

# Capstone Project TELECOM CHURN ANALYSIS (EDA)

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### **♦ Telecom Customer Churn Analysis**□ Problem Description

Customer churn means shifting from one service provider to its competitor in the market. Customer churn is one of the biggest fears of any industry, particularly for the telecom industry. With an increase in the number of telecom service providers in France, the level of competition is quite high. Although there are many reasons for customer churn, some of the major reasons are service dissatisfaction, costly subscription, and better alternatives. The telecom service providers strive very hard to sustain in this competition. So to sustain this competition they often try to retain their customers than acquiring new ones as it proved to be much costlier. Hence predicting churn in the telecom industry is very important. To reduce customer churn, telecom companies need to predict which customers are at high risk of churn.







- Objectives:
  - To boost the plan for customers and make profit for company as well as retained the churn customer.
- Abbreviate: To determine the key problem of customer as well as to improve the service quality without any issues.
- Reduced the constraints: We give offers and discount to customers as well as to improve the service quality without any issues.



## **♦** Let's Understand – "What is customer churn in telecom industry"



- Customers are the most important resources for any companies or businesses. What if these customers leave the company due to high charges, better competitor offers, poor customer services or something unknown? Hence, Customer churn rate is one of the important metrics for companies to evaluate their performance
- > Customer churn rate is a KPI to understand the leaving customers. Churn rate represents the percentage of customers that company lost over all the customers at the beginning of the interval.
- ➤ For example, If company had 400 customers at the beginning of the month and only 360 at the end of the month, means company's churn rate is 10%, because company lost 10% of the customer base. Companies always try to minimize the churn rate to as close as 0%.

#### **♦ Let's Understand – "What is customer**

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#### churn in telecom industry"

- The cost of achieving new customers is up to 24.5% times higher than the cost of retained customer, so we reducing the churn rate of customer is key of solution.
- To reduce the churn customers, telecom industries need to predict the customers which are on high risk of churn, from this prediction we taking the benefit of larger edging of rich telecom customer data.
- > When we got the list of churn customers, then we easily gone through towards the proposal of offer for reducing the churn rate of customers in future.



#### Data Collection



- Data collection is an essential part of exploratory data analysis. It refers to the process of finding and loading a data into our system. Data must be good reliable and in proper way
- ➤ The data depicted below represent the telecom churn dataset. It contains informations of customer details, their plan detail, call duration and their churning status.

	State	Account length		International plan	Voice mail plan	Number vmail messages	Total day minutes	Total day calls	Total day charge	Total eve minutes	Total eve calls	Total eve charge	Total night minutes	Total night calls	Total night charge	Total intl minutes	Total intl calls	Total intl charge	Customer service calls	Churn
	) KS	128	415	No	Yes	25	265.1	110	45.07	197.4	99	16.78	244.7	91	11.01	10.0	3	2.70	1	False
	<b>1</b> OH	107	415	No	Yes	26	161.6	123	27.47	195.5	103	16.62	254.4	103	11.45	13.7	3	3.70	1	False
	2 N.	137	415	No	No	0	243.4	114	41.38	121.2	110	10.30	162.6	104	7.32	12.2	5	3.29	0	False
,	3 OF	84	408	Yes	No	0	299.4	71	50.90	61.9	88	5.26	196.9	89	8.86	6.6	7	1.78	2	False
	<b>4</b> Ok	75	415	Yes	No	0	166.7	113	28.34	148.3	122	12.61	186.9	121	8.41	10.1	3	2.73	3	False

#### Data Description

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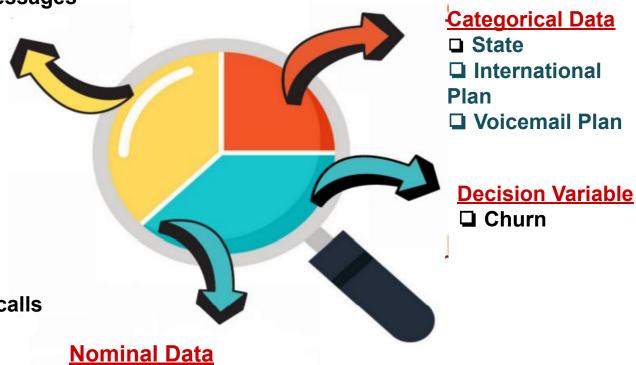
- **□** STATE: 51 Unique States name
- □ Account Length: Length of The Account
- □ Area Code: Code Number of Area having some States
- International Plan : Yes Indicate International Plan is Present and No Indicates no subscription for Internatinal Plan
- **□** Voice Mail Plan: Yes Indicates Voice Mail Plan is Present and No Indicates no subscription for Voice Mail Plan
- Number vmail messages: Number of Voice Mail Messages ranging from 0 to 50
- **☐** Total day minutes: Total Number of Minutes Spent in Morning
- Total day calls: Total Number of Calls made in Morning.
   Total day charge: Total Charge to the Customers in Morning.
- ☐ Total eve minutes: Total Number of Minutes Spent in Evening
- ☐ Total eve calls: Total Number of Calls made in Evening.
- **□** Total eve charge: Total Charge to the Customers in Evening.
- **□** Total night minutes: Total Number of Minutes Spent in the Night.
- **□** Total night calls: Total Number of Calls made in Night.
- **□** Total night charge: Total Charge to the Customers in Night.
- ☐ Customer service calls: Number of customer service calls made by customer
- ☐ Churn: Customer Churn, True means churned customer, False means retained customer

#### Data Description



#### **Numerical Data**

- Numerical vmail messages
- □ Total day minutes
- ☐ Total day calls
- **□** Total eve minutes
- ☐ Total eve calls
- □ Total eve charges
- **□** Total night minutes
- ☐ Total night calls
- □ Total night charges
- **☐** Total intl minutes
- ☐ Total intl calls
- □ Total intl charges
- ☐ Customer service calls
- □ Account length



□ Area code

#### Data Cleaning

- Data cleaning is a process of removing unwanted variables and values from dataset and getting rid of any irregularities.
- Now it's time to clean the dataset. Firstly need to check the number of missing values in each column
- In telecom dataset their is no missing values are present

Column Name	Missing values
State	0
Account length	0
Area code	0
International plan	0
Voice mail plan	0
Number vmail messages	0
Total day minutes	0
Total day calls	0
Total day charges	0

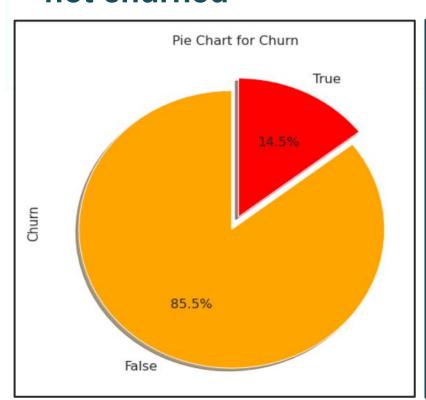
Column Name	Missing values
Total eve calls	0
Total eve charges	0
Total night minutes	0
Total night calls	0
Total night charges	0
Total intl minutes	0
Total intl calls	0
Total intl charges	0
Customer service calls	0
Churn	0

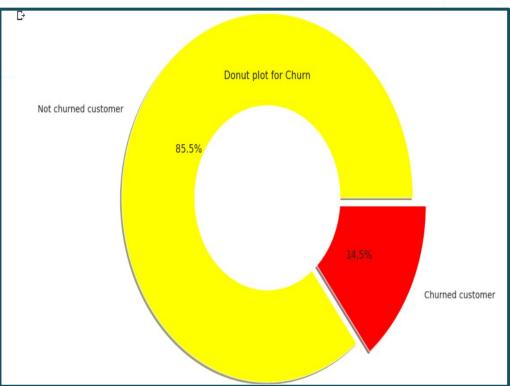


#### **Exploratory Data Analysis**



Finding the total percentages of customers churned and not churned



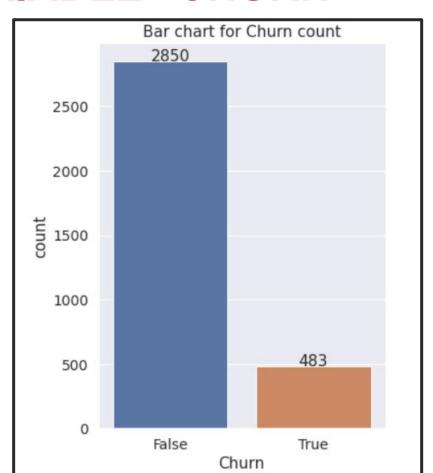




#### **EDA - ANALYSING VARIABLE "CHURN"**

From the above plotting of pie-chart and bar plot, We conclude that :-

- Total number of user 3333
- ☐ Total number of churn 483
- **☐** Total percentage of churn -14.5%
- **☐** Total number of unchurn 2850
- ☐ Total percentage of unchurn-85.5%

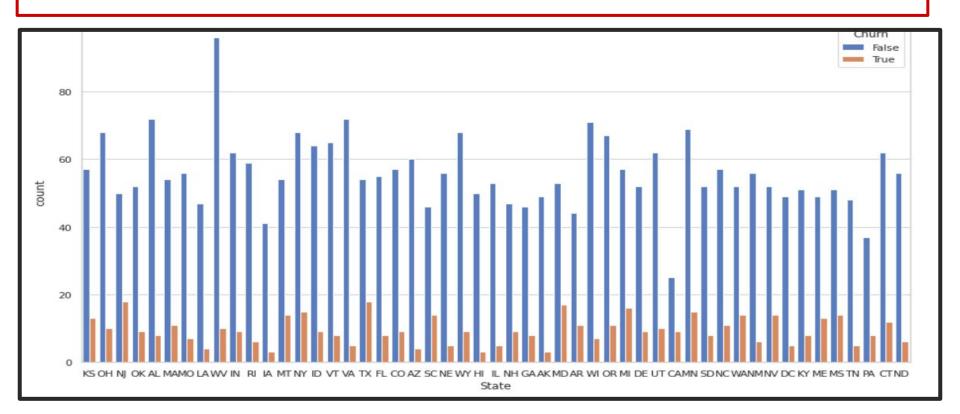




#### **EDA-Analysing churning rate statewise**



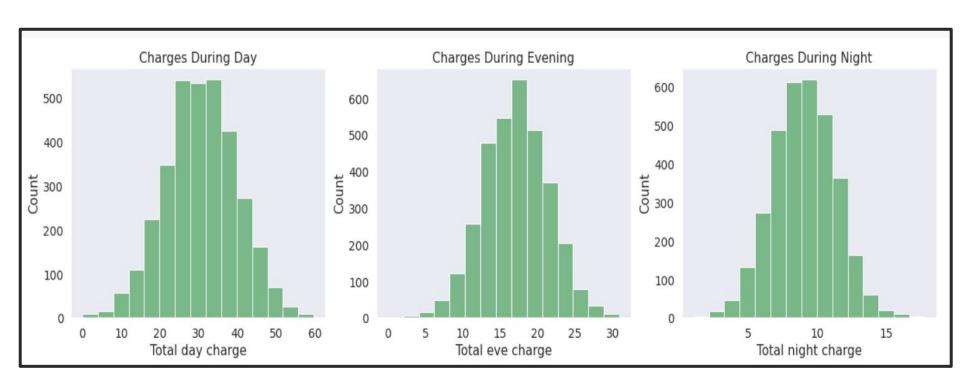
These states (CA, NJ, TX, MD, SC, MI) are those states which have higher rate of churned.







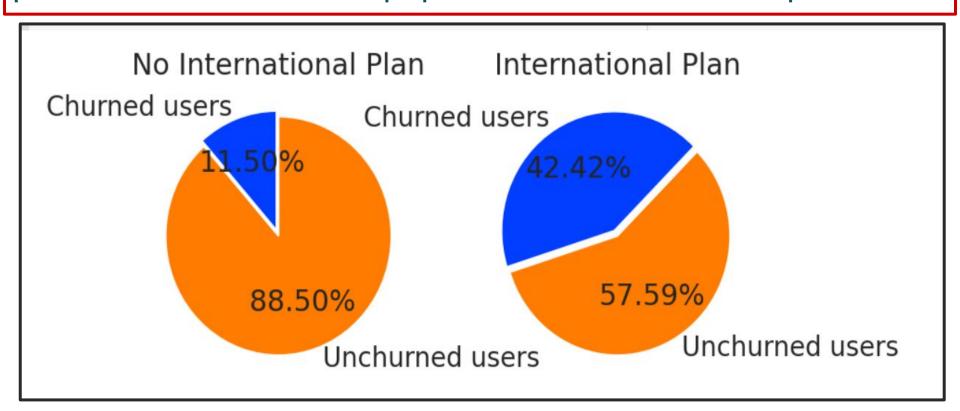
The customers Day call charges are high as compared to evening call charges and night call charges







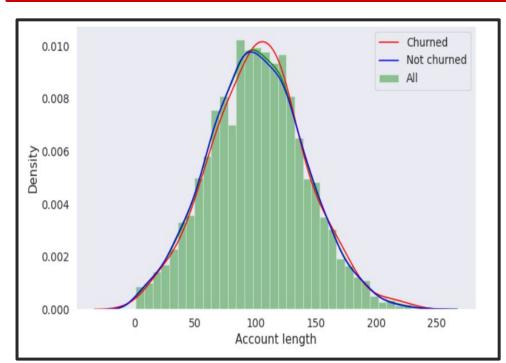
The figure above shows the percentages of churn among people who have an international plan about four times the number of people who are not on the international plan

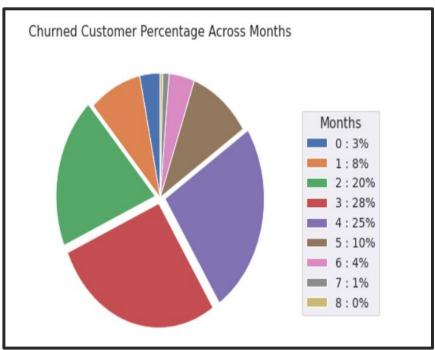






Majority of churning of customers occurs in the 2 to 4 months of interval which in terms of account length is between 84 days and 140 days.

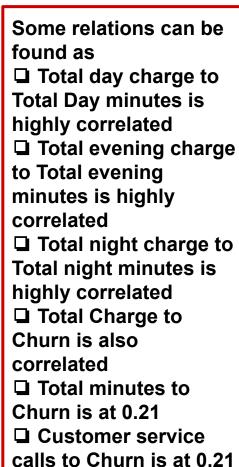


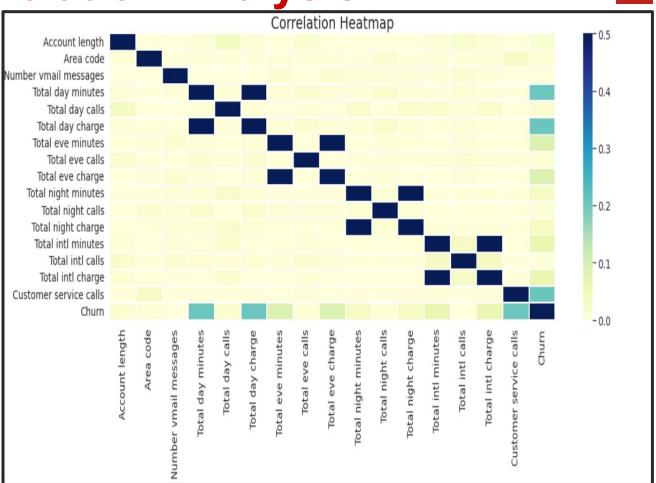




#### EDA - Correlation Analysis



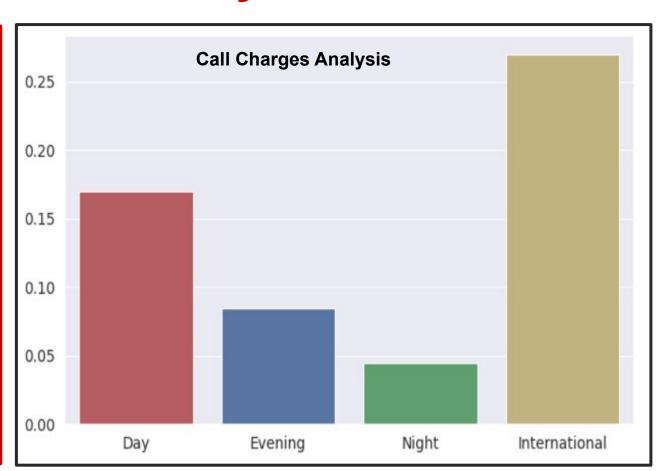








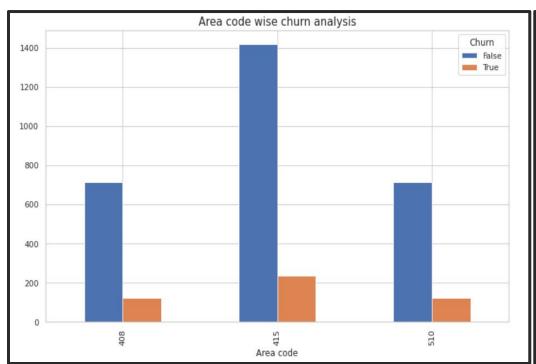
**➤The plot below, this** bar shows the comparison between all call charges per minute **➤International call** charges are higher than others, that is an obvious thing but it can be a cause of churn for international plan customers.

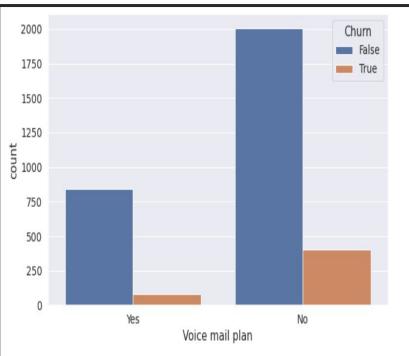




There is no any relation between area code and churning of customers

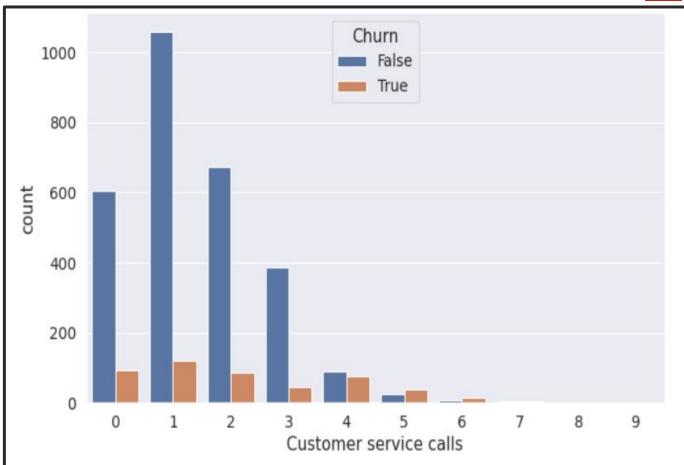
There is no significance voice mail plan and churning of customers





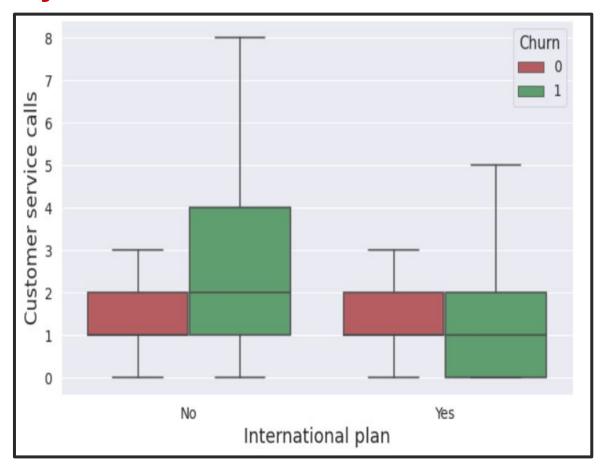


When any unsatisfied customer called in the service centre then the churn rate is high, if his/her problem will not solve on single call.





International plan between users and non-users; Called customers with no international plan are making a median of 2 customer service calls compared to subscribers with an international plan who are making a median of 1 customer service call.





### Challenges

- ☐ A huge amount of data needed to be deal while doing the project which is quite an important task also we are facing some issue in visualisation better graph
- ☐ In this project,we are stuck into the analyse columns like:area code,international plan,account length, and etc
- □ Handling the numerical and categorical data in order to find appropriate conclusions and recommendations
- We are facing issues while doing bivariate analysis



#### Recommendations



- In any telecom industry key factor of churning is network reliability. Continuous telecom network traffic monitoring and measuring telecom network performance are essential & take a proactive measures that help to improve telecom network reliability in area where churning rate is high.
  - Analyse customers needs and try to give the customized product and solutions.
- Try to improve the service quality and resolve customer issue as early as possible.
- > Take feedback form from customer with the ratings also ask for suggestions from customer.
- Try to give some rewards and offers for valued customers and this will lead to reduce churning rate.
- Also give the discounts on international plans that will reduce the churning rate



#### Conclusion



- The section of account length and area code does not play any kind of role regarding the churn rate.
- > Those customers who use international plans they are more likely to churn due to the high charge of international calling. So, these customer are not satisfied with network as well as high calling charge
- > In somes states where the churn rate is high as compared to others may be due to bad network.
- > When any unsatisfied customer called in the service centre then the churn rate is high, if his/her problem will not solve on that time.
- > When we talking about voicemail section, if the quality of voicemail is not much good, may be it increase the churn rate.
- Last but not the least, the customers whose price are high in the day calls and evening calls then these customers tends to churn



### THANK YOU