D211 Essay

Telecommunication Churn Data

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D211: Advanced Data Acquisition

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A2.  Provide step-by-step instructions to guide users through the dashboard installation.

I used Tableau Public, a free data visualization tool, to upload my dashboard so that anyone with a Tableau Public account can view and share. This allows for universal access to the data and analysis presented in the dashboard, making it accessible to a wide range of audiences. To access the dashboard, simply create a Tableau Public account, and search up, “Darien Nguyen” in the search bar or click/email the [shareable link](https://public.tableau.com/app/profile/darien.nguyen/viz/D211_16855048176260/Dashboard1) to the interactive for other viewers.

A3.  Provide clear instructions to help users navigate the dashboards.

Navigating through the dashboard is simple and intuitive. By hovering a clicking through the interactive figures; a reader can highlight, focus, and enhance key data points and numbers within a small field. For example, clicking on a state within the demographic visualization highlights the state and expands the data further into its individual monthly charge rate and customer churn. All other figures also contain the click and focus function to enhance navigation.

A4.  Provide a copy of *all* SQL code and other code supporting the dashboards.

–Creates external\_churn table

CREATE TABLE public.external\_churn

(

    churn VARCHAR(255),

    accountweeks INT,

    contractrenewal VARCHAR(255),

    dataplan VARCHAR(255),

    datausage DECIMAL(10,2),

    custservcalls INT,

    daymins DECIMAL(10,2),

    daycalls INT,

    monthlycharge DECIMAL(10,2),

    overagefees DECIMAL(10,2),

    roammins DECIMAL(10,2)

)

tablespace pg\_default;

alter table public."external\_churn"

owner to postgres;

– groups external\_churn  by churn then counts that amt of churn whilst taking the avg monthly charge

select churn, COUNT (\*) as count\_customers, avg(monthlycharge) as avg\_monthlycharge, avg(overagefees) as avg\_overage\_fees

from external\_churn

group by churn;

– groups internal customers by churn then counts that amt of churn, whilst averaging the monthly charge and bandwidth usage.

select churn, COUNT (\*) as count\_customers,

avg(monthly\_charge) as avg\_monthlycharge,

avg(bandwidth\_gp\_year) as avg\_bandwidth

from customer

group by churn;

C1.  Explain how the purpose and function of your dashboard aligns with the needs outlined in the data dictionary associated with your chosen data set.

The main objective of the newly created dashboard is to provide businesses with a clear and comprehensive view of the various factors that contribute to customer churn, such as monthly charges, and data usage per year. This aligns with the requirements stated in the data dictionary, which includes detailed information on customer demographics, service usage, and contract details.

With this dashboard, users can easily and quickly identify patterns and trends in customer churn based on selected parameters, and dive deeper into the data to uncover more insights. For instance, users can filter data by charge rates to investigate whether it plays a role in churn

Overall, this dashboard offers a user-friendly interface for exploring and analyzing the data related to customer churn. It enables businesses to gain valuable insights into the factors contributing to churn and identify areas for improvement that can help reduce churn and increase customer retention. By leveraging these insights, businesses can make data-driven decisions to improve their customer experience and retention efforts, thus increasing company retention.

C2.  Justify the selection of the business intelligence tool you used.

During our analysis, we utilized SQL to delve deeper into the data and extract meaningful insights. SQL proved to be an essential tool for manipulating and sorting the data effectively. We created queries to extract the necessary information from our database, filtering and aggregating the data to reveal patterns and trends. SQL's GROUP operation allowed us to combine data from different tables, giving us a comprehensive view of the relationships within the data. By applying AVG and COUNT, we were able to reformat the data, making it easier to identify outliers and key findings.

To visualize and present our discoveries, we turned to Tableau, a powerful business intelligence tool. Tableau's interactive dashboards provided an engaging way to explore the data, allowing us to drill down into specific details and filter data dynamically. Through a variety of visualization options, such as charts, graphs, and maps, we could effectively represent the insights we uncovered. We utilized Tableau's storytelling features to build a narrative around the data, providing context and highlighting the implications of our findings. The interactive nature of Tableau's visualizations encouraged exploration and enabled us to uncover additional insights on the spot.

By combining the capabilities of SQL and Tableau together, we were able to perform in-depth analysis, gain valuable insights, and present our findings in a compelling and understandable way. This blend of tools empowered us to make informed business decisions based on the patterns and trends we discovered within the data.

C3.  Explain the steps used to clean and prepare the data for the analysis.

During the data cleaning phase using SQL, I made great use of the “COUNT” and “AVG” functions to streamline and manipulate the data. The “COUNT” function became my go-to tool for figuring out the number of records in specific datasets or columns. This helped me spot any irregularities or missing values that needed attention. By carefully examining the counts, I could identify anomalies or discrepancies that required further investigation and resolution.

The ”AVG” function proved to be incredibly valuable for data manipulation. It enabled me to calculate the average value of numerical columns, which shed light on the central tendencies within the data. This allowed me to pinpoint any extreme values or potential errors that might have skewed the overall analysis. By computing the average, I gained a deeper understanding of the data's distribution and underlying patterns.

By combining these functions with other SQL techniques, I was able to clean and transform the data effectively. I could filter out irrelevant or erroneous records, address missing values, and gain comprehensive insights into the data's characteristics. The information derived from utilizing the “COUNT” and “AVG” functions helped guide my decision-making throughout the data cleaning process, setting the stage for subsequent analysis and visualization tasks.

C4.  Summarize the steps used to create the dashboards.

In the process of creating the Tableau dashboards, we took several steps to ensure meaningful and impactful visualizations. First, we created the US map that depicted the average monthly charge in relation to the churn rate. By incorporating color or size variations on the map, we were able to visually represent the churn rate across different regions, providing a view of how it varied geographically. To complement this map, we also designed an accompanying bar graph that further highlighted the churn rate and its connection to the average monthly charge.

Additionally, we recognized the importance of presenting the company data in a clear and organized manner. Therefore, we created well-structured tables that specifically focused on churn-related metrics. These tables were carefully formatted and arranged to ensure readability and easy comparison of relevant information. Through these tables, we gained valuable insights into the behavior of churn, enabling us to make informed decisions and delve deeper into the dynamics of our business.

By combining maps, bar graphs, and tables, the Tableau dashboards provided a comprehensive view of churn-related insights. These visualizations not only communicated the relationships and patterns within the data effectively but also empowered us to uncover key insights that drove our decision-making process.

C5.  Discuss the results of your data analysis and how it supports executive decision-making.

Our data analysis revealed a clear correlation between lower churn rates and lower monthly charges among telecom customers. This finding highlights the importance of pricing strategies in customer retention. Executives can optimize customer retention by offering competitive and affordable monthly charges. This insight informs decisions regarding pricing structures, promotions, and loyalty programs. By leveraging data-driven insights, executives can enhance customer satisfaction, reduce churn, and drive business growth.

C6.  Discuss the limitation(s) of your data analysis.

While using SQL for data analysis and Tableau for visualization has its advantages, there are a few limitations to consider. SQL can be complex, requiring expertise in writing queries for complex calculations and data transformations. Analyzing intricate data relationships or performing advanced calculations may pose challenges and time constraints. Additionally, SQL databases may experience performance issues with large datasets or complex queries, resulting in slower response times.

When it comes to data visualization, Tableau provides powerful capabilities, but it does have some limitations. Customizing and flexibly designing advanced visualizations may require additional effort or workarounds.

Moreover, both SQL and Tableau store static data that needs manual or scheduled updates. Real-time data analysis may not be easily achievable, necessitating manual management of data refreshes to keep the analysis up to date.

Both SQL and Tableau have learning curves, and gaining proficiency in these tools requires time and training. Users must invest in learning SQL query writing and understanding Tableau's features to effectively utilize their capabilities.

It's important to be aware of these limitations while leveraging SQL and Tableau for data analysis and visualization. By understanding these constraints, organizations can make informed decisions, overcome challenges, and achieve successful data analysis and visualization outcomes.

D.  Record the web sources used to acquire data or segments of third-party code used to support the application. Ensure the web sources cited are reliable.

Kumar, B. (2020). Customer Churn. Retrieved April 4, 2023, from <https://www.kaggle.com/datasets/barun2104/telecom-churn>.

E.  Acknowledge sources, using in-text citations and references, for content that is quoted, paraphrased, or summarized.

Kumar, B. (2020). Customer Churn. Retrieved April 4, 2023, from <https://www.kaggle.com/datasets/barun2104/telecom-churn>.

Project Links

[Tableau](https://public.tableau.com/app/profile/darien.nguyen/viz/D211_16855048176260/Dashboard1)

[Panopto](https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=9bd8e9f7-d4c7-447b-a0ee-b01a003a8f0c)