

# Customer Churn Analytics Dashboard for Vertex Mobile Net

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## TELECOM CUSTOMERS CHURN ANALYSIS

Final Project in the Only Quality Data Internship Project series

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## Introduction

### Project Objective:

Customer Churning happens when a customer cancels a specific service like a data or voice plan, or value-added services.

Analysing service churn helps companies adapt offerings to customer preferences and needs.

With Vertex Mobile Net being a Telecom company and does offer services including **Telephone Services** and **Internet Services, Data Services, Television Broadcasting, Wireless Communication: Cloud Services and Networking**: it has experienced a reduction in revenue over the past few months

The manager started an initiative to make fundamental changes in customer retention strategies and business operations basing on the insights from their customer data.

For these reasons, I was tasked with analysing customer data to track customer attrition rate so that we can help adjust the company policies and thus keep the customers happy as they use the company's telecom services.

**Scope:** This dashboard will give insights into the customer attritions rates, below are the areas of focus in this dashboard;

- ✓ Customer Status.
- ✓ Demographics.
- ✓ Contract information.
- ✓ Subscription types and Charges.

## Data Preparation

**Data Source:** I used the "Vertex Mobile Net. Data" dataset which contains information about customers of VERTEX Mobile Net, here is a summary of the columns in the dataset:

- **Customer ID:** Unique identifier for each customer.
- **Churn Label:** Indicates whether the customer has churned (Yes/No).
- **Account Length (in months):** Duration of the customer's account in months.
- **Local Calls:** Number of local calls made by the customer.
- **Local Mins:** Total minutes of local calls.
- **Intl Calls:** Number of international calls made by the customer.
- **Intl Mins:** Total minutes of international calls.
- **Intl Active:** Indicates if the international service is active (Yes/No).
- **Intl Plan:** Subscription status for an international plan (yes/no).
- **Extra International Charges:** Additional charges for international services.
- **Local Active:** Indicates if the local service is active (Yes/No).
- **Local Plan:** Subscription status for a local plan (yes/no).
- **Extra Local Charges:** Additional charges for local services.
- **Long Distance Active:** Indicates if long-distance service is active (Yes/No).
- **Long Distance Plan:** Subscription status for a long-distance plan (yes/no).
- **Extra Long-Distance Charges:** Additional charges for long-distance services.
- **Senior Citizen:** Indicates if the customer is a senior citizen (Yes/No).
- **Age Group:** Age group category of the customer.
- **Data Plan:** Subscription status for a data plan (Yes/No).
- **Extra Data Charges:** Additional charges for data services.
- **Streaming Plan:** Subscription status for a streaming plan (Yes/No).
- **Extra Streaming Charges:** Additional charges for streaming services.
- **Senior:** Indicates if the customer is a senior (Yes/No).
- **Group:** Indicates if the customer is part of a group (Yes/No).
- **Number of Customers in Group:** Number of customers in the group.
- **Device Protection & Online Backup:** Indicates if the customer has device protection and online backup services (Yes/No).
- **Contract Type:** Type of contract the customer has (e.g., Month-to-Month, One Year).
- **Payment Method:** Method used by the customer to make payments (e.g., Direct Debit, Paper Check).
- **Monthly Charge:** The monthly charge for the customer's account.
- **Total Charges:** Total charges incurred by the customer.
- **Churn Category:** Category of churn, if applicable.
- **Churn Reason:** Reason for churn, if applicable.

### Data Cleaning:

Here is a brief procedure I followed to clean the data;

Firstly, I used the “column profile” option under the “VIEW” tab to check the quality of my columns, whether there are any duplicates in my values

I then removed rows which were completely empty from the dataset

### Data Preparation

I went on to change data type of “**Local Mins**” and “**Intl Mins**” columns to number format because I was dealing with number of minutes in this case

## Dashboard Design and Features

### Overview

In this dashboard, I will be presenting visuals which show how the customer churn rate and churned customer numbers vary with other factors, which fall under Customer Demographics, Contract information, Subscription types and Charges.

**Here is the overview of the various visuals on the dashboard;**

1. **Slicers:** the two slicers filter data depending on customers' gender and the customer contract, which can be either Month to Month, One Year and Two Years.
2. **Customer Churn Rate Over Time:**  
**Chart Type:** KPI Indicator  
**Description:** Shows the overall churn rate of 26.86% and a trend line indicating changes in churn rate by month.
3. **Churn by State:**  
**Chart Type:** Bar Chart  
**Description:** Highlights the number of churned customers and churn rate for various states, with CA having the highest churn rate.
4. **Churn by Account Length:**  
**Chart Type:** Line Chart.  
**Description:** Depicts the relationship between account length (in months) and churn rate, showing a decreasing trend as account length increases.
5. **Churn by Average Monthly GB Download:**  
**Chart Type:** Bar Chart.  
**Description:** Demonstrates how different data usage groups (e.g., 11GB-20GB) correlate with churn rates.
6. **Churn by Gender and Contract Type:**  
**Chart Type:** Clustered Bar Chart.  
**Description:** Compares churn rates across gender and contract types, with females and month-to-month contracts having higher churn rates.

7. **Distribution by Contract Type:**

**Chart Type:** Pie Chart

**Description:** This pie chart shows the distribution of customers by contract type, indicating that the majority of customers have month-to-month contracts, followed by one-year and two-year contracts.

8. **Churn by Age:**

**Chart Type:** Combined Bar and Line Chart

**Description:** Illustrates churn rates across different age groups, with higher churn rates in younger age brackets.

9. **Churn Groups:**

**Chart Type:** Combined Bar and Line Chart

**Description:** Line chart and bar chart showing the proportion of customers who churned versus those who didn't, along with average monthly charges and churn rate.

10. **Churn Category:**

**Chart Type:** Pie Chart

**Description:** A pie chart depicting the proportion of customers churning due to different reasons, such as competitor influence, dissatisfaction, and price.

11. **By Churn Reason:**

**Chart Type:** Horizontal Bar

**Chart Description:** A horizontal bar chart displaying the count of churned customers categorized by their reasons for churning, with competitor-related reasons being the most frequent.

12. **By Unlimited Data Plan:**

**Chart Type:** Combined Bar and Line Chart

**Description:** A combined bar and line chart showing the number of churned customers and the churn rate, categorized by whether they had an unlimited data plan or not.

13. **By Age:**

**Chart Type:** Combined Bar and Line Chart

**Description:** A combined bar and line chart presenting the number of churned customers and the churn rate across different age groups, with adults aged 30-64 showing the highest churn rate.

**14. By Customer Service Calls:**

**Chart Type:** Line Chart

**Description:** A line chart indicating the churn rate based on the number of customer service calls made, showing a clear increase in churn rate with more service calls.

**15. Count of Customer Service Calls by Churn Label:**

**Chart Type:** Line Chart

**Description:** A line chart depicting the count of customer service calls made by customers who have churned, highlighting an increase in the number of calls before churn



## Key Insights:

### 1. Overall Churn Rate Analysis:

- **Analysis:** The overall churn rate is 26.86%, indicating that about a quarter of the customer base has left the service.
- **Trends:** This high churn rate suggests a significant issue with customer retention.
- **Implications:** The company needs to investigate the causes of churn and implement strategies to improve customer satisfaction and retention.

### 2. State-wise Churn Rate:

- **Analysis:** California (CA) has the highest churn rate among the states analyzed.
- **Trends:** Certain states exhibit higher churn rates, indicating potential regional issues.
- **Implications:** Targeted strategies should be developed for states with high churn rates, possibly including localized promotions or improvements in service quality.

### 3. Churn by Account Length:

- **Analysis:** Churn rates decrease as the length of the account increases.
- **Trends:** Longer-tenured customers are less likely to churn, showing loyalty builds over time.
- **Implications:** Initiatives to engage customers early and extend account tenure could help reduce churn rates.

### 4. Churn by Average Monthly GB Download:

- **Analysis:** Higher data usage groups tend to have higher churn rates.
- **Trends:** Customers with higher data consumption are more likely to leave, potentially due to dissatisfaction with service value.
- **Implications:** Reviewing data plan offerings and ensuring high-usage customers feel they are receiving good value could mitigate this churn.

### 5. Churn by Gender and Contract Type:

- **Analysis:** Females and customers with month-to-month contracts show higher churn rates.
- **Trends:** Short-term contracts are less stable, and there may be gender-specific factors affecting churn.
- **Implications:** The company should consider developing more attractive long-term contract options and address any gender-specific concerns.

### 6. Churn by Age:

- **Analysis:** Younger age groups exhibit higher churn rates.
- **Trends:** Younger customers are less loyal and more likely to switch providers.
- **Implications:** Tailored marketing strategies and service offerings aimed at younger demographics could help improve retention in these age groups.

### 7. Churn Groups (Monthly Charges):

- **Analysis:** Customers who have churned tend to have higher average monthly charges.
- **Trends:** Higher spending customers are leaving, which could indicate dissatisfaction with the perceived value.
- **Implications:** Ensuring high-value customers feel they are getting adequate value for their money is critical, possibly through enhanced services or loyalty rewards.

#### 8. Churn Reasons Analysis:

- **Analysis:** The main reasons for customer churn are competitor influence and dissatisfaction with support.
- **Trends:** Competitor-related churn is the most significant, suggesting a strong influence of market competition.
- **Implications:** The organization needs to enhance competitive strategies and improve support services to retain customers.

#### 9. Unlimited Data Plan Impact:

- **Analysis:** Customers with unlimited data plans have a lower churn rate compared to those without.
- **Trends:** There is a noticeable reduction in churn among customers with unlimited data plans.
- **Implications:** Promoting and expanding unlimited data plan offerings could effectively reduce churn rates.

#### 10. Age Group Churn Rates:

- **Analysis:** Adults aged 30-64 exhibit the highest churn rate, whereas seniors (65 & above) show the lowest.
- **Trends:** Middle-aged adults are more likely to churn compared to other age groups.
- **Implications:** Tailoring retention strategies specifically for the 30-64 age group could help in lowering overall churn rates.

#### 11. Customer Service Calls Influence:

- **Analysis:** There is a direct correlation between the number of customer service calls and the churn rate.
- **Trends:** An increase in customer service calls leads to a higher likelihood of churn.
- **Implications:** Improving the efficiency and effectiveness of customer service could help in reducing churn associated with high call volumes.

#### 12. Overall Churn Rate:

- **Analysis:** The overall churn rate stands at 26.86%, with a significant portion of customers churning due to dissatisfaction and competitor influence.
- **Trends:** High churn rates indicate underlying issues in customer satisfaction and competitive positioning.
- **Implications:** Addressing key dissatisfaction factors and strengthening competitive offerings are crucial to reducing the overall churn rate.

## Recommendations

1. **Enhance Customer Retention Programs:**
  - **Strategy:** Implement targeted retention programs focusing on high churn states like California and regions with elevated churn rates.
  - **Improvements:** Collect detailed regional data on customer preferences and pain points to tailor retention strategies more effectively.
2. **Promote Long-term Contracts:**
  - **Strategy:** Develop and market attractive long-term contract options with incentives to encourage month-to-month customers to switch.
  - **Improvements:** Track customer feedback on contract preferences to refine offerings and increase conversion rates from short-term to long-term contracts.
3. **Improve Service Value for High Usage Customers:**
  - **Strategy:** Introduce value-added services and competitive pricing for high data usage customers to enhance their perceived value.
  - **Improvements:** Monitor high-usage patterns and satisfaction levels to adjust data plans and services dynamically.
4. **Address Gender-specific Churn Factors:**
  - **Strategy:** Conduct targeted surveys to understand and address specific reasons for higher churn rates among female customers.
  - **Improvements:** Use gender-specific data to create more inclusive and appealing marketing campaigns and service packages.
5. **Engage Younger Customers:**
  - **Strategy:** Develop engaging, tech-savvy marketing campaigns and loyalty programs tailored to younger demographics to boost their retention.
  - **Improvements:** Collect detailed demographic data to better understand young customers' preferences and adjust offerings accordingly.
6. **Value Perception for High-Spending Customers:**
  - **Strategy:** Enhance loyalty programs and provide exclusive benefits to high-spending customers to improve their value perception.
  - **Improvements:** Continuously analyze spending patterns and satisfaction levels to keep high-value customers engaged and satisfied.
7. **Localized Service Enhancements:**
  - **Strategy:** Implement localized improvements in service quality and customer support in regions with higher churn rates.
  - **Improvements:** Gather more granular, location-based customer feedback to identify specific service issues and resolve them effectively.
8. **Enhance Competitive Strategies:**
  - **Strategies:** Develop new competitive pricing plans and unique service features to differentiate Vertex Mobile from competitors.
  - **Improvements:** Implement a competitor analysis system to continuously monitor and respond to market trends.

#### 9. **Improve Customer Support:**

- **Strategies:** Invest in advanced training for customer support representatives and implement a robust feedback system to identify and address customer pain points.
- **Improvements:** Collect detailed data on customer service interactions to analyze and improve service quality continuously.

#### 10. **Promote Unlimited Data Plans:**

- **Strategies:** Launch targeted marketing campaigns highlighting the benefits of unlimited data plans to attract and retain customers.
- **Improvements:** Track customer usage patterns and satisfaction levels with unlimited data plans to refine and enhance these offerings.

#### 11. **Target Middle-Aged Adults:**

- **Strategies:** Create personalized retention programs and offers tailored to the needs and preferences of the 30-64 age group.
- **Improvements:** Gather more granular demographic data to better understand and predict the behaviors of different age groups.

#### 12. **Optimize Customer Service Efficiency:**

- **Strategies:** Implement automated solutions such as chatbots and AI-driven customer service to handle routine inquiries and reduce call volume.
- **Improvements:** Collect and analyze data on the performance and customer satisfaction of these automated solutions to continually improve their effectiveness.

#### 13. **Address Overall Churn Factors:**

- **Strategies:** Conduct regular surveys and focus groups to identify and address the root causes of customer dissatisfaction.
- **Improvements:** Enhance data collection methods to capture more detailed insights into the reasons behind customer churn.

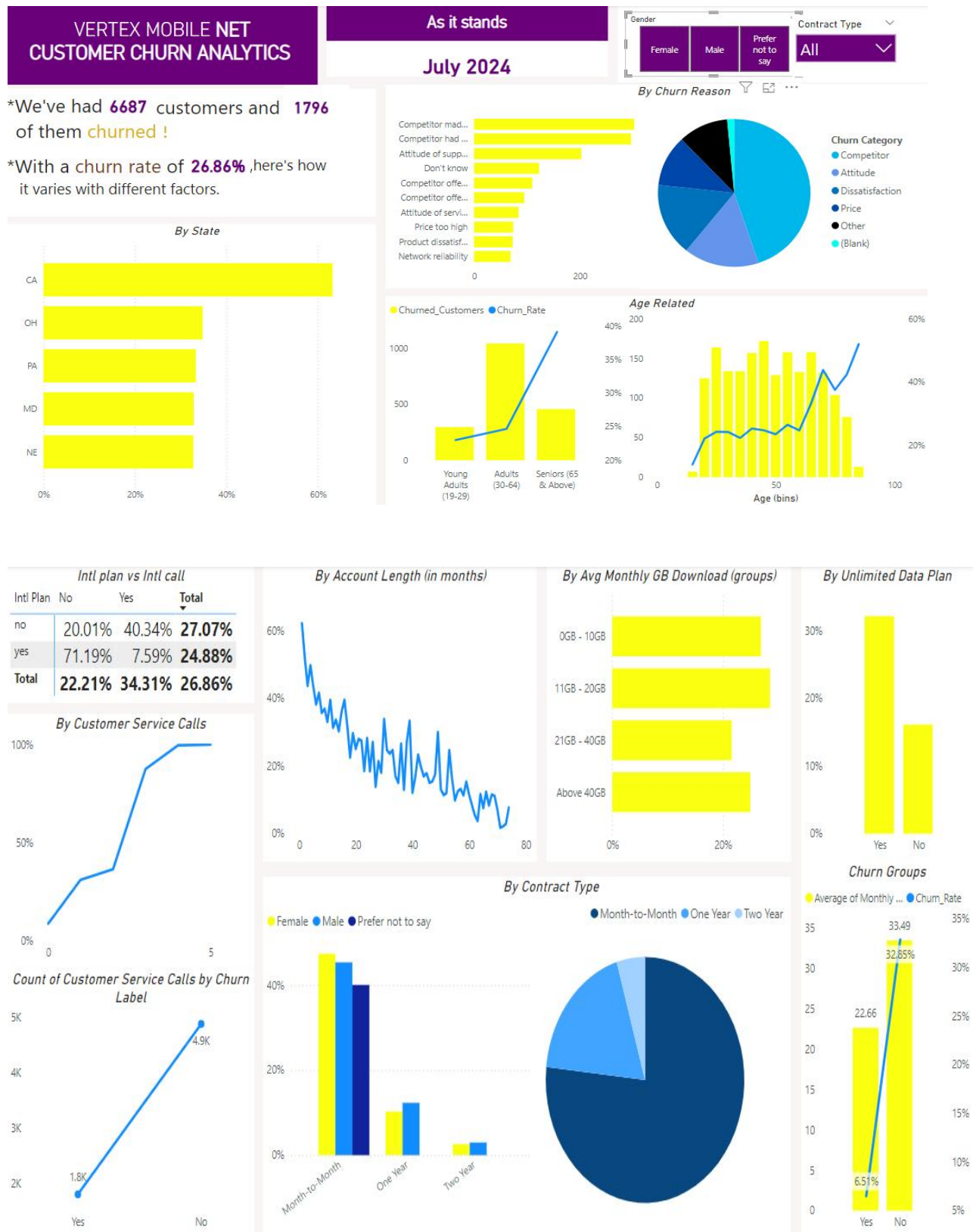
## Conclusion

- **Summary:** The dashboard effectively highlights critical insights into customer churn rates, identifying key areas such as contract type, data usage, and demographics that influence customer retention.
- The dashboard provides valuable insights into customer churn reasons, the impact of unlimited data plans, age group churn rates, and the influence of customer service calls, helping Vertex Mobile identify key areas for improvement and strategic action

## Future Work

1. Conduct in-depth analysis of the impact of promotional campaigns on customer retention.
2. Explore the correlation between customer service interactions and churn rates to enhance support strategies.
3. Investigate the effectiveness of personalized offers and communications in reducing churn among high-risk segments.
4. Customer Satisfaction Analysis: Further research on the specific aspects of service that lead to customer dissatisfaction and targeted improvements.
5. Predictive Churn Modeling: Develop predictive models to proactively identify customers at risk of churning based on their behavior and interaction patterns.
6. Competitive Analysis Enhancement: Continuously monitor and analyze competitor strategies to refine Vertex Mobile's market positioning and offerings.

## APPENDIX



#### Intl plan vs Intl call

Intl Plan	No	Yes	Total
no	20.01%	40.34%	27.07%
yes	71.19%	7.59%	24.88%
<b>Total</b>	<b>22.21%</b>	<b>34.31%</b>	<b>26.86%</b>

#### By Account Length (in months)

#### By Avg Monthly GB Download (groups)

Download Group	Churn Rate (%)
0GB - 10GB	~25%
11GB - 20GB	~22%
21GB - 40GB	~18%
Above 40GB	~15%

#### By Unlimited Data Plan

Unlimited Data Plan	Churn Rate (%)
Yes	~15%
No	~30%

#### By Customer Service Calls

#### Count of Customer Service Calls by Churn Label

Churn Label	Count
Yes	1.8K
No	4.9K

#### By Contract Type

Contract Type	Female (%)	Male (%)	Prefer not to say (%)
Month-to-Month	~45%	~42%	~40%
One Year	~10%	~12%	~10%
Two Year	~2%	~3%	~2%

#### Churn Groups

Group	Average of Monthly Churn Rate (%)	Churn Rate (%)
Yes	22.66%	6.51%
No	32.85%	33.49%