Identify customers reaching **3 service calls** and offer immediate resolution or incentives to prevent them from reaching the high-churn threshold of 4 calls.

- **Retention Milestones**: Launch automated retention campaigns targeting customers as they approach the **84-day** account age mark.

- **Regional Focus**: Investigate service quality and competition in **Texas (TX)**, as it shows the highest churn rates.

- **Feature Promotion**: Encourage adoption of the **Voicemail Plan**, as users of this feature show significantly lower churn rates.