D210 Performance Assessment

Representation and Reporting

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# Part 1: Interactive Dashboard

## Links to all Dashboards created:

Demographics Dashboard: <https://public.tableau.com/app/profile/nicole.haibach/viz/NhaibachD210-Demographics/CustomerDemographics?publish=yes>

Revenue per capita Dashboard:

<https://public.tableau.com/app/profile/nicole.haibach/viz/NhaibachD210/RevenueperCapita?publish=yes>

Loyal Customer Dashboard:

<https://public.tableau.com/app/profile/nicole.haibach/viz/NhaibachD210-LoyalCustomers/TopLoyalCustomerStates?publish=yes>

## Representations:

|  |  |  |
| --- | --- | --- |
| Dashboard | Primary Visual | Secondary Visual |
| Demographics | Tree map | Stacked Bar chart |
| Revenue | Heatmap | Heatmap |
| Loyal Customer | Heatmap | Table |

## Two Interactive Controls

|  |  |  |  |
| --- | --- | --- | --- |
| Dashboard | Calculated | Created Groups | Filter |
| Demographics |  | Tenure groups/ Income Levels | Gender/ Churn |
| Revenue | Lost revenue per capita/ Overall Revenue per Capita |  | Region |
| Loyal Customer | Loyal Customers per 1000 people | Loyal Customers | Region |

## Key Performance Indicators

**Lost revenue per capita:** Total aggregation of annual revenue lost because of lost customers divided by the population.

([Churned customers] \* (AVG([Monthly Charge])\*12))/ Population

**Overall Revenue per Capita:** Total aggregation of annual revenue because of total customers divided by the population.

(AVG([Monthly Charge])\*12)/ Population

**Loyal Customers per 1000 people:** Loyal customers were created by the parameters of tenure over 12 months and no churn.

(SUM([Loyal Customer]) / SUM([Pop])) \* 1000

Data will be included in the submission. The sources of the data are the WGU churn dataset and US Census Bureau.

Data Source:

NST\_EST2023\_POP Annual Estimates of the Resident Population for the United States, Regions, States, District of Columbia, and Puerto Rico: April 1, 2020 to July 1, 2023 (US Census Bureau, 2023)

# A2: Step-by-Step Instructions for Setting Up a Tableau Dashboard

**Prerequisites:**

1. **Tableau Desktop** installed on your computer.
2. **Dataset** containing State, Churn, Revenue, and Population.

**Step 1: Load Data into Tableau**

1. **Open Tableau Desktop:**
   * Launch Tableau Desktop on your computer.
2. **Connect to Data Source:**
   * Click on File > Open... and select your dataset file (e.g., Excel, CSV).
   * Alternatively, click on the appropriate data source option on the Tableau start page and follow the prompts to load your data.
3. **Verify Data:**
   * Ensure the data is correctly loaded and the columns are correctly recognized.

**Step 2: Create Calculated Fields**

1. **Total Lost Revenue:**
   * Go to the Data pane, right-click on your dataset, and select Create Calculated Field.
   * Name it " Lost Revenue" and use the formula:

Copy code

[Churned customers]\*(AVG([Monthly Charge])\*12)

1. **Total Population:**
   * Create another calculated field named "Total Population" and use the formula:

sql

Copy code

SUM([Population])

1. **Lost Revenue per Capita:**
   * Create a calculated field named "Lost Revenue per Capita" and use the formula:

Copy code

[Lost Revenue]/ [sum population]

**Step 3: Create a Choropleth Map**

1. **Create a New Worksheet:**
   * Click on the New Worksheet icon at the bottom of the Tableau interface.
2. **Drag Fields to the View:**
   * Drag the State field to the Detail shelf on the Marks card. Tableau should automatically generate a map view.
   * If Tableau does not automatically generate a map view, right-click on the State field, select Geographic Role, and choose State/Province.
3. **Add Lost Revenue per Capita to Color:**
   * Drag the "Lost Revenue per Capita" field to the Color shelf on the Marks card. This will color the states based on their lost revenue per capita values.
4. **Adjust Color Settings:**
   * Click on the Color shelf and choose Edit Colors.
   * Select a color palette that clearly distinguishes the values. A sequential palette (e.g., light to dark shades) is often effective.
5. **Add Labels and Tooltips:**
   * Drag the "Lost Revenue per Capita" field to the Label shelf to display the values on the map.
   * Optionally, add more fields to the Tooltip shelf to provide additional context when hovering over a state.

**Step 4: Create Calculated fields**

1. **Total Revenue:**
   * Go to the Data pane, right-click on your dataset, and select Create Calculated Field.
   * Name it "Revenue" and use the formula:

Copy code

[Monthly Charge]\*12

1. **Revenue per Capita:**
   * Create a calculated field named " Revenue per Capita" and use the formula:

Copy code

[Revenue]/[Pop]

**Step 5: Create a Choropleth Map**

1. **Create a New Worksheet:**
   * Click on the New Worksheet icon at the bottom of the Tableau interface.
2. **Drag Fields to the View:**
   * Drag the State field to the Detail shelf on the Marks card. Tableau should automatically generate a map view.
   * If Tableau does not automatically generate a map view, right-click on the State field, select Geographic Role, and choose State/Province.
3. **Add Revenue per Capita to Color:**
   * Drag the "Revenue per Capita" field to the Color shelf on the Marks card. This will color the states based on their lost revenue per capita values.
4. **Adjust Color Settings:**
   * Click on the Color shelf and choose Edit Colors.
   * Select a color palette that clearly distinguishes the values. A sequential palette (e.g., light to dark shades) is often effective.
5. **Add Labels and Tooltips:**
   * Drag the “Revenue per Capita" field to the Label shelf to display the values on the map.
   * Optionally, add more fields to the Tooltip shelf to provide additional context when hovering over a state.

**Step 6: Create a Dashboard**

1. **Create a New Dashboard:**
   * Click on the New Dashboard icon at the bottom of the Tableau interface.
2. **Add Worksheets to the Dashboard:**
   * Drag each worksheet you created (e.g., both Choropleth Map) to the dashboard.
3. **Arrange the Layout:**
   * Arrange the worksheets and other dashboard components as needed to create a cohesive and informative layout.
4. **Add Filters and Interactivity:**
   * Add filters to the dashboard to allow users to interact with the data (e.g., filtering by region).
   * Ensure that filters are set to apply to all relevant worksheets.
5. **Add Titles and Descriptions:**
   * Add titles and descriptions to each worksheet and the dashboard to provide context and make the dashboard easy to understand.

**Step 7: Save and Share the Dashboard**

1. **Save the Workbook:**
   * Save your Tableau workbook by clicking on File > Save As and choosing a location on your computer.
2. **Share the Dashboard:**
   * You can share the dashboard by publishing it to Tableau Server or Tableau Online, or by exporting it as a PDF or image

# A3: Step-by-Step Instructions for Accessing and Interacting with the Tableau Dashboard

**Step 1: Open the Dashboard Link**

1. **Click on the Dashboard Link:**
   * Open your web browser and click on the following link: [Revenue per Capita Dashboard](https://public.tableau.com/app/profile/nicole.haibach/viz/NhaibachD210/RevenueperCapita?publish=yes).

**Step 2: Understanding the Dashboard Interface**

1. **Dashboard Overview:**
   * Once the dashboard loads, you will see a variety of visualizations, including maps, tables, and other graphical representations of data.
2. **Toolbar:**
   * At the top of the screen, you might see a toolbar with options like Download, Share, Full Screen, and more.
3. **Filters and Interactive Elements:**
   * Look for interactive filters, dropdown menus, and buttons on the dashboard. These elements allow you to customize the view and filter data based on your interests.

**Step 3: Using Filters and Interactive Elements**

1. **Region Filter:**
   * The menu labeled "Region," can be used to filter the data displayed on the dashboard by selecting one or multiple regions to be excluded from the visual.

**Step 4: Exploring Visualizations**

1. **Choropleth Map:**
   * The map will be color-coded based on the selected metric (e.g., revenue per capita or lost revenue per capita). Hover over each state to see detailed information in a tooltip.
2. **Additional Charts:**
   * There may be other visualizations like tables that provide additional insights. Interact with these charts to explore relationships between different metrics and states.

**Step 5: Downloading or Sharing the Dashboard**

1. **Download:**
   * To download the dashboard, click on the "Download" button in the toolbar. You can choose to download the dashboard as an image, PDF, or Tableau Workbook.
2. **Share:**
   * To share the dashboard, click on the "Share" button in the toolbar. You can copy the link to the dashboard and share it via email or social media.
3. **Full Screen:**
   * For a better viewing experience, click on the "Full Screen" button to expand the dashboard to full screen mode.

**Additional Tips**

* **Refreshing Data:**
  + If the data in the dashboard is periodically updated, you might see a "Refresh" button to reload the latest data.

# Part 2: Storytelling with Data

This will be included in the submission

# Part 3: Reflection Paper

## Explain how the purpose and function of your dashboard

The "Revenue Lost and Gained per Capita" section of the dashboard offers a detailed comparison of lost and gained revenue on a per capita basis across different states. This component includes choropleth maps that geographically display the distribution of lost and gained revenue per capita, allowing users to identify regions with significant financial performance variations. The accompanying summary statistics provide aggregate values for the total population, number of loyal customers, total revenue, and total lost revenue, offering a quick overview of the data. This section is essential for understanding financial performance in relation to population size, highlighting areas where revenue optimization strategies may be needed.

The "Churn Rate" section focuses on visualizing customer churn across different tenure periods, helping to identify when customers are most likely to leave. A treemap categorizes churned customers into different tenure ranges, providing a clear visual representation of churn patterns. Additionally, interactive filters allow users to segment the data by gender and churn status, enabling a more granular analysis of demographic trends and their impact on churn rates. This section addresses the critical need for tracking customer retention and identifying key areas where intervention could reduce churn, supporting targeted retention strategies. In the "Demographics Distribution" section, the dashboard provides insights into the distribution of customers by income level and age group, segmented by their loyalty status. A bar chart displays the count of customers across various demographic segments, distinguishing between churned and loyal customers. This visualization is crucial for understanding the demographic characteristics of the customer base and identifying which groups are more likely to remain loyal or churn. By revealing demographic trends, this section supports strategic planning for marketing and retention efforts aimed at specific segments of the population.

The "Loyal Customers" section identifies and highlights states with high numbers of loyal customers, focusing on the distribution of these customers per 1000 population. A choropleth map visualizes the percentage of loyal customers per 1000 population for each state, while an accompanying table lists the states along with their loyal customer percentages and population figures. This component is key to understanding geographic patterns of customer loyalty, allowing for the identification of regions with strong customer retention. This information is vital for resource allocation and developing targeted strategies to foster and maintain customer loyalty in different areas.

This dashboard is designed to meet the needs outlined in the data dictionary by providing comprehensive visualizations that enable easy comparison and analysis of revenue, customer loyalty, and demographic trends. Each component of the dashboard is tailored to address specific data points and provide actionable insights, making it a valuable tool for strategic decision-making.

## Explain how the variables in the additional data set enhance the insights

Integrating the US population data with the telecommunications data set significantly enhances the insights by providing normalized comparisons across states with varying population sizes. By incorporating population figures, the dashboard can calculate revenue and lost revenue on a per capita basis, offering a fair comparison that accounts for population differences and revealing which states are particularly efficient or inefficient in revenue generation. Additionally, calculating loyal customers and churn rates per 1000 population allows for a more nuanced understanding of customer loyalty and retention relative to the size of the customer base. This normalization helps identify states with strong customer loyalty and regions where customer retention is a significant issue, guiding targeted financial and retention strategies. Furthermore, the geographic analysis is enhanced by providing context for interpreting financial and customer behavior metrics, helping in resource allocation and regional strategy development. The choropleth maps, such as those in the "Revenue Lost and Gained per Capita" and "Loyal Customers" sections, visually represent how metrics vary across states, pinpointing specific areas of high performance or concern. This comprehensive integration supports data-driven decision-making and strategic planning, helping businesses optimize operations and improve customer satisfaction across various regions.

## Explain two different data representations from your dashboard

The choropleth map for lost revenue per capita visually represents the distribution of lost revenue across different states, normalized by population. Each state is colored based on the amount of lost revenue per capita, with darker shades indicating higher lost revenue relative to the population. This representation helps to highlight geographical disparities in financial performance, providing a clear visual cue on where the company's revenue losses are most concentrated.

Executive leaders can use this visualization to identify states where the company is losing the most revenue per resident. By pinpointing these high-loss areas, executives can prioritize regions for targeted intervention strategies. For instance, they can allocate more resources to customer retention programs in states with high lost revenue per capita or investigate underlying issues causing higher losses. This map supports informed decision-making regarding where to focus efforts to minimize revenue losses and improve overall financial performance.

The bar chart for demographics distribution shows the count of customers across various income levels and age groups, segmented by their loyalty status (loyal or churned). This visualization highlights the differences in customer loyalty and churn rates across different demographic segments, providing a comprehensive view of the customer base. It reveals patterns and trends in customer behavior that are crucial for strategic planning.

Executive leaders can use this bar chart to gain insights into which demographic groups are more likely to remain loyal or churn. Understanding these patterns allows executives to tailor marketing and retention strategies to specific segments. For example, if the chart reveals that middle-income, younger customers have higher churn rates, the company can develop targeted retention programs or personalized marketing campaigns for this demographic. Conversely, identifying segments with high loyalty rates can help in reinforcing successful strategies and replicating them in other segments. This data-driven approach supports more effective resource allocation and strategic planning, ultimately enhancing customer retention and satisfaction.

These two data representations provide executive leaders with crucial insights into revenue loss and customer demographics. By leveraging the choropleth map for lost revenue per capita and the bar chart for demographics distribution, executives can make informed decisions to address financial performance issues and tailor customer retention strategies to specific demographic groups. This enhances the company's ability to optimize operations, improve customer satisfaction, and drive overall business success.

## Explain two interactive controls in your dashboard

The Region Filter is a dropdown menu or multi-select list that allows users to filter the dashboard data by selecting specific regions. This control is typically located at the top or side of the dashboard for easy access. The Region Filter enables users to narrow down the data to one or more selected regions, such as Northeast, Midwest, South, and West. When a user selects a region or multiple regions from the dropdown menu, all the visualizations on the dashboard update to reflect only the data for the chosen regions. This interactivity allows users to focus on specific geographic areas and analyze data at a more granular level. For example, an executive might want to compare the revenue per capita and lost revenue per capita for the Northeast and Midwest regions. By using the Region Filter, they can quickly adjust the dashboard to show only the data relevant to those regions, enabling more targeted analysis and strategic decision-making.

The Gender Filter is a set of checkboxes that allow users to filter the data based on gender attributes, typically including options such as Male, Female, and Nonbinary. This control is usually positioned near the visualizations that display demographic data. The Gender Filter enables users to modify the presentation of data by selecting or deselecting specific gender attributes. For example, if the filter includes checkboxes for Male, Female, and Nonbinary, users can choose to view data for all genders or isolate data for a specific gender. When users adjust these filters, the visualizations update in real-time to reflect the filtered gender data. This interactivity allows users to explore how different gender segments impact metrics like churn rate and customer loyalty. By enabling users to focus on specific gender groups, the Gender Filter helps in understanding trends and patterns within those segments, supporting more informed and strategic decisions.

## Accessibility of Dashboards

To make the dashboard accessible for individuals with colorblindness, a colorblind-friendly palette was used, avoiding problematic color combinations like red and green. High contrast colors were selected to ensure readability, with light backgrounds and dark text or vice versa. Clear and descriptive labels were added to visualizations, along with detailed tooltips to provide additional context. The dashboard was tested using colorblindness simulators and feedback was sought from colorblind users to ensure effectiveness. These measures ensure that the dashboard is inclusive and provides clear, distinguishable data representations for all users.

## Explain how your data representations support the story

The choropleth map for lost revenue per capita and the bar chart for demographics distribution together support the story of identifying and addressing key areas for financial and strategic improvement. The choropleth map highlights states with the highest lost revenue per resident, guiding executive leaders to prioritize resources and develop targeted strategies to minimize revenue losses in those areas. The bar chart, on the other hand, reveals patterns in customer loyalty and churn rates across different income levels and age groups, enabling the company to tailor marketing and retention strategies effectively. By understanding which demographics are more likely to churn, the company can focus on developing targeted retention programs, while also reinforcing successful strategies in segments with high loyalty rates. These visualizations ensure data-driven decision-making, helping to optimize operations and improve customer satisfaction.

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

Audience analysis was crucial in tailoring the presentation to effectively communicate key insights to executive leaders. Understanding their focus on high-level strategic decisions, the presentation emphasized critical metrics like lost revenue per capita and customer churn rates, highlighting areas needing immediate attention and their impact on business performance. To accommodate executives' preference for simplicity and clarity, clear and visually impactful data representations, such as choropleth maps and bar charts, were used to convey complex data succinctly. The presentation also provided actionable insights and tailored recommendations aligned with the company's strategic objectives, ensuring relevance, and facilitating informed decision-making. Additionally, by using colorblind-friendly palettes and maintaining high visual appeal, the presentation ensured accessibility and engagement, making it easier for executives to grasp and act on the information presented.

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

To ensure universal access for all audiences, the presentation was designed with several key accessibility features. Colorblind-friendly palettes were used to make sure color-coded data was distinguishable by individuals with various types of colorblindness. High contrast colors were employed to enhance readability for users with visual impairments, and clear, descriptive labels and annotations were added to provide context without relying solely on color. Textures and patterns were incorporated alongside colors to differentiate data points, and alternative text descriptions and detailed tooltips were included for screen reader users. The presentation was tested with accessibility tools and simulators to ensure its effectiveness, and feedback from diverse users, including those with disabilities, was incorporated to refine accessibility features. These measures ensure the presentation is inclusive and easily understood by all audiences.

## Explain two elements of effective storytelling

In the presentation, effective storytelling was achieved through a clear narrative structure and compelling data visualizations with interactive elements. The narrative structure was organized logically, starting with an overview of key metrics like lost revenue and revenue per capita, then diving into detailed analyses of demographic trends and customer loyalty. This progression ensures that the audience can follow the story from a high-level summary to more detailed insights, keeping them engaged and aiding comprehension. Compelling data visualizations, such as choropleth maps and bar charts, transformed raw data into accessible visuals, while interactive controls, like region and demographic filters, allowed the audience to explore the data dynamically. These interactive elements encouraged direct engagement with the data, providing a hands-on experience that fosters deeper insights and understanding, making the presentation both informative and engaging.