PROJECT REPORT

ON

# Telecom customer churn prediction

# using Watson Auto AI

**BY:**

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**1. INTRODUCTION**

**1.1 Overview :**

The main contribution of our work is to develop a **churn prediction** model which assists **telecom** operators to **predict customers** who are most likely subject to **churn**

Project Requirements :IBM Cloud,IBM Watson Auto AI,Node-Red ,Node JS.

Functional Requirements :IBM Cloud.

Software Requirements :Watson Auto Ai,Node-Red.

Project deliverables ,customer churn prediction using Watson Auto AI .

###### 

#### 1.2 Purpose:

Customer churn is the major problem and one of the most important concern for large company.Due to the direct effect on the revenues of the companies ,especially in the telecom fields , companies are devoloping means to predict potential customer to churn . Therefore finding factors that predict ccustomer churn is important to take neccessary actions to reduce this churn . churn prediction helps in identifying customers who are likely to leave a company. The contribution of our woek is to devolop a churn prediction model which assists telecom operators to predicts the customers.

**2. LITERATURE SURVEY**

**2.1. Existing problem:**

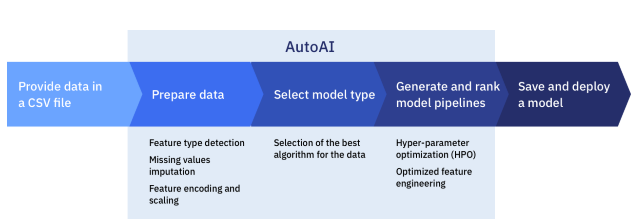
Customer churn is a major problem and one of the most important concerns for large companies. Due to the direct effect on the revenues of the companies, especially in the telecom field, companies are seeking to develop means to predict potential customer to churn. Therefore, finding factors that increase customer churn is important to take necessary actions to reduce this churn. The main contribution of our work is to develop a churn prediction model which assists telecom operators to predict customers who are most likely subject to churn. The model developed in this work uses machine learning techniques .

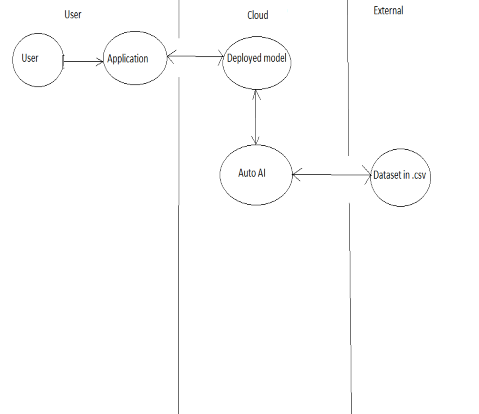
**2.2 Proposed Solution:**

Telecommunication industry always suffers from a very high churn rates when one industry offers a better plan than the previous there is a high possibility of the customer churning from the present due to a better plan in such a scenario it is very difficult to avoid losses but through prediction we can keep it to a minimal level. We are building a Machine Learning model to predict the customer churn using IBM Watson AutoAI Machine Learning Service. The model is deployed on IBM cloud to get scoring end point which can be used as API in mobile app or web app building. We are developing a web application which is built using node red service. We make use of the scoring end point to give user input values to the deployed model.

**3. Theoretical Analysis**

3.1 Block/ﬂow diagram :





**3.2 Hardware /Software designing**

**Step 1:Create IBM Cloud account and create IBM Watson Studio .**

**Step 2:Build and Train the experiment**

**2.1 Specify basic experiment details**

1 .From the Assets page of your project ,click Add to Project and choose Auto AI Experiment

2. In the page that opens,fill in the basic felds : specify a name and optional description for your new Experiment. confirm that the IBM Watson Mcahine learning service instance that you associate with your project is selected in the machine learning service selection.

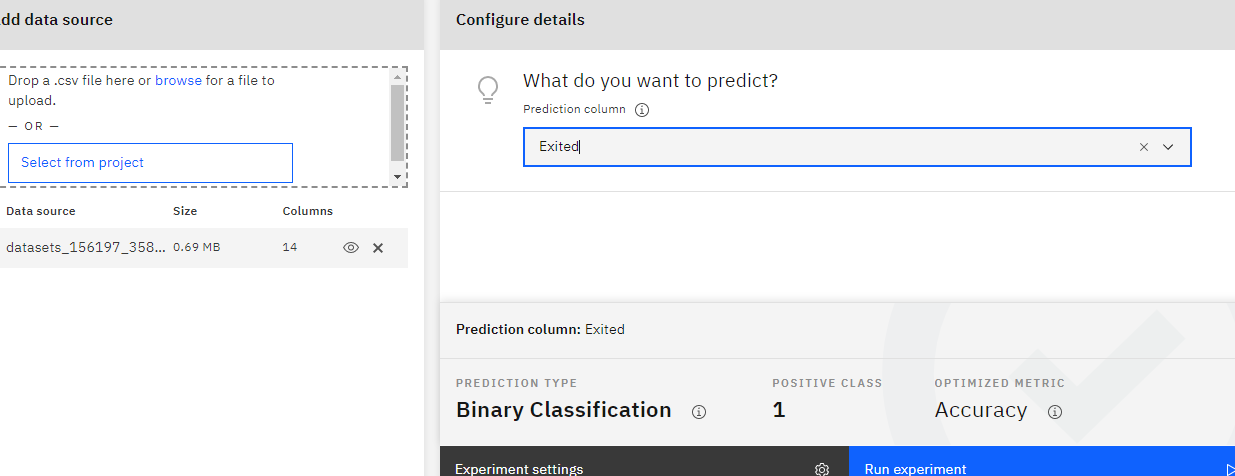
3.Click Create.

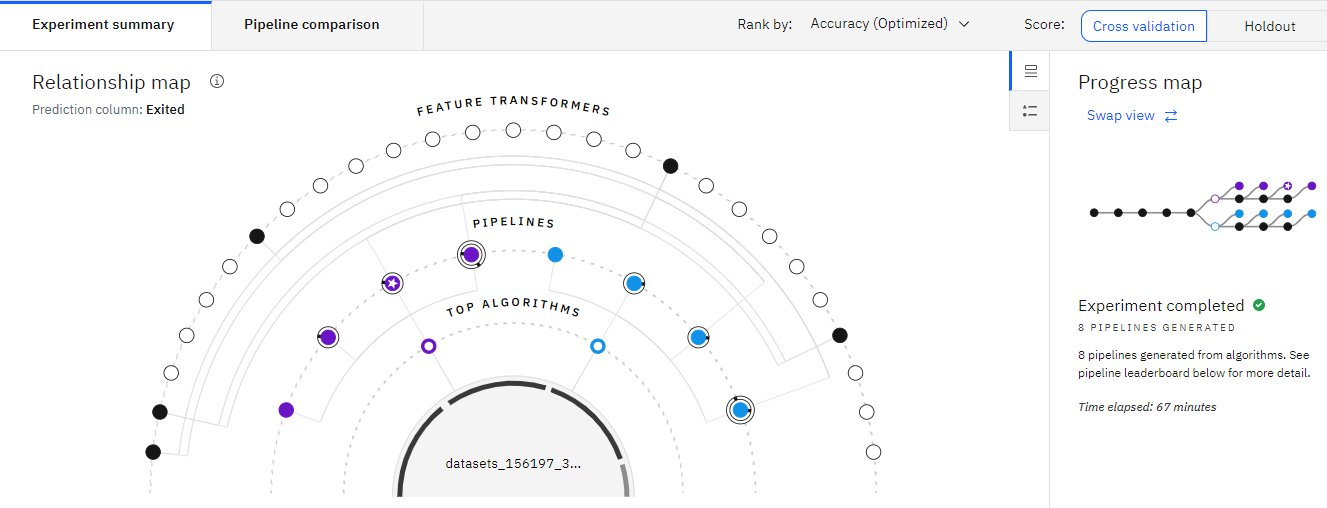
2**.2 Add training data:**

Upload the training data ﬁle, auto.csv, from your local computer by dragging the ﬁle onto the data panel or by clicking browse and then following the prompts.

**2.3 Train the model** :

Choose the column you want to predict and also in add experiment select the columns withe data that supports prediction column save it and select run the experiment

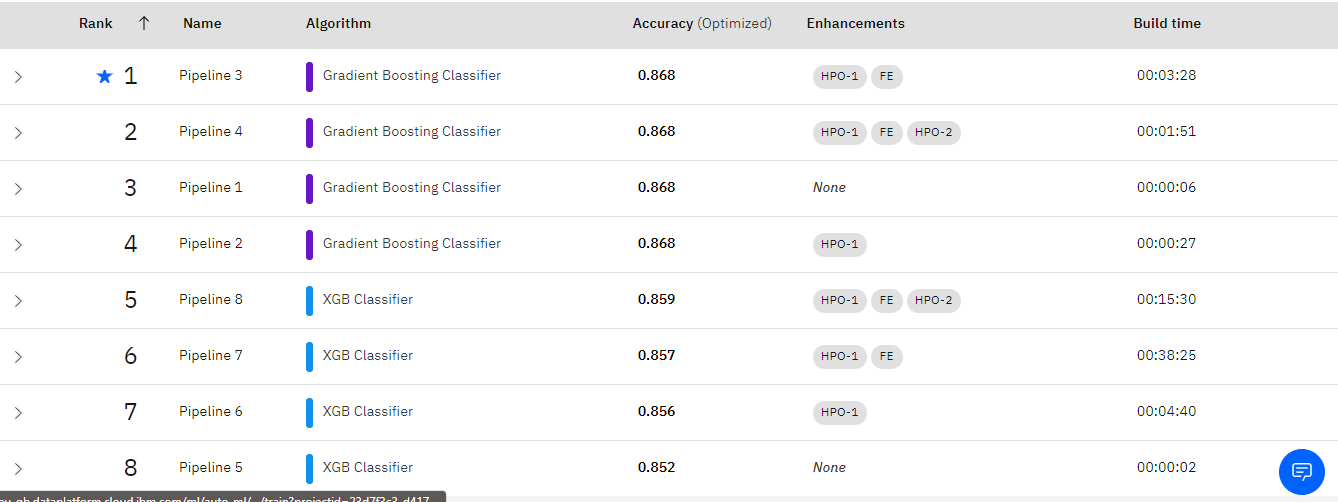




As the model trains, you will see an infographic that shows the process of building the pipelines.

**2.4 Choose a pipeline**

Once the pipeline creation is complete, you can view and compare the ranked pipelines in a leaderboard.



Choose Save model from the action menu for Pipeline 3. This saves the pipeline as a Machine Learning asset in your project.

**Step 3 :Deploy the Model :**

Before you can use your trained model to make predictions on new data, you must deploy the model.Clicking on the model name in the notiﬁcation displayed when you save the model

From the model details page:

Click the Deployments tab.

Click Add Deployment.

In the page that opens, ﬁll in the ﬁelds:

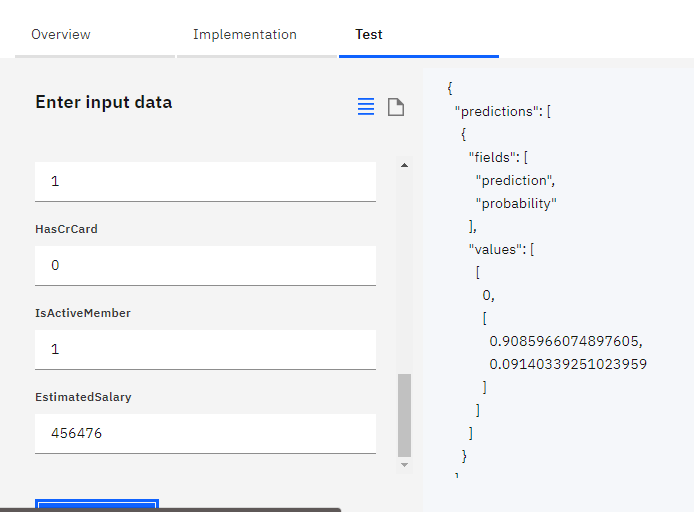
Specify a name for the deployment.

Click Save.

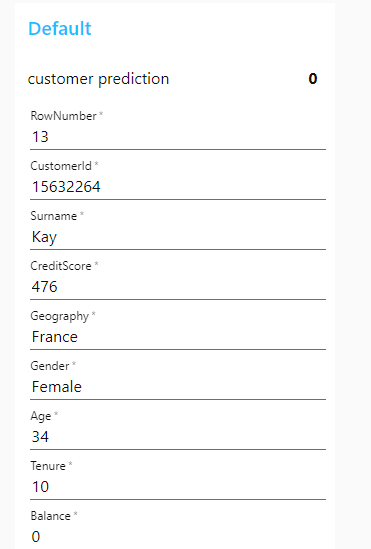
After you save the deployment, click on the deployment name to view the deployment details page.

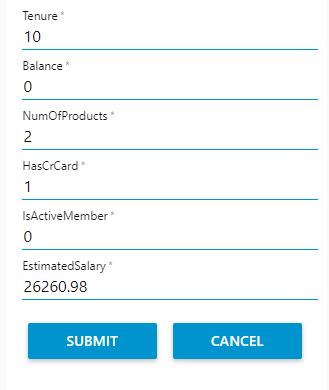
**Step 4:Test the Deployed model**

You can test the deployed model from the deployment details page: On the Test tab of the deployment details page, either ﬁll out the form with test values, or enter the following JSON test data.Click pr edict to predict the price



**4 . Experiment Investigation:**





**5. Flowchart**

**Insert the following nodes into the ﬂow in Node-Red.**

**● ui\_Form**

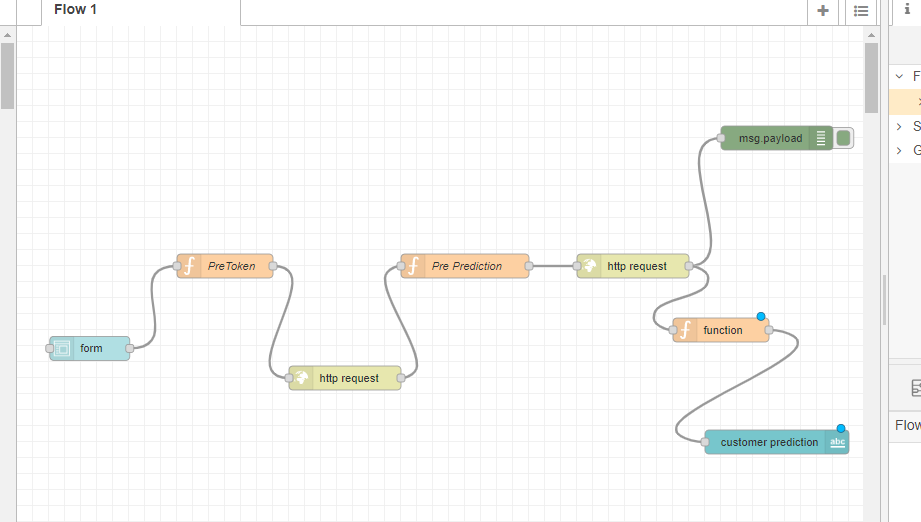
**● Input**

**● Function**

**● Http request**

**● Text**

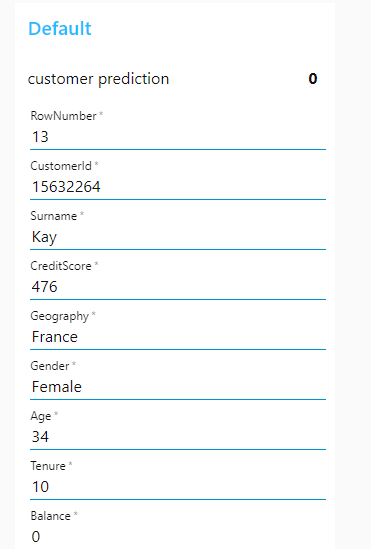
**● Debug**

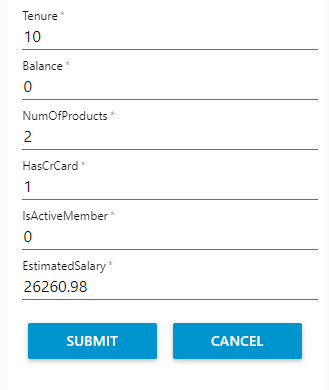


**6. Result**

Web based UI was developed by integrating all the sevices using NODE-RED

URL for UI dashboard :<https://node-red-qpzzg.eu-gb.mybluemix.net/ui>





**7. Advantages and Disadvantages**

**Advantages**

predict potential customers

assist telecom operators to predict

**disadvantages**

more customers would churn ,the less is the potential for the business

problems in offers and packages

increase in complexity

**8. Applications**

* applying the proposed techniques
* Due to the high cost of acquiring new customers, customer churn prediction has emerged as an indispensable part of telecom sectors’ strategic decision making and planning process.

**9. Conclusion**

It has become known that predicting churn is one of the most important sources of income to telecom companies.These prediction models need to achieve high AUC values.

**10. Future Scope**

The study of **predicting** which persons are going to **churn** in advance will help the **telecommunication** industry and the CRM department to identify which persons are going to leave the network.

**11. Bibliography**

**1 .Auto AI with IBM Watson studio :**

<https://www.ibm.com/in-en/cloud/watson-studio/autoai>

**2 .Node-RED starter application :**

<https://developer.ibm.com/tutorials/how-to-create-a-node-red-starter-application/>

**12. Appendix**

**URL for UI dashboard :**

<https://node-red-qpzzg.eu-gb.mybluemix.net/ui>

**Source Code**

**N ode-RED Flow code**

[{"id":"efd31199.51881","type":"tab","label":"Flow 1","disabled":false,"info":""},{"id":"d50a3683.1a4368","type":"function","z":"efd31199.51881","name":"PreToken","func":"global.set(\"rn\",msg.payload.rd)\nglobal.set(\"ci\",msg.payload.ci)\nglobal.set(\"sn\",msg.payload.sn)\nglobal.set(\"cs\",msg.payload.cs)\nglobal.set(\"geo\",msg.payload.geo)\nglobal.set(\"ge\",msg.payload.ge)\nglobal.set(\"ag\",msg.payload.ag)\nglobal.set(\"te\",msg.payload.te)\nglobal.set(\"bal\",msg.payload.bal)\nglobal.set(\"nop\",msg.payload.nop)\nglobal.set(\"hcc\",msg.payload.hcc)\nglobal.set(\"am\",msg.payload.am)\nglobal.set(\"es\",msg.payload.es)\nvar apikey=\"xhiLjQCaF8DsG1-XfuDGzM7cAEn9c0y-W5Ytt\_lwJnrZ\";\nmsg.headers={\"content-type\":\"application/x-www-form-urlencoded\"}\nmsg.payload={\"grant\_type\":\"urn:ibm:params:oauth:grant-type:apikey\",\"apikey\":apikey}\nreturn 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global.get('hcc')\nvar am = global.get('am')\nvar es = global.get('es')\nvar token=msg.payload.access\_token\nvar instance\_id=\"7a0e3ade-b37d-4cdc-8edf-e44f882a3d34\"\nmsg.headers={'Content-Type': 'application/json',\"Authorization\":\"Bearer \"+token,\"ML-Instance-ID\":instance\_id}\nmsg.payload={\"input\_data\": [{\"fields\": [\"RowNumber\", \"CustomerId\", \"Surname\", \"CreditScore\",\"Geography\",\"Gender\",\"Age\",\"Tenure\",\"Balance\",\"NumOfProducts\",\"HasCrCard\",\"IsActiveMember\",\"EstimatedSalary\"], \"values\": [[rn,ci,sn,cs,geo,ge,ag,te,bal,nop,hcc,am,es]]}]}\nreturn msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","x":560,"y":300,"wires":[["a70cf6e0.64d868"]]},{"id":"a70cf6e0.64d868","type":"http 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prediction","format":"{{msg.payload}}","layout":"row-spread","x":850,"y":400,"wires":[]},{"id":"4bf6215.35d75e","type":"function","z":"efd31199.51881","name":"","func":"msg.payload=msg.payload.predictions[0].values[0][0]\nreturn msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","x":740,"y":180,"wires":[["2f8deb54.2da9b4"]]},{"id":"7408f749.ff5cb8","type":"ui\_group","z":"","name":"Default","tab":"d01a6bcb.669be8","order":1,"disp":true,"width":"6","collapse":false},{"id":"d01a6bcb.669be8","type":"ui\_tab","z":"","name":"Home","icon":"dashboard","disabled":false,"hidden":false}]