

CAPSTONE PROJECT

TELECOM CHURN ANALYSIS (EDA)

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Introduction: Telecom Churn

A “churn” with respect to the Telecom industry, is defined as the percentage of subscribers moving from a specific service or a service provider to another in a given period of time.

According to research conducted by Bain & Company, a 5% increase in customer retention rates can increase profits from 25% to 95%.

Churn is also known as Customer accident . With the help of powder dataset, companies try to find the specific reasons behind the churn numbers and work on those factors with appropriate action plans.

Telecom companies do churn analysis know in advance about upcoming customer segments Leave the service and get a chance to stop it.

Generally many factors are responsible behind the customer dissatisfaction and the decision to leave the facility.

➤ **Puff Up:**

To boost the plan for customers and make profit for company as well as retained the churn customer.

➤ **Abbreviate:**

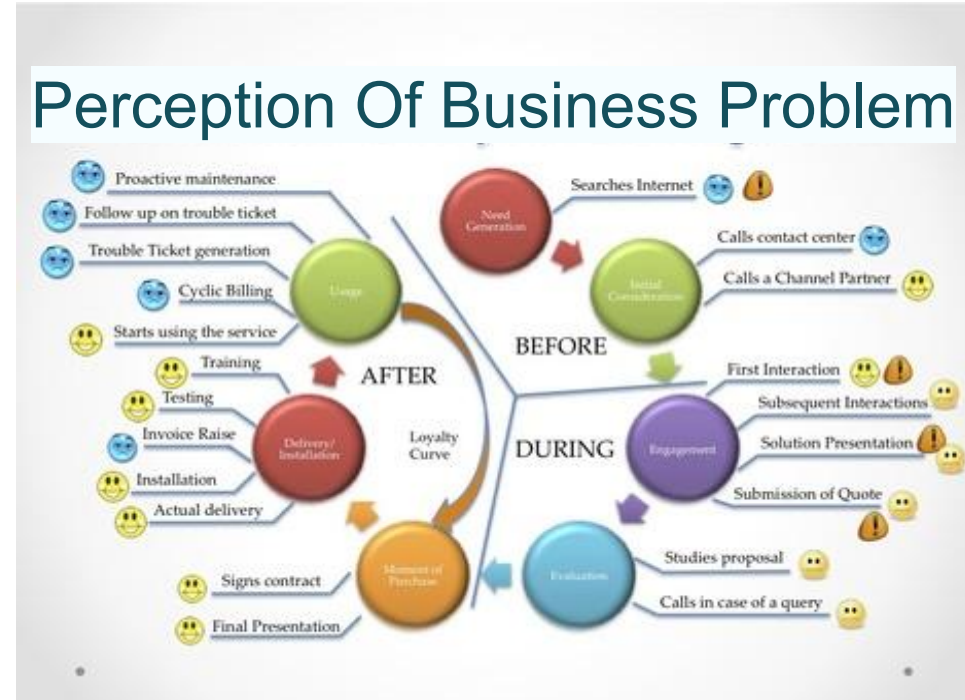
To determine the key problem of customer as well as to improve the service quality without any issues.

➤ **Reduced the constraints:**

We give offers and discount to customers as well as to improve the service quality without any issues.

Perception Of Business Problem

- Churning of customer in the telecom industry, which is the most significant risks to loss of revenue.
- In telecom industry, the average churn rate is approx 1.9% per month , but it would be arise high as 66% annually, as per survey conduct.

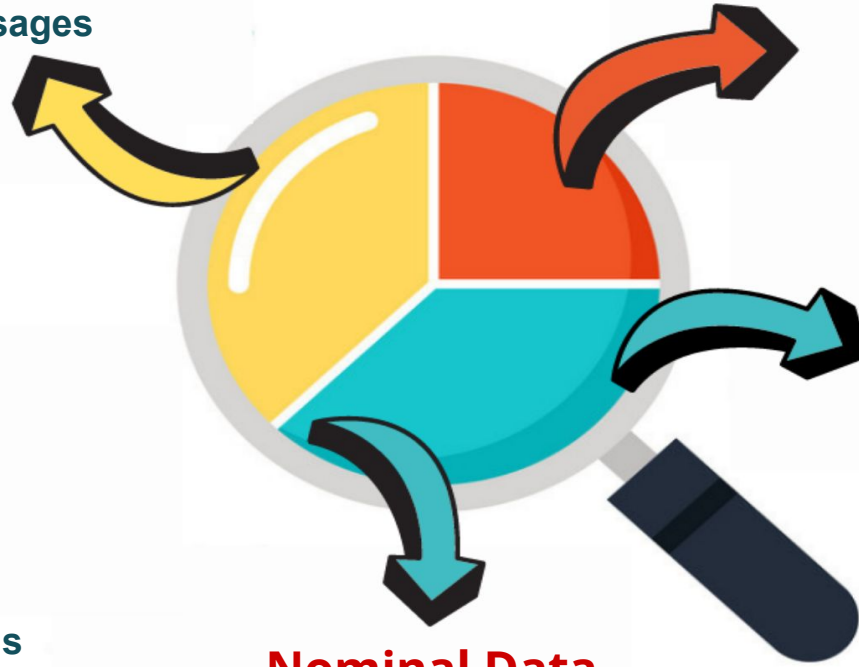


- Hence, the cost of achieving new customers is up to 24.5% times higher than the cost of retained customer , so we reducing the churn rate of customer is key of solution.
- To reduce the churn customers, telecom industries need to predict the customers which are on high risk of churn, from this prediction 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.
- The main aim of this project is , to analyse the data for determine the problem of customers which are churned towards to another one, and what steps we take to regain the most precious customers.

Data Summary

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



Categorical Data

- ❑ State
- ❑ International Plan
- ❑ Voicemail Plan

Decision Variable

- ❑ Churn

Nominal Data

- ❑ Area code

Data Summary

In the given below ,there is dataset of telecom churn which shows the top and bottom five rows respectively.

	State	Account length	Area code	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
0	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
1	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	NJ	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	OH	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
4	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

	State	Account length	Area code	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
3328	AZ	192	415	No	Yes	36	156.2	77	26.55	215.5	126	18.32	279.1	83	12.56	9.9	6	2.67	2	False
3329	WV	68	415	No	No	0	231.1	57	39.29	153.4	55	13.04	191.3	123	8.61	9.6	4	2.59	3	False
3330	RI	28	510	No	No	0	180.8	109	30.74	288.8	58	24.55	191.9	91	8.64	14.1	6	3.81	2	False
3331	CT	184	510	Yes	No	0	213.8	105	36.35	159.6	84	13.57	139.2	137	6.26	5.0	10	1.35	2	False
3332	TN	74	415	No	Yes	25	234.4	113	39.85	265.9	82	22.60	241.4	77	10.86	13.7	4	3.70	0	False

Features Description

AI

State:

In this section, there are 51 unique states present.

Account length:

In the given section, it is the length that tends to account which is used by customers.

Area Code:

In this section, there are 3 unique area codes present.

Total (Day/Evening/Night/International) (Minutes/Calls/Charges):

In this section, there are 12 columns and all are numerical data types which contain the data of calls, minutes, charges etc. of the customers.

International Plan & Voicemail Plan:

These two's section or columns which describe as a categorical feature but plan taken means yes , and plan not taken means no.

No. of Voicemail Messages:

The number of voicemail make by the voicemail plan which are taken by customers.

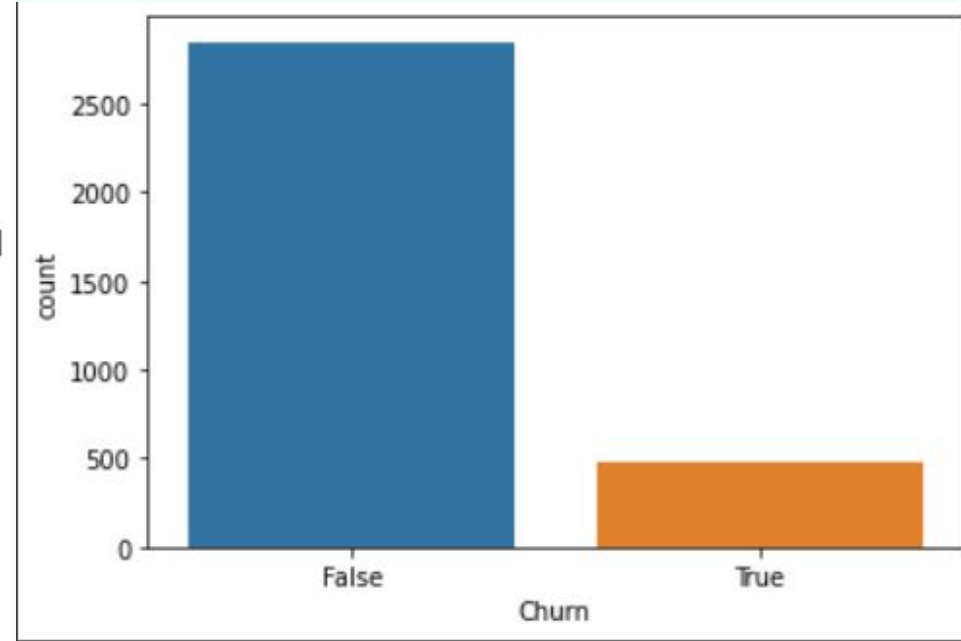
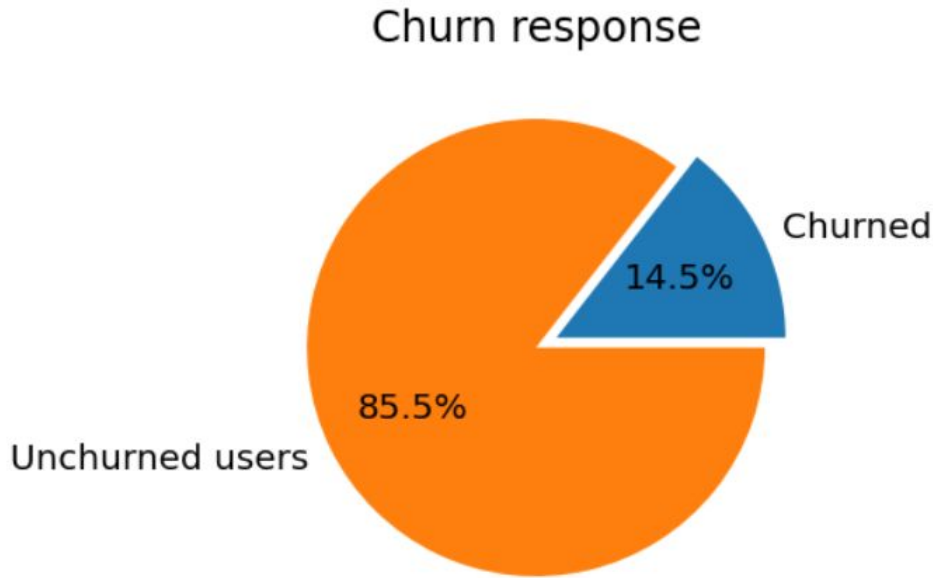
Customer Service Calls:

In this section, there is service centre which is present to take the number of calls.

Churn:

This section is our dependent variable which consist of boolean data types of true or false.

Exploratory Data Analysis



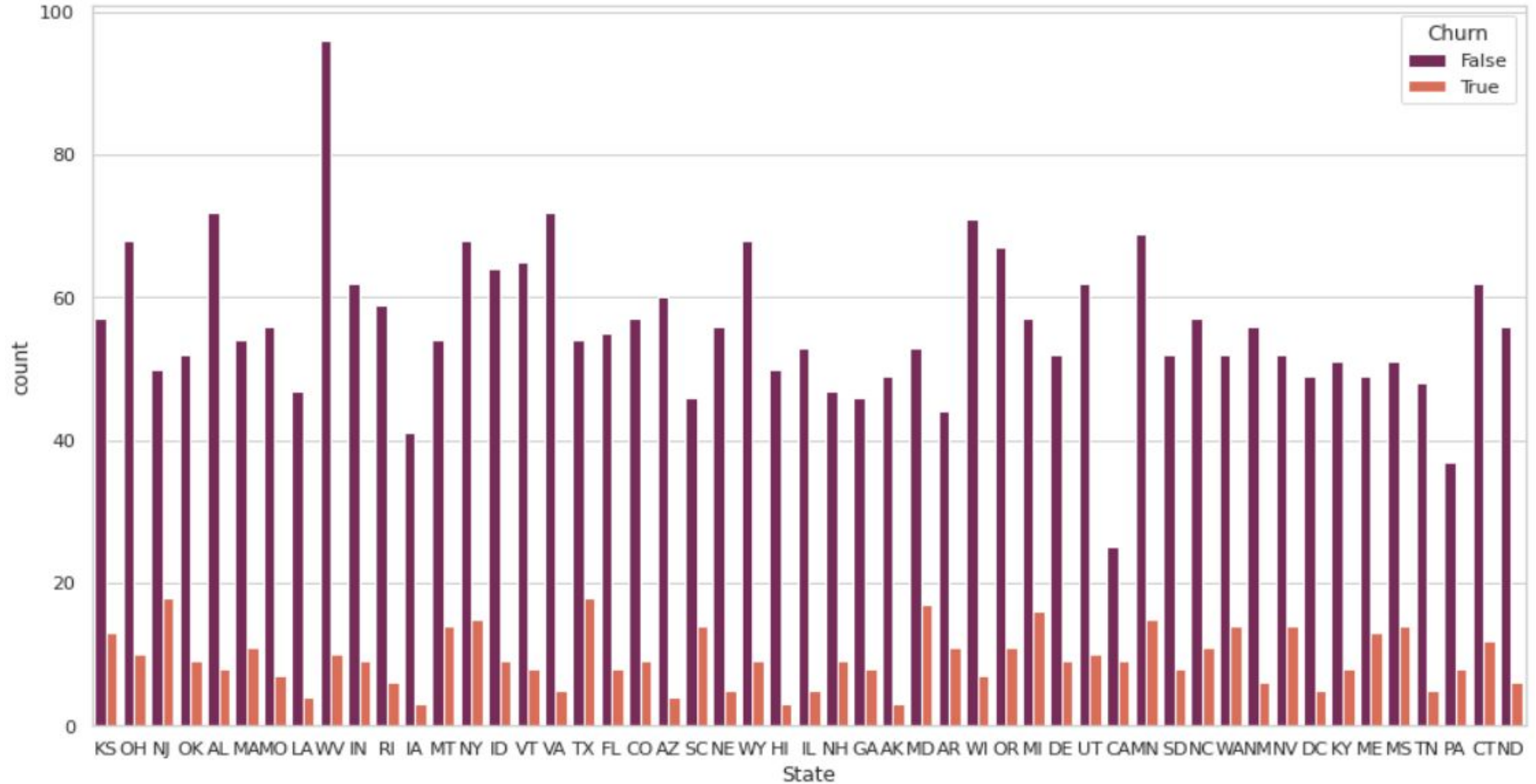
Finding the total number of customers churned

ANALYSING VARIABLE “CHURN”

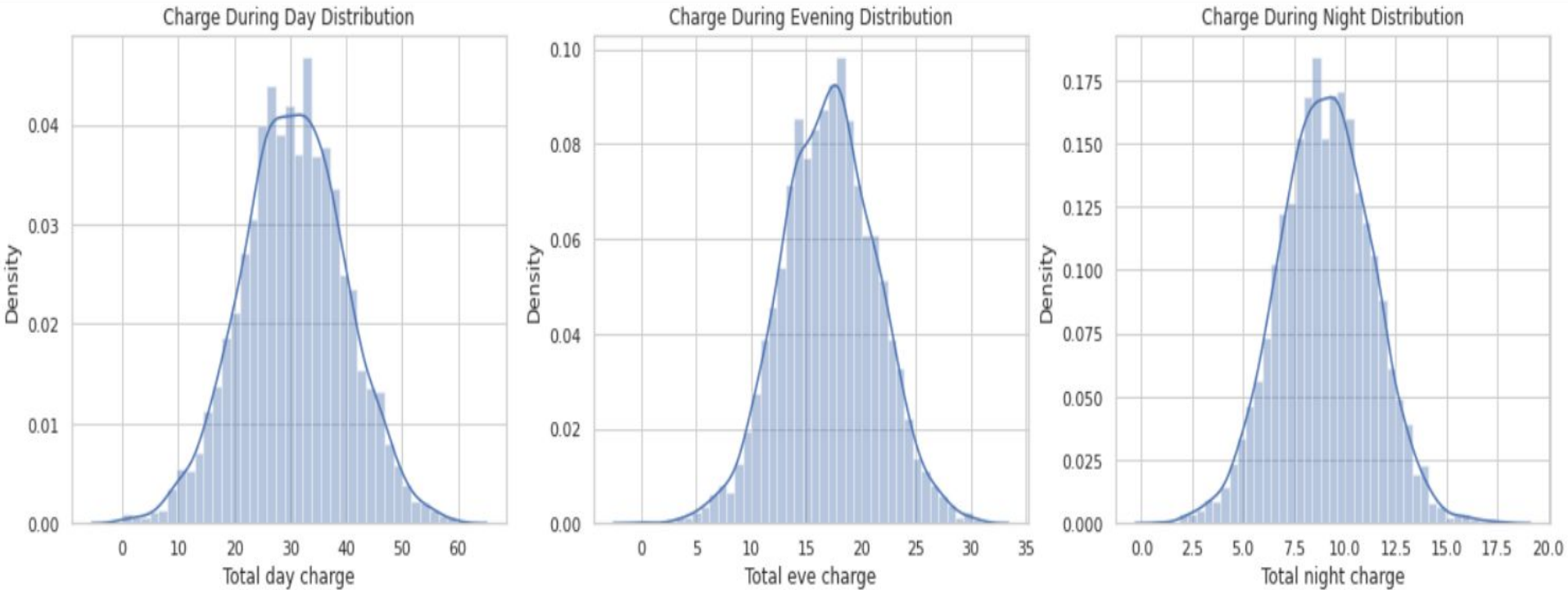
From the above plotting of pie-chart and bar plot, I found :-

- ❖ **Total number of user - 3333**
- ❖ **Total number of churn - 483 (14.5%)**
- ❖ **Total number of unchurn - 2850 (85.5%)**

Analysing churning rate in each state



Univariate Analysis

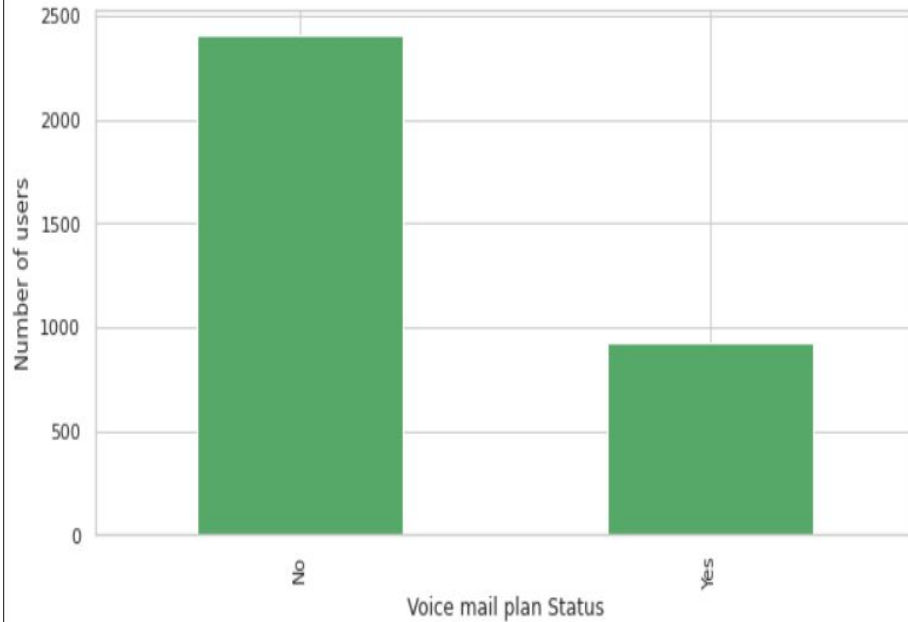


The charge distribution is approx similar for all day, evening and night

Univariate Analysis

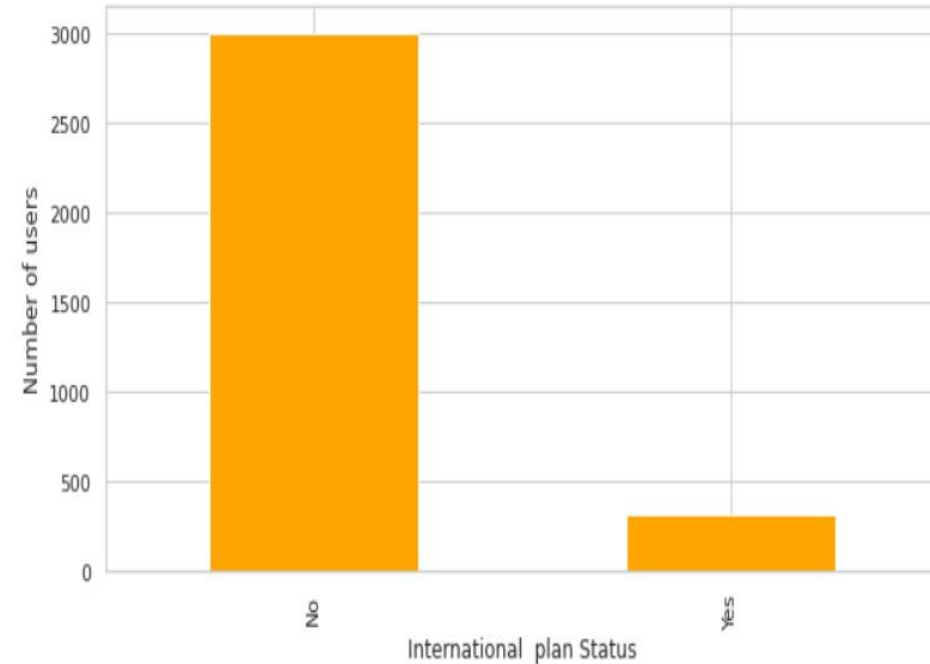
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Voice mail users:



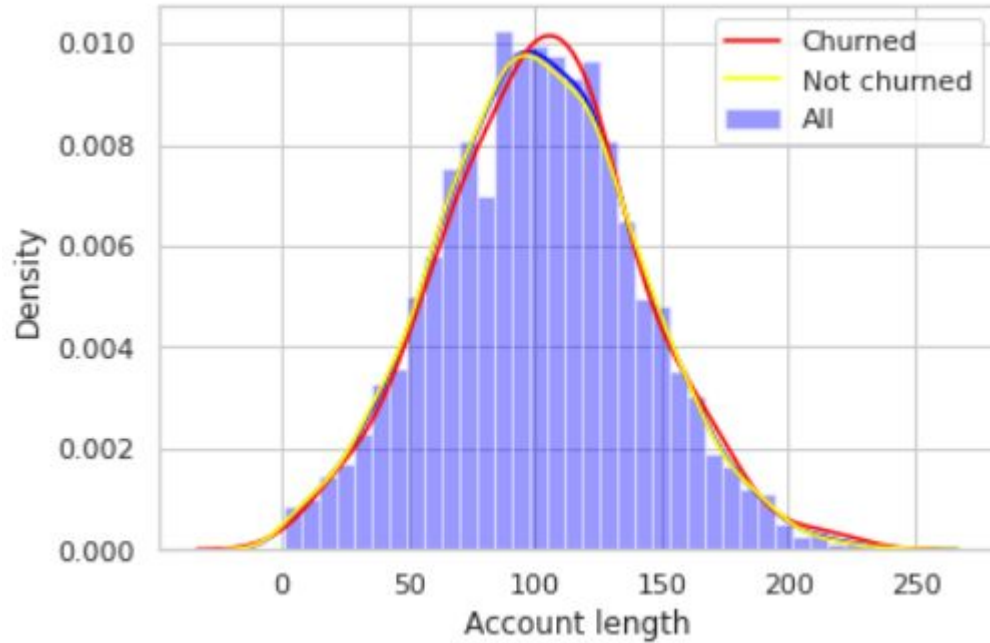
About 28% of customers are using voice mail plan

International Plan users:



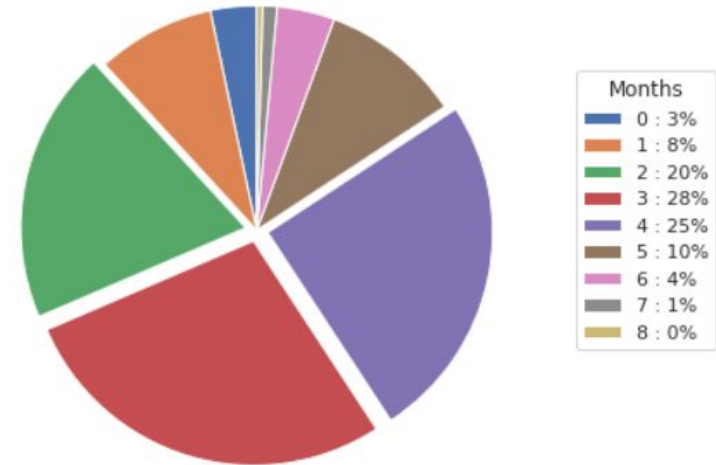
About 9.7% of customers use international planning

Effect Of Account Length On Churn



Churn customer percentage across months:

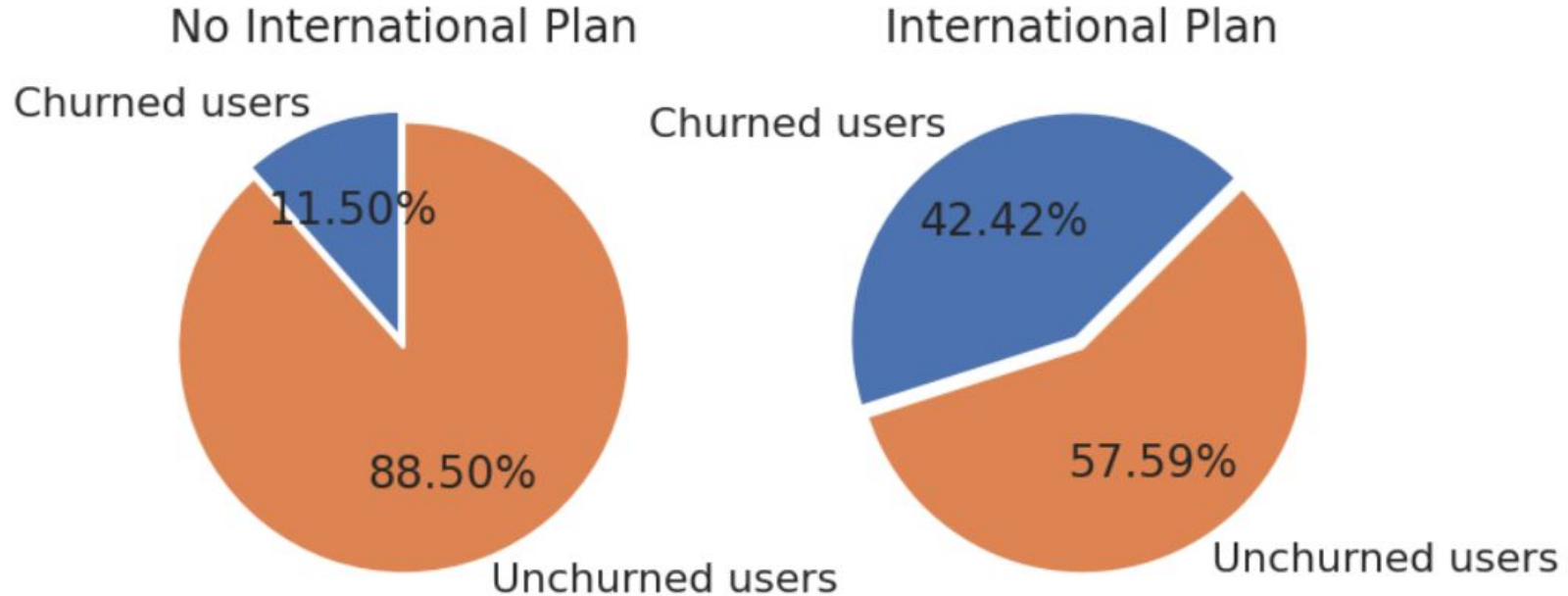
Churned Customer Percentage Across Months



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.

Univariate Analysis

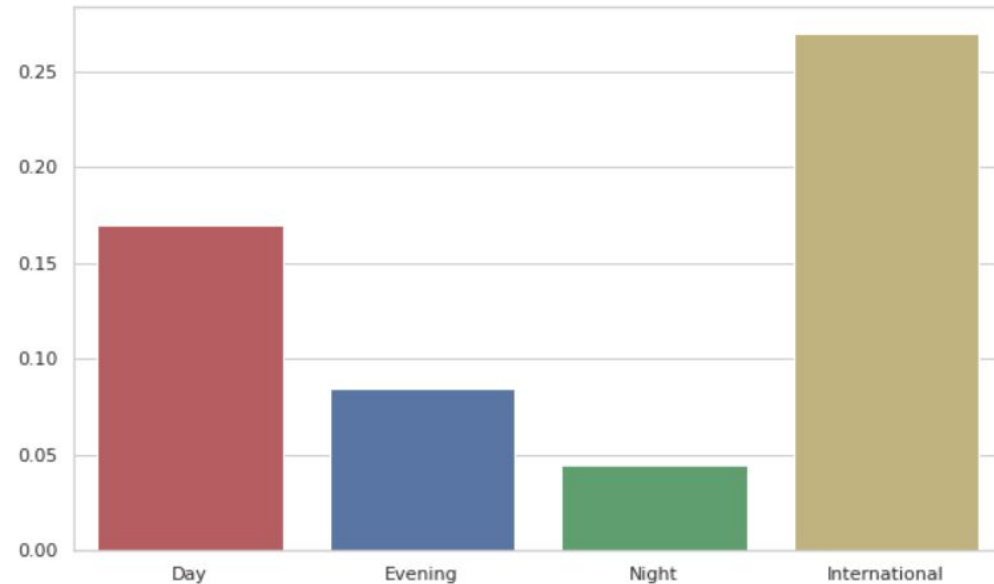
Dependency of Churn customer with the International Plan



The figure above shows the % of churn among people who have an international plan about 4 times the number of people who are not on the international plan

Univariate Analysis

➤ The plot below, this bar shows the comparison between all call charges per minute



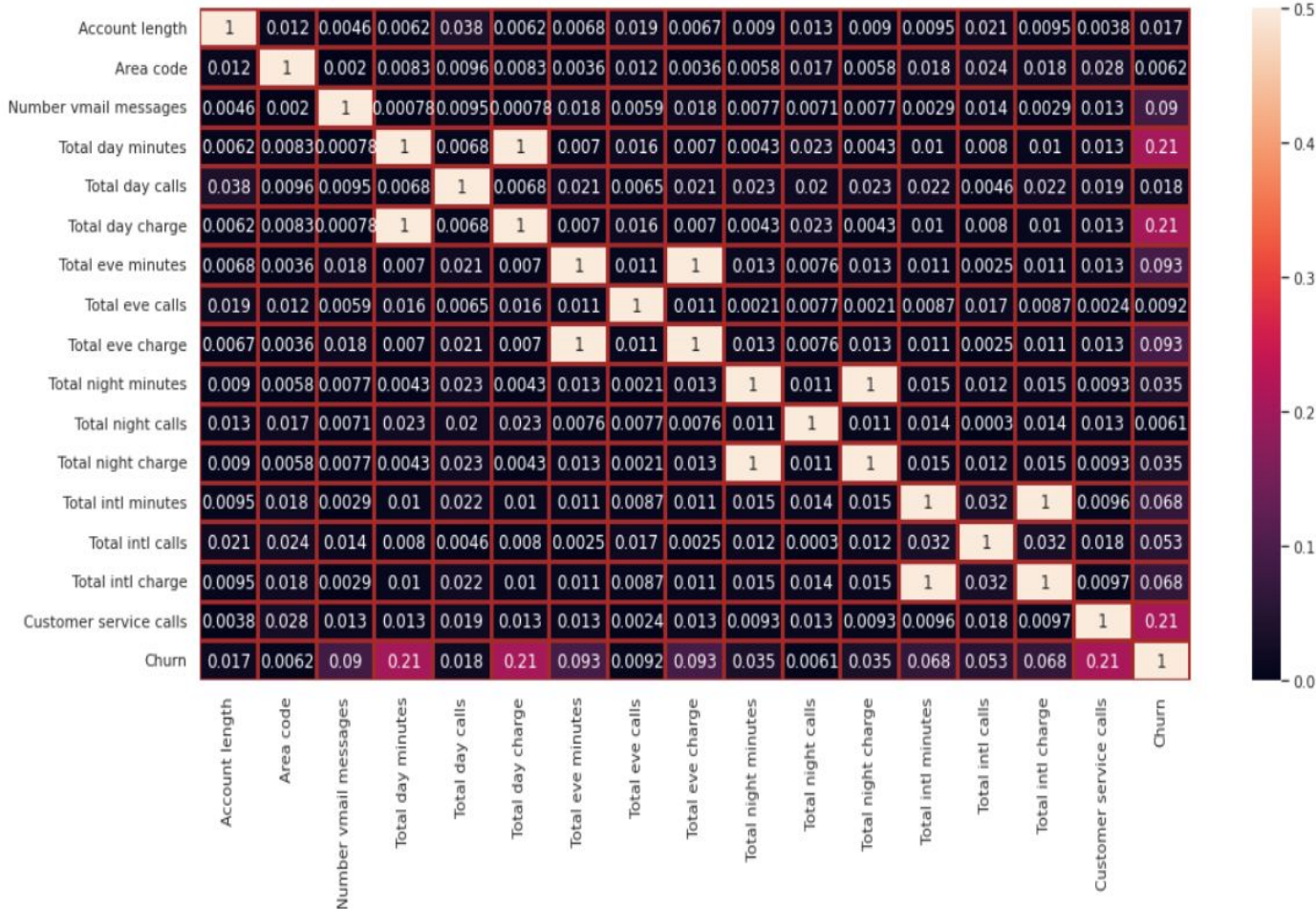
➤ International call charges are higher than others, that is an obvious thing but it can be a cause of churn for international plan customers.

Relation between Area code and Churn

Area Code	Churn False	Churn True	Percentage
408	716	122	14.56
415	1419	236	14.26
510	715	125	14.88

From the churn percentage it can be deducted that there is no significant relationship between the area Code and Churn Customers

Correlation among the features



Some relations can be found as

- ❑ Total day charge to Total Day minutes is at 1
- ❑ Total evening charge to Total evening minutes is at 1
- ❑ Total night charge to Total night minutes is at 1
- ❑ Total Charge to Churn is at 0.21
- ❑ Total minutes to Churn is at 0.21
- ❑ Customer service calls to Churn is at 0.21

Bivariate Analysis

Analysis of Total day minutes with Churn when Customer service calls increases

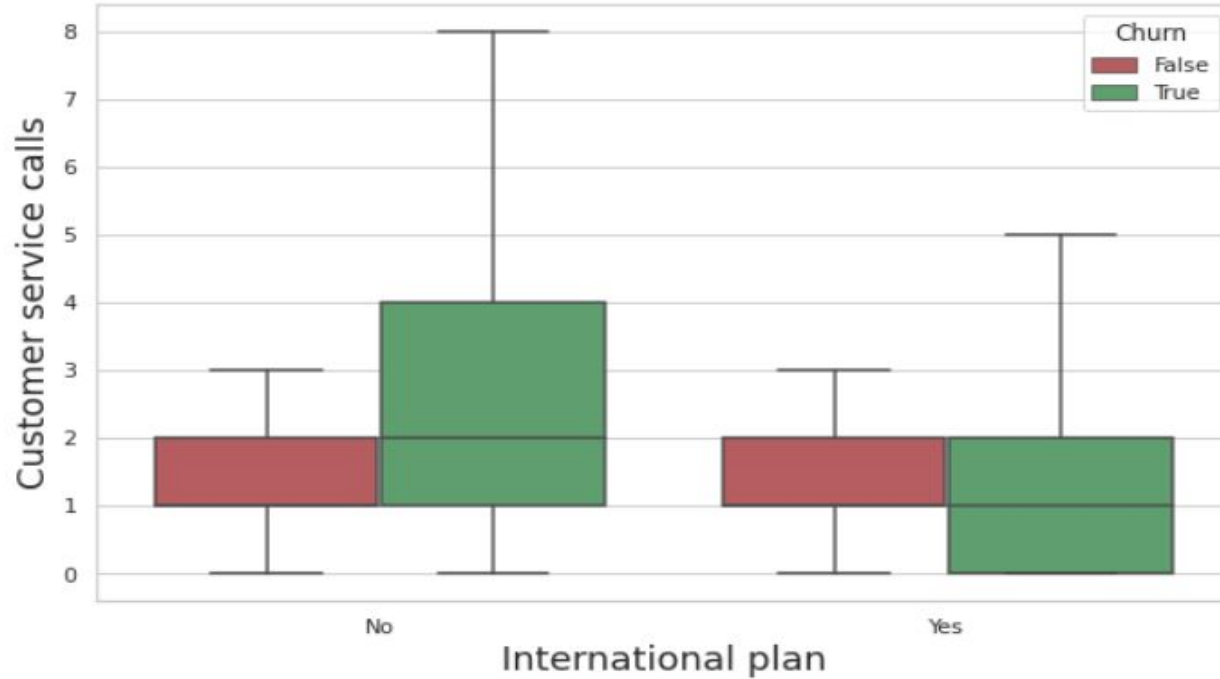


The reason for taking total minutes of the day is because during the day the customers with the least call minutes are paying the highest and hence this can prove to be a factor for the customer.

Bivariate Analysis

International charge/minute vs International plan taking churn into consideration

RELATION BETWEEN CUSTOMER SERVICE CALLS AND INTERNATIONAL PLAN USERS AND NON-USERS CATEGORISED ON BASIS OF CHURN STATUS



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.

Obstacles

- In this project, we are stuck into the analyse columns like: area code, international plan, account length, and etc.
- In this project, many times we are facing some problems related to codes and visualisation for better graphs.
- When we make our project then, there is a need of plotting graphs to show the visuals for better understanding of data.
- When we see our data, there is a lot of features are involved with churn and unchurned customers. So, they create confusion between them.

Recommendation

- One key factor impacting the churn rate in the telecom industry is 'Network Reliability' which is the most common issues reported by customers is a slow,down,or spotty network connection.So, we improve networks in churn area.
- An effective strategy for reducing churn rate in telecom industry is 'Managing Customer Values' which added the values and shows the gratitude towards our customers.
- The leading cause for customer churn in telecom is poor customer services experiences.So, we implement 'Customer complaints'.
- Last but not the least , after uses services the customers share his/her feedback in the form of numbers or star.

Conclusion

- Those customers who use international plans they are more churn due to the high charge of international calling. So, these customer are not satisfied with network as well as high calling charge.
- When we talking about voicemail section, if the quality of voicemail is not much good, may be it increase the churn rate.
- We know that, some states where the churn rate is high as compared to others may be due to bad network.
- The section of account length and area code does not play any kind of role regarding the churn rate.
- 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.
- Last but not the least, the customers whose price are high in the day calls and night calls then these customers tends to churn.

THANK YOU