8138 - SARANATHAN COLLEGE OF ENGINEERING

Department of CSE

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DAC Phase-5 Project Submission

Team-6 Customer Churn Prediction

OBJECTIVES:

The main objective of Customer Churn Prediction is to identify the customers who are at the risk of churning. This allows the businesses to focus their retention efforts on the customers who are most likely to leave. Customer Churn is a tendency of customers to cancel their subscriptions to a service they have been using and, hence, stop being a client of that service.

DESIGN THINKING:

Design thinking is an innovative problem-solving approach that can be applied to the customer churn prediction to create customer-centric solutions.

In customer churn prediction, design thinking can be used to:

- Empathize with customers to understand their needs, pain points, and motivations. This can be done through customer interviews, surveys, and focus groups.

- Define the problem of customer churn by identifying the root causes of why customers leave. This can be done by analyzing quantitative data (e.g., customer usage data, churn

rates) and qualitative data (e.g., customer feedback, customer interviews).

- Ideate solutions to prevent customer churn. This can be done by brainstorming ideas with stakeholders from different departments (e.g., product, marketing, customer support).

- Prototype and test potential solutions to validate their effectiveness. This can be done by creating prototypes of new features or services and testing them with a small group of customers.

- Deploy the most effective solutions to prevent customer churn. This may involve making changes to products, services, or marketing strategies.

DEVELOPMENT PHASES:

Developing a customer churn prediction system involves various phases for successful implementation and utilization of churn prediction models. The various phases include

- Importing necessary libraries
- Data Collection and Preparation
- Data Preprocessing
- Exploratory Data Analysis
- Model Selection
- Data Splitting
- Model Training and Evaluation
- Feature Importance Analysis
- Model Interpretation
- Deployment
- Model Prediction

ANALYSIS OBJECTIVES:

Customer churn prediction is a critical business task that involves identifying customers who are likely to leave or discontinue their relationship with a company. The objectives of customer churn prediction are to help businesses reduce customer attrition and its associated negative impact on revenue, customer base, and brand reputation.

1. Early identification of Churn:
   It is highly important to identify potential churners as early as possible. Detecting churn at an early stage allows businesses to take proactive measures to retain these customers.

2. Segmentation:
   Segmenting the customer base into different groups based on their likelihood to churn can help businesses tailor or retention strategies for each segment. For example, high value customers may require different approaches compared to low value customers.

3. Risk Assessment:
   Quantify the risk associated with each customer, which enables prioritization of retention efforts. Focus on customers with the highest churn risk first to maximize the impact of retention strategies.

4. Predictive Accuracy:
   Develop accurate predictive models that can forecast churn with a high degree of precision. This involves using various machine learning algorithms and data sources to improve prediction performance.

5.Feature Importance:

Identify the most important factors or features that contribute to customer churn. This information can guide decision-making and help businesses address the root causes of churn.

6.Model Evaluation:

Continuously assess the performance of churn prediction models to ensure they remain accurate and relevant. This may involve using metrics like accuracy, precision, recall, and F1-score.

7.Customer Satisfaction

Ensure that churn prevention efforts do not negatively impact customer satisfaction. The objective is to retain customers while providing a positive customer experience.

DATA COLLECTION:

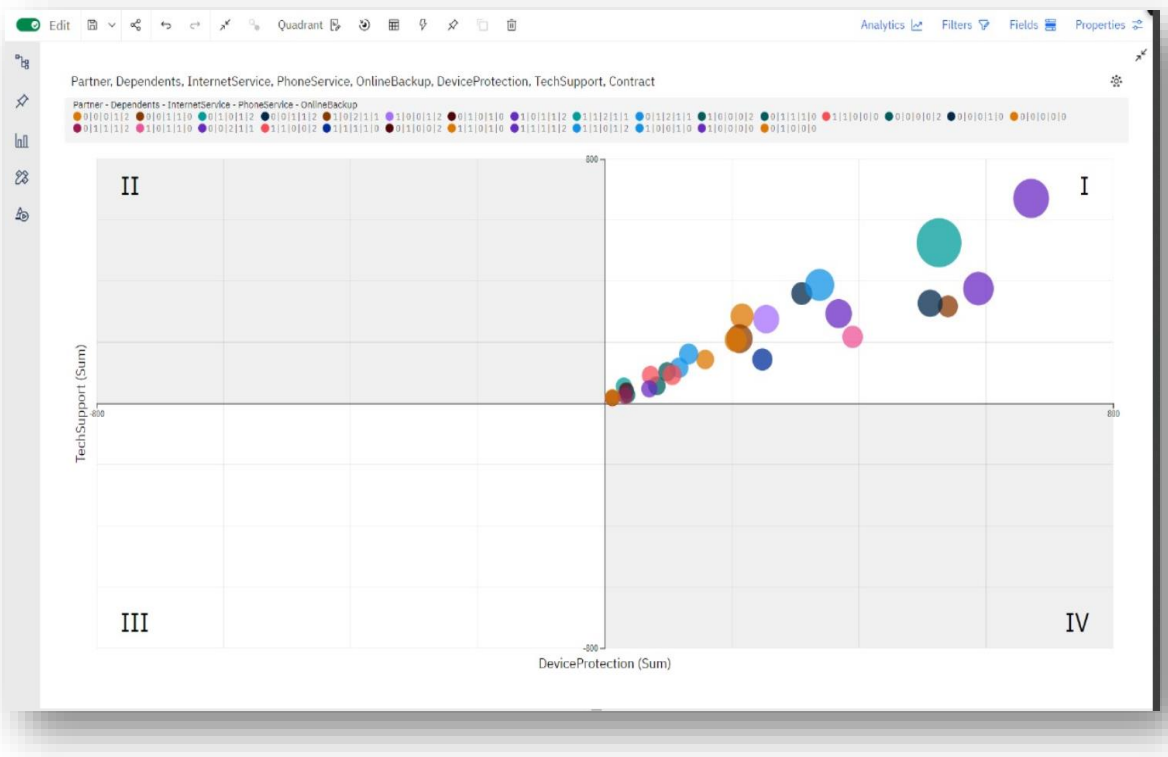
- The customer data used involves the Telco Customer Churn Dataset.
- The dataset was acquired from the Kaggle for analyzing the customer data and build the machine learning model

DATA VISUALIZATION:

Various visualizations are done using the dataset in IBM Cognos.

Some of the visualizations are as follows:

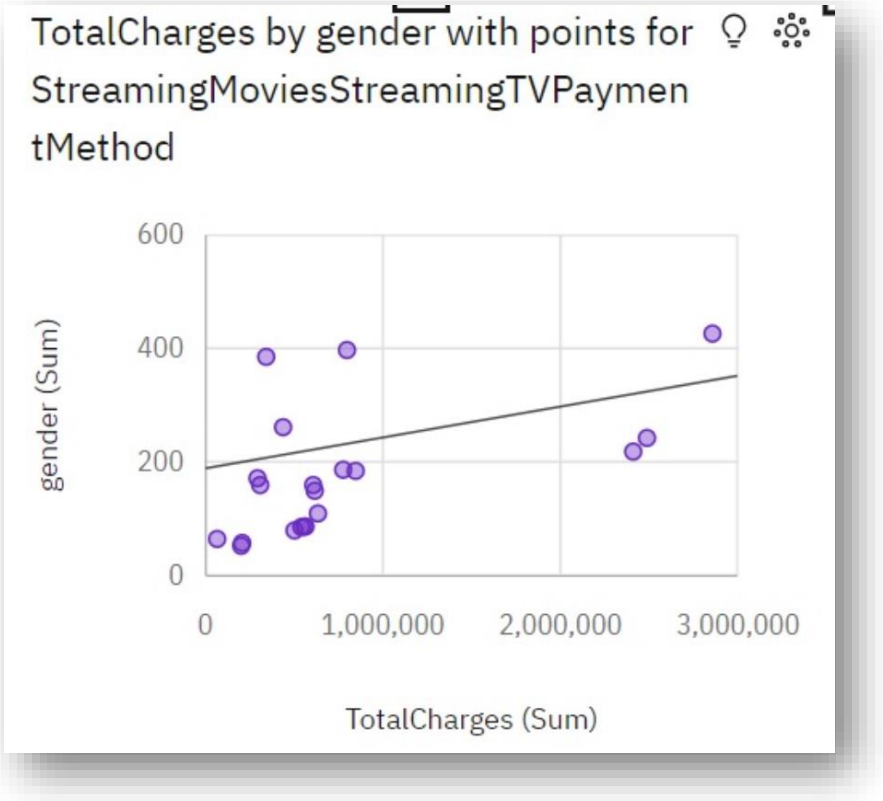
1. Quadrant



1. Dependents 0 has the highest total Contract due to InternetService 0.
2. Dependents 0 has the highest values of both Contract and PaymentMethod.
3. OnlineBackup 2 has the highest values of both Contract and MultipleLines.
4. Partner 1 has the highest values of both Contract and MultipleLines.
5. MultipleLines and Contract diverged the most when InternetService is 1, and when MultipleLines was almost 2500 higher than the Contract.
6. MultipleLines and Contract diverged the most when OnlineBackup is 0, and when MultipleLines was nearly two thousand higher than the Contract.
7. InternetService 0 has the highest Contract at nearly two thousand, out of which Dependents 0 contributed the most at over a thousand.
8. InternetService 1 has the highest Total MultipleLines but is ranked #3 in Total Contract.

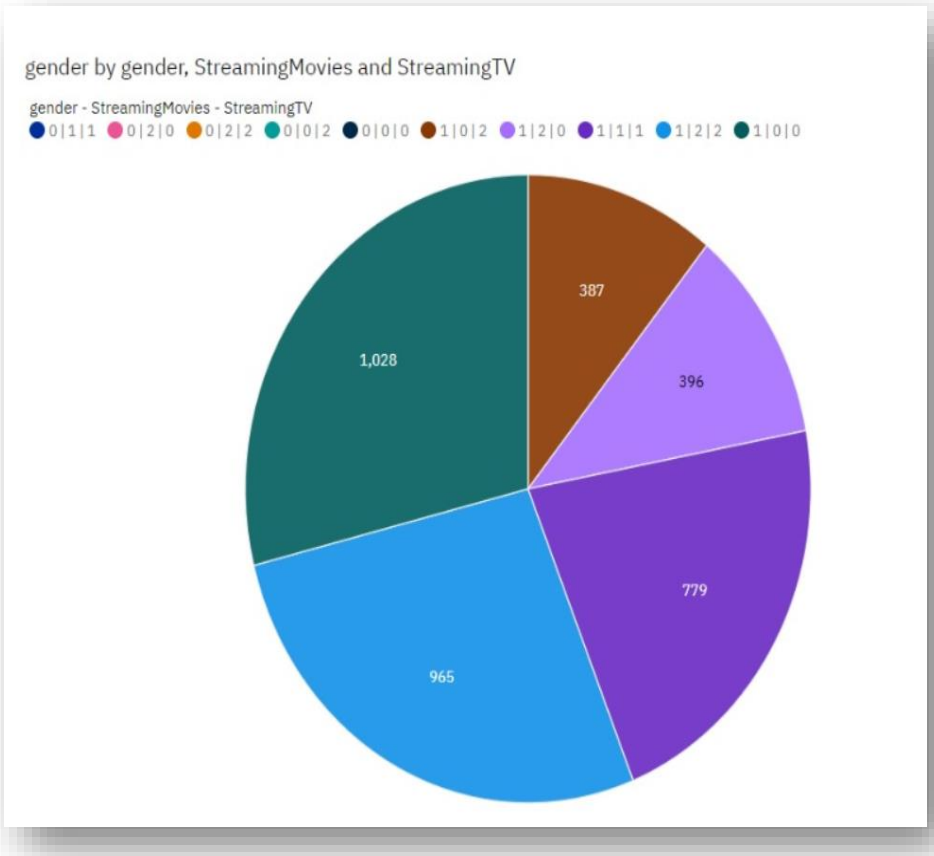
9. InternetService 0 has the highest Total Contract but is ranked #2 in Total MultipleLines.

2. Scatter Plot



StreamingMovies 2 and StreamingTv 2 has the highest values of both TotalCharges and MultipleLines.
.TotalCharges weakly affects gender. The relationship is positively linear

3.Pie Chart:



The above pie chart visualizes the features gender, Streaming Movies and Streaming TV. For gender, represents Female and 1 represents Male.

When the gender is at 0 both Streaming TV and Streaming Movies have the same values i.e., yes values.

PREDICTIVE MODELLING:

The goal of predictive modeling is to leverage data to forecast or estimate specific target variables based on patterns and relationships observed in historical data.

For our project we have used Logistic Regression for prediction. It is a Supervised Machine Learning algorithm. It classifies the customer who are prone to churn.

INSIGHTS

Predictive models can:

- ❖ Identify at-risk customers early.
- ❖ Segment customers for tailored retention strategies.
- ❖ Prioritize resources based on churn risk.
- ❖ Personalize offers and recommendations.
- ❖ Test and refine retention strategies.
- ❖ Analyze feedback for improvement.
- ❖ Estimate customer lifetime value (CLV).
- ❖ Proactively address subscription renewals.
- ❖ Optimize resource allocation for cost savings.
- ❖ Foster a data-driven culture of customer retention**.**