D211 PA

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D211: Advanced Data Acquisition

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## 

## D211

## Part 1: Data Dashboards

A1. The external data set is attached. The churn data set is on the virtual machine lab environment and accessible through pgAdmin. It can be accessed through the churn database.

A2. To install the dashboard, you first must download the D211 tableau workbook and comp\_data files. Open pgAdmin. Click on servers. Click on the churn server. The click schemas. Then click on tables. Right click tables and select query tool from menu. In the query editor, paste the following and run it using the play icon in the top toolbar:

*CREATE TABLE public.comp\_data (*

*customerID VARCHAR(50),*

*gender VARCHAR(10),*

*SeniorCitizen INTEGER,*

*Partner VARCHAR(3),*

*Dependents VARCHAR(3),*

*tenure INTEGER,*

*PhoneService VARCHAR(3),*

*MultipleLines VARCHAR(20),*

*InternetService VARCHAR(20),*

*OnlineSecurity VARCHAR(20),*

*OnlineBackup VARCHAR(20),*

*DeviceProtection VARCHAR(20),*

*TechSupport VARCHAR(20),*

*StreamingTV VARCHAR(20),*

*StreamingMovies VARCHAR(20),*

*Contract VARCHAR(20),*

*PaperlessBilling VARCHAR(3),*

*PaymentMethod VARCHAR(50),*

*MonthlyCharges NUMERIC,*

*TotalCharges VARCHAR(20),*

*Churn VARCHAR(3)*

*);*

After the query is executed, right click on tables and you should see the new table. After that, right-click on the comp\_data table and select import/export. In the pop-up window, toggle the first switch to import. Click the three dots button, navigate to downloads or where you saved the CSV file. Click on the comp\_data.csv and then click on the select button. Choose CSV as format. Toggle header to yes and in delimiter choose the comma ‘,’ then click on the ok button. After that is complete. Right-click on the tables on the sidebar and select query tool. Paste the following in there and click on run:

*CREATE TABLE churn\_clean AS*

*SELECT \**

*FROM Customer AS c*

*JOIN Contract AS ct USING (contract\_id)*

*JOIN Location AS l USING (location\_id)*

*JOIN Payment AS p USING (payment\_id)*

*JOIN Job AS j USING (job\_id);*

After it is finished running, minimize pgAdmin. Navigate to the workbook that was downloaded earlier and open it. A window will appear, if not prefilled, use the login information from the left sidebar, otherwise type “postgres” in username and “Passw0rd!” in password. Then click sign in. The workbook should now load.

A3. At the bottom of the tableau workbook, there will be a toolbar with multiple tabs. Skip over the tabs and click on the tab called Story1. Story1 combines multiple dashboards. The first tab is called Overview. Clicking on this tab will lead users to a page that displays a pie chart of the gender distribution of the customers. A color legend appears on top of it, and a gender filter that affects the pie chart also appears next to it. The second visualization is the map. The map shows the average monthly charge of customers in each state. A legend appears on the right showing the color meaning. Under it is the CLV table. It shows a table with the customer lifetime value of the WGU company and the competitor. Next to it, is a table named Churn Rate. This tab shows the churn rate for WGU and the competitor. Clicking on the second tab called insights leads to another page. The top line chart is named Tenure and Monthly charge. It shows a line chart of churn and monthly charge. The right side shows a churn filter and a color legend. Under it is a chart called churn. It shows users a histogram showing the count of churns. A filter appears on the right called gender filter that allows users to filter by gender only on the churn chart. The next tab is called action. This tab leads users to a page with a list of recommendations based on the insights from the dashboard.

A4. The SQL code is attached as SQL.txt.

## Part 2: Demonstration

B. https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=2b3b2d32-9699-4de2-9d76-b0d1014dc34b

## Part 3: Report

C1. The purpose of the dashboard is to gain insight into customer data and competition through visualization in order to support the stakeholders in making data driven decisions. The line chart depicting tenure and monthly charges showcases the correlation between the duration of customer relationships and their monthly expenditure. Company leaders can leverage this visualization to inform decisions concerning both customer retention and pricing strategies. By analyzing this chart, they can discern patterns indicating how customers with longer tenures tend to spend. For example, an upward trend in monthly charges with increasing tenure might suggest potential tactics to retain loyal customers, such as offering tailored packages or loyalty incentives. Additionally, examining whether there is a connection between tenure and fluctuations in monthly charges can inform pricing strategies, particularly if long-term customers display sensitivity to price alterations. The histogram illustrating churn frequency provides insights into the occurrence of customer attrition. This information proves valuable in recognizing churn patterns and deploying effective retention approaches. Executives can utilize the histogram's filters to identify trends in customer turnover. Peaks within specific tenure groups or associated with particular monthly charge brackets might indicate areas warranting further investigation or targeted interventions. Moreover, by considering the frequency of churn across different customer segments, leaders can tailor retention strategies accordingly. For instance, if a particular segment exhibits a higher churn rate, strategies aimed at bolstering retention within that specific group can be developed.

C2. Tableau was selected as the business intelligence tool for this project. Tableau has a user-friendly interface that makes it easy to create charts and dashboards. Furthermore, it is easy for users of varying levels of technical skill to use. In addition, Tableau makes it easy to create and switch between a variety of visuals using the show me feature. Furthermore, Tableau makes it easy to connect to various data sources like CSV and PostgreSQL.

C3. Both files were assumed to be clean based on the file descriptions, so no further cleaning was required. The churn database had multiple tables. These tables were joined together using the primary keys found in the tables into one new table called churn\_clean. The comp\_data file was examined, and a SQL query was used to create a new table called comp\_clean with columns that aligned with the CSV file in pgAdmin. The import tool was then used to upload the data to this table.

C4. To create the dashboards, I imported two tables from PostgreSQL and created a relationship between them. I then created the gender pie chart using the gender count field and the show me feature. Map was created with the Lng and Lat fields. It was then color coded with the average monthly charge field. Chur frequency was created using the field count churn. The tenure and monthly charge line chart was created using tenure and average monthly charge. The lines were color coded by churn status. A CLV and churn rate table were created using calculated fields. These worksheets were then combined into two dashboards and organized in a story for a better user experience and facilitate a seamless flow of information.

C5. The data revealed many insights. The line chart depicting tenure and monthly charges reveals a compelling correlation between customer relationship duration and their monthly expenditure. This visualization empowers company leaders to make informed decisions regarding customer retention and pricing strategies. By delving into this chart, decision-makers can discern distinct patterns, illustrating that customers who churned had an average monthly charge of $199 over an average tenure of 13 months, while those who remained had an average monthly charge of $163 over an average tenure of 42 months. This understanding of the relationship between tenure and charges highlights the potential for tailored packages or loyalty incentives to retain long-term customers effectively. Furthermore, analyzing the fluctuations in monthly charges concerning tenure may inform strategic pricing decisions, particularly with long-term customers who might display sensitivity to price changes. The histogram depicting churn frequency provides invaluable insights into customer attrition occurrences, indicating that most customers did not churn, consistently observed across all genders. Leveraging this information aids in recognizing churn patterns and deploying targeted retention approaches. Executives can utilize the histogram's filters to pinpoint trends in customer turnover, identifying specific tenure groups or monthly charge brackets warranting further investigation or targeted interventions. Moreover, understanding churn frequency across diverse customer segments facilitates tailored retention strategies, focusing on segments with higher churn rates. The map chart reveals that the Northeast and South-Central regions have the highest average monthly charges among regions. This could suggest regions that the company could expand. Additionally, the comparative churn rate of 26.5% for our company, slightly trailing the competitor's 26.53%, provides crucial insights. The gender pie chart illustrates customer demographics, aiding in understanding preferences for tailored engagement strategies. Similarly, the customer lifetime value table emphasizes WGU's significantly higher customer lifetime value compared to the competitor, underscoring both enhanced profitability and customer value. These insights guide strategies aimed at customer retention, while the churn rate table, outlining the comparative churn rates, informs efforts to enhance customer engagement and benchmarks the company against competitors for strategic improvements.

C6. The data analysis has limitations. The data might lack other variables that could affect churn, such as market conditions or other customer behavior. Furthermore, the timeframe of the data might also be limiting because customer behavior can change over time.

D. https://community.ibm.com/community/user/businessanalytics/blogs/steven-macko/2019/07/11/telco-customer-churn-1113