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**Representation and Reporting: Churn Data**

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In this paper, I will use the provided data set containing cleaned customer data from a fictional telecommunications company. To supplement the provided data, I have included an additional data set that is similar to the one provided to serve as a competitor to the first company. The primary purpose is to create visualizations to highlight differences between the two companies and provide insights to leadership on how to retain customers.

# Part I: Interactive Data Dashboard

## A. Interactive Data Dashboard

Please see included tableau file.

## A1. Data Sets

Please see the included data csv files.

## A2. Installation Instructions

I installed the dashboard by first connecting to the data sets. Let us call the provided data set Data Set 1 and the additional data set Data Set 2. I created my first sheet using the Latitude and Longitude values from Data Set 1, created a calculated field called Churn Rate, and added it to the color filter. I created a Pie Chart worksheet of customer churn and a Bar Chart worksheet of customer churn by Area (Rural, Suburban, Urban). I added both of these, along with Churn Rate, to the Tooltip in the first worksheet. I created four copies of this worksheet to highlight areas of the map that were difficult to view – Alaska, Hawaii, Puerto Rico, and Washington DC. I then created a Heatmap of states based the sum of customers who had Churned (Yes = 1 and No = 0). All of these were added to a Dashboard called Customer Churn by Location and can be used as filters for each other.

I then created several paired worksheets using data from both data sets. Tenure vs Monthly Charge for both Data Set 1 and Data Set 2 were created by taking the fields of the same name to create a scatterplot which I colored by Churn. I noticed that the scale for the y-axis (Monthly Charge) were dramatically different, so I changed them to have a consistent, fixed scale. I created copies of these sheets and colored them by another custom calculated field called Streaming Services (categories: Both, TV Only, Movies Only, Neither, No Internet Service). I added a State filter for the worksheets that came from Data Set 1 and added all of these to the dashboard called Cost Comparison. The individual worksheets can serve as filters for each other.

Finally, I created a series of bar charts all colored by Churn (Yes/No) for both Data Set 1 and Data Set 2. These included Contract, Streaming Services (custom calculated field), Internet Service, and Phone Service. I added all of these to the Service Comparison dashboard with a State filter for worksheets from Data Set 1 and made it so all worksheets could serve as filters for each other.

All three dashboards were added to a Story called Presentation.

## A3. Navigation Instructions

With the Tableau workbook opened, confirm the Presentation tab at the bottom is selected, then press the Presentation Mode button in the ribbon at the top. (See Figure 1).

Map

Description automatically generated

***Figure 1***

In Presentation Mode, use the arrows at the top to navigate between dashboard pages. (See Figure 2)

Map

Description automatically generated

***Figure 2***

**Customer Churn by Location Dashboard**

Hover your cursor over different states to get a peek at some demographic information. (See Figure 3).

Chart, treemap chart

Description automatically generated

***Figure 3***

Click on the Heatmap on the right side to see information about a specific state. You can select multiple states by pressing “CTRL” while clicking the states you’re interested in. (See Figure 4)

Map

Description automatically generated

***Figure 4***

**Cost Comparison Dashboard**

Chart

Description automatically generatedYou can click on values in the legends one at a time or select multiple by pressing “CTRL” while clicking the ones you want. Click in an empty space on the screen to clear your selections. (See Figure 5)

***Figure 5***

Graphical user interface, application

Description automatically generatedTo filter by State, click the drop down and uncheck “All,” check the states you want to view, and click “Apply”. (See Figure 6).

***Figure 6***

**Service Comparison Dashboard**

You can select a single component of a bar chart such as “No” in Month-to-month contracts or all users with DSL internet service (See Figure 7).

Chart

Description automatically generatedTimeline

Description automatically generated

***Figure 7***

You can also multiselect by pressing the “CTRL” button while clicking on the categories you want such as All DSL users with One Phone Line who have not churned. (See Figure 8)

Graphical user interface

Description automatically generated with medium confidence

***Figure 8***

# Part II: Storytelling with Data

## B. Panapto Storytelling with Data

Please see attached Panapto video.

# Part III: Reflection Paper

## C1. Dashboard Alignment

There are three dashboards to highlight Key Performance Indicators (KPIs). The first dashboard provides an overview of customer churn by location (State and Area). This, accompanied by the information in the other dashboards, will be useful to the Panel of Regional Vice Presidents as they will be able to search for information in their own areas. Two of the Principal Components identified in an earlier phase of data analysis are Tenure and Monthly Charge. The second dashboard displays scatterplots of these Principal Components (colored by both Churn and Streaming Services) and offers filters by Churn, Streaming Services, and State. This dashboard provides insights into how much customers are spending for their services and how long they have been with their current service provider. The third dashboard provides a more in-depth view of customer churn by contract and services. The final two dashboards will be of particular interest to the Senior Vice President for Customer Experience (SVP) and the Executive Vice President of Sales (EVP).

## C2. Additional Data Insight.

The additional data set contains many of the same fields as the provided data set. The ability to compare our company to a competitor can highlight the strengths and weaknesses of each. In turn, the analyis can guide future decisions for our company – our advertising team can promote the areas where we excel, and our sales and customer experience teams can make improvements to areas we fall short of our competitor. All fields previously identitfied are available in both data sets with the exception of State – which the additional data set does not have. While we are unable to compare state-to-state, the overall view of the competitor’s performance still provides valuable insight.

## C3. Decision-Making Support

The SVP can use the Services Comparison Dashboard to analyze which products are used by customers that stay with our service. For the purposes of retention, the Contract analysis should be of particular interest as the percentage of churned customers is much lower for the One-Year and Two-Year categories than the Month-to-month.

The Cost Comparison dashboard should provide some insights for the EVP – an obvious highlight being that the highest monthly charges for our competitor matches with the lowest monthly charges for our customers. The main question to ask because of this observation is “Are the services we provide significantly higher quality?” If so, can we create and advertising campaign to communicate the ways in which our products are superior to our competitors? If our service is of comparable quality, can we justify the higher cost or are there ways to bring down the cost to our customers to retain them?

The state filter applied to any of the dashboards would provide valuable information to the Regional VPs. Filtering on their regions, they can use the Customer Churn by Location dashboard to get an overview of Churn Rate, Total Churn (pie chart), and Churn by Area (bar chart) using the Tool Tip. They can ask the same questions as the SVP and EVP, but at a smaller level where they can cater to their specific demographics.

## C4. Interactive Controls

Every worksheet within the dashboards serve as a filter for the other worksheets in the same dashboard so there are many ways that users could manipulate the view of the data. The Churn by Location dashboard has a search feature within the map views to find specific states. The tool tip for each state provides information on Churn Rate, Churn Total, and Churn by Area.

The Cost Comparison dashboard has a State filter that applies to the two scatterplots marked with “(Us)”. The filter is a multiple-select dropdown menu specifically for the RVP group so they can select the states in their regions (one at a time, or several together). The categories of Churn and Streaming Services also function as filters for all four worksheets on the dashboard.

The Service Comparison dashboard also has a State filter and Churn filter. Using the individual worksheets to filter on subcategories (such as Month-to-month, DSL, Multiple Lines, etc.) the SVP can gather insights into user demographics to help answer the question of what key characteristics make up a customer that may drive their behavior.

## C5. Colorblindness

Consideration for colorblind individuals was part of the process. The Churn by Location dashboard uses Purple to indicate Churn Rate and Red to indicate Churn Total. The tooltip contains a pie chart and bar chart colored by churn – Red for “yes” (to follow the color scheme of Churn Total) and Blue for “no.” The Yes/No (Red/Blue) color for Churn is used throughout. These colors should be sufficiently distinct for users with colorblindness.

The Cost Comparison dashboard also uses a scatterplot colored by Churn (Yes/No), but also has scatterplots based on a customized Streaming Services field which has five categories. The Classic Color Blind 10 Tableau Palette was used to select colors for the categories. This palette, while discontinued, is a Tableau-created palette for colorblind users.

The Service Comparison dashboard only has worksheets colored by Churn (Yes/No).

## C6. Data Representations

As outlined in C3. Decision-Making Support, the Cost Comparison dashboard shows that we charge significantly more for our services than our competitor. The Service Comparison dashboard shows that customers are less likely to churn if they are on a One- or Two-year contract as opposed to Month-to-month. These two areas are likely to be the greatest opportunities to increase customer retention.

## C7. Audience Analysis

As outlined in C3. Decision-Making Support, I stated how each audience type could use the dashboards to answer questions in their specific areas of interest.

## C8. Universal Access

I designed the presentation and the dashboard to be accessible to any audience member. For all users, I chose simple (colorblind-friendly) color scales for the visuals – light-to-dark for the Churn by Location dashboard and different colors to represent the different measurements of Churn Rate (purple) and Total Churn (red). Many of the visuals were colored by Churn (Yes/No) – all of which were colored with the same legend for each dashboard to maintain consistency and readability.

Some attendees may not have a data analytics background so I avoided discussing highly technical aspects of my analysis and focused on overarching themes that could be easily remembered. Using the color features outlined above, I was able to effectively draw attention to the key findings used in the storytelling (outlined in C9 below). These attendees would be able to leave the presentation having understood the key components and actionable insights while more technical folks would have the tools they need to delve deeper into the data.

## C9. Effective Storytelling

After introducing the data set and providing an overview of what it shows, I moved on to the second dashboard to discuss Cost Comparison (which contains scatterplots of Tenure vs Monthly Charge colored by Churn and Streaming Services). I addressed the obvious disparity between the range of monthly charges between our company and our competitors – the lowest range of charges for our customers matched the highest range for our competitors. While this would be reasonably jarring to many, it was a key finding in my analysis, so it was important for all listeners to remember. To provide greater context for the issue, I asked the attendees to imagine a customer who has been with us for a short while but has a large monthly charge. (Knaflic 155). Why would they stay with us, when there is another company who charges one-third the price for the same service? Should the data visualizations not be clear enough for some attendees, this is a question that (likely) everyone has asked themselves at one point or another about their own service providers.

Throughout the presentation, I went back to the key points of my analysis and what steps could be taken to address them – using the storytelling elements of “repetition” and “call to action.” After outlining the final dashboard (Service Comparison), I returned to the Cost Comparison dashboard to reiterate the disparity between the Monthly Cost ranges for our company and our competitor’s. I followed up with a request to the sales and/or marketing team to review the prices we charge for our services and look for opportunities to reduce cost to our customers (the specifics of which are beyond the scope of the data provided to me). Returning to the Services Comparison dashboard, I highlighted the number of customers we lost that had both Streaming TV and Streaming Movies services (which was a greater ratio than our competitor). This I used as an example of one place we could reduce cost by offering a bundle discount for users who enroll in both streaming services. By repeating the key findings and reasonable, actionable steps to follow, the attendees of the presentation will be more likely to leave feeling they have a path to affect change. (Knaflic 157-160).

## D. Sources

**References**

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