D210: Representation and Reporting Task 1

Justin Huynh

Student ID: 012229514

M.S. Data Analytics

A1. Data Sets

The two data sets being provided are the WGU churn data set and the JB Telco customer churn data set from Kaggle. Both will be submitted in this task.

A2. Installation Instructions

No installation is necessary as users can access the dashboard through this link here on a modern web browser. This makes the dashboard more accessible to anyone who may not have Tableau downloaded on their device. If they do want to see the dashboard on their device instead of a browser however, they can do so by downloading Tableau public here, signing up for an account, and opening the file labeled D210.twb which will be submitted in this task. This will allow users to view the dashboard directly on their device.

A3. Navigation Instructions

Navigation of the dashboard is fairly simple. Once the dashboard has been opened up, they can view the story of the presentation, which has the 4 boxes at the top to navigate the different tabs. The intro tab provides a brief overview of what the presentation is about, the data sets used, and my name as the person who created the story.

The “Who Are The Customers?” tab is an interactive dashboard that shows the customer churn attributes by monthly charge, age, gender, and tenure. The data can be filtered in multiple ways. One being the age filter on the top left with the age slider for the WGU data set from 18-89 and another age slider for the JB Telco data set from 19-89 as there are the age ranges within their data sets. They will only update their respective data sets. The other filter is the average tenure by gender pie charts where

they will update all the visualizations within the dashboard. Clicking on the gender of the pie chart will update the data on all visualizations and they can exit that view when clicking out of the chart so it goes back to default.

The “Conditions KPI” is another interactive dashboard that observes the metric as key performance indicators (KPI), which are churn rate by age and churn rate by gender, demonstrating what type of customers churn. In these bar charts, there will be filters for them as well with the age group filter for both the WGU and JB Telco data sets. When selecting the age group, the corresponding data set will update only on those visualizations. However, the gender bar charts have filters themselves and will update the entire dashboard when selecting the gender.

The last tab is the “Takeaways & Recommendations” where key takeaways will be given and recommendations will be provided based on the analysis of the dashboards. These, like the intro slide, are non-interactive so they will just be static texts.

B: Panotop Storytelling with Data

A link to the Panotop video will be submitted with this task.

C1: Dashboard Alignment

The primary purpose of the dashboard is to provide a comprehensive view of customer churn across various demographics and metrics, enabling executive leaders to make informed decisions to improve customer retention. The dashboard accomplishes this by presenting key performance indicators (KPIs) such as churn rate by age and gender, average monthly charges, and tenure, which are important for understanding customer behavior and identifying trends.

The data dictionary outlines the importance of reducing customer churn and retaining profitable customers. It emphasizes the need for a dashboard that can help executive leaders explore data, identify trends, and compare key metrics. The following points highlight how the dashboard aligns with these needs:

- Executive Leaders' Focus Areas:
    - The dashboard provides insights into churn rates by age and gender, allowing the SVP to identify demographic groups that may require targeted engagement strategies since the SVP is focused on increasing customer engagement and understanding customer characteristics that drive behavior.
    - The dashboard's visualizations of average monthly charges, tenure, and churn rates by demographic variables help the EVP understand how different customer segments are performing across regions since the EVP is interested in the broad categorization of customers and demographic trends.
    - Each Regional VP can use the dashboard to set policies and manage operations based on region-specific data trends. The dashboard's filters allow them to view data relevant to their region and make data-driven decisions.
- Data Exploration:
    - The interactive elements of the dashboard, such as age sliders and gender filters, enable users to explore data dynamically and identify trends specific to their areas of interest. This interactivity aligns with the need for

a tool that helps team members explore data and create actionable insights.

C2: Additional Data Set Insights

The inclusion of the JB Telco customer churn data set from Kaggle enhances the insights that can be drawn from the WGU churn data set by providing a broader context and additional variables for analysis. Here's how the variables from the Kaggle data set enhance the insights:

- Comparative Analysis:
    - By comparing churn rates, average monthly charges, and tenure across both datasets, the dashboard allows for a more comprehensive analysis. For example, the significant difference in churn rates for the 60 and above age group in the Kaggle data set highlights the importance of investigating age-specific retention strategies, which might not have been as apparent when analyzing the WGU data alone.
- Service Usage and Satisfaction:
    - The Kaggle data set includes variables related to service usage (e.g., phone service, internet service type) and customer satisfaction (e.g., customer service requests, equipment failures) that may not be in the WGU data set. These variables provide additional layers of insights into how different services and satisfaction levels impact churn. For example, understanding the correlation between service outages and churn can help in prioritizing infrastructure improvements.
- Behavioral Patterns:

- The variables related to customer behavior in the Kaggle data set, such as the number of referrals and payment methods, provide insights into how customer engagement and financial behavior influence churn. For example, customers who were referred by friends might have a lower churn rate, indicating the effectiveness of referral programs.

C3: Decision-Making Support

The first data representation is churn rate by age. This bar chart displays the churn rates across different age groups for both the WGU and Kaggle datasets. Each age group is represented by a bar, with the height of the bar indicating the churn rate percentage. This helps executive leaders identify which age groups have the highest churn rates. For example, the Kaggle dataset shows a significantly higher churn rate for the 60 and above age group. This insight can prompt leaders to investigate the reasons behind this high churn and develop targeted retention strategies for older customers. By understanding which age groups are more likely to churn, leaders can allocate resources more effectively. For example, more marketing and engagement efforts can be directed towards the 20-29 age group if they are identified as having a high churn rate in the WGU dataset.

The second data representation is average monthly charge by age. This line chart plots the average monthly charge for customers across different age groups. The x-axis represents the age, while the y-axis shows the average monthly charge. This helps executive leaders to evaluate the pricing strategies for different age groups. For example, if the average monthly charge is significantly higher for older customers in the Kaggle dataset, leaders can assess whether the pricing is justified by the services

provided or if it is contributing to the higher churn rate in that age group. By identifying age groups with higher average monthly charges, leaders can explore opportunities for bundling services that offer better value for money. This can help in retaining customers who might consider switching providers due to high costs.

C4: Interactive Controls

The first interactive control is the age slider, which allows users to filter the data displayed on the dashboard by selecting a specific age range. There are separate sliders for the WGU and Kaggle datasets. Users can adjust the age slider to focus on specific age ranges that are of interest. This enables executive leaders to analyze data for particular demographic segments without being overwhelmed by the entire dataset. By manipulating the age slider, leaders can observe how churn rates and average monthly charges vary across different age groups, and get a deeper understanding of age-related trends and patterns.

The second interactive control is the gender pie chart that allows users to filter the data by selecting a specific gender (Female, Male, Nonbinary). Clicking on a segment of the pie chart updates the entire dashboard to reflect data for the selected gender. This control enables executive leaders to perform gender-specific analyses. For example, if the SVP for Customer Experience wants to understand how female customers are engaging with the services, they can use this filter to isolate data for female customers and make informed decisions based on that subset. By switching between different genders using the pie chart filter, leaders can compare churn rates, average monthly charges, and tenure across genders. This comparative analysis helps in identifying if any particular gender group requires targeted interventions.

C5: Color Blindness

When designing the dashboard, we wanted to ensure that it is accessible to individuals with colorblindness. Color Blindness affects a significant portion of the population, and different types of colorblindness can make it difficult for users to distinguish between certain colors. The dashboard was built to be accessible for individuals with colorblindness by utilizing a blue-teal color palette. These colors were chosen because they are distinguishable by most individuals with common types of colorblindness, such as red-green colorblindness. The blue-teal palette provides sufficient contrast and ensures that all users, including those with colorblindness, can differentiate between data points. It is consistently used across all visualizations (line charts, pie charts, and bar charts), so the dashboard maintains uniformity, which helps users to easily interpret the data without confusion.

C6: Data Representation

The first data representation will be the bar chart showing the churn rates across different age groups for both the WGU and Kaggle datasets. The chart clearly identifies which age groups have the highest churn rates. For example, the Kaggle dataset shows a significantly higher churn rate for the 60 and above age group, while the WGU dataset has more consistent churn rates across age groups. This helps tell the story of how age can influence customer retention and identifies specific demographics that need targeted retention strategies. By showing the differences in churn rates across age groups, executive leaders can make informed decisions about where to focus their efforts.

The second data representation will be the line chart that plots the average monthly charge for customers across different age groups for both datasets. The chart shows how average monthly charges vary with age, highlighting the financial contribution of different age groups. For example, the WGU data shows relatively stable charges across ages, while the Kaggle data indicates a significant increase in charges for older customers. This can tell a story about how pricing strategies might be affecting customer satisfaction and retention. This visualization helps executive leaders see potential issues with pricing structures. If older customers are paying significantly more and also have higher churn rates, this could indicate dissatisfaction with the value for money, prompting a review of pricing policies to ensure they are fair and competitive.

C7: Audience Analysis

Executive leaders would need clear, actionable insights that inform strategic decisions. They do not typically have a technical background, so the data needs to be presented in an easily understandable format. For adaptation, using bar charts and line charts simplifies complex data, making it easier for executive leaders to quickly understand key trends and insights. By focusing on key performance indicators (KPIs) like churn rate and average monthly charges, the presentation addresses the metrics that are most relevant to the executives' strategic goals. Interactive features such as age sliders and gender filters allow executives to explore the data dynamically, giving them the flexibility to focus on areas of specific interest.

Data analytics peers are interested in the methodology, design, and detailed insights that can be drawn from the data. They have a technical background and appreciate deeper analytical insights. The presentation includes detailed breakdowns of

churn rates by age and gender, as well as average monthly charges, providing a comprehensive view of the data. By comparing insights from two different datasets, the presentation offers a deeper level of analysis that technical peers can appreciate and build upon in their own work.

C8: Universal Access

This analysis was designed to be universally accessible by any user. With the dashboard being uploaded to Tableau Public, anyone with a web browser can access the dashboard without having to download any software. A consistent color-palette was also applied due to its high contrast and accessibility to individuals with colorblindness. This ensures that the visuals are easily distinguishable for all viewers, including those with color vision deficiencies. The presentation includes interactive elements like age sliders and gender pie chart filters, which are designed to be intuitive and easy to use, allowing users to explore the data at their own pace. This interactivity caters to different levels of familiarity with data analysis tools. Descriptive texts are also included for all images and visual elements, making the presentation accessible to screen readers.

C9: Effective Storytelling

The first storytelling element implemented is a clear narrative structure. The presentation begins with an introduction that sets the stage, providing context about the datasets and the purpose of the analysis. This helps the audience understand what to expect and why the analysis is important. The main body of the presentation is structured around key results, such as churn rates by age and gender, and average monthly charges. Each section is focused on a specific aspect of the data, making it easy to follow and digest. The presentation concludes with key takeaways and

recommendations based on the analysis. This provides actionable insights for the audience, linking the data back to practical strategies for improving customer retention.

The second storytelling element is having relatable examples and context. The presentation uses real-world examples and context to make the data more relatable. For example, explaining how high churn rates in the 60 and above age group could indicate dissatisfaction with service quality or pricing helps the audience understand the practical implications of the data, which is relevant to most people as most people have a relationship with some telecommunications company. By linking the data to real-world scenarios and business challenges, the presentation engages the audience on a deeper level and shows how the analysis can lead to actionable strategies that address actual problems faced by the organization.

D: Sources

1. “Tableau Public: What is the right way to create Calculated Fields” Retrieved from https://stackoverflow.com/questions/64581915/tableau-public-what-is-the-right-way-to-create-calculated-fields

H: Web Sources

1. “Tips for Working with Calculated Fields in Tableau” Retrieved from https://help.tableau.com/current/pro/desktop/en-us/calculations_calculatedfields_tips.htm
2. “JB Link Telco Customer Churn” Retrieved from https://www.kaggle.com/datasets/johnflag/jb-link-telco-customer-churn