D210- Representation and Reporting

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Part 1: Interactive Dashboard

A1. The datasets used for this performance assessment:

- The WGU medical dataset, provided by WGU.
- Average Income and Rent in the United States, provided by Kaggle

The WGU medical dataset was further cleaned for my data analysis. The result data can be found in 'final_churn_clean'.
Similarly, the external dataset was cleaned for my data analysis. The result data can be found in 'final_external_clean'.

Finally, I joined the two datasets so they can be easily interpreted in Tableau. The result can be found in 'final_clean'. This final dataset was used in my data visualization. The code can be found in 'D210_PA.ipynb' file.

A2. Dashboard Installation:

1. Go to tableau public and download tableau.
2. Follow the instructions to install tableau public.
3. Right click on the D210PZip file and select extract all to extract the files to the downloads folder.
4. Double click Tableau 2023.1 to open Tableau Desktop.
5. The 'final_dataset' was used to create the visualisations. Please select this dataset to view the dashboards.
6. At the top left click File>Open and navigate to download.
7. Select 'D210_Customer_Analysis_story to view the dashboards.
8. You can also view the dashboards separately by selecting 'D210_Dashboard_AvgIncome', 'D210_Dashboard_ContractTypeServices' and 'D210_Dashboard_CustomerInfo'.

A3. Navigate through Dashboard:

Customer Churn Analysis

Once the dashboards are loaded, the story can be viewed. Use the top row of tabs to navigate between the dashboards within the story.

Income and Churn Rate (Dashboard)

The first tab shows the visual findings of the churn rates varying across states and average income levels using internal and external datasets. The graph can be filtered using the 'Average Income' custom slider to display the churn rates on the states within the average income levels the user would like to see. The 'Churn Rate' across the states is highlighted based on the 'Red-Blue-White Diverging' color gradient. Users can hover over the states to view the State, Average Income, Number of Churned Customers, and Churn rate. Above the graph, the KPI for Income and Churn rate are displayed based on Average Income levels.

Churn Based on Customer Information (Dashboard)

The dashboard displays the Churn rate against Age and gender. The first graph is an interactive visualization of Churn Rate and Age. Using the filters on the Age, we can dive deeper into how the customer age impacts the churn rate. Note that there is a decline in churn for Customers between 30 and 40, followed by an increase for customers over 40. Users can hover over each bar to view details such as Age bins, churn rate, and number of customers.

The second graph is a visualization of the Churn rate over gender. I implemented a filter where the user can view both churned and/or not churned customers based on the three genders: 'Female,' 'Male,' and 'Nonbinary.'

The dashboard also contains a parameter to make it more accessible to colorblind users. On the top right corner is a filter called 'Colorblind' with two dropdown options, Yes and No. If the user selects 'Yes,' the colors on the graph change to display colorblind-friendly palettes.

Churn Rate based on Contract Type and Services (Dashboard)

The last dashboard displays the Churn rate based on the various contract types, month-to-month, One-year, and Two-year, and services offered, such as 'DSL' and 'Fiber Optics.' There are several ways to filter this data. If you click on services like 'DSL,' you can view the churn rate for each contract type. However, if you want to narrow it down, you can view the churn rate based on just one or more contract types using the filter to highlight each contract type.

The dashboard displays the KPI for the percentage of customers who have high income and are on long-term contracts and Customers on low income are on month–month contract Churn rates.

The dashboard also contains a parameter to make it more accessible to colorblind users. Next to the graph below the filters, you can see the 'Colorblind' option with two dropdown values, Yes and No. If the user selects 'Yes,' the colors on the graph change to display graphs with colorblind-friendly palettes.

Part 2: Storytelling with Data

B. Panopto link:
https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=d95f587b-308e-4738-a23e-b1e1012deef7

Part 3: Reflection Paper

C1. Dashboard Alignment

Churn or customer attrition is when a company loses customers over months, quarters, or years. Understanding churn helps businesses identify and pinpoint weaknesses that lead to revenue loss. A lower churn rate for

telecommunication companies helps to protect and grow the revenue because you retain more customers. For example, a satisfied customer will likely make more purchases, consider add-ons and upgrade to longer subscription periods.

C2. Additional dataset

The external dataset provided insights into customer average incomes across various states within the United States. Understanding the patterns across these states will allow us to target retention strategies. The churn rate across income levels helps us determine whether lower or higher-income customers are more likely to churn, and whether pricing strategies impact retention.

C3. Data Representations and support for decision - making

On examining the Income and Churn Rate dashboard, the churn rate by average income level displays how churn behavior changes across different income brackets across various states. This helps executive leaders identify whether lower or higher-income customers are more likely to churn and make informed decisions on pricing strategies that are impacting retention.

From the Churn rate based on Contract and Services it be observed that the churn rate for both the services Fiber Optics and DSL are highest in the month–to – month contract types. Using this visualization the business can decide on implementing retention strategies such as offering incentives to switch to longer-term contracts.

C4. Interactive controls

The Churn rate across Average Income levels and states is an interactive dashboard enabling users to filter through the average income levels to display the churn rate of the different states. On the right corner is an ‘Average Income’ custom slider with the range of average income levels across each state. The churn rates are highlighted with the ‘Red-Blue-White Diverging’ color gradient

(*Diverging colors for Color vision Deficiency*, *n.d.*). The Churn rate and Age bins graph contains an interactive control for choosing the age bins. By checking the checkbox near each age, the user can view data based on the age bins provided in the filter. The Gender-wise churn rate graph displays the number of churned customers based on the genders provided in the dataset. The user can view the data of churned and not churned customers by selecting the color tiles on the filter, and the data is highlighted. The churn rate is based on the various contract types, month-to-month, one-year, and two-year, and services offered, such as 'DSL' and 'Fiber Optics.' There are several ways to filter this data. If you click on services like 'DSL,' you can view the churn rate for each contract type. However, if you want to narrow it down, you can view the churn rate based on just one or more contract types using the filter to highlight each contract type.

C5. Colorblindness

The 'Colorblind' filter can be used to switch between views to suit the user. If the user selects 'Yes,' the colors on the graph change to display graphs with colorblind-friendly palettes. The churn rate across the states is highlighted using colorblind friendly 'Red-Blue-White Diverging' color gradient (*Understanding Sequential and Diverging color Palettes in Tableau, Robert Rouse. 2014, December*).

C6. Data representation:

Analyzing the Income and Churn rate dashboard, it can be observed that the churn rate for high and low incomes is close, indicating it may not be a factor affecting churn behavior. However, the churn rate is slightly high among low-income customers, suggesting they are more sensitive to pricing and financial values. From the Churn rate based on Services and contract type visualization, we can conclude that typically month–to–month contract types have the highest churn rate. These customers may be more price-sensitive or less satisfied with the services. Strategies to reduce churn could include offering incentives to switch to longer-term contracts or improving customer engagement.

C7. Audience analysis

The data visualizations and dashboards were created to benefit and be used by executive leaders to guide decision-making. It involved identifying and adapting the representations to their interest and level of understanding. Knowledge of the topic is vital as audience knowledge can vary widely. Therefore, guidance from the data dictionary helped me tailor my observations to suit the audience best.

C8. Universal access

The visualizations were made understandable for users by providing distinguishable names and labels for different elements in the dashboard. Colorblind palettes were used to select appropriate colors for the view. Interactive data visualizations effectively communicated the churn analysis factors.

C9. Effective storytelling

Tableau allows for effective storytelling through many features. I implemented custom sliders so users can dynamically adjust parameters. This feature tells a narrative and explores different data scenarios, enabling deeper insights without changing dashboards. Tooltips enhance data context without cluttering the main visualization. It helps to highlight important points and understand data better without the need for additional instructions.

D. References

In-text citation

Customer churn (or customer attrition) is the rate a company loses customers over months, quarters, or years.

Reference entry

Leanne Stahulak (2023, January). What is Churn and how does it affect your business. https://blog.acquire.com/what-is-churn-and-how-does-it-affect-your-business/

In-text citation

Audience knowledge of a topic can vary widely on any given occasion, therefore, communicators should find out what their audience already knows about the topic.

Reference entry

University of Pittsburg (n.d.). Audience Analysis. https://www.comm.pitt.edu/oral-comm-lab/audience-analysis

In-text citation

My recommendation is to replace red-green deverging palette by red-white-blue or red-yellow-blue diverging palette.

Reference entry

Diverging Colors for Color Visionary Deficiency. https://community.tableau.com/s/question/0D54T00000C5hBUSAZ/diverging-colors-for-color-vision-deficiency

Average Income and Rent in United States. (n.d). www.kaggle.com. https://www.kaggle.com/datasets/shahriarkabir/average-income-and-rent-in-united-states