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Advanced-Data Acquisition – D211

Masters Data Analytics

Part 3: Report – Telecom Churn Data

This reflection paper demonstrates the purpose and meaning of the data analysis lifecycle of information gathered from the telecom industry. I have learned growing deeper insights about the data I began with two months ago during this process. I will demonstrate through the following that though the raw data points and numerous dimensions were complex, even with such a relatively small dataset. The business intelligence tools that I used are SQL analysis and descriptive statistics, and build visualizations with Tableau Desktop serve to bring order.

The purpose and function of the executive dashboard are to demonstrate who is at high risk of leaving the company (the column is called churn), how many customers are churned, and which cities have higher numbers of revenue. The dashboard and presentation begin with the company's churn rate of 26.50%. Following this rate is the presentation of general key performance indicators for churn customers. Finally, a national map allows executives and data analytics and compare metrics across states. These lots of data about customer accounts, demographics, usage, and geographies help the company create divisions of customers. In addition, the company can personalize understanding of the customer behavior, such as when customers are using more or less of a service and develop a more targeted customer. Following these analyses, the business can offer more attractive services and packages and lower their monthly charges.

The additional dataset enhances the insights for optimism and prediction in decision making. The WA-Fn_UseC_Telco_Customer_Churn data set is the public data set from

Kaggle.com, which gives us the information on the customer account, such as how long they've been a customer, contract, payment method and monthly charge, and their demographic info about customers such as gender, age range. According to the dashboard analysis, the telecom churn rate is 26.54%, almost the same as the churn rate in our original data set. "Wireless companies today measure voluntary churn by a monthly figure, such as 1.9 percent or 2.1 percent. This is the average number of customers who quit their service per month. Annual churn rates for telecommunications companies average between 10 percent and 67 percent." (Hughes, 2021)

The business intelligence virtualization tool used was Tableau. "Tableau helps turn insight into action, cut down analysis time, and change behaviors that help everyone be more data-driven across the business." (Tableau, n.d) Tableau is the quick interactive visualizations tool that helps data research make analysis more accessible, faster, and intuitive. The selection menu is easy to approach and friendly to users. The users click on the checkbox or dropdown functions to select what they would like to see. The users can also view the dashboard and see how it operates on several devices not limited to the laptop. "Tableau automatically understands the device that you're viewing the report on and makes adjustments accordingly." (Dewan, 2019)

Steps used to clean the data include:

- View tables in pgAdmin: customer, job, payment, contract, location
- Access Postgres - pgAdmin from Tableau with credentials:

Server: localhost

Port: 5432

Database: churn

Username: postgres

Password: Passw0rd!

- Create custom SQL to join five tables from pgAdmin (customer, job, payment, contract, location). Please see Part 1.4 Supporting codes.
- Save the dataset as churn_dataset .csv (uploaded)
- View summary and statistics of the dataset
- Download the additional data set: WA Fn-UseC –Telco-Customer-Churn.csv (uploaded) and link WA_Fn-UseC_-Telco-Customer-Churn | Kaggle
- Upload the additional data to Tableau
- Create custom calculated fields. Please see Part 1.4 supporting codes.
- Create all reporting tabs with Filters on Gender and State
- Create the dashboard by combining tabs
- Create the story

I create the dashboard in six main steps. In the top left of the dashboard, the first, the color-blind sensitive, the interaction menu was set up to give users the ability to select the gender and state option. These menus interact with the churn by gender, churn by social class, churn by Age group, key performance indicators for States, Revenue by State heat map, and Top 10 Revenue by City chart. We can select the category menu to visualize and discover the relationships between different churned and non-churned groups and gender and income groups. Interactive controls are as follows:

- Select State from the dropdown and click apply to view the specified State in all dashboards from the State dropdown menu.
- View male elements from the Gender checklist by selecting the "male" gender icon in the gender menu; view numbers of female accounts by choosing the "female" gender icon in the gender menu.

- We can also select the group of Gender click on the checklist.
- View the tooltip information; move the mouse to the area you want to view.

In the top right of the dashboard, the second is a churn rate that measures a company's loss in a customer in the last month compared to the number of customers we began the month with. The third, the color-blind feature was on, the demographic of churn by gender (male, female, prefer not to answer), social class (Low income, Middle class, High income), and age group (Under 30, 30 to 40, 41 to 59, over 60). The fourth, the table of key performance indicators for State and Gender in the center of the dashboard to give us the ability to compare all features of churn and loyal customers such as how many churned and loyal customers remain, their average income, monthly charge, total revenue, average tenure, average bandwidth gap per year and yearly equipment failure information. Fifth, look at the color palette for the national heat map – the Revenue by State. The colors range from light brown to dark brown. The State has high revenue in the dark brown, and the State has low payment in the light brown. "Colour Scale feature helps end-users to structure business data and information and highlight it according to the region they belong to." (btProvider, n.d). Have many different options in Tableau to develop and design the dashboard for all to see. I used the "Color Blind" palette in the Tableau. I also used Megan's idea to create colorblind-friendly dashboards, and I did not use red and green colors. The State's national heat map of revenue allows the business to see which regions have the most payment. This may guide executives on how to allocate marketing to regional. Interactive controls are as follows:

- From the "Revenue by State" heat map, click on a state to view specified state information in all other charts.

- We can also select the group of States to click on the dropdown list or Ctrl-click on the heat map.

The final step was a stacked bar chart showing the top 10 revenue by the cities of the churned and loyal customers. Virtual interactions were delivered with the external dataset via the map and bar chart visualizations to give us a sense of a selection competitor in our market.

On the overall layout of the dashboard, I keep the number of a graph is minimal to present no threatening access to the datasets. I suggest the critical results in quickly understanding integers, dollar amounts, and percentages. The audience can find the dashboard and the dataset source, which I provided by clicking on the link below.

- Dashboard: Executive Dashboard - Telecom Churn
- WA Fn-UseC –Telco-Customer-Churn.csv (uploaded) and link WA_Fn-UseC_-Telco-Customer-Churn | Kaggle

Based on the observation, the churn rate is 26.50%, and the telecom churn rate is 26.54%. Churn rate by gender for females 25.31%, almost the same as for males, is 27.80%. Therefore, it might be reasonable to target the marketing project for both genders, not just focus on one.

Also, we can see that the company has many customers who earn less than **$49,000 per year**. We had 5287 loyal customers with low income, 1777 loyal customers in the middle class, and 286 loyal customers with high income. So the individual patient characteristics might influence the churn rate.

To reduce the churn rate, the company needs to understand the customer's demographics, usage, and geographies to help the company create divisions of customers. The company can personalize understanding of the customer behavior, such as when customers are using more or less of a service and develop a more targeted customer. The most loyal customers are the low-

income class. The targeted customers are middle and high-income classes. The business can offer more attractive services and package to high and middle-income customers and may lower the customer's monthly charge to attract more low-income customers. "A recent Accenture poll concluded that 77% of telecom customers are more likely to churn compared to three years ago. At the heart of this churn is bad customer experience, which can now spread like wildfire across social media." (Calderon, 2020). For a better view and better decision, the executives may look at the growth rate of tracking new customers. If the churn rate is greater than the growth rate, the company will experience a loss. If the growth rate is greater than the churn rate, the company expects to grow. "It is critical for a company to ensure that its growth rate is higher than its churn rate; otherwise, it will experience declining revenues and profits with the eventual scenario of having to close the business." (Frankenfield, 2021)

The limitations of the telecom data set (5 tables: customer, job, contact, payment, location provided by WGU) are that the data are not from the data warehouse. Therefore, we need to gather more and better data. I cannot reach out to the employee that collected, organized and figured this information to ask them why there are many missing records. Why are fields such as age missing information relevant to answering a question about customer retention? In a real-world project, I would go down to the department where these people worked and fill in the empty fields or discover why areas are left blank. Another factor is that we do not know what types of customers are leaving the company. The company may have a promotion or discount program to attract new customers. The impact of losing customers in the long term is critical. According to Frankenfield, the new customers are temporary while the old customers are established and have liked the company's product and there must be a more important reason as

to why they are leaving." (Frankenfield, 2021). The additional data set "WA_Fn-UseC_-Telco-Customer-Churn.csv" has the same limitations.

References

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