**Telecom Churn Analysis**

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**Abstract:**

To track their customers' performance, such as churn rate, consumption, etc., the telecom sectors use a variety of exploratory data analysis approaches. We were given one such dataset to analyse these items. They may strengthen their business and client retention by using our data to better understand the numerous factors that contribute to the churning rate, the services they offer, and other issues.

**Keywords:** Churn analysis, Exploratory data analysis, telecom.

**Problem statement:**

The French multinational telecommunications company Orange SA, formerly known as France Telecom SA, is the source of the dataset. The cleaned customer activity data (features) from Orange Telecom's churn dataset are combined with a churn label that indicates if a client cancelled their service. The main goal is to investigate and analyse the data to identify the main causes of customer churn and develop solutions or recommendations to ensure client retention.

**Introduction:**

The number of operators in the market increases significantly as a result of globalisation and technological improvements in the telecommunications sector, intensifying competition. In this cutthroat era, it is necessary to put up a variety of customer-adhering methods and effectively work on them in order to maximise revenues on a periodic basis.

Customer churn is one of the best measures of service quality and customer service satisfaction in the telecom industry. There are many other indicators that may be used as well.

Because it is expensive to gain a new customer, churn (loss of consumers to competition) is a concern for telecom firms because they want to keep their current customers. Voluntary churn is a problem for most telecom carriers. Because it influences both the duration of service and the company's future revenue, the churn rate has a significant impact on the lifetime value of the customer. For instance, a firm's customer lifetime will be shorter if its churn rate is very high; conversely, a company with a very low churn rate will have a very high customer lifetime.

With the focused strategy, the business aims to predict which clients are most likely to leave. For telecom businesses to grow their revenue-generating base and draw in new customers while preventing contract cancellations is essential. Because of the high acquisition costs and poor margins per customer in the telecommunications industry, churn research is essential for businesses to discover and keep the most profitable customers. Dematerialization and the regulation of services in mature markets make it more challenging to process, therefore it's essential to build strong, long-lasting customer retention tactics to maintain the quality of life for consumers. The business then offers these clients exclusive incentives or promotions. If churn forecasts are off, this strategy can result in significant losses for a business since companies waste incentive money on clients who would have stayed anyhow.

**Reasons of getting churn:**

Due to the progression, a number of factors might cause consumers to break their agreements and become churned, including:-

1. Exorbitant talk time fees.
2. Obtaining more competitive pricing and a compelling package on the market.
3. Terrible customer service.
4. The customer's personal situation changes.

**Step Involved:**

**Data collection:**

Importing some fundamental libraries was the initial step because they are required for the entire case. This includes the data management and processing tools Pandas and Numpy as well as the visualisation tools Matplotlib and Seaborn.

The data set is downloaded to a local location, read into the Google Colab notebook, and then placed in a Pandas DataFrame for this study.

**Column Overview:**

A general knowledge of the features can be developed by looking at the columns and their distinctive values. Each record uses the first 20 features to characterise the profile of a specific customer and the last attribute to classify the client's churn in this relatively small dataset of 3,333 records.

Here are the different features:

**State**: the state in which the customer resides, indicated by a two-letter abbreviation.

**Account Length**: the number of days that this account has been active.

**Area Code**: the three-digit area code of the corresponding customer’s phone number.

**Int’l Plan**: whether the customer has an international calling plan: yes/no.

**VMail Plan**: whether the customer has a voice mail feature: yes/no.

**VMail Message**: presumably the average number of voice mail messages per month.

**Day Mins**: the total number of calling minutes used during the day.

**Day Calls**: the total number of calls placed during the day.

**Day Charge**: the billed cost of daytime calls.

**Eve Mins**: the total number of calling minutes used during the evening.

**Eve Calls**: the total number of calls placed during the evening.

**Eve Charge**: the billed cost of evening time calls.

**Night Mins**: the total number of calling minutes used during the night.

**Night Calls**: the total number of calls placed during the night.

**Night Charge**: the billed cost of night time calls.

**Intl Mins**: the total number of international minutes.

**Intl Calls**: the total number of international calls.

**Intl Charge**: the billed cost for international calls.

**CustServ Calls**: the number of calls placed to Customer Service.

**Churn?**: whether the customer left the service: true/false.

**Classification label**

**Churn:** whether the customer left the service: true/false

**Null value:** Checking null values is part of this phase. As a result of our investigation, we discovered that this dataset contains no null values.

**Exploratory Data analysis:** The data frame's structure, columns it contains, and data types are assessed in the first section of EDA. Gaining a general overview of the data set, assessing domain expertise, and generating first ideas for research subjects are the objectives of this step.

**Evaluation:**

We examined many elements that influence customer attrition while conducting the exploratory data analysis. To identify the dependency of distinct aspects to one another, we used a variety of graphical tools. We were able to understand the relationships between things using heat maps in a highly numerical approach.

Some significant evaluations are:

1. According to the data set provided, we have lost about 15% (14.5%) of our members.
2. The state with the most subscribers is West Virginia, and California has the fewest.
3. Despite being one of the top-performing states, NY still has a high turnover rate of 18 percent.
4. New York, Vermont, Colorado, Maryland are few of the states from where a lot of customers make more than 3 customer service calls.
5. 42% of customers who opted for international plan are getting churned.
6. Customer making more than 3 customer service calls is most likely to get churned.
7. 8% of our total customers are making more than 3 customer service calls.
8. 8 - 9% of customers who opted for voice mail plans are getting churned.
9. 90% of total local charge comes from day calling charges.
10. Churning rate increases as total day minute and day charge increases. Most of the customers who have total day calling minutes more than 250 minutes and total day charge more than $40 are churned.
11. Number of people not getting churned increases till account length reaches the range of 90-120 days and then it starts declining.
12. Number of people getting churned is highest when account length reaches the range of 90 - 120 days. But the rate of people getting churned is less than the rate at which people are not getting churned in this range.

**Conclusion:**

We discovered some extremely deep insights after thoroughly analysing it that caused the consumer to close their account and experience churn. Some of the assessments include:

* The likelihood of losing consumers who make more calls (>3) to customer care is extremely high. Also the customers who have made only one customer service call have high churn rate which means their issues were not resolved at the first attempt.
* Churning rate increases as total day minute and day charge increases. Most of the customers who have total day calling minutes more than 250 minutes and total day charge more than $40 are churned.
* When the customer service calls are less than 3 then the total day charge has the predominant effect on churning and as the customer service calls increases and goes beyond 4 it replaces total day charge and has the predominant effect on churning.
* Subscribers having international plans are churning more.
* When the account length is between 90 and 120 days, there is a lot of volatility.

**Recommendations :**

* The company should concentrate on the Top 5 States with the Highest Churning Rate and offer discounts and coupons to lower the rate.
* The top 5 states with the lowest churn rates can receive rewards from the company in the form of various incentives because they are consistent customers and sources of income.
* Provide attractive offers and discounts to customers when they complete the milestone of 90 days. This will help in retaining more customers and hence reducing the churning rate. If scheme feedback is good we can continue giving offers for multiple of 90 days as well for retaining subscribers for long period of time.
* As most of the customers who churn are those whose "total day min" is quite high, the company can lower daytime calling rates by offering these customers a high talk time offer.
* Improve customer service assistance services.
* In order to lower its churn rate, Orange Telecom requires additional infrastructure in terms of marketing, technology, and services, particularly in CA and also in NY.
* Orange Telecom can offer special deals and services for international plans to attract foreign subscribers from local prospects.
* Additional services like the voicemail plan and the international plan need to be updated.

**References :**

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