Part 3: Report

1. The purpose of the dashboard is to provide executives a way to compare the company's key performance indicators with a competitor's indicators. The second function of the dashboard is to allow executives to explore which customers are churning. Churn refers to if a customer cancels services in the given month. Th average churn rate of a telecom company in the United States in 2020 was 21% (Customer churn rate in the United States in 2020, 2021). The dashboard shows two indicators tied to churn rate in addition to key performance indicators. A national map of customers by state and the ability to filter by churn and location have been included to aid in discovery.

2. The business intelligence tool used was Tableau. Tableau is a popular tool for analyzing data and creating visualizations. It has a drag and drop interface that is easy for any user regardless of skill level. It offers many ways to connect to data both locally and remotely. It supports different coding languages. The dashboards created by Tableau can be shared in both dynamic and static forms. (Dcruz, 2020)

3. Steps to clean and prepare the data to use in the dashboard:

- Import dataset to juypter notebook
- View the shape of data frame, rows and columns, and data types
- View summary statistics to check for outliers
- Check data for missing values. Some missing from TotalCharges. After inspection, all the rows with missing values have a Tenure of 0. This indicates that they are new customers who have not paid a bill yet. I filled in the blanks with 0's.
- Saved a copy of cleaned data as churn_clean and Competitor_data.
- Using pgadmin, a database was created for the competitor data.
- In Tableau, using custom SQL querys, the tables were combined using left joins to select only the columns needed to create the dashboard. The columns were combined using primary and foreign keys. This ensured referential integrity remains intact.

4. The dashboard was created by combining individual worksheets into one interactive space. In the upper left corner, the churn percentage is visible for both the company and competitor. A calculated field was created using the number of customers churned divided by the total number of customers for both data sets. The churn filters are in the upper right corner. They allow the dashboard to be filtered by whether the customers have churned or not. The next item on the dashboard are the key performance indicators. Executives can easily compare revenue, average monthly cost, and customer counts for both companies. The graphs were

created to compare two of the key markers for churn. A thin boarder was placed around corresponding graphs to show they are linked. The largest bar is highlighted while the others are lightened to recede into the background. Lastly the map was created to show customer density. Colors were chosen from the color-blind palette to make it accessible.

5. The key performance indicators allow for an easy comparison with another company. Prior data analysis showed that there is a link between contract length, monthly charge, and churn. The contract length graph shows that the largest number of churn customers are on a month-to-month contract and have a monthly payment between $180 and $195. The dashboard allows decision makers to discover these connections. They can then use that information to build a strategy to retain these customers. The map allows strategies to be pinpointed to specific areas of need.

6. Limitations of this data set include the size of the data set and the timeframe it covers. The data sets only include a small part of the overall population. A quick Google search showed that the top three telecommunications companies have over 20 million customers each. Secondly, the dataset only covers a single month. This small window of time does not allow for inspections of patterns over time.

Works Cited

Customer churn rate in the United States in 2020. (2021, February 9). Retrieved September 2021, from Statista: https://www.statista.com/statistics/816735/customer-churn-rate-by-industry-us/

Dcruz, J. (2020, November 4). *Tableau visualizations*. Retrieved November 2021, from towardsdatascience.com: https://towardsdatascience.com/tableau-visualizations-dc9e544dc9a8