**NAME:** Ninganolla Sai Chandra Reddy

**Email:** [reddynscr@gmail.com](mailto:reddynscr@gmail.com)

**Batch:** RSIP Career Basic ML 059

**Internship Organizer:** smartinternz.com (TheSmartBridge Internships)

**MACHINE LEARNING BASED INTERNSHIP PROJECT REPORT.**



**Telecom Customer Churn Prediction Using Watson Auto AI**

**INDEX**

**1.Introduction**

1.1 Overview

1.2 Purpose

**2.Literature Survey**

2.1 Existing Problem

2.2 Proposed Solution

**3.Theoretical Analysis**

3.1 Block Diagram

3.2 Hardware/software designing

**4. Experimental Investigation**

**5.Flowchart**

**6.Result**

**7.Advantages and Disadvantages**

**8.Application**

**9.Conclusion**

**10.Future Scope**

**11. Bibliography**

**Appendix**

1. **Source Code**
2. **INTRODUCTION** 
   1. **Overview**

* In this, " Telecom customer churn prediction using WATSON AI" we create a model that predicts the customer churns or not. It is achieved by ibmcloud.in this the best model is obtained.
* In this machine learning algorithms used.
* By the help of node red we create an application in which model is deployed. Based on inputs data it predicts that customer churns or not.
  1. **Purpose**
* As customer churn is a major concern for large companies. It effects the revenue of that companies especially in telecom field so company need to predict which customer churn.
* Therefore, the reasons of their churn help the companies to reduce that reasons so that company growth is increased.

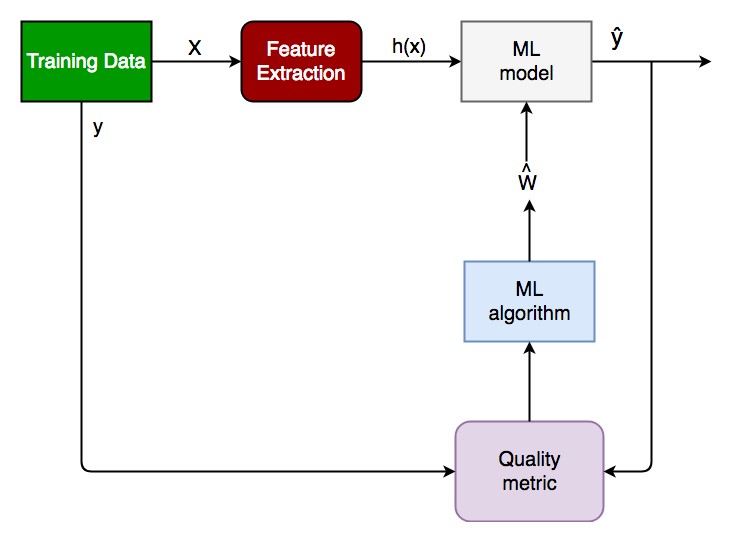
1. **LITERATURE SURVEY**

* 1. **Existing Problem**

* Telecom Industry always suffer for high churn rates when the better plan comes than more people churned in that time there is more loss but when we predict before it incurs less loss.

* 1. **Proposed Solution**
* A Machine learning model using IBM WATSON Auto AI machine learning service.
* The model is deployed on IBM cloud to get scoring endpoint which is used as API for web building.
* A web application is developed using node red service.
* we use endpoint to give endpoints and predict output

1. **Theoretical Analysis** 
   1. **Block Diagram**



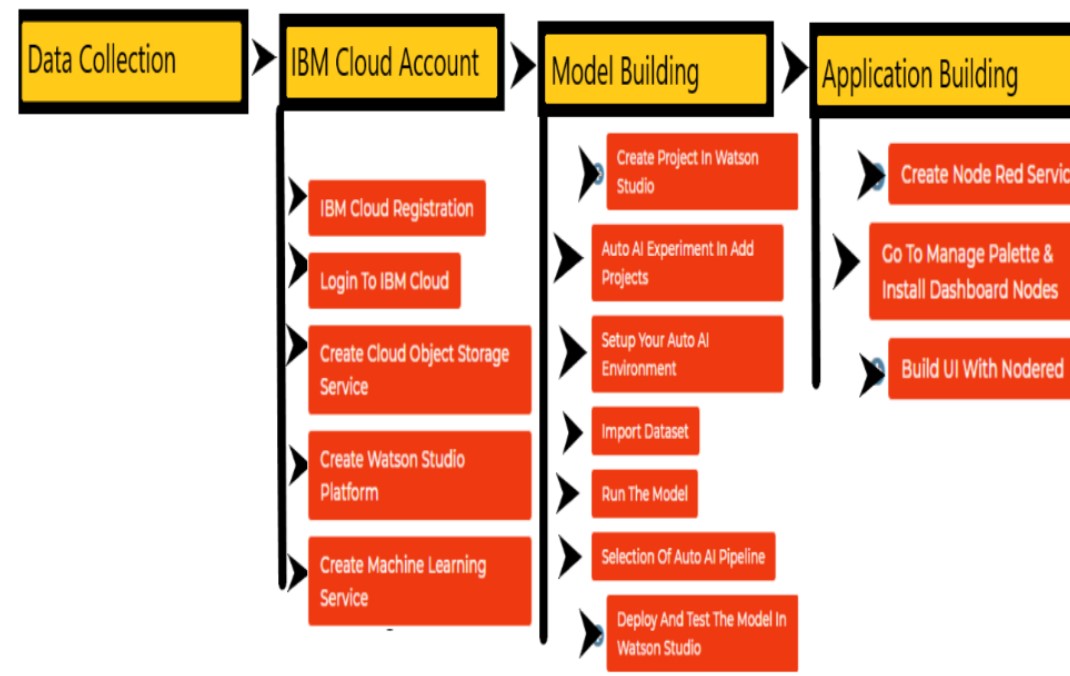
* 1. **Hardware/Software designing**
* Here a pc or other devices is required.
* The software used is IBM cloud. A machine learning service, CLOUDANT, IBM WATSON and NODERED are used.

1. **Experimental Investigation**

**There are 6 steps in this for a general project**

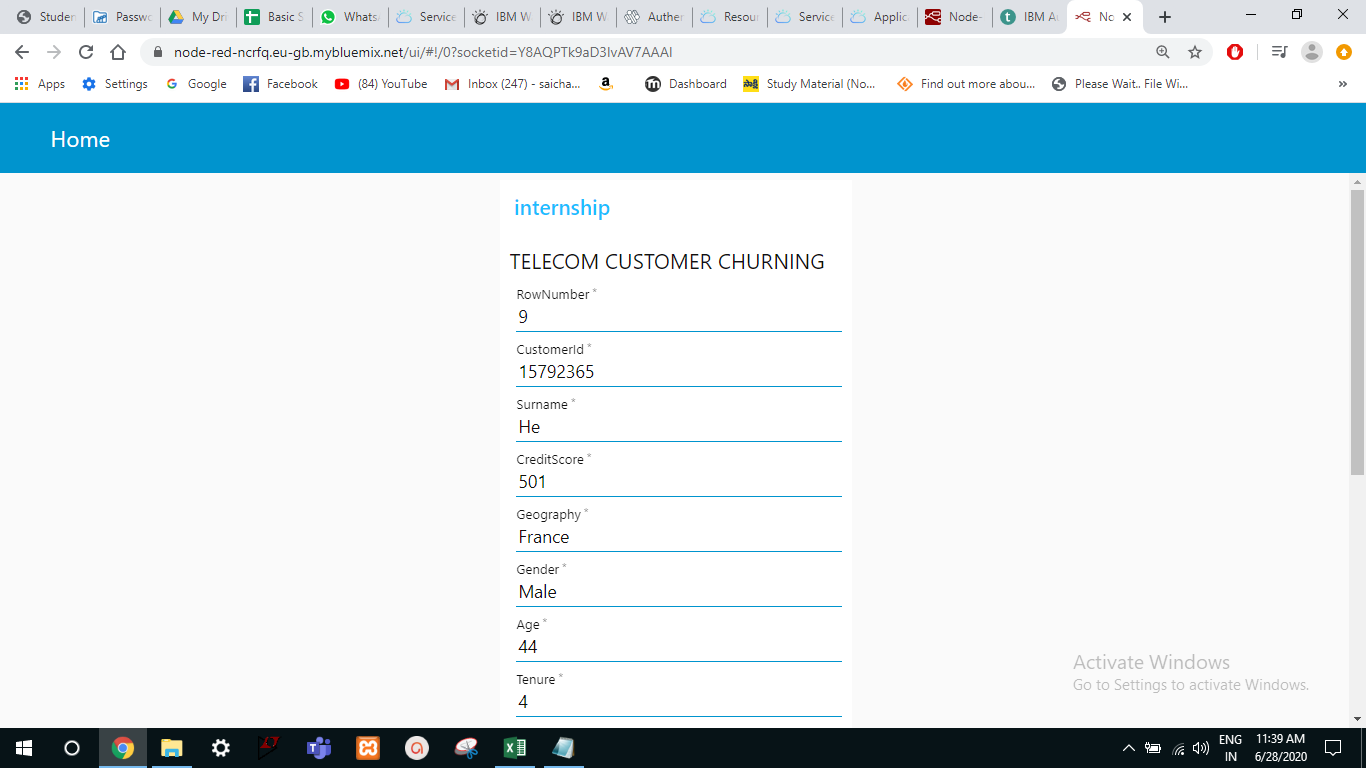
* Choose an idea
* Do research and collect data
* Compose a hypothesis
* Design model or Experiment
* Analyze and draw conclusions
* In this project, first we take a telecom churn prediction and then collect data and arrange in a format and use IBM WATSON AutoAI. Then predict what we need and draw output that is churned or not.

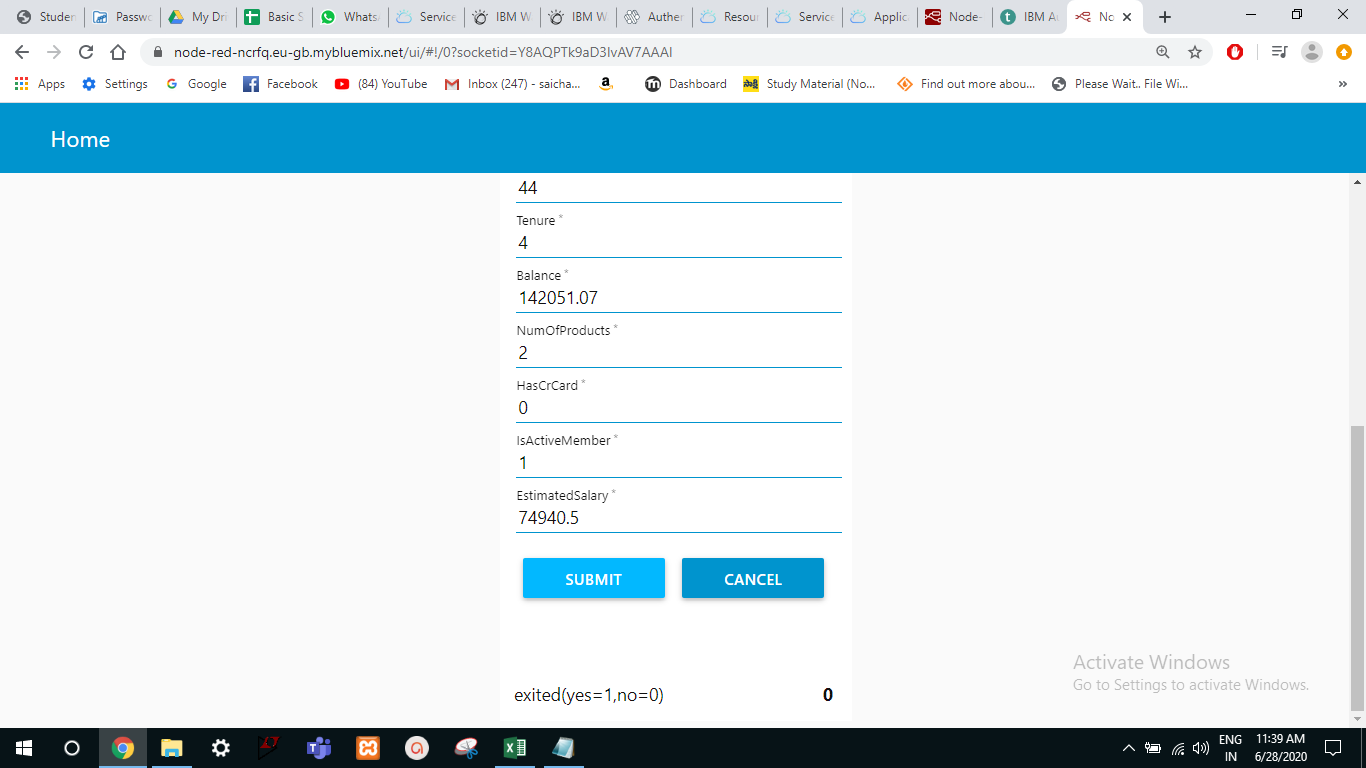
1. **Flow chart**



1. **RESULT**

* We create a model using WATSON AutoAI.
* Then using that model and node red we create web application.
* Here, after deployment, when we give inputs in node red we get either the 0 or 1.
* 0 = Not Churned
* 1 = Churned





1. **ADVANTAGES AND DISADVANTAGES**

The advantages are:

* Can be implemented easily No human intervention is needed.
* Handle complex data.
* Available 24/7

The Disadvantages are:

* Time and resources
* Data Acquisition Interpretation of results High error susceptibility.

1. **Applications**

* In this application company can know the people who churns and who does not.
* By using WATSON most of the work is automated.
* Node red service helps in giving inputs so that prediction is easy.

1. **Conclusion**

* Watson has most benefits which is very helpful in machine learning and other type of services.
* If analytics, prediction, computation is automated then people's work is reduced.

1. **Future scope**

* As we can see continuous growth in WATSON so that more accurate results will be available.
* This project can help different large companies in telecom so that revenue increases and comes up with better plans.

1. **Bibliography**

The services used in this project are:

* IBM cloud
* Node Red Application
* Watson Auto AI
* Cloud Storage Service.

1. **Appendix**
2. **Source Code**

[{"id":"595b4d13.c28e84","type":"tab","label":"Flow 1","disabled":false,"info":""},{"id":"e1eec53e.ce9248","type":"function","z":"595b4d13.c28e84","name":"PreToken","func":"global.set(\"row\",msg.payload.row)\nglobal.set(\"custid\",msg.payload.custid)\nglobal.set(\"sur\",msg.payload.sur)\nglobal.set(\"credit\",msg.payload.credit)\nglobal.set(\"geog\",msg.payload.geog)\nglobal.set(\"gend\",msg.payload.gend)\nglobal.set(\"age\",msg.payload.age)\nglobal.set(\"ten\",msg.payload.ten)\nglobal.set(\"bal\",msg.payload.bal)\nglobal.set(\"nop\",msg.payload.nop)\nglobal.set(\"crc\",msg.payload.crc)\nglobal.set(\"iam\",msg.payload.iam)\nglobal.set(\"es\",msg.payload.es)\n\nvar apikey=\"HejpyM\_wn67vdB79iHdziHU4EpNvOkJNs3XMy0Ga4KnX\";\nmsg.headers={\"content-type\":\"application/x-www-form-urlencoded\"}\nmsg.payload={\"grant\_type\":\"urn:ibm:params:oauth:grant-type:apikey\",\"apikey\":apikey}\nreturn msg;","outputs":1,"noerr":0,"x":200,"y":260,"wires":[["7cf70ea0.3ecd7"]]},{"id":"7cf70ea0.3ecd7","type":"http request","z":"595b4d13.c28e84","name":"","method":"POST","ret":"obj","paytoqs":false,"url":"https://iam.cloud.ibm.com/identity/token","tls":"","persist":false,"proxy":"","authType":"","x":350,"y":120,"wires":[["f514d84.88f1228"]]},{"id":"d6eb8a98.0d33b8","type":"inject","z":"595b4d13.c28e84","name":"","topic":"","payload":"","payloadType":"date","repeat":"","crontab":"","once":false,"onceDelay":0.1,"x":60,"y":120,"wires":[["e1eec53e.ce9248"]]},{"id":"18768165.bc2a1f","type":"debug","z":"595b4d13.c28e84","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg","x":870,"y":40,"wires":[]},{"id":"f514d84.88f1228","type":"function","z":"595b4d13.c28e84","name":"Pre Prediction","func":"var row = global.get('row')\nvar custid = global.get('custid')\nvar sur = global.get('sur')\nvar credit = global.get('credit')\nvar geog = global.get('geog')\nvar gend = global.get('gend')\nvar age = global.get('age')\nvar ten = global.get('ten')\nvar bal = global.get('bal')\nvar nop = global.get('nop')\nvar crc = global.get('crc')\nvar iam = global.get('iam')\nvar es = global.get('es')\nvar token=msg.payload.access\_token\nvar instance\_id=\"754b599e-b4ee-4839-a843-8a773f9d318f\"\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\": [[row,custid,sur,credit,geog,gend,age,ten,bal,nop,crc,iam,es]]}]}\nreturn msg;","outputs":1,"noerr":0,"x":540,"y":280,"wires":[["2c6f8277.641a7e"]]},{"id":"2c6f8277.641a7e","type":"http request","z":"595b4d13.c28e84","name":"","method":"POST","ret":"obj","paytoqs":false,"url":"https://us-south.ml.cloud.ibm.com/v4/deployments/5458d335-88e7-4af0-9c25-e09ba3922bd0/predictions","tls":"","persist":false,"proxy":"","authType":"","x":670,"y":120,"wires":[["d9f5fce0.5134f","18768165.bc2a1f"]]},{"id":"79e924a.38f9bdc","type":"ui\_form","z":"595b4d13.c28e84","name":"","label":"","group":"ac728a96.f8da18","order":0,"width":0,"height":0,"options":[{"label":"RowNumber","value":"row","type":"number","required":true,"rows":null},{"label":"CustomerId","value":"custid","type":"number","required":true,"rows":null},{"label":"Surname","value":"sur","type":"text","required":true,"rows":null},{"label":"CreditScore","value":"credit","type":"number","required":true,"rows":null},{"label":"Geography","value":"geog","type":"text","required":true,"rows":null},{"label":"Gender","value":"gend","type":"text","required":true,"rows":null},{"label":"Age","value":"age","type":"number","required":true,"rows":null},{"label":"Tenure","value":"ten","type":"number","required":true,"rows":null},{"label":"Balance","value":"bal","type":"number","required":true,"rows":null},{"label":"NumOfProducts","value":"nop","type":"number","required":true,"rows":null},{"label":"HasCrCard","value":"crc","type":"number","required":true,"rows":null},{"label":"IsActiveMember","value":"iam","type":"number","required":true,"rows":null},{"label":"EstimatedSalary","value":"es","type":"number","required":true,"rows":null}],"formValue":{"row":"","custid":"","sur":"","credit":"","geog":"","gend":"","age":"","ten":"","bal":"","nop":"","crc":"","iam":"","es":""},"payload":"","submit":"submit","cancel":"cancel","topic":"","x":46,"y":359,"wires":[["e1eec53e.ce9248"]]},{"id":"ae7eaf0b.70d6e","type":"ui\_text","z":"595b4d13.c28e84","group":"ac728a96.f8da18","order":1,"width":0,"height":0,"name":"","label":"churned(0=no,1=yes)","format":"{{msg.payload}}","layout":"row-spread","x":900,"y":100,"wires":[]},{"id":"d9f5fce0.5134f","type":"function","z":"595b4d13.c28e84","name":"","func":"msg.payload=msg.payload.predictions[0].values[0][0]\nreturn msg;","outputs":1,"noerr":0,"x":770,"y":320,"wires":[["ae7eaf0b.70d6e"]]},{"id":"ac728a96.f8da18","type":"ui\_group","z":"","name":"Default","tab":"d2c43050.0856b","order":1,"disp":true,"width":"6","collapse":false},{"id":"d2c43050.0856b","type":"ui\_tab","z":"","name":"Home","icon":"dashboard","disabled":false,"hidden":false}]

1. **Other AI platforms:**

Google Ai platform, Tensor Flow, Azure by Microsoft, Rainbird, Infosys Nia, Wipro-Holmes, KAI, Wit, Lumiata, Ayasdi, Premonit.

RedNode\_ui:

<https://node-red-ncrfq.eu-gb.mybluemix.net/ui/#!/0?socketid=Y8AQPTk9aD3IvAV7AAAI>