**Reflection paper: Data Representation and Reporting**

D210

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**1. Dashboard Alignment with Data Dictionary Needs**

The purpose and function of my dashboard are closely aligned with the needs outlined in the data dictionary associated with the chosen data sets. The primary data set focuses on customer churn, bandwidth usage, and monthly charges across various states. The dashboard was designed to provide a clear representation of these variables, which are crucial for analyzing customer behavior and service usage patterns. The dashboard's goal was to enable stakeholders to quickly understand which states exhibit higher churn rates, lower bandwidth usage, and how these metrics correlate with income levels. The data dictionary's definitions for churn, bandwidth, and charges were directly integrated into the dashboard design to ensure clarity and ease of use.

2. **Enhancement through the additional data set**

The additional of median income data from the U.S. Census Bureau enhanced the original data set by providing valuable socioeconomic context. Without the income data, insights into customer churn and bandwidth usage would have been one-dimensional. By incorporating state-level median income, the analysis became more robust, enabling a deeper understanding of how financial factors influence customer behavior. For example, the dashboard was able to reveal that states with lower median incomes, such as West Virginia and Kentucky, had higher churn rates. This enhanced insight supports more targeted decision-making and intervention strategies.

**3.Data Representations and Executive Decision-Making**

Two key data representations in the dashboard support executive decision-making:

* **Churn Bar Chart**: This visualization allows executives to easily compare churn rates across different states, segmented by income level. This insight enables leaders to prioritize resources toward states with higher churn, allowing for targeted retention strategies. For example, states like West Virginia and Oklahoma can be flagged for immediate intervention.
* **Tree Map of Bandwidth Usage by Income**: The tree map provides a clear visual representation of bandwidth usage trends across states, categorized by median income. Executives can use this information to assess the relationship between income and service consumption, helping them optimize product offerings and marketing strategies in high-usage areas like New York and California.

**4. Interactive Controls and User Modification**

The dashboard includes several interactive controls that enable users to modify the data presentation:

* **Churn Filter**: This control allows users to filter data based on churn rates. Users can adjust the filter to focus on states with specific churn percentages, enabling detailed analysis of churn behavior by state. This is particularly useful for regional managers who need to identify critical areas for intervention.
* **Median Income Slider**: This interactive control lets users adjust the range of income data displayed in the dashboard. By changing the income range, users can explore how customer churn and bandwidth usage vary across different socioeconomic groups. This feature allows for dynamic exploration of the correlation between income and customer behavior.

**5. Colorblind Accessibility**

To ensure accessibility for individuals with colorblindness, I followed best practices by choosing color palettes that are distinguishable for those with common forms of color blindness, such as red-green colorblindness. I used color schemes like blue and orange for the churn chart and a consistent, monochromatic gradient for the bandwidth tree map. Additionally, I added labels and text descriptions to minimize reliance on color alone, ensuring that data is accessible to all users.

**6. Supporting the Story with Data Representations**

Two key data representations that support the narrative of the analysis are:

* **Churn Rate vs. Income Scatter Plot**: This visualization shows the relationship between churn rates and state-level income, demonstrating how lower-income states tend to have higher churn rates. This graph supports the story that income plays a significant role in customer retention, guiding decision-makers to focus their efforts on income-based strategies.
* **Customer Tenure Bubbles**: This visualization represents customer tenure across different states, giving insight into how long customers stay with the service in each region. This helps to highlight patterns in customer loyalty and areas where retention efforts have been successful or need improvement.

**7. Audience Analysis and Adaptation of the Message**

Understanding the audience was key to adapting the message in the presentation. The target audience includes executives and decision-makers with limited time to analyze detailed data. As a result, the dashboard and accompanying presentation were designed to prioritize clarity, simplicity, and actionable insights. Visuals were chosen to provide a clear overview at a glance, while interactive features allow for more in-depth analysis when needed. The inclusion of key performance indicators (KPIs) such as churn rates and customer lifetime value also ensured that the presentation aligned with the high-level business goals of the audience.

**8. Design for Universal Access**

I designed my presentation using **Tableau Public**, which allows universal access without requiring viewers to pay for access or have a Tableau license. By publishing the dashboard on Tableau Public, users can freely view and interact with the data through any web browser. Additionally, the presentation was optimized for mobile and desktop devices, ensuring accessibility across various platforms. The decision to use Tableau Public ensures that the analysis is not only visually appealing but also accessible to the widest audience possible, making the insights available to a larger, more diverse set of users.

<https://public.tableau.com/app/profile/josue.gonzalez3363/viz/D210Customerchurn/Comparativeanalysisofcustomerchurn>

**9. Effective Storytelling Elements**

Two elements of effective storytelling implemented in the presentation were:

**1. Clear and Concise Narrative Structure:**The presentation follows a clear structure, starting with an overview of the problem (customer churn and bandwidth usage across states), then progressing through key findings (churn rates, state income comparisons, and bandwidth consumption), before concluding with actionable insights. This structure helps the audience easily follow the story and understand the implications of the data. Research by Segel and Heer (2010) highlights that a logical narrative flow improves the comprehension and retention of key information in data storytelling.

**2. Data-Driven Storytelling:**I used visualizations that directly aligned with the questions I aimed to answer: What factors are influencing customer churn, and how does median income affect bandwidth usage? The inclusion of visual elements like churn bar graphs and tree maps simplifies complex data and showcases patterns clearly. Cairo (2013) asserts that using visual storytelling in data enhances engagement by allowing the audience to interact with the information, making it easier to absorb and analyze.

***References:***

*Cairo, A. (2013). The Functional Art: An Introduction to Information Graphics and Visualization. New Riders.*

*Segel, E., & Heer, J. (2010). Narrative Visualization: Telling Stories with Data. IEEE Transactions on Visualization and Computer Graphics, 16(6), 1139-1148.*