**D210 NAM2 – Task 1: Data Dashboard and Storytelling**

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**Part 1: Interactive Data Dashboard**

1. The interactive Tableau dashboard can be found here:

<https://public.tableau.com/app/profile/chases/viz/ChurnandCTAnalysisKPIInteractiveDashboard/ChurnVsCTData?publish=yes>

1. The two data sources that were used to develop the dashboard can be found here:

Public Data Set Source

<https://www.kaggle.com/code/mattop/cellular-towers-in-the-united-states-eda/data?select=celltowers.csv>

WGU Data Set Source

<https://access.wgu.edu/ASP3/aap/content/f9tjr8djg83jd8c3sdf8.zip>

1. Step-by-step installation instructions.
2. To begin, click on the hyperlink above in section A.
3. From here, you will be directed to the Tableau website in which the dashboard was published. There is a selection toolbar located just above the dashboard. When you hover your cursor over the icon that looks like a rectangle with an arrow pointing down, it will say Download. Click it. See image below for guidance.

Graphical user interface, application, map

Description automatically generated

1. A window will pop up that will give you options on what file format you wish to download. Image of what you should be seeing on screen is mirrored below. Click on “Tableau Workbook”.

Graphical user interface

Description automatically generated

1. Another window will appear. You will be asked to select a version of the workbook to download. There is a drop down list in which you can pick a version. In most cases, you will always want to pick the most current version to ensure the dashboard will be functional in the most efficient and most up-to-date features as possible. With that being said, the selection should already be “Current”. Leave it the same and click “Download.” See image below for guidance as to what should be shown on your screen.

Graphical user interface, text, application, email

Description automatically generated

1. The download should begin. Once finished, open the downloaded file.
2. You will be prompted to choose what application to use to open the Tableau workbook. Depending on what you have installed you can choose Tableau Public or Tableau Desktop. Both options will allow you to view the workbook.
3. Congratulations, installation is complete! You may now use the interactive dashboard for analysis and insights.
4. Instructions to navigate the dashboard.
5. There are a total of eight (8) data representations that are featured on this Tableau dashboard. They are described as the follow:
6. Located at the upper center, this data representation calculates key performance indicators (KPI) for the course data set – Retained Customers, Average Monthly Charge, Churn Rate, and Average Age.
7. Located at the upper right, this data representation calculates key performance indicators (KPI) for the public data set – Cell Tower Count, AT&T Count, and Verizon Count.
8. Located in the far left of the dashboard, the data representation is a vertical scale for customer churn count by state. This visualization is in descending order and is interactive to the rest of the visualizations. Clicking on any given state will filter all other fields specific to that state.
9. Located in the very center of the dashboard is a United States map that displays the total number of customers with the phone service. Just like the last data representation visual, this visualization is alter interactive with the rest of the data representations in the dashboard. Clicking on any given state or region will filter out all of the key performance indicators and visualizations specific to that state or region.
10. Located on the far right center of the dashboard is a pie chart that displayed the cellular tower structure types. Each slice of the pie chart represent another color and tower structure with the total number of towers per structure type. Unlike the other interactive visualizations, this pie chart is interactive specifically to the KPI data representation for the cellular tower data set. Clicking on any given structure type slice will filter out the Cell Tower Count, AT&T Count, and Verizon Count.
11. Located on the bottom middle of the dashboard is a visualization that represents that number of total customers (churn or not churn) with phone service and by gender. This data representation is a bar chart that can be filtered by triggering the interactive visualizations. It does not feature a controllable filter like some of the other data representations.
12. Located in the right middle, just below the Structure Type pie chart, is another key performance indicator data representation for Overall Statistics. This consists of Population, Average Tenure, and Average Children. This is not an interactive control but can be filtered with the triggers and controls of the mentioned interactive visualizations.
13. Located on the bottom right of the dashboard and the final data representation is a pie chart visualization that displayed the customers with multiple lines and phone service. Unlike the other pie chart in this dashboard, this visual does not include a control for interactive filtering of the dashboard or other visuals. However, the data can be filtered and triggered by the interactive controls of the other visualizations.
14. As an example of the dynamics and functionality of the dashboard, below, you will see a filter for the US Map that focuses on the state of TX. All KPI data representations are filtered to show only statistics for the state of TX. The Number of Customers by Gender is also filtered for TX. Also, the Cell Tower data set also filters for the state of TX as demonstrated in the pie chart of Structure Types and the KPI for Cell Tower Count, AT&T Count, and Verizon Count.

Graphical user interface, map

Description automatically generated

1. To demonstrate further, below you will see a second filter applied to the Structure Type pie chart that filters only the orange slice of GTOWER in TX. As you will notice, the KPI data representation in the upper right most visual will trigger due to the filter applied in the pie chart. This is an effective way to draw insight and analysis within the dashboard and to find specific statistics or key performance indicators with each applied filter or modification.

Graphical user interface, map

Description automatically generated

1. This concludes the demonstration and navigation of the dashboard. It is strongly encouraged to customize filters in your own way and find specific interactive controls within the dashboard to find more insightful representations.

**Part 2: Storytelling with Data**

1. Link to Panopto multimedia presentation can be found here: <https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=13786f5c-6908-437b-93d9-afbf003d9030>

**Part 3: Reflection Paper**

C.  Demonstrate understanding of data representation and reporting.

1.  Purpose and function of the dashboard.

As an analyst team member for the popular telecommunications company, it is essential for the interactive dashboard to align with the needs and goals stated in the data dictionary. With that being said, the dashboard was developed with the idea that it should be easy to navigate and for all levels of the executive leadership team in order to draw clear analytics and insights to further improve business strategies and improve operations and decision-making for profitability in the long-term. To explain further, the following leadership and executive roles and the dashboards impact include:

* Senior Vice President for Customer Experience (SVP) – Being that this role focuses on customer engagement and understanding the key characters that influence their behavior, the Tableau data dashboard can give a broad overview of customer traits and statistics in different regions or states of the country. For example, the SVP can study several different states with a strong customer retention rate, looking into what characteristics and statistics they have in common. As a next step, the SVP can compare these characteristics with regions or states with higher customer churn rates to potentially see what are the different key characteristics that are leading customers to leave the company. In doing so, the SVP can engage with the audience in a different approach with different services that align with their characteristics. Additionally, they can target the customers that best match the behaviors and preferences of the current customers with high tenure.
* Executive Vice President of Sales (EVP) – The EVP will especially benefit from the Tableau data dashboard in the sense that they concentrate on the broad categorization of customers and how it differs from one region to another. Analyzing different regions with a broad statistical summary generated by the dashboard will ensure the EVP can refine customer outreach promotions to apply to existing customers and targeted future customers for a dual-functioning strategy to grow the customer base significantly.
* Panel of Regional Vice Presidents (Regional VP) – The Panel of Regional VP’s are executives from different regions all over the country and will meet on a regular basis for managing operations. Similar to the SVP and EVP of the organization, the Regional VP’s can use the interactive dashboard to their advantages to compare regional statistical summaries and taking action towards areas with high customer churn rates by applying what worked in the more effective regions for overall profitability and operational success.

1. Enhancing with new variables.

With the help of an additional data source, the initial data set and the analytics that can be drawn from it only get stronger. The supporting data source is public data that was produced from [www.kaggle.com](http://www.kaggle.com), and recorded the cellular towers in the United States. How does this data set assist in the storytelling of the customer churn data set? Analysis can be interpreted from the customers that committed to the organization’s phone line and multiple lines services. The specific variables in the additional data set include:

-Cell tower state – The particular states in which the cell towers exists

-license – the license or ownership of the cellular towers, which only comprises of two options - Verizon, and AT&T.

-structure\_type – the different kinds of cellular towers for each different license.

As an example, the dashboard can be used to look at a specific US state to determine the customer churn rate, the population, what type of cellular towers are nearby, and what cellular carrier or license is residing near the customer to better understand the competition and behaviors of potential or existing customers.

As a result, the dashboard is a powerful tool to easily gain insight and analytical views on the organization’s customers and to draw predictive analysis on how the competitor’s cellular towers can influence customer retention rates.

3.  T**wo** different data representations from the dashboard.

The first visual data representation to point out is the US map located in the center of the interactive dashboard titled “Number of Churn Customers By State With Phone Service”. The executive leader or leaders can see a bird’s-eye view of the number of customers for each State that have a phone line service. Right off the bat, the states with lower customers will stick out to the executives to want to understand what the reason might be for why some states have less customers than others.

Each data representation on the dashboard is supported by one another, and any interaction performed on the US map will instantaneously trigger the other representations to further summarize the key performance indicators and statistics to influence more understandings.

For the second data representation, I want to showcase the informational key performance indicator box for the cellular tower data set that is located on the upper right-most side of the dashboard. This is a powerful data representation that is detailed and simple at the same time when looking at specific regions or states to view the key performance indicators for both data sets like average monthly charge and customer age and how they correlate or impact the customer churn rate or different from other regions.

The data within the dashboard are advantageous in the sense that trends can be discovered looking at the states or regions with the lowest churn rates and studying those detailed ranges thoroughly to predict what may be reducing customer churn in order to apply the same patterns to the regions or states with higher customer churn rates.

1. T**wo** interactive controls in the dashboard.

As mentioned above, there are a few data representations that are interactive and are influenced to change in sync throughout the dashboard in its entirety. To further elaborate, the US map representation consists of states and the number of customers within those states that also provides an interactive control. To add to that, the customers that reflect on the map signed up exclusively for the phone service with the telecommunications company. This is an important detail to point out as the supporting data source helps assist in the analysis. When clicking on a single state or multiple states, the representations will filter to only show the key performance indicators and statistics specific to the selected state or states.

Another data visualization from the dashboard with an interactive control is the right-most pie chart data representation. The visualization includes the structure types of the cellular tower data. When clicking on a single pie slice, the statistical summary above it will filter to show the number of licenses of each carrier (Verizon or AT&T) for that particular cellular tower structure. The utilization of these controls will be demonstrated in the Panopto video and instructions were provided above.

1. Describe how you built your dashboard to be accessible for individuals with colorblindness.

When putting together a data dashboard, it is important to understand the data in which you’re presenting and to know your audience. There needs to be an understanding that not everyone in the audience may comprehend different color combinations the same way as the presenter. With that being said, the data should be represented in such a way that it can easily be construed and refrain from using too many similar colors or colors that blend well together that may cause difficulties for the colorblind audience to distinguish the difference.

Some visualizations are better than others, while others are simpler than others. In the challenging case of the customer churn and the cellular tower data set, it was important to visualize the different states and regions to aid the executive leaders to data-driven decisions to benefit the organization. Even though this is not recommended and may go against the consideration of the individuals with colorblindness, this issue is alleviated with the support of larger data labels to help differentiate the data points and the avoidance of placing red and green shades next to each other as those colors may appear alike to the colorblind individuals.

To summarize, it was inevitable for the interactive data dashboard from Tableau to exclude multiple color schemes to better illustrate the collected data and for understanding, but as a solution, the data is presented with clearly comprehensible data labels and keeping parallel colors apart from each other in order to benefit the audience as a whole.

1. T**wo** data representations in the presentation that support the story being told.

On the far left of the dashboard, the data representation visual labeled “Churn By State” consists of a blue-to-white, scale-like bar that sequentially measures the different states with customer churn rates from highest to lowest. This representation supports the storytelling in the sense that it easily identifies which states has the highest customer turn-over rate when interacting with either the US map, or the churn rate scale.

In a similar way, the data representation visualization on the bottom-most tile, titled “Gender”, shows the number of each gender for each counted customer. Again, this scale is interactive to change depending on the interactive control performed by the user on the dashboard. Filters can be set with a single click of a button, and to easily showcase key performance indicators.

1. Explain audience analysis.

The expression, “know your audience,” is the key to engage the audience and to keep them involved and interested throughout the entire presentation. Keeping that in mind, we know that the dashboard is easy to use and simple enough for the appropriate executive leader to use and focuses on the centralized data and details that most interest them for their roles and functions. With that level of understanding, the interactive dashboard can be filtered and customized to the preferences of all the different levels of the executive leadership team.

Additionally, the presentation should be easy to understand and follow. It would be a complete waste to present information to an audience that is not able to follow or understand what is being explained. What makes it worse is this presentation involves a large amount of data in which a normal audience would be overwhelmed just trying to follow what is being explained. With that being said, it is a relief that the dashboard consists of simple-to-understand and easy-on-the-eyes visualizations. Even if individuals in the audience cannot interpret a large amount of data points at a time, the charts and data representations help simplify the processing of understanding the story being told.

Why is audience analysis so important? It will determine the approach and are the fundamentals or foundation of a good presentation. The audience of this dashboard consists of the executive leadership team, whom are not as analytically inclined to the exposure to data like the analyst is. The goal is the make things simple, quick, efficient, and easy for them to understand and analysis what data they need that best suits their functions and goals of the business.

1. Universal access by all audiences.

The interactive dashboard was made with very simple interactive controls, but with a generally large selection of key performance indicators that can be used by almost anyone that wants to understand the two data sets more. With the press of a single control, data can be filtered throughout the entire dashboard.

Also, the dashboard was intended to be distributed and installed by a multitude of different individuals since the dashboard was published on Tableau public for everyone to see and explore. In terms of the telecommunication company, the dashboard is easy to navigate and modify for the executive leadership team who are not technically inclined to the building of the data set. Also, any individual that may have colorblindness should also be able to distinguish the different data types, statistics, and key performance indicators in order to identify trends, analyze, and guide them to data-driven decision making to improve business profits and operational growth.

1. Explain **two** elements of effective storytelling that you implemented in your presentation and how each element was intended to engage the audience.

The first element of effective storytelling is the engagement of the audience. This can be performed successfully by focusing on the points that are most appealing to the audience or related aspects that can draw their full-fledged attention. For example, for the Panel of Regional VP’s, making a detailed explanation for the interactive data representations that spotlight the operational analysis that can be interpreted on the regional level to acknowledge their interests and organizational goals. Such metrics that regional operations can include are average monthly charge, average length of customer tenure, customer churn rate, population, number of cell tower structures, and licenses.

The second element for effective storytelling goes back to the requirements of question one, which states, “explain how the purpose and functions of the dashboard align with the needs outlined by the organization.” As the foundation to the development of the dashboard, reiterating and reminding the audience of the goal for this presentation will ensure the audience is in the same mindset. As the lead presenter and analyst, it’s crucial to verbalize any insightful findings and predictions to support decision-making and keep the audience engaged. On top of that, the very demonstration of how the interactive dashboard behaves when filtering fields is a great way to keep the executive leaders involved despite not having a technical data analysis background. To demonstrate how the western customer population is behaving as opposed to the central or eastern part of the country that can influence the customer churn rate can go a long way for the audience and show the analyst’s dedication to the project and representation.

In the end, effective storytelling comes with commitment and dedication of understanding the data being presented and representing or translating your findings and high level data in the simplest language possible for the audience that have a less technical data analysis background. The visuals should be easy to understand, unbiased, and appealing to all types of individuals alike. This is a skill that will develop overtime with repetition and is a must in the real job-world of analysts.

D.  Sources and references.

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