

ANALYZING CUSTOMER CHURN

▪ Analyzing Context

Databel is a fictional telecom company. Databel acknowledges that churned customers have a significant impact on their business profits and aims to conduct an analysis of customer churn to identify the reasons for customer attrition and explore possible solutions to reduce it.

The company provides a dataset covering a specific period of its business operations for the purpose of data analysis.

The data source can be found [here](#)

▪ Analyzing Process

In this analysis project, the analytical process consists of five steps: it begins by asking business questions, then proceeds to process data and analyze various dimensions to uncover insights hidden within the data. Finally, the information is compiled into suitable dashboards to share the findings with the audience



■ Ask

The goal of data analysis is to answer key business questions through the data analysis process, assisting stakeholders in making effective business decisions. Therefore, it is crucial to pose the right questions at the outset of a data analysis project to identify the business question that needs to be addressed.

Following exemplar questions could be helpful:

- What topic are you exploring?
- What business questions need to be answered at the end the analysis?
- What metrics will you use to measure your data to achieve the objectives?
- How will the data help the stakeholder to make business decisions?

In this data analysis project, the goal is to identify the reasons for customer churn and explore possible solutions to reduce it. Therefore, the **churn rate** would be a suitable metric to measure the data.

Churn rate, also known as **customer attrition rate** or **customer churn**, is a business metric that calculates the percentage of customers who stop using a product or service during a given period. It is particularly relevant in subscription-based business models, telecommunications, and other industries where customer retention is a key factor.

The **churn rate** is calculated using the following formula:

$$\text{Churn Rate} = \left(\frac{\text{Number of Customers Lost during a Period}}{\text{Total Number of Customers at the start of the Period}} \right)$$

■ Process

In this step, we will explore the data fields and their meanings and we can attempt to group relevant data fields for further analysis. Additionally, we will check for duplicate entries and empty values in the dataset.

In Tableau, on the data source page, we obtain an overview of the dataset: 29 fields and 6687 entries/rows. We can group the fields into several groups according the information they contain:

Customer information	
Customer ID	The unique ID that identifies a customer
Churn Label	With ,Yes' or ,No ' to indicate if a customer churn or not.
Churn Reason	The reason that a customer ends the contract
Churn Category	The category that a churn reason belongs to
Phone Number	Telefonnumber of a customer
State	State code where the customer lives
Contract information	
Contract Type	,Month-to-Month' , ,One Year' , ,Two Year'
Payment Method	,Direct Debit ' , ,Paper Check ' or ,Credit Card '
Group	With ,Yes' or ,No ' to indicate if a contract is in a group contract
Number of Customers in Group	Indicate how many customers are in a group contract
Demographic information	
Gender	Gender of the customer: ,Male' ,Female' or ,Prefer not to say'
Age	The age of a customer
Under 30	With ,Yes' or ,No ' to indicate if a customer is under 30 years old
Senior	With ,Yes' or ,No ' to indicate if a customer is above 65 years old

Subscription information	
Account Length (in months)	Number of month a customer has been subscribed with Databel service
Local Calls	Number of local calls(only in US) a customer has been made
Local Mins	The minutes of local calls from a customer
Intl Calls	Number of international calls a customer has been made
Intl Mins	The minutes of international calls from a customer
Intl Active	With ,Yes' or ,No ' to indicate if a customer called internationally
Intl Plan	With ,Yes' or ,No ' to indicate if a customer has an international call plan
Extra International Charges	Extra charge for internal calls that are not in an international call plan
Customer Service Calls	Number of customer service calls from a customer
Avg Monthly GB Download	Average monthly data volumn downloaded in gigabyte from a customer
Unlimited Data Plan	With ,Yes' or ,No ' to indicate if a customer has an unlimited data plan
Extra Data Charges	Extra charge for data volumn for a customer who has no unlimited data plan
Monthly Charge	Average monthly charge from a customer
Total Charges	Sum of monthly charge
Other information	
Device Protection & Online Backup	With ,Yes' or ,No ' to indicate if the customer device has protection and online backup

- **Process**

In order to check if the dataset has duplicate entries, we can compare the number of customers and the number of unique customers. Both give the same results: 6687, so there is no duplicate in the dataset.

- **Analyze**

- **Churned Number and Churned Rate**

Since we are analyzing the churn rate and reasons for customer churn, it's a good idea to first obtain an overview of the entire **churn rate** before diving deeper into further analysis. The column [**Churn Label**] can be utilized as a condition to calculate the number of churned customers, which is then divided by the total number of customers to derive the churn rate. The results are contained in worksheet **Churned Number** and **Churned Rate**.

- **Investigating churn reasons and churn category**

The next step is to explore the different churn reasons and their distributions. We can utilize a bar chart to visually represent the distribution of churn reasons in descending order. In the [**Churn Reason**] worksheet, it is observed that 17.13% of customers churned due to a competitor making a better offer.

As there are 20 distinct reasons that can be grouped into different categories, obtaining a clear overview of the churn categories could be beneficial. Here, in the [**Churn Category**] worksheet, a pie chart is employed to display the churn numbers in various categories and it shows that 44.82% of customers churned due to competitor reasons.

- **Churn Rate Map**

A state map could be instrumental in exploring the churn situation in different states. To comprehensively explain the churn rate, it is essential to include the number of total customers and churned customers in each state, in addition to the churn rate, to provide a thorough illustration of the information.

- **Investigating churn rate in demographics**

To explore the churn rate across different genders, a text table can be used to present the churn rate for each gender. The results indicate that there is no significant difference in the churn rate among all genders; it remains at approximately 27%.

Moving forward to analyze the senior group, we observe in the text table that the senior group (customers above 65 years) exhibits a significantly higher churn rate than the average level, standing at 38.22%. This prompts us to further analyze the churn rate across all age groups, and using age bins is a suitable approach. By grouping all ages into bins, for example, with an interval of 5, we discover that customers between 70 and 75 years old have the highest churn rate, reaching 43.85%.

- **Investigating churn rate in group contract**

Databel offers a group contract for individuals residing in the same household, accompanied by a discount. This factor could influence customers' decisions to subscribe to services with Databel. Utilizing a bar chart, we can investigate how the group contract affects the churn rate. Additionally, incorporating information about customer size, churned customer size, and average monthly charge will provide a more comprehensive understanding of the churn rate within each group. The chart shows that the customers within a group have much lower churn rate(<10%), but most of the customers are not in a group.

- **Investigating unlimited data plan**

Databel provides an unlimited data plan for customers, with the assumption that individuals with unlimited data plans are less likely to churn. To investigate the validity of this assumption, a bar chart is employed to explore how the unlimited data plan affects the churn rate. Upon analyzing each data usage group, categorized with an interval of 5 GB, we observe a surprising trend. Contrary to expectations, customers with unlimited data plans are found to be more likely to churn in every usage group.

- **Investigating international call plan**

Databel also offers customers an international call plan, providing free international calls, and this plan is reflected in the monthly charge. Analyzing how the international call plan influences the churn rate can assist Databel in developing strategies to reduce customer churn. A highlighted table provides a clear visualization, revealing that customers with an international plan who don't make international calls are more likely to churn, reaching 71.19%. This is followed by customers who make international calls but don't have an international call plan, with a churn rate of 40.34%.

- **Investigating subscriptions**

In the service subscription, customers have the option to choose a month-to-month, one-year, or two-year contract. To investigate whether the contract type is relevant to customer churn, a scatter plot is employed to illustrate how the different contract types and payment methods may influence the churn rate. The plot indicates that customers with longer contract periods, such as two-year contracts, are less likely to churn.

■ Visualize

For visualization purposes, four dashboards have been created to represent the differentiations and enable the audience to interact with the dashboards through various filters.

The **Overview** dashboard presents general churn information, including the total number of customers, the number of churned customers, and the churn rate. Additionally, it includes the distribution of the churn rate across categories and states.

The **Age & Group** dashboard presents information on how customer age group and group contract influence the churn rate.

The **Data Plan** dashboard displays the impact of unlimited data plans and international call plans on the churn rate.

The **Contract Type & Payment** dashboard provides information on how contract type and payment method affect customers' decisions to remain with Databel or not.

Finally, the four dashboards are integrated into a story to convey the message to the stakeholders.