

# INTELLIGENT CUSTOMER RETENTION :

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USING MACHINE LEARNING FOR ENHANCED PREDICTION

OF TELECOM CUSTOMER CHURN

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# INTRODUCTION

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Customer retention is a critical component of a business's long-term success. The ability to predict which customers are most likely to churn (i.e., stop doing business with a company) is a valuable capability for businesses. In recent years, machine learning has emerged as a powerful tool for predicting customer churn. This report will explore the concept of intelligent customer retention using machine learning and how it can be used to enhance prediction.

## Intelligent Customer Retention:

Intelligent customer retention refers to the use of data and technology to predict which customers are at risk of churning and to take proactive measures to retain them. Machine learning is a key component of intelligent customer retention, as it allows businesses to analyze large amounts of customer data to identify patterns and trends.

## Machine Learning for Customer Retention:

There are several machine learning techniques that can be used for customer retention. Some of the most commonly used techniques include:

1. **Classification models:** These models can be used to classify customers as either churners or non-churners. They work by analyzing historical customer data and identifying patterns that are associated with churn. Once the model has been trained, it can be used to predict which customers are at risk of churning in the future.

2. **Regression models:** These models can be used to predict the likelihood of churn for individual customers. They work by analyzing customer data and identifying factors that are associated with churn. Once the model has been trained, it can be used to predict the probability of churn for each customer.

3. **Clustering models**: These models can be used to group customers based on their characteristics and behavior. They work by analyzing customer data and identifying similarities and differences between customers. Once the model has been trained, it can be used to identify which groups of customers are most at risk of churning.

Benefits of Machine Learning for Customer Retention:

The use of machine learning for customer retention offers several benefits for businesses, including:

1. **Enhanced prediction accuracy**: Machine learning algorithms can analyze large amounts of customer data to identify patterns and trends that are not visible to the human eye. This allows for more accurate predictions of which customers are at risk of churning.

2. **Personalized retention strategies**: Machine learning can be used to analyze customer data at an individual level, allowing businesses to develop personalized retention strategies for each customer.

3. **Reduced churn**: By identifying which customers are at risk of churning and developing targeted retention strategies, businesses can reduce their overall churn rate and improve customer retention.

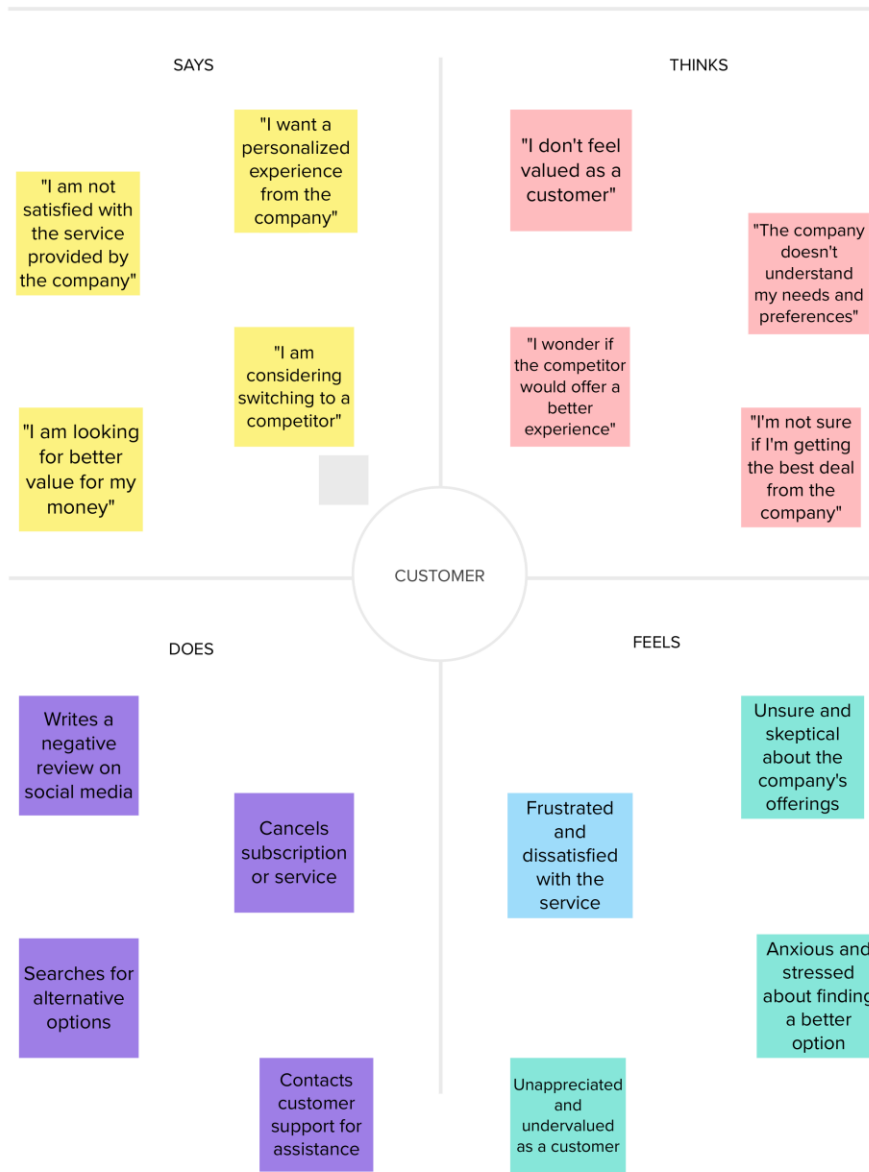
## Conclusion:

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Intelligent customer retention using machine learning is a powerful tool for businesses looking to improve customer retention. By analyzing large amounts of customer data, businesses can identify patterns and trends that are associated with churn and develop targeted retention strategies to retain at-risk customers. The use of machine learning for customer retention offers several benefits, including enhanced prediction accuracy, personalized retention strategies, and reduced churn. As such, it is likely to become an increasingly important part of customer retention strategies in the coming years.

# Empathy Map

Intelligent Customer Retention :  
Using Machine Learning For Enhanced  
Prediction



# IDEATION AND BRAIN STROMING :

### 1 Define your problem statement

What problem are you trying to solve? Frame your problem as a clear, specific statement. This will be the focus of your brainstorm.

10 minutes

Problem: How can we reduce customer churn and improve customer retention through personalized marketing strategies?

Key rules of brainstorming:

- Be in topic
- Be creative
- Be judgment-free
- Be for volume
- Listen to others
- It's possible, be wild!

### 2 Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

Personas	Wishes	Knowledge	Liberty
Offer personalized experiences to customers based on their preferences	Analyze customer feedback to identify areas of improvement in the customer experience	Use machine learning algorithms to optimize pricing and product offerings based on customer behavior and market trends	Use gamification techniques to encourage customer loyalty and engagement
Use predictive modeling to identify customers who are at risk of churning	Develop a recommendation engine to suggest products and services that customers are more likely to purchase	Use social media analytics to identify customers who are disengaged and address their concerns proactively	Use sentiment analysis to identify customers who are at risk of churning

### 3 Group ideas

Take turns sharing your ideas with clustering similar or related notes as you go. Once all sticky notes have been posted, group each cluster a customer the ideas. If a cluster is larger than six sticky notes, try and split it up and break it up into smaller sub-groups.

10 minutes

Personalization and Recommendation	Offer personalized experiences to customers based on their preferences	Use predictive modeling to identify customers who are at risk of churning	Predictive Modeling and Incentives
Develop a recommendation engine to suggest products and services that customers are more likely to purchase	Offer targeted incentives to retain customers who are at risk of churning	Customer Feedback and Sentiment Analysis	Analyze customer feedback to identify areas of improvement in the customer experience

### 4 Prioritize

Your ideas should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

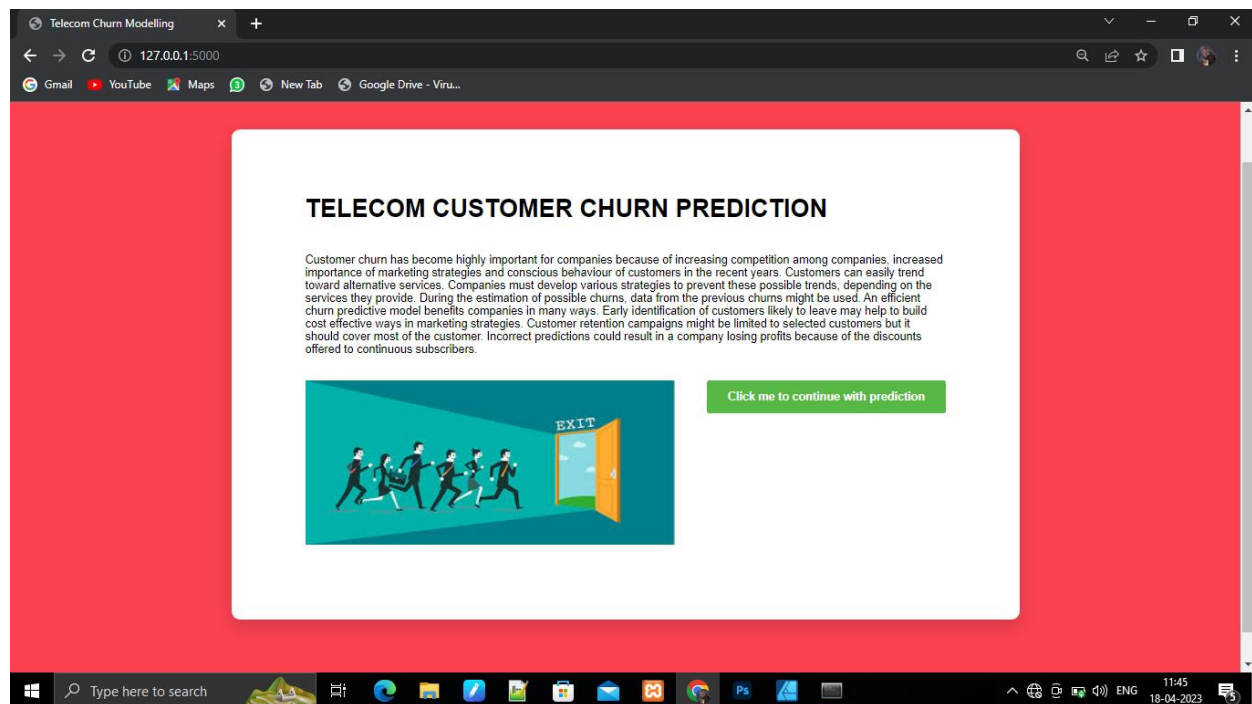
10 minutes

Importance

Feasibility

Remember: The top-right quadrant is the most desirable. Ideas in the other three quadrants are still valuable, but they need more work.

# RESULT



Telecom Customer Churn Predict: X +

127.0.0.1:5000/assessment?

Gmail YouTube Maps New Tab Google Drive - Virtu...

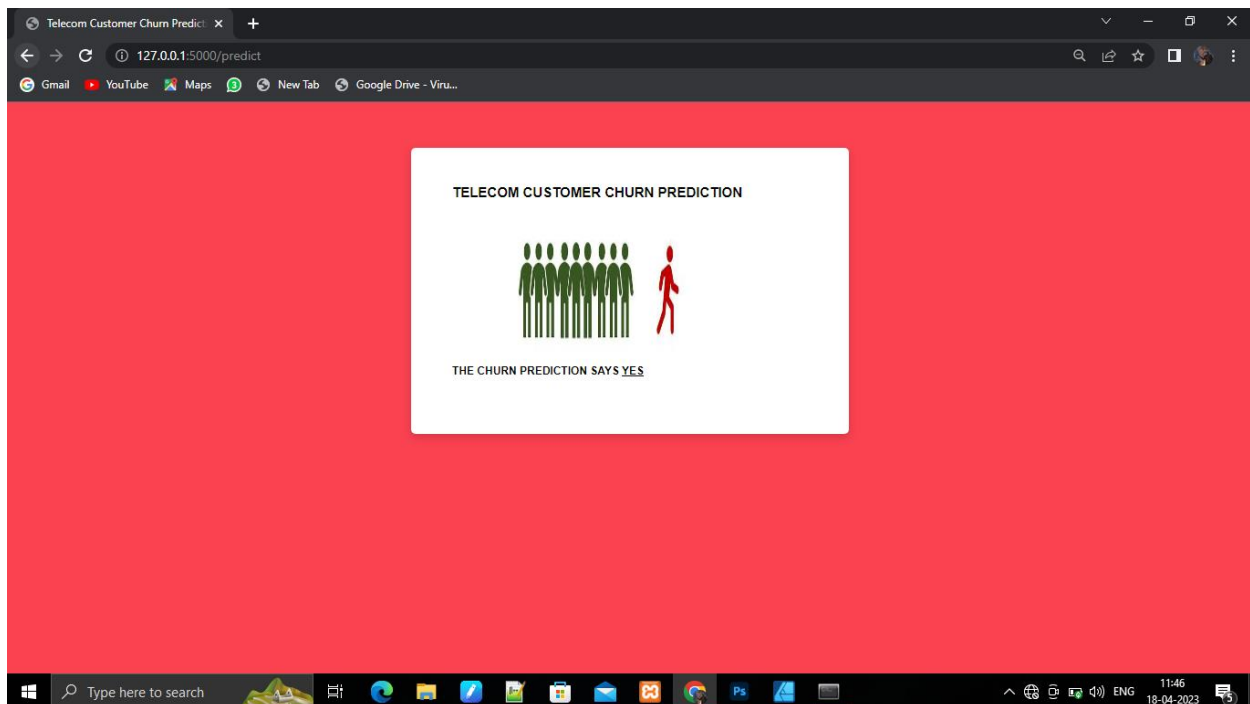
### PREDICTION FORM

Male	No
Yes	No
4	Yes
Yes	Fibre Optics
Yes	Yes
Yes	Yes
Yes	No
Month to Month	Yes
Bank Transfer(Automatic)	3000
60000	

Submit

Type here to search

11:46 18-04-2023



## SOURCE CODE

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```
from flask import Flask, render_template, request

app = Flask(__name__)

import pickle

model = pickle.load(open('churnnew.pkl','rb'))


@app.route('/')

def helloworld():

    return render_template("base.html")

@app.route('/assessment')
```



```
def prediction():  
    return render_template("index.html")  
  
@app.route('/predict', methods = ['POST'])  
def admin():  
    a= request.form["gender"]  
    if (a == 'f'):  
        a=0  
    if (a == 'm'):  
        a=1  
    b= request.form["srcitizen"]  
    if (b == 'n'):  
        b=0  
    if (b == 'y'):  
        b=1  
    c= request.form["partner"]  
    if (c == 'n'):  
        c=0  
    if (c == 'y'):  
        c=1  
    d= request.form["dependents"]  
    if (d == 'n'):  
        d=0  
    if (d == 'y'):  
        d=1
```

```
e= request.form["tenure"]

f= request.form["phservices"]

if (f == 'n'):

    f=0

if (f == 'y'):

    f=1

g= request.form["multi"]

if (g == 'n'):

    g1,g2,g3=1,0,0

if (g == 'nps'):

    g1,g2,g3=0,1,0

if (g == 'y'):

    g1,g2,g3=0,0,1

h= request.form["is"]

if (h == 'dsl'):

    h1,h2,h3=1,0,0

if (h == 'fo'):

    h1,h2,h3=0,1,0

if (h == 'n'):

    h1,h2,h3=0,0,1

i= request.form["os"]

if (i == 'n'):

    i1,i2,i3=1,0,0

if (i == 'nis'):

    i1,i2,i3=0,1,0
```

```
if (i == 'y'):
    i1,i2,i3=0,0,1
j= request.form["ob"]
if (j == 'n'):
    j1,j2,j3=1,0,0
if (j == 'nis'):
    j1,j2,j3=0,1,0
if (j == 'y'):
    j1,j2,j3=0,0,1
k= request.form["dp"]
if (k == 'n'):
    k1,k2,k3=1,0,0
if (k == 'nis'):
    k1,k2,k3=0,1,0
if (k == 'y'):
    k1,k2,k3=0,0,1
l= request.form["ts"]
if (l == 'n'):
    l1,l2,l3=1,0,0
if (l == 'nis'):
    l1,l2,l3=0,1,0
if (l == 'y'):
    l1,l2,l3=0,0,1
m= request.form["stv"]
if (m == 'n'):
```

```
    m1,m2,m3=1,0,0
if (m == 'nis'):
    m1,m2,m3=0,1,0
if (m == 'y'):
    m1,m2,m3=0,0,1
n= request.form["smv"]
if (n == 'n'):
    n1,n2,n3=1,0,0
if (n == 'nis'):
    n1,n2,n3=0,1,0
if (n == 'y'):
    n1,n2,n3=0,0,1
o= request.form["contract"]
if (o == 'mtm'):
    o1,o2,o3=1,0,0
if (o == 'oyr'):
    o1,o2,o3=0,1,0
if (o == 'tyrs'):
    o1,o2,o3=0,0,1
p= request.form["pmt"]
if (p == 'ec'):
    p1,p2,p3,p4=1,0,0,0
if (p == 'mail'):
    p1,p2,p3,p4=0,1,0,0
if (p == 'bt'):
```

```

    p1,p2,p3,p4=0,0,1,0

    if (p == 'cc'):

        p1,p2,p3,p4=0,0,0,1

    q= request.form["plb"]

    if (q == 'n'):

        q=0

    if (q == 'y'):

        q=1

    r= request.form["mcharges"]

    s= request.form["tcharges"]


t=[[int(g1),int(g2),int(g3),int(h1),int(h2),int(h3),int(i1),int(i2),int(i3),int(j1),int(j2),int(j3),int(k1),int(k2),int(
k3),int(l1),int(l2),int(l3),int(m1),int(m2),int(m3),int(n1),int(n2),int(n3),int(o1),int(o2),int(o3),int(p1),int(p
2),int(p3),int(p4),int(a),int(b),int(c),int(d),int(e),int(f),int(q),float(r),float(s)]]

x = model.predict(t)

if (x[0] == 0):

    y="No"

    return render_template("predno.html", z = y)


if (x[0] == 1):

    y="Yes"

    return render_template("predyes.html", z = y)


if __name__ == '__main__':

    app.run(debug = False)

```