Western Governor's University
D210 - Representation and Reporting

Reflection Paper: Analysis of the Churn Dataset paired with US Census Data

Bernard Connelly

College of Information Technology, Western Governors University

Dr. Kesselly Kamara

September 30, 2024

D210 – Representation and Reporting Reflection Paper

Completing the steps of this course has been illuminating and encouraging in the data analytics journey I am currently embarking upon. Tableau is a very intuitive program that can create dashboards and data representations, allowing the layperson and a seasoned data professional to draw practical conclusions about the information presented. Without performing in-depth coding or analysis of the raw datasets, I created an interactive dashboard that integrated additional data and provided representations that were easy to manipulate and effective for drawing conclusions. Using the churn dataset from WGU and population data from the 2018 US Census, I crafted interactive visualizations that provided clean Key Performance Metrics for senior-level executives to navigate and draw conclusions.

My primary purpose was to highlight how shifting certain variables reduced churn ratios across the dataset of available customers. Tying the population in from the census dataset permitted analysis to include comparisons to potential customers and presented potential outreach opportunities. State-level analysis was offered with at-a-glance figures to review the available rankings and how certain variables were lower in scenarios where churn was higher and vice versa. A vital point of the data dictionary was the focus on maintaining high-paying customers - the dashboard allows executives to compare the longer tenure of customers who pay less with higher-paying customers who remain for shorter periods and determine which yields increased profits in the long term. The sliders and rapidly updating KPIs presented in the dashboard provided enhanced insights to draw relevant conclusions.

Integration of the census dataset was crucial as the population of the individual states allows executives to put the overall churn statistics into a larger backdrop. The field analyzing customers churned per 100,000 people was calculated in Tableau to standardize the relative loss of customers across the country instead of individual frequency within the dataset. This also allows executives to

narrow down the focus on where to invest resources to maintain or acquire new customers. An illustration of this was seen when comparing Rhode Island to California; the churn rate within the dataset was demonstrated to be 10% for RI but 19% for California. Adding in population reveals that both states lost customers at a coefficient near .18 and .19, respectively, showing a clearer vision of actual loss. This also permits business leaders to identify where their advertising, outreach, or other subscription-based offers can have a more significant impact, as they would inherently reach more potential customers due to the higher populations of larger states.

The primary representation created was a map of the United States colored by population levels per state from the census data and housing rankings of metrics from the churn dataset to highlight average customer income levels, tenure, monthly charge, and GBs used. Tableau permitted me to create a story using calculated fields to focus annual metrics into monthly metrics and develop calculations to highlight the state-by-state churn levels within the telecommunications company and compare them to the state's overall population. Sliding scales and dropdown filters allowed the data to be manipulated to create a story to focus on the critical tasks, interests, or responsibilities of several senior executives in the telecommunications company. The needs of the executive audience were further analyzed by looping in population data and tying it to the churn dataset, allowing the telecommunication dataset to be leveraged to fit the needs of each of these executives individually. The presence of a map with population scaling highlights areas where the EVP could identify where more specific product outreach would be helpful over the regions within the country. It also permits this executive to work closely with the SVP to increase engagement with services and identify what may be driving customers to maintain and utilize different portions of the platform. A combination of the bar chart listing all states and a population slider allowed swaths of similar populations to be compared quickly and effectively. This allowed regional VPs to promptly narrow down to the specific states within their purview to focus analysis on their particular region. By analyzing the

needs of each executive individually based on descriptions in the data dictionary, a story was created that highlights their specific needs.

It is also worth noting that certain metrics did not appear to hold any statistical significance to the data story, which can be an essential detail in and of itself. The analysis of children per customer bucketed into bins in a bar chart did not yield any apparent trends or determinations regardless of other metrics or boundaries selected. Similarly, the overall income of customers, at least on average, did not appear to have a statistical significance on churn or maintenance of customers. This insight is helpful since both GB used monthly and lower monthly costs directly correlated to higher tenure and lower churn. This insight allows the audience to narrow their focus further to more relevant metrics of engagement and cost.

In addition to the effectiveness of the Dashboard, this project forced me to contemplate a variety of important storytelling and presentation details that need to be considered to ensure application to a broad audience. Creating a color palette that avoided “non-compatible color combinations” (Accessibility, 2023) is a significant effort that I would have overlooked if not explicitly called out. Utilizing blues and browns while avoiding reds and greens as much as possible and using black and white where possible to demonstrate stark contrast makes the visualizations easier to access for someone with a colorblindness disability. Similarly, using a well known symbol such as a map of the United States allows users an alternative to color alone to navigate the nuance of a dashboard.

Requirements to share findings and visualizations with high-level executives and data analytics peers presented a unique challenge. I had to craft a presentation that was easy to use and navigate for a layperson and multiple tooltips, sliders, and analysis metrics for others who are more familiar with data analytics programs. Guidance was provided using a few lines of instruction for all users, and an inherently intuitive point-and-click design drove the overall presentation, allowing for most areas of the dashboard to provide updated metrics. The inclusion of grids that updated KPIs based on specific

choices allowed individuals who needed narrow or broad details for their areas of expertise to access those quickly and effectively. Finally, posting the presentation on Tableau public lowered the bar for overall access to only having an internet connection to access the overall presentation.

Telling a story was the final piece of this project, and it was an additional challenge. Reviewing the Six Elements of an Effective Data Story (2023, Correlation One) allowed me to select the two areas that most effectively suited my needs. The primary element of effective storytelling utilized in the dashboard was visualizations - which "make(s) data analytics more accessible" (2023, Correlation One) to the lay audience or senior executives who need quick to access actionable insights to share with peers and create a plan for increasing the companies goals. By utilizing a visualization that was easy to engage with and showed compelling relationships in the data, information, and insights can be easily shared amongst members of the organization at various levels. Delivery is the second element utilized to cater the presentation to the specific audience that the dataset was created for in the first place. In addition to the visualizations of the original dataset, reliable census data was included to create a broader vision of customer gain and maintenance opportunities. Regional data became available quickly for a narrowed view of insights across the executives. Finally, by creating a “conclusions” story point with actionable insights already highlighted, the dashboard matched the presentation to the audience by ensuring they had key takeaways already highlighted before even looking into the Dashboard itself.

In conclusion, this project was enjoyable and engaging throughout. Tableau is a fantastic tool that is highly intuitive, effective, and fun to use. Thinking of ways to present and make different pieces of information come to life is gratifying and increasingly enjoyable as more skills are learned and leveraged into specific visualizations. I look forward to increased opportunities to massage and create data correlations in the future. I can only imagine how much more effective an analyst I will become when I can leverage both the coding and visualization sides of this craft more effectively.

References

Tableau Public Dashboard created by Bernard Connelly: https://public.tableau.com/app/profile/bernard.connelly4716/viz/D210-TelecommunicationsCompanyCustomerChurn/PrimaryStory

Telecommunications Churn Dataset. Western Governor's University. Data Analytics Department.

Lucasvictor. (2018, May 08). US State populations - 2018. Kaggle.com. https://www.kaggle.com/datasets/lucasvictor/us-state-populations-2018

Milbergs,Kaspars. (2023, May 12). You are making Your Website Accessible for Color-Blind Users (Comprehensive Guide). Accessibility.com. https://accessiblyapp.com/blog/color-blind-accessibility/#:~:text=Be%20careful%20with%20contrasting%20colors,contrast%2C%20but%20so%20are%20colors.

Correlation One. (2023, September 19). The Six Elements of an Effective Data Story. correlation-one.com. https://www.correlation-one.com/blog/6-elements-of-an-effective-data-story