CUSTOMER CHURN PREDICTION

Ragil Tri Junizar, 2020

JCDS-09

About Me

RAGIL TRI JUNIZAR

IT SUPPORT FOR 6 YEARS

I WANT TO CHANGE MY CAREER PATH TO TECH DIV

WHAT IS CUSTOMER CHURN?

Simply put, customer churn occurs when customers or subscribers stop doing business with a company or service.

Business Stakeholder

TELCO COMPANY

TelCo is a company that offers telecommunications services (e.g. telephone, internet, television) to consumers in exchange for a subscription fee.

Business Objective

Every Company is concerned about high customer churn rate. When customers are unhappy, they stop doing business with you and customers going in search of a better service. It’s that simple. The more customers that leave, the less you grow. If you want to keep your customers, then you need to address customer churn. Customer churn has a significant impact on your business as it lowers revenues and profits. Yet surprisingly, more than 2 out of 3 companies have no strategy for preventing customer churn.
One of the key things for the busines to run is loyal customeers , meaning minimize the churn rate.

Why should reducing customer churn rate be a priority?

Churn Ratio Table

Monthly Revenue	Month	10% deduction due to churn	Final Profit
52000	1	5200	46800
48800	2	4880	44120
46120	3	4612	41508
43508	4	4350.8	39158
43158	5	4315.8	38843
40843	6	40843	36759

If your customer churn rate is higher than your new customer acquisition rate, your business will struggle. from the table on the side highlights how quickly churn can decrease revenue and erode profit.

DATASET

https://www.kaggle.com/blastchar/telco-customer-churn

TELCO CUSTOMER CHURN

[IBM SAMPLE DATA SETS]

ROWS: 7043
COLUMNS: 21

MODEL:
CLASSIFICATION
TARGET: CHURN
OR NOT CHURN
NUMERICAL FEATURES: 3
CATEGORICAL: 17

Problem

01 **Predict customer churn subsequent period of time:**
to optimize the program that will be given to customers to prevent Customer Churn and
Minimize operational costs and increase marketing efficiency

02 **what contribute to the highest customer churn rate**

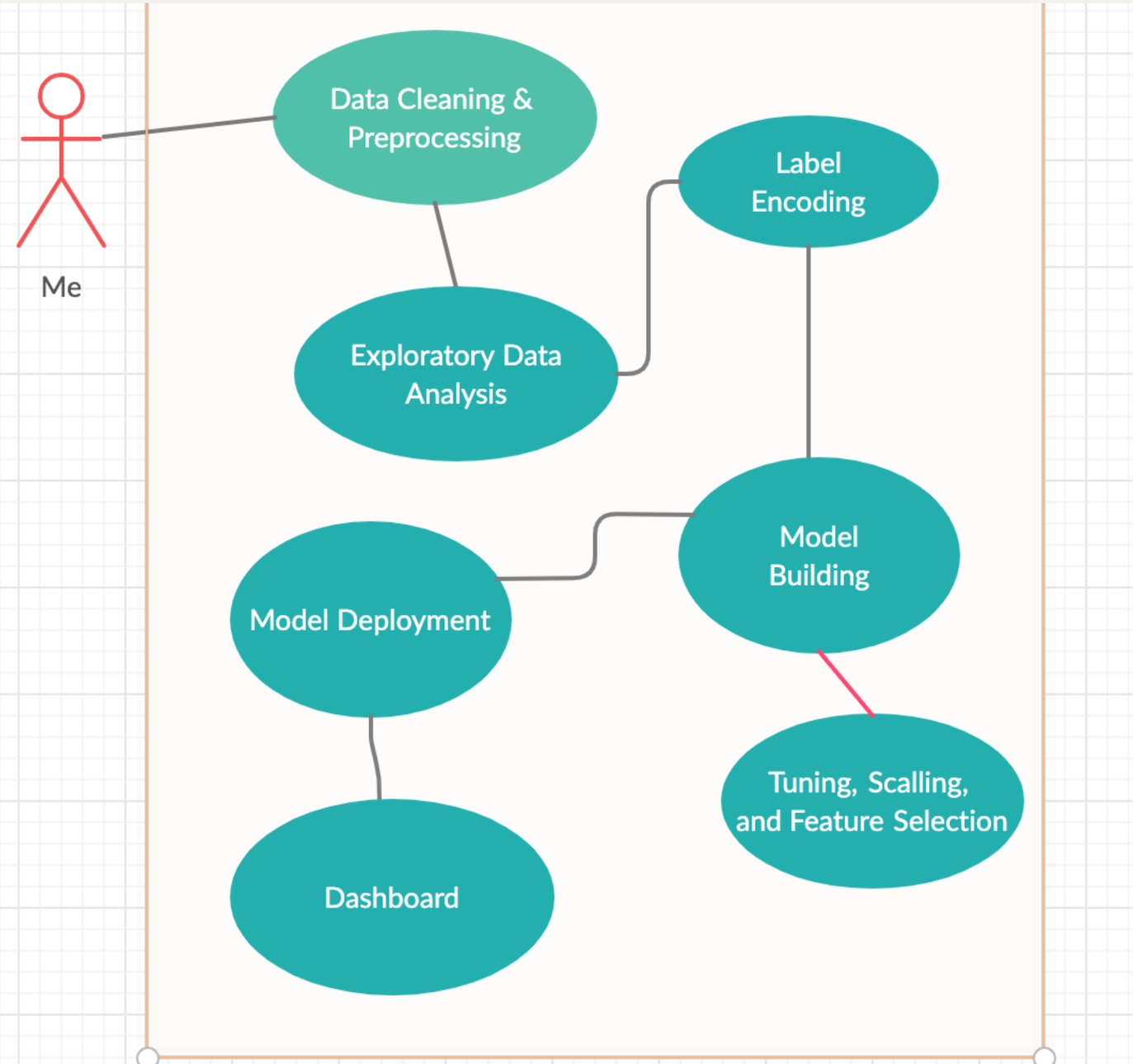
03 **what services we can improve to prevent customer churn.**

04 **Helps decision making not only for marketers, but also Operational**

Research methodology

1. BUILD A MODEL THAT CAN PREDICT WHICH CUSTOMERS WILL CHURN.
2. ANALYZE CUSTOMER DATA TO UNDERSTAND REASON FOR CHURN AND WHO COULD BE THE NEXT POTENTIAL CUSTOMER TO LEAVE THE COMPANY
3. WHAT CONTRIBUTES TO THE HIGHER CHURN RATE OF CUSTOMER AND WHAT COULD BE SOME OF THE PROBABLE SOLUTION TO ADDRESS THE SAME.

WorkFlow


Me
Data Cleaning & Preprocessing
Exploratory Data Analysis
Label Encoding
Model Building
Model Deployment
Tuning, Scalling, and Feature Selection
Dashboard

Step by step

Data Cleaning

- Null & MissingValue
- Label Encode
- Convert Feature to numeric

Exploratory Data Analysis (EDA) & Data Visualization

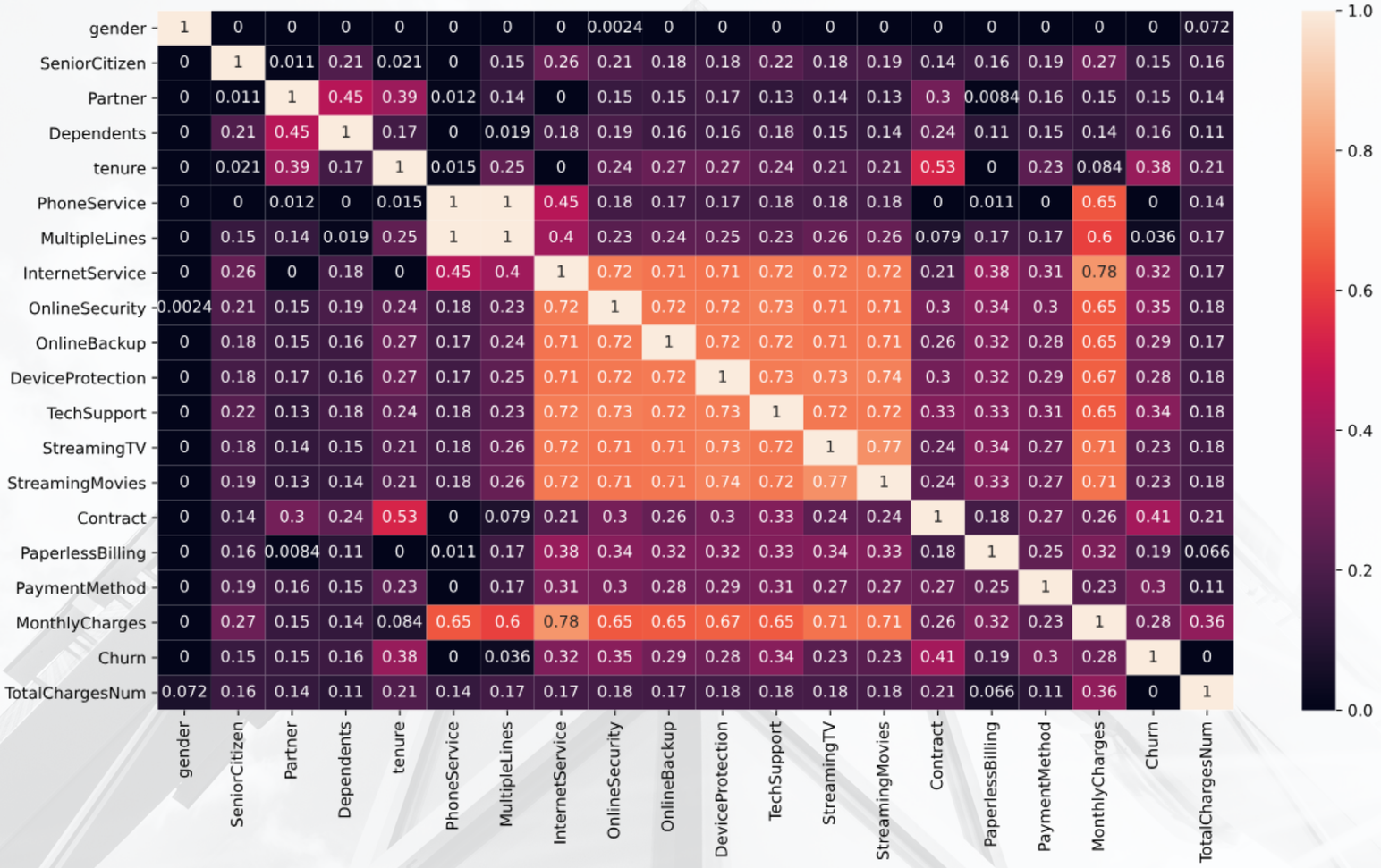
- Distribution
- Correlation
- Plot
- Insight

Model Building & Model Evaluation

- Scalling
- Feature Selection
- Parameter Tuning

Correlation

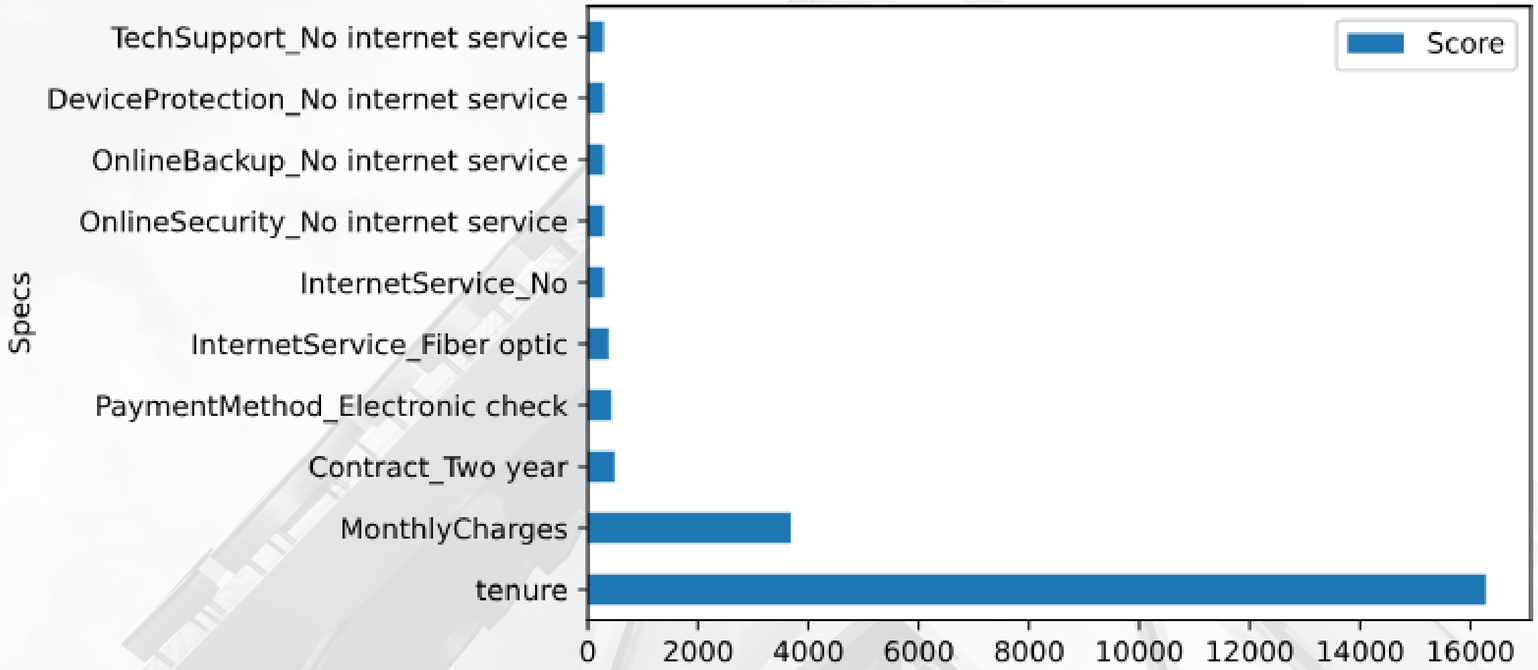
Cramers'v for categorical feature correlation



10 feature that have high correlation with target (Curn) that is : Contract, tenure, techsupport, onlinesecurity, internetservice, onlinebackup, deviceprotection, monthlycharge, streamingtv, streamingmovies.

Feature Selection

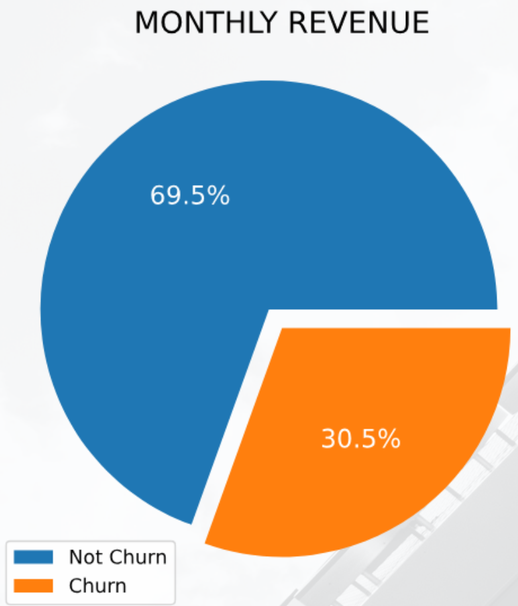
Chi-square Test for feature selection

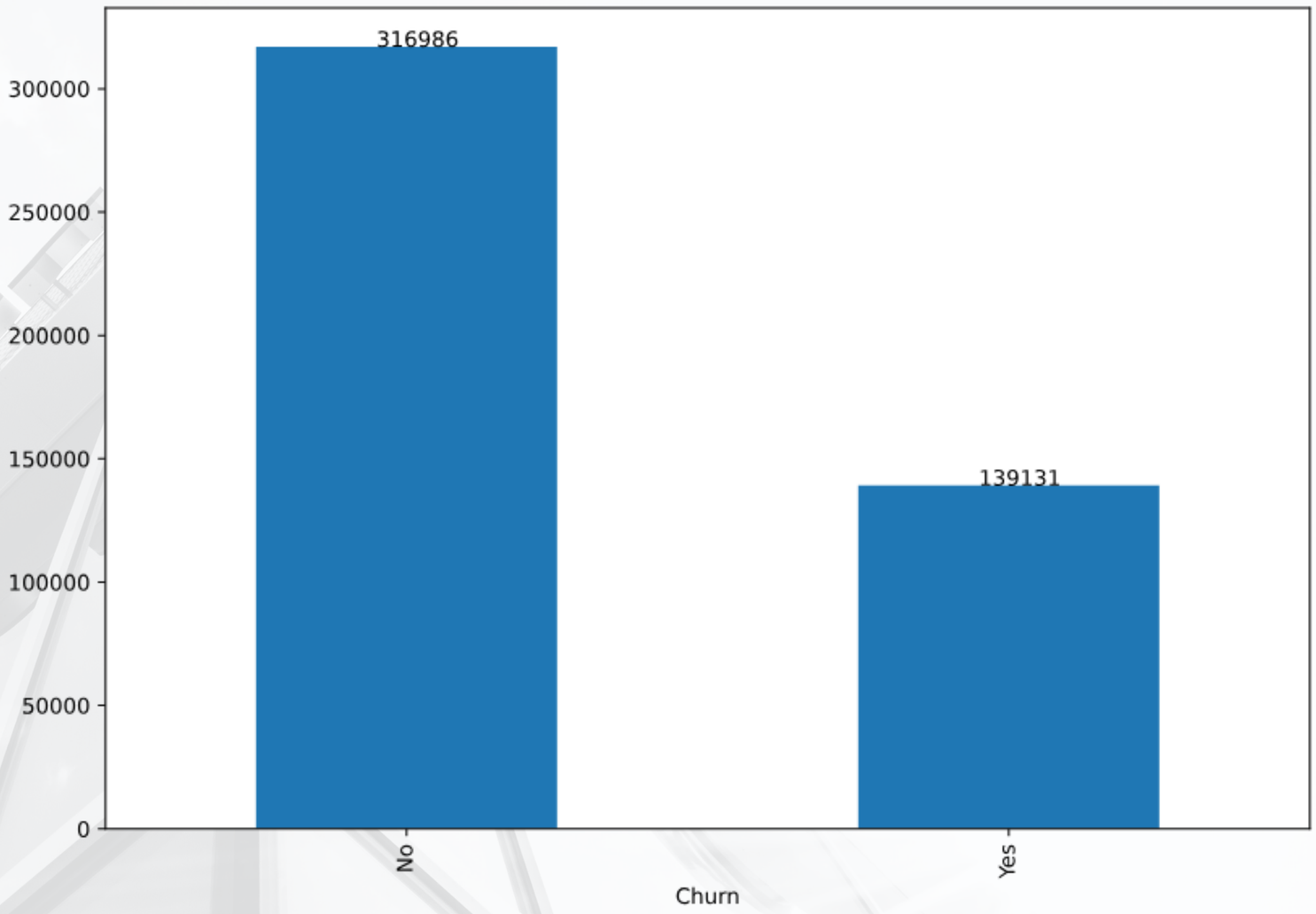


From Chi-square Test we got 10 largest score:

Tenure, MonthlyCharges, Contract_Month-to-month , Contract_Two year, PaymentMethod_Electronic check, OnlineBackup_No internet service, OnlineSecurity_No internet service, TechSupport_No internet service, InternetService_Fiber optic , InternetService_No.

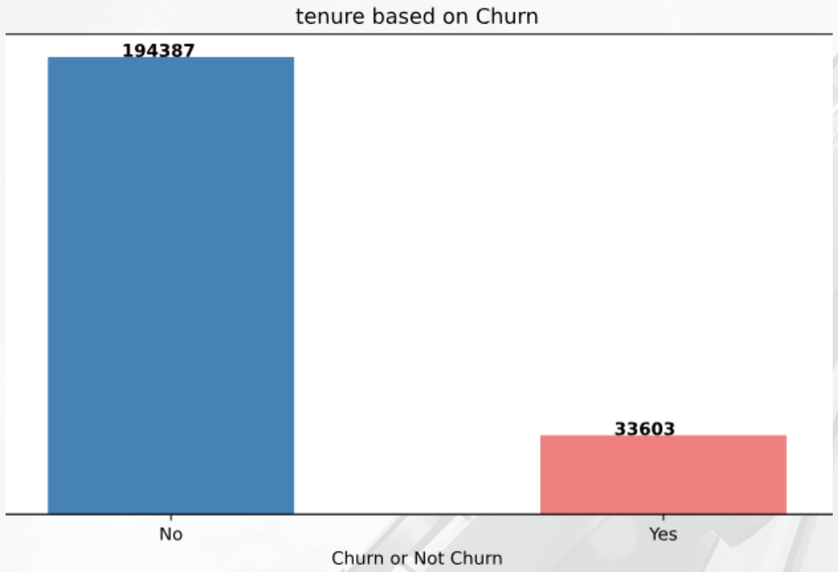
Visualization

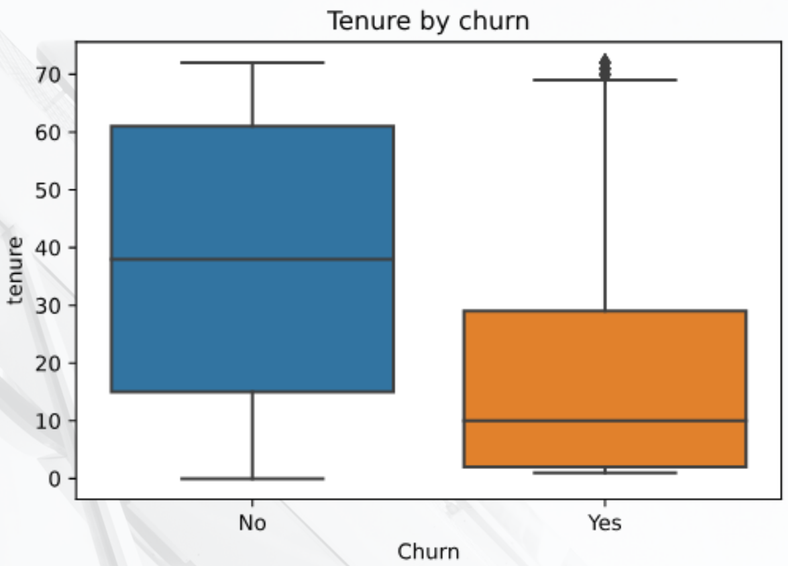




Revenue Lost By Churn

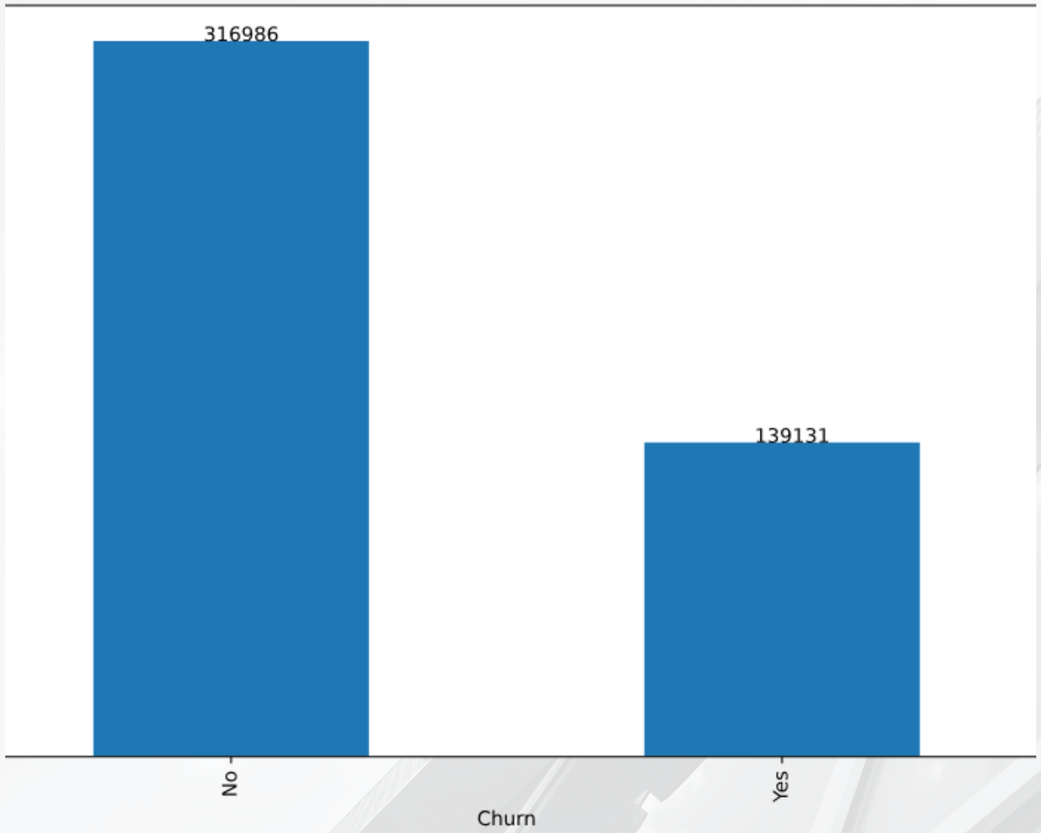
Tenure

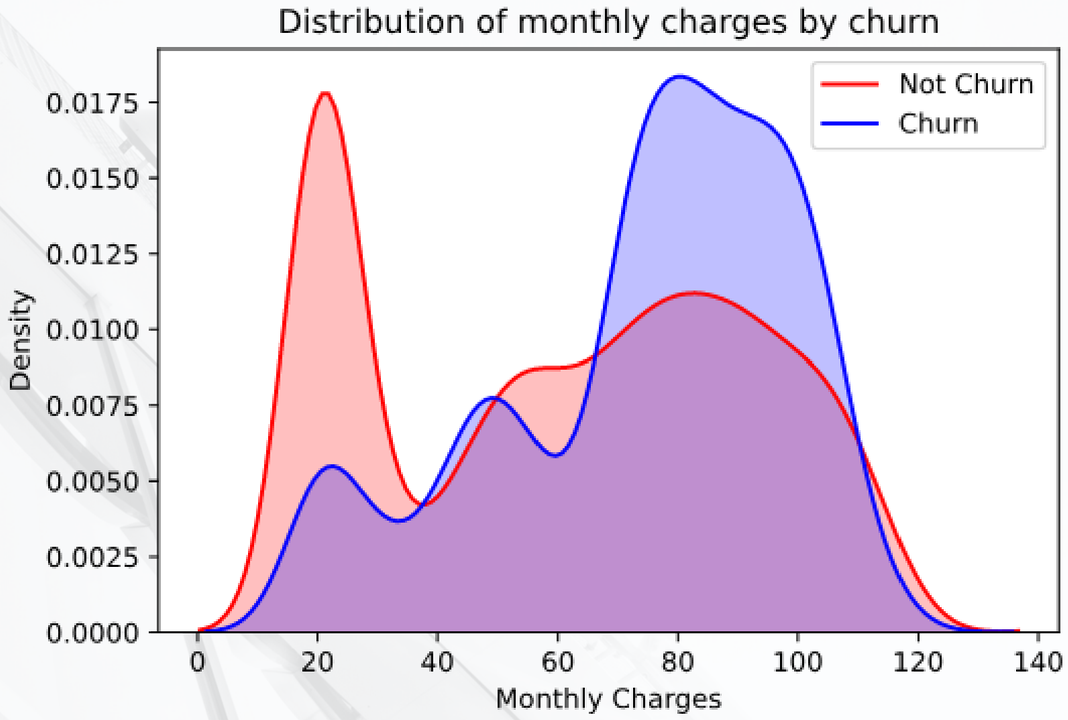




1. We have lot customers in 69-72 months range. They are the loyal customers
2. We have major chunk of customers in 0-1 month period. Lot of them might be cutomers who tried the service and left or liked the service and continued
3. Between 10 months to 65 months, we can see flat distribution of data

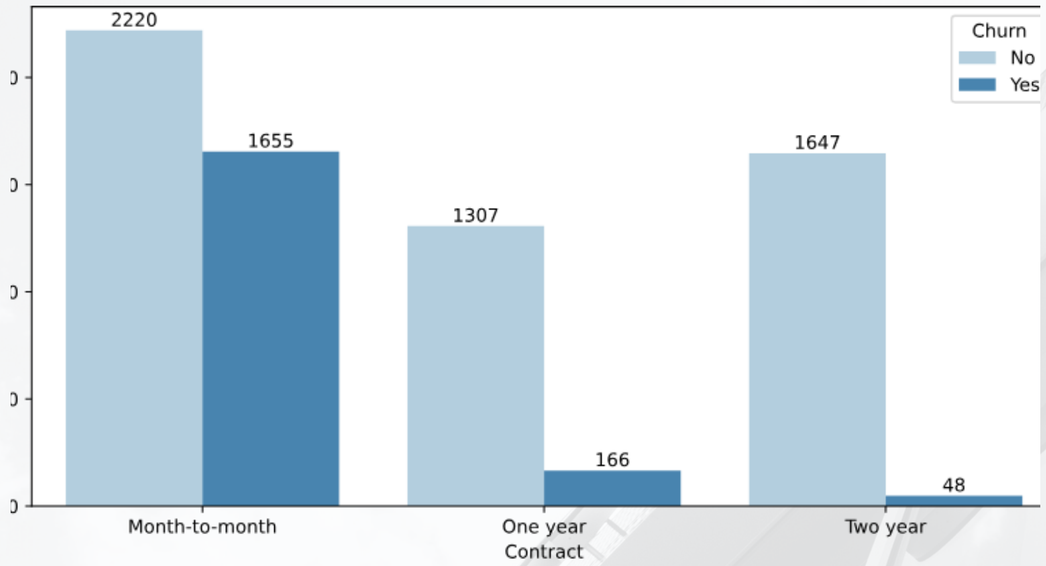
Monthly Charges

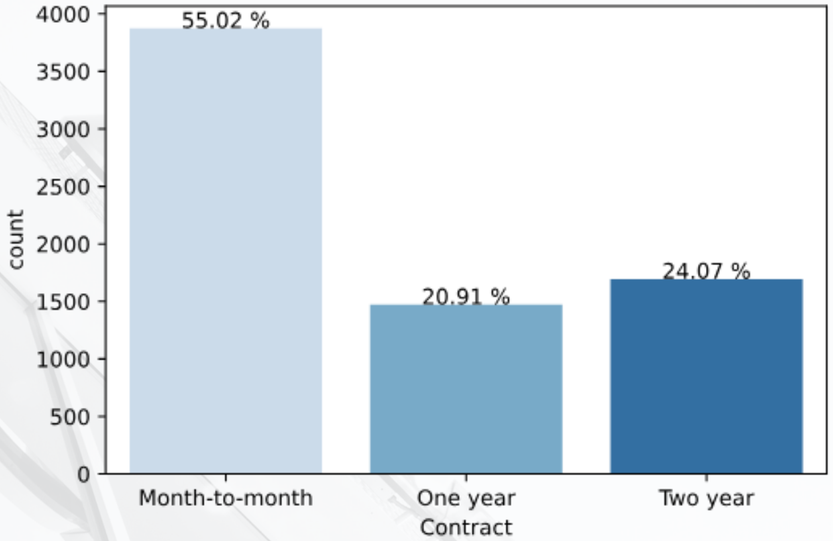




1. Majority of customers are paying 18to 20 dollars. Must be the service charge for basic service. Majority of customers are subscribed to basic package.
2. Between 70− 100 dollars, we have quite a number of customers. They might be the ones subscribed for multiple services.
3. These figures may indicate that cheap packages is step for to prevent customer churn

Contract

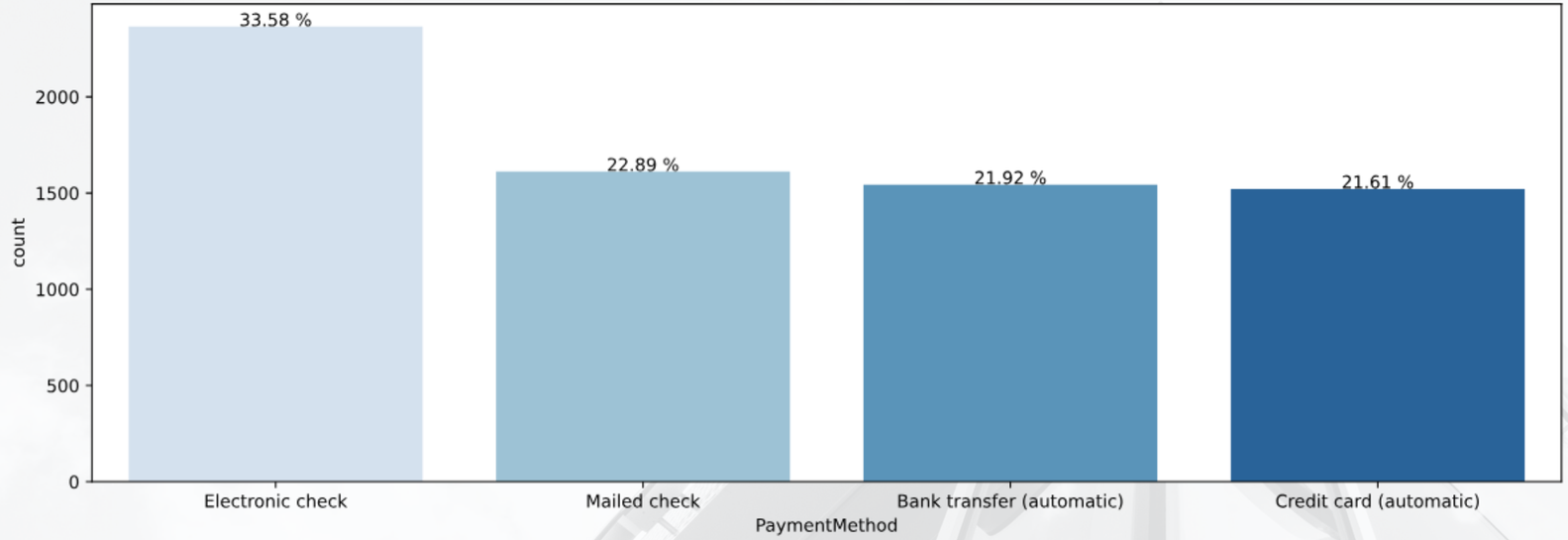




55 % of our customers choose month to month contract, i think this is big problem for this company, it means there are almost half the customers still unsure and Month to Month customers have likely higher chances to leave. but there are 45% customers who already sure and probably loyal to this company.

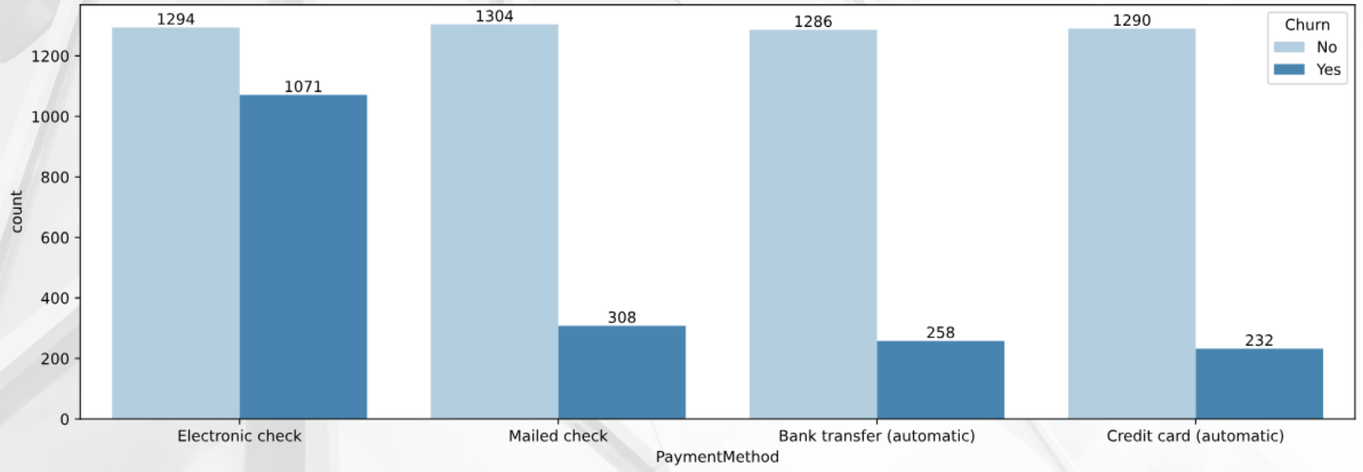
A solution would be to either remove these short-term contracts and offer only long-term ones, or promote long-term contracts with lower monthly charges than short ones.
Furthermore, it may be interesting to create loyalty program with bonus points : the longer you stay in the company, the higher the discount on new devices, smartphones and subscriptions.

Payment Method



Majority of customers pay eletronic check.

43 % prefer Automatic payment (Bank Transfer and Credit Card).



Building Model

THE BEST MODEL WIN

Model	Choose Scalers	Feature Selection	Hyperparameter Tuning	The Best Score
Logistic Regression	X			
Decision Tree	X	X	X	X
Random Forest	X	X	X	
XGBoosting	X		X	
Gradient boosting			X	
KNN	X		X	

*We Try the best model without scalling, it is still has a good result, that is the model we use on the dashboard

We prefer to reduce prediction errors Churn negative, therefore we choose the model with the highest recall.

	LRG BEST	DT BEST	RF BEST	XGB BEST	GRAD BEST	KNN BEST
ACCURACY	0.820440	0.809084	0.793471	0.819730	0.821859	0.805674
PRECISION	0.685185	0.633333	0.652985	0.696370	0.698052	0.679245
RECALL	0.595174	0.662198	0.469169	0.565684	0.576408	0.556701
F1 SCORE	0.637016	0.647444	0.546022	0.624260	0.631424	0.611898

Conclusion

SUCCESSES:

- **From Build Machine Learning to predict which customers will churn.**

  We Can Implements effective programs for customer retention

  We Can Minimize operational costs and increase marketing efficiency

- **From EDA / Data Visualization :**

  How much revenue we lose due to customer churn

  We can know what contribute to the highest customer churn rate

  Insight to another Division

  Evaluate success of marketing efforts/ strategies/investments

  Define roadmap for new and loyal customer

THANK YOU!