D210 Representation and Reporting Performance Task 1

Data Dashboard and Storytelling

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WDU Data Analytics

MSDA D210

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Part 1: Interactive Data Dashboard:

[**https://public.tableau.com/views/D210PATelecommunicationandElectricityan alysis/Dashboard1?:language=en- US&:display_count=n&:origin=viz_share_link**](https://public.tableau.com/views/D210PATelecommunicationandElectricityanalysis/Dashboard1?:language=en-US&:display_count=n&:origin=viz_share_link)

A. Provide a copy of your interactive Tableau dashboard to support executive decision-making. Your dashboard must be accessible to users with colorblindness, and must include the components in each of the following bullet points:

• **data integrated from both chosen data sets**

• **four different data representations to summarize the data or display trends**

• **two different interactive controls that allow the user to modify the presentation of data**

• **two different metrics or key performance indicators computed using data from both chosen data sets**

A copy of my interactive tableau dashboard to support executive decision making can be found by clicking the link here.

Metrics:

● The data integration is shown with the use of "generation (megawatthours)" and the relationship connection through the state abbreviations in the figure below the next bullet point.

- The four data representations are found below and are a heatmap, pie chart, bar histogram, and a packed bubbles representation:

D210 PA: Telecommunications and Electricity
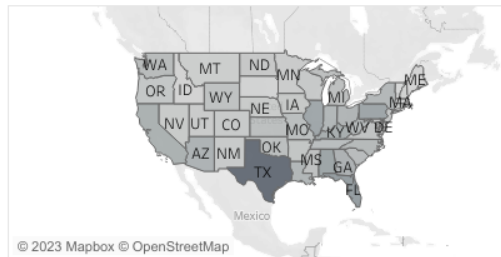
Electricity Generation and Outage Seconds Per Week

State. Color shows median of Outage sec perweek. Size shows average of GENERATION (Megawatthours). The marks are labeled by State. The view is filtered on State, which excludes Null.

Churn Analysis

© 2023 Mapbox © OpenStreetMap

Map based on Longitude (generated) and Latitude (generated). Color shows average of GENERATION (Megawatthours). The marks are labeled by State. The view is filtered on average of GENERATION (Megawatthours), State and Top States. The average of GENERATION (Megawatthours) filter ranges from 6,219 to 3,347,155. The State filter excludes Null. The Top States filter ranges from 1 to 51.

Churn and Average Monthly Charge

Churn (color) and average of Monthly Charge (size).

Electricity Per State and Tenure

Average of GENERATION (Megawatthours) for each State. Color shows median of Tenure. The view is filtered on State and Top States Tenure. The State filter excludes Null. The Top States Tenure filter ranges from 1 to 10.

Median Outage sec perwe..
9.069 — 10.746

Avg. GENERATION (Mega..
6,219 — 3,063,290

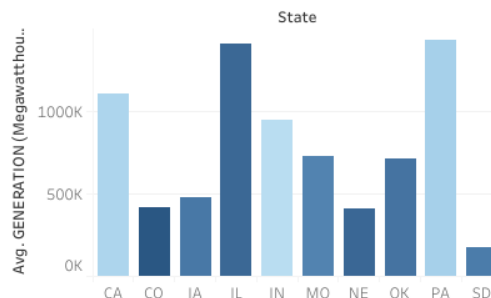**Top States Bandwidth pe..**
1 to 51

Median Tenure
21.40 — 46.55

Churn
No
Yes

Highlight State
No items highlighted

Top States Tenure per Ele..
1 to 10

Avg. Monthly Charge
362.30

- The interaction controls are: Highlight which specific state you are viewing and two different ranking controls to view a range of ranked statistics based on different metrics (Tenure and Bandwidth per electricity).

Median Outage sec perw...

9.069   10.746

Avg. Monthly Charge

362.30

Top States Tenure per El...

1   51

Median Tenure

11.02   54.37

Churn

- No
- Yes

Top States Bandwidth pe...

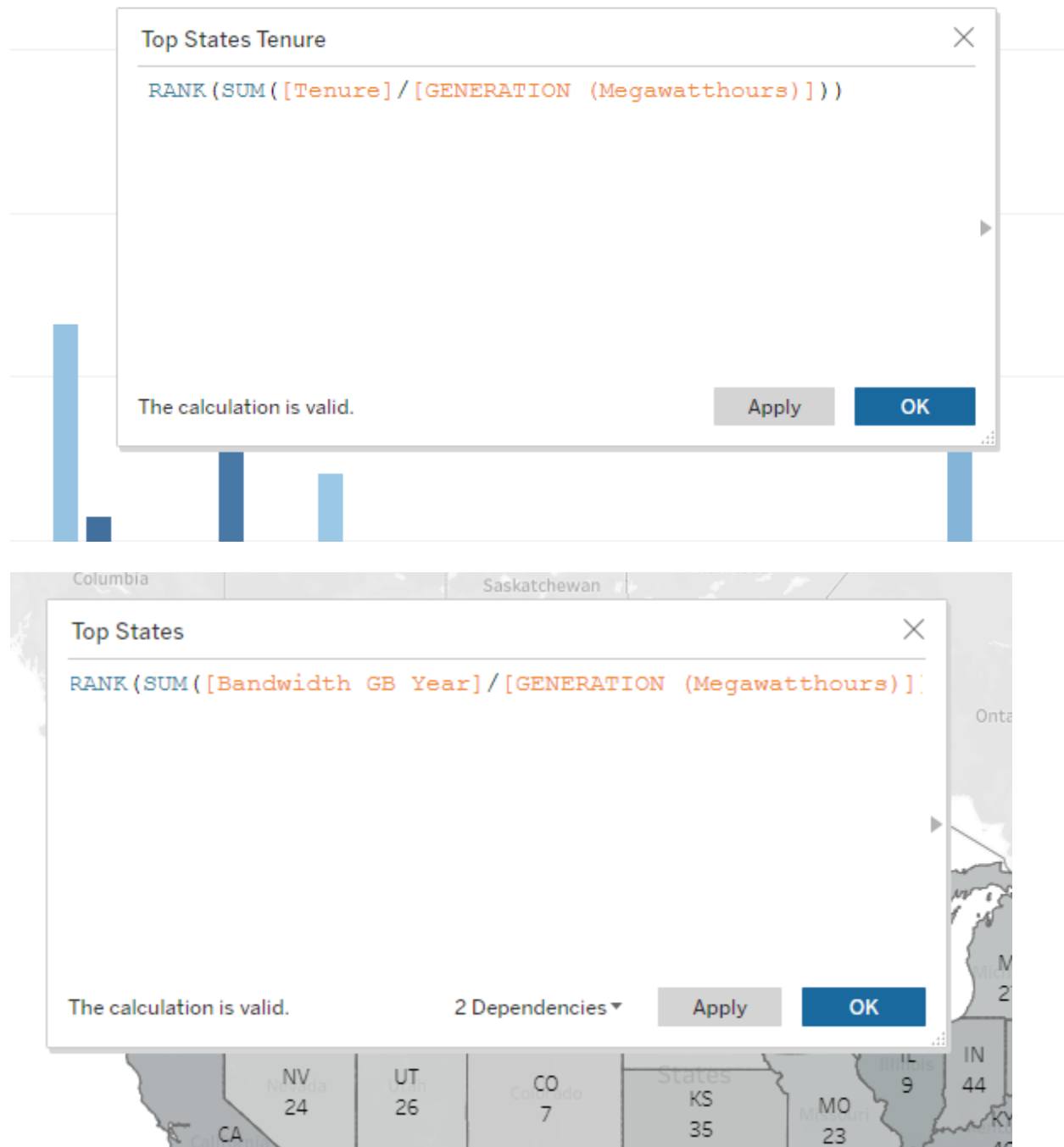1   51

Avg. GENERATION (Mega...

6,219   3,063,290

Highlight State

Highlight State

- The metrics are a ranked scale of bandwidth per electricity and then Tenure per electricity to view data from both datasets and to visualize how the electricity data from the second dataset may or may not relate to the first dataset's variables.

Top States Tenure ✕

`RANK(SUM([Tenure]/[GENERATION (Megawatthours)]))`

The calculation is valid. Apply OK

Columbia Saskatchewan

Top States ✕

`RANK(SUM([Bandwidth GB Year]/[GENERATION (Megawatthours)]`

Ont

The calculation is valid. 2 Dependencies ▾ Apply OK

IN

NV	UT	CO	States		9	44
24	26	7	KS	MO		KY
CA			35	23		

1. Provide both data sets that serve as the data source for the dashboard.

The original data set provided by WGU is the attached "churn_clean.csv" file. The external dataset is attached as "organised_gen.csv."

2. Provide step-by-step instructions to guide users through the dashboard installation.

Instructions have been provided in the file "Instructions for PA: Representation and Reporting (NAM2)."

3. Provide instructions to help users navigate the dashboard.

Instructions have been provided in the file "Instructions for PA: Representation and Reporting (NAM2)."

Part 2: Storytelling with Data

B. Provide a link to a Panopto multimedia presentation in which you tell a story about the data to an audience of data analytics peers. Your presentation should implement elements of effective storytelling and include each of the following elements:

• **an introduction of yourself and your background**

• **a summary of both chosen data sets and the context in which they occur**

• **an outline of key results from your analysis of the two data sets**

- **two different data representations to serve as supporting evidence for your**

results

- **a summary of actionable insights based on your results**

The link to my panopto video presentation:

https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=7330deee-a3a5-4df6-9585-afaa01575704

Written summary of insights found later in the report:

The churn and monthly charge can be used to inform prediction of which customers are more likely to churn. The three representations using the 50 states and variables of both datasets can be used to gather data to inform the organization's retention efforts, seeing what electricity generation, bandwidth usage, outage seconds, and tenure can be affected to increase retention.

Key actionable insight and recommended actions can be summarized here:

- Customers who churn have a higher avg monthly charge
- Energy consumption of local area does not indicate an impact on outage seconds for customers
- Further analysis is needed between Tenure and the energy consumption of an area
- Texas is a state with a higher outage per second
- Top 10 states for tenure all have a low energy consumption
- Using our dashboard with data representations
- Bring monthly charge averages closer to the avg of customers who do not churn.
- Increase support for infrastructure in texas to reduce outage seconds.
- Put more resources into the investigation of Tenure in states with lower power consumptions

Part 3: Reflection Paper

C. Write a reflection paper to demonstrate your understanding of data representation and reporting by doing the following:

1. Explain how the purpose and function of your dashboard align with the needs outlined in the data dictionary associated with your chosen data set.

The purpose of this dashboard aligns with the needs of the organization because the telecommunications company is searching for actionable insight from their customer dataset and the external dataset. My chosen dataset, electricity generation information from all 50 states, is used as the external dataset to further the insights we can gain from the churn data. The purpose of my dashboard is to find actionable insight into a major performance metric, churning, and to find actionable insights that link the organised_gen file to our churn dataset. By actionable insight, I mean I am looking for trends or connections through bivariate and univariate analysis with the representations in the dashboard that I can use to recommend future actions to the organization.

My dashboard analyzes the relationship between churn and monthly charge, informing the organizations key metric of customer turnover with their main profit force, monthly charge. The other three representations show the relationship between the 50 United States and key metrics such as Tenure and Bandwidth per year with the electricity generation of the state, a demographic that can be used to analyze trends. The function of showing these data trends and using electricity generation to inform the churn dataset allows for actionable insights to be made that align with the needs in the data dictionary; retaining customers and predicting which customers are at a high rate of churn.

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2. Explain how the variables in the additional data set enhance the insights that can be drawn from the data set you chose from the provided options.

The variables in the organised_gen dataset enhance the insights that can be drawn from the telecommunication dataset, churn_clean, by giving the organization an expanded view of their customer base. More specifically, by using a breakdown of the average electricity generated in each state, the company can have another variable to make connections with customer retention and provide information on customer retention and where the organization's efforts need to be spent.

3. Explain two different data representations from your dashboard and how executive leaders can use them to support decision-making.

One data representation from this dashboard is the churn and monthly charge representation, here:
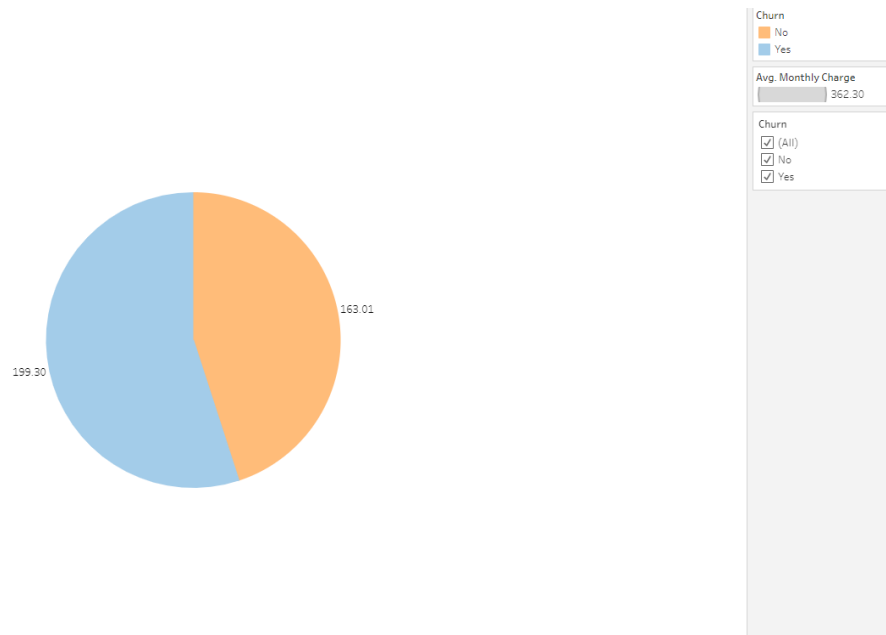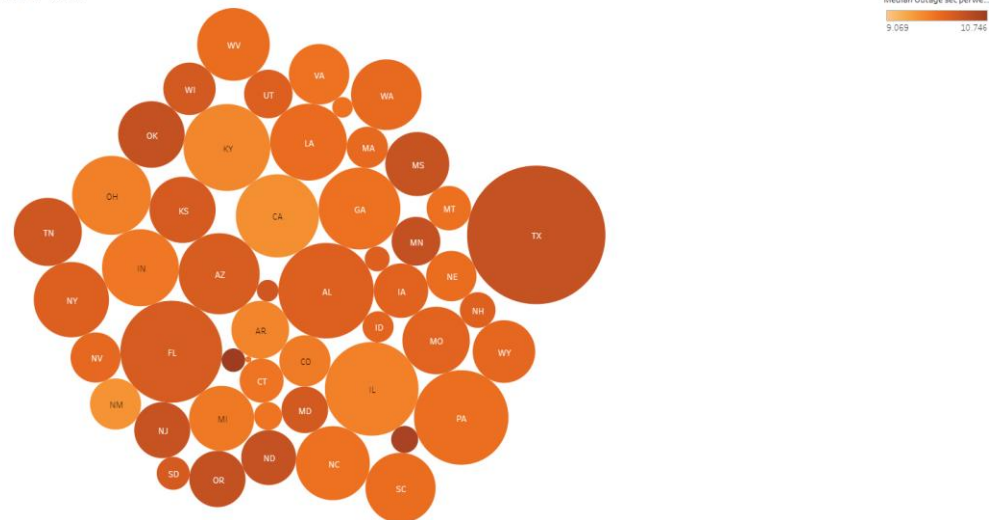

This representation can be used by the leaders of this organization to inform their pricing measures and how it impacts customer retention and churning. We have a higher monthly charge for customers that churn, indicating there could be a relationship and more resources are needed in determining if lowering the monthly charge can in fact reduce churn.

The second data representation from this dashboard is the visualization of outage seconds per week and energy generation, here:
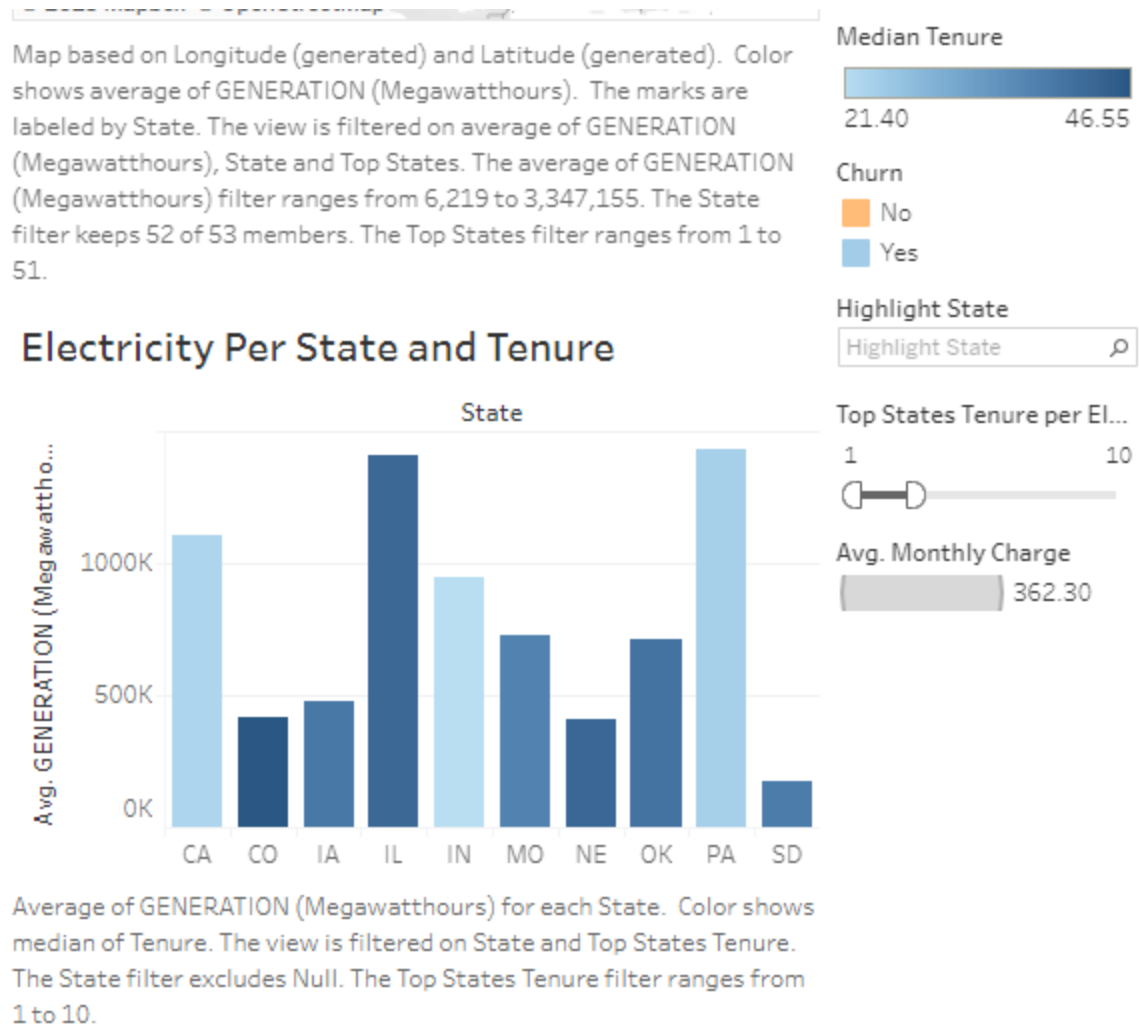
Electricity Generation and Outage Seconds Per Week

This representation can be used by the leaders of this organization to narrow down what states need more resources and support to reduce service outages in alignment with which states are high energy consumers. For example, Texas has one of the highest median outage seconds per week and is also one of the largest energy consumers, informing the leaders of the type of infrastructure support that could be set up to reduce outage seconds per week based on energy demands, therefore informing our key metric of customer retention.

4. Explain two interactive controls in your dashboard and how each enables the user to modify the presentation of the data.
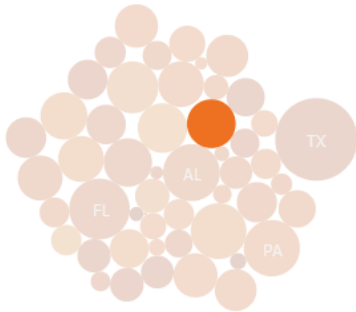
There are many interaction controls in the dashboard that can highlight a specific state, metric, or ranking based on the needs and desires of the organization. One interactive control in this dashboard is the Top States per Electricity ranking system:

Map based on Longitude (generated) and Latitude (generated). Color shows average of GENERATION (Megawatthours). The marks are labeled by State. The view is filtered on average of GENERATION (Megawatthours), State and Top States. The average of GENERATION (Megawatthours) filter ranges from 6,219 to 3,347,155. The State filter keeps 52 of 53 members. The Top States filter ranges from 1 to 51.

Median Tenure

21.40   46.55

Churn
- No
- Yes

Highlight State

Highlight State

Top States Tenure per El...

1   10

Avg. Monthly Charge

362.30

Electricity Per State and Tenure

Average of GENERATION (Megawatthours) for each State. Color shows median of Tenure. The view is filtered on State and Top States Tenure. The State filter excludes Null. The Top States Tenure filter ranges from 1 to 10.

If you change either end of the slider, it will show that number of ranking states and the resulting median tenure. For example, if we want to see the top 10 states with long tenured customers for the electricity generation, we set the slider to 1 and 10. This also changes the median Tenure range to 21.40 to 46.55.

A second interaction control is the highlight state function:

0 PA: Telecommunications and Electricity

If you type in the two-letter abbreviation for the state in question, it will highlight that

state from the two representations in the dashboard, "Electricity generation and Outage Seconds

Pew Week" and "Churn analysis". This function allows you to narrow down and view the outage

seconds per week, bandwidth per week, and average electricity generation for that state. As an

example, I have typed in "GA" for Georgia and we can now see the information pertaining to

Georgia has been highlighted amongst the rest of the 50 states.

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

I built my dashboard to be accessible for individuals with colorblindness by using the

color-blind color palette accessibility feature in Tableau. This feature provides colors that can be

used together or individually to make a representation more accessible to those with color

blindness. Below is an example of this palette for the pie chart (*Color blind | Digital*

Accessibility).
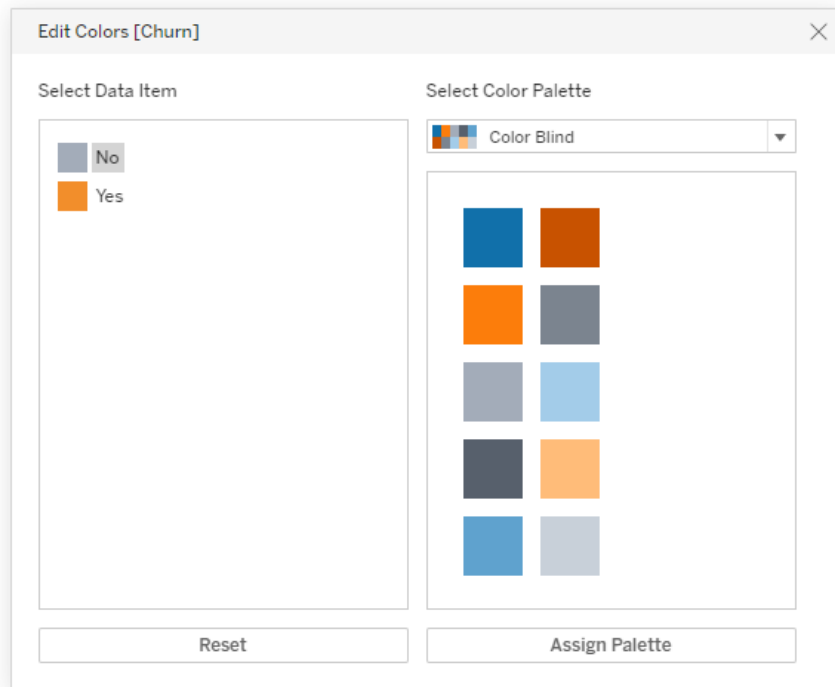
6. Explain how two data representations in your presentation support the story you wanted to tell.

The data representations support the story I wanted to tell because they allow me to provide actionable insight on customer retention. The first one, outage seconds per week and electricity generation, allow the organization to use customer demographic and reported information to inform decisions based on reducing outages for customers in specific areas. This recommended action, to put resources into reducing outages in states with large median outages per week, supports the story of what we can do to retain customers and improve the customer experience.

The second representation that supports this story is the churn pie chart. This visual allows us to see how monthly charge is different for customers that churn. By visualizing this, I can recommend the organization to lower the average monthly charge of all customers closer to the number for non-churning customers to see if we can reduce churn and increase customer retention.

7. Explain how you used audience analysis to adapt the message in your presentation.

I used audience analysis to adapt the message in my presentation by focusing on the targeted audiences in the data dictionary. The main focus is on the leadership of the organization with little data analysis background. As a result of this analysis, I provided clear, layman terms for the representations and metrics in the dashboard. The following list highlights the audience analysis and what was told specifically for each group I am presenting to:

- For my peer audience, the visualizations and metrics will be easily understood and navigated. More advanced analysis can be found using the interface tools with their advanced understanding of the calculations and implications.

- For general audiences, the representations are visual enough to convey the message. The pie chart and size map are striking and simple. The histogram is relatively easy to digest and the geography map is entertaining to look at.

- For the Senior vice president, there are key representations demographic information based on the state the customer lives in.

- For the External vice president of sales, the demographics of bandwidth usage per state can help inform outreach and support systems.

- For the panel of regional vice presidents, the policies relating to monthly charge, outage seconds and the support system to reduce outages, tenure, churn, and bandwidth can be viewed by states and electricity generated.

8. Describe how you designed your presentation for universal access by all audiences.

I designed my presentation for universal access by all audiences by providing a dashboard that can be viewed by color blind individuals, in a pdf format, or on a phone screen or computer screen. By making the dashboard a single encompassing square image, it can be easily converted to pdf and viewed on a phone, tablet, presentation board, or computer. The dashboard itself is also large enough with clear captions and colorblind accessibility that it can be presented clearly on a large screen. I have designed my presentation for universal access with these key themes in mind that are the same from the audience analyzation:

- For my peer audience, the visualizations and metrics will be easily understood and navigated.
- For general audiences, the representations are visual enough to convey the message.
- For the Senior vice president, there are key representations demographic information based on the state the customer lives in.
- For the External vice president of sales, the demographics of bandwidth usage per state can help inform outreach and support systems.

- For the panel of regional vice presidents, the policies relating to monthly charge, outage seconds and the support system to reduce outages, tenure, churn, and bandwidth can be viewed by states and electricity generated.

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

One element of effective storytelling I implemented in my presentation is varying levels of data literacy. It was intended to engage the audience by tailoring my dashboard to individuals of all levels of data literacy through using easy to read visual representations and then more advanced data analytics with histograms and calculations. Through differentiating my dashboard to people who understand very little analytics and need simple visuals to people who are my peers and may know more about analytics than me and giving them the raw results and ranking abilities, I have utilized the differentiation of data literacy element of effective data analysis storytelling.

A second element of effective storytelling I implemented in this presentation is letting the data tell the story, without having to explain the representations in essays BEFORE they can be understood. It was intended to engage the audience by allowing them to digest the dashboard at their own pace and level before being told what they were looking at. The pie chart visualization is very striking and simple to look at and understand. The histograms show great and easy to read data contracts. The two size and color heatmaps take more time and a higher level of analysis that may need to be explained to the audience.

Either way, this data tells them about churning and monthly charges, two of the most important metrics first. Then as the audience digests the more complicated visuals, the data tells

them about Tenure lengths and outage seconds, two key metrics the organization wants to

monitor. Finally, the bandwidth usage and electricity generated highlight an additional dataset

and metric that can be used to discuss and think about what can be done to retain certain

customers. Once the visual story is told through striking and simple representations, I can come

in and dive into it and further explain it, utilizing the element of effective storytelling where the

data itself does most of the engaging presentation of information (*6 Steps to Persuasive Data

Storytelling (+Examples)*.

D. Acknowledge sources, using in-text citations and references, for content

that is quoted, paraphrased, or summarized.

References

Color blind | Digital Accessibility. (n.d.). Accessibility.huit.harvard.edu.

https://accessibility.huit.harvard.edu/disabilities/color-blind

Create level of detail, rank, and tile calculations. (n.d.). Help.tableau.com.

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https://help.tableau.com/current/prep/en-

us/prep_calculations.htm#:~:text=Calculate%20rank%20or%20row%20

number%201%20PARTITION%20%28optional%29%3A

6 Steps to Persuasive Data Storytelling (+Examples) | [Wordstream]. (n.d.).

WordStream.https://www.wordstream.com/blog/ws/2021/05/27/data-

storytelling

E. Demonstrate professional communication in the content and presentation of your submission.

This aspect of the rubric is evaluated through the entirety of this report and I hope professionalism has shown continuously.