

# Telecom churn case study

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# Problem Statement

## Business problem overview

In the telecom industry, customers are able to choose from multiple service providers and actively switch from one operator to another. In this highly competitive market, the telecommunications industry experiences an average of 15-25% annual churn rate. Given the fact that it costs 5-10 times more to acquire a new customer than to retain an existing one, customer retention has now become even more important than customer acquisition.

For many incumbent operators, retaining high profitable customers is the number one business goal.

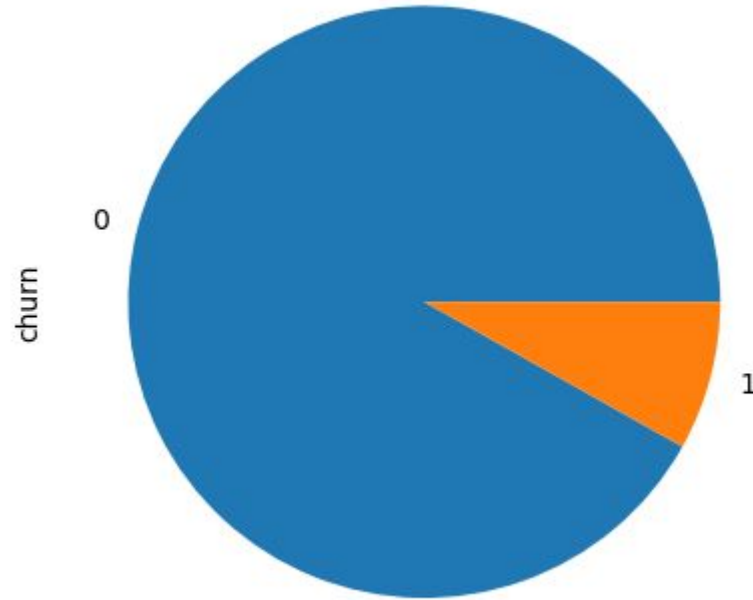
To reduce customer churn, telecom companies need to predict which customers are at high risk of churn.

In this project, we will analyse customer-level data of a leading telecom firm, build predictive models to identify customers at high risk of churn and identify the main indicators of churn.

## Objective

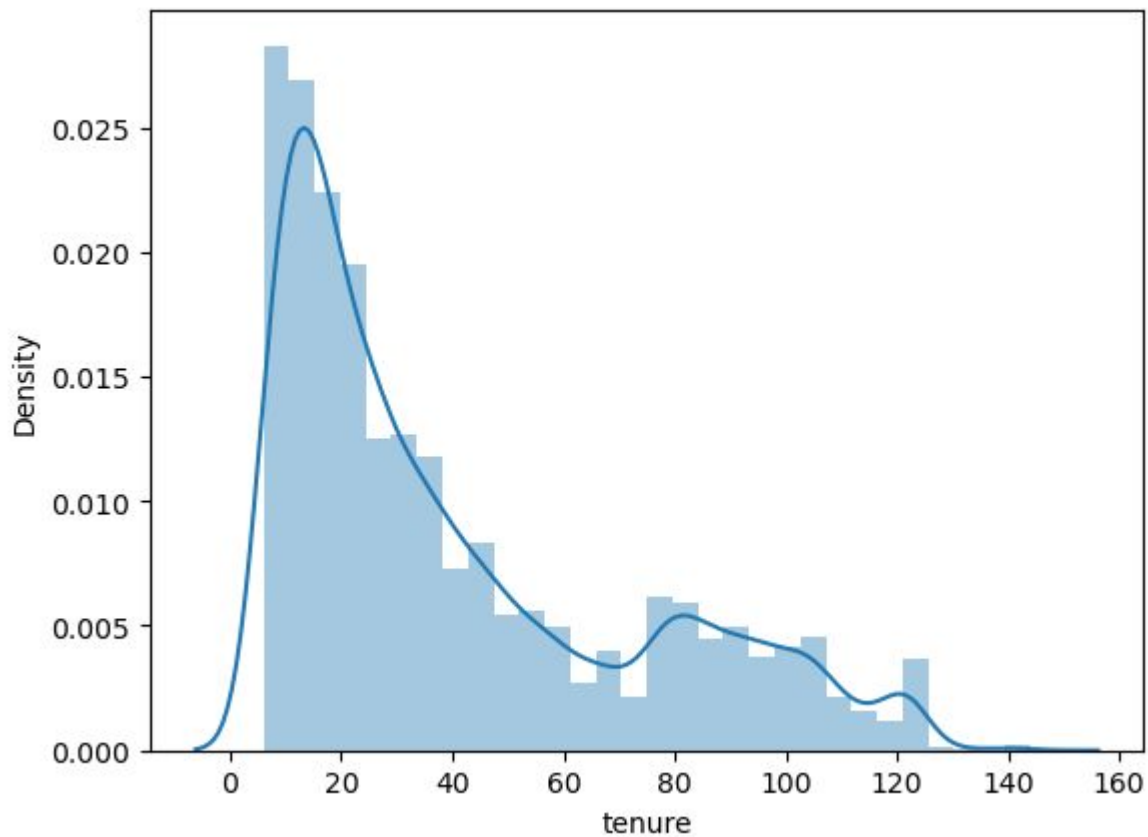
To Predict the customers who are about to churn from a telecom operator Business Objective is to predict the High Value Customers only We need to predict Churn on the basis of Action Period (Churn period data needs to be deleted after labelling) Churn would be based on Usage

## Churn vs non churn representation

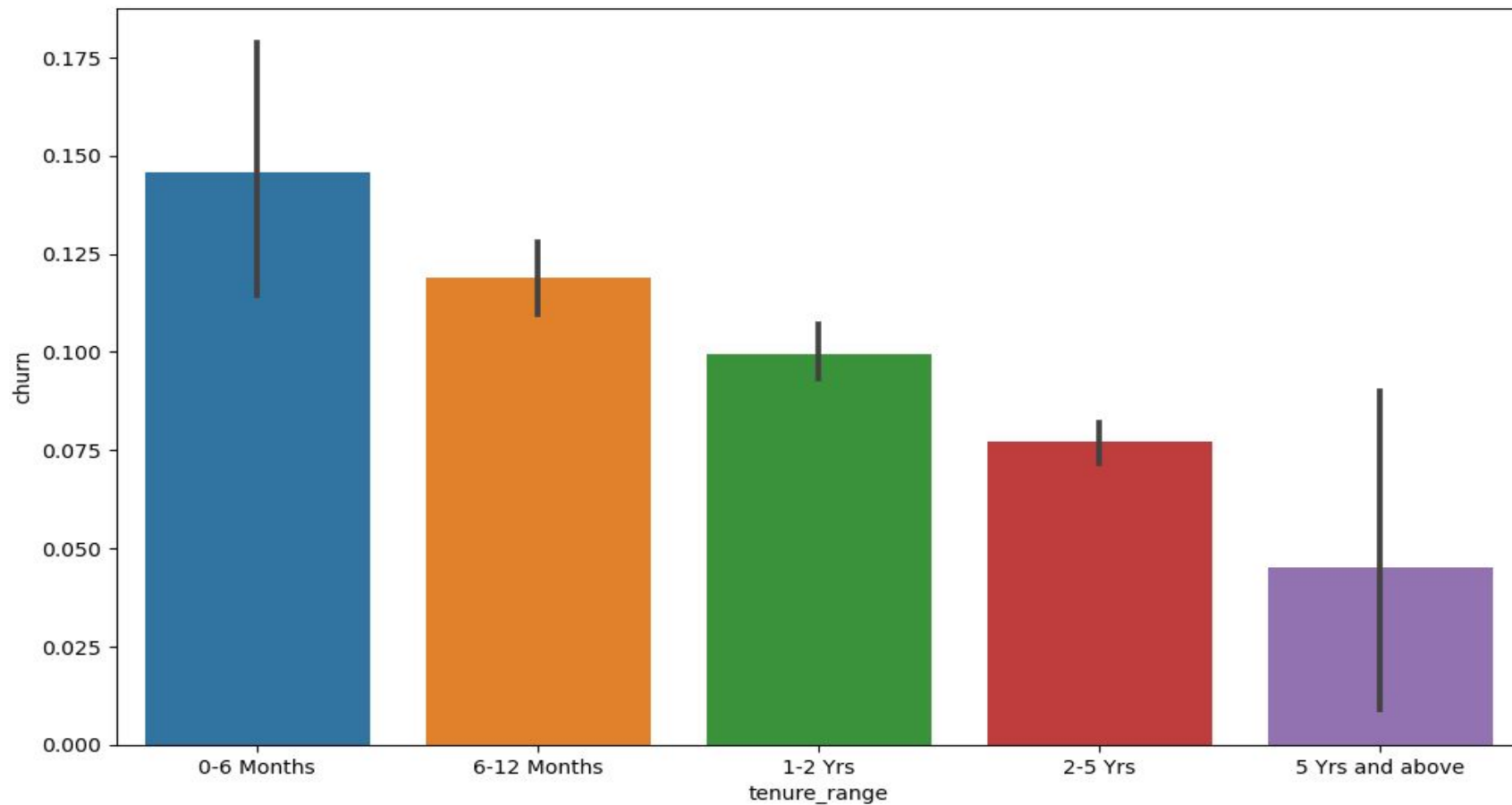


***As we can see that 97% of the customers did not churn, there is a possibility of class imbalance***

Distribution of the tenure variable



Bar plot for tenure range



## **Note:**

Note that the best parameters predicted the accuracy of 91% which is not significantly deterred than the accuracy of original random forest, which is pegged around 92%

## **Conclusion :**

The best model to predict the churn is observed to be Random Forest based on the accuracy as performance measure.

The incoming calls (with local same operator mobile/other operator mobile/fixed lines, STD or Special) plays a vital role in understanding the possibility of churn. Hence, the operator should focus on incoming calls data and has to provide some kind of special offers to the customers whose incoming calls turning lower.

## **Details:**

After cleaning the data, we broadly employed three models as mentioned below including some variations within these models in order to arrive at the best model in each of the cases.

## **Logistic Regression :**

Logistic Regression with RFE Logistic regression with PCA Random Forest For each of these models, the summary of performance measures are as follows:

### **Logistic Regression**

. Train Accuracy : ~79% . Test Accuracy : ~80%

### **Logistic regression with PCA**

. Train Accuracy : ~91% . Test Accuracy : ~92%

### **Decision Tree with PCA:**

. Train Accuracy : ~93% . Test Accuracy : ~92%

# Content

1. Understanding Churn Prediction Models
2. Leveraging Data Insights for Proactive Interventions
3. Tailored Strategies for Customer Retention







## Section 1

# Understanding Churn Prediction Models

# Role of Predictive Churn Models

01

## Importance of Predictive Models

Predictive churn models play a crucial role in estimating future churn rates, aiding revenue prediction, and mitigating risks such as overspending.

02

## Revenue Forecasting

Utilizing predictive churn models helps in forecasting revenue and identifying potential risks associated with customer churn, enabling proactive measures to sustain growth.

03

## Risk Avoidance

By extrapolating data, predictive churn models assist in predicting customer churn rates, allowing businesses to take preemptive actions to avoid revenue loss and maintain customer retention.



# The Best Model: Random Forest

## Performance Measure

The best model for predicting churn is observed to be Random Forest, with an accuracy of approximately 91%, which is comparable to the original random forest accuracy of around 92%.

## Accuracy Comparison

The best parameters yielded an accuracy of 91%, demonstrating the effectiveness of the Random Forest model as a reliable predictor of customer churn.

## Conclusion

Based on the performance measure of accuracy, Random Forest emerges as the optimal model for predicting customer churn, offering valuable insights for proactive retention strategies.

# Importance of Incoming Calls Data

01

## Significance of Incoming Calls

Analysis indicates that incoming calls, whether from local same operator mobile, other operator mobile, or fixed lines, play a pivotal role in understanding the likelihood of churn.

02

## Focus Area for Operators

Operators should prioritize analyzing incoming calls data to identify potential churn, enabling them to provide targeted special offers to customers experiencing a decline in incoming calls.

03

## Proactive Retention Strategies

Leveraging insights from incoming calls data empowers operators to design tailored retention initiatives, addressing the specific needs of customers and enhancing overall satisfaction.





# Leveraging Data Insights

## Data-Driven Decision Making

Employing predictive churn models and analyzing incoming calls data enables data-driven decision-making, empowering operators to proactively address customer churn.

## Customized Offer Design

Insights from data analysis facilitate the design of personalized offers and promotions, tailored to individual customer behaviors and preferences, fostering stronger customer relationships.

## Strategic Focus

By leveraging data insights, operators can strategically focus on mitigating churn risks, optimizing resources, and enhancing customer satisfaction through targeted initiatives.

## Section 2

# Leveraging Data Insights for Proactive Interventions

# Role of Logistic Regression



## Model Variations

Logistic Regression was employed with Recursive Feature Elimination (RFE) and Principal Component Analysis (PCA) to explore variations and identify the best-performing model.



## Performance Summary

Logistic Regression with PCA demonstrated a train accuracy of approximately 91% and a test accuracy of around 92%, showcasing its effectiveness in predicting customer churn.



## Proactive Intervention

The insights derived from Logistic Regression with PCA enable proactive interventions to mitigate churn risks and preserve customer relationships.

# Decision Tree Analysis



## Performance Evaluation

Decision Tree with PCA exhibited a train accuracy of about 93% and a test accuracy of 92%, highlighting its robust predictive capabilities in identifying potential churn.



## Risk Mitigation

Leveraging insights from Decision Tree analysis with PCA empowers businesses to implement targeted interventions, reducing the likelihood of customer attrition and preserving revenue streams.



## Early Identification

The model's accuracy in early identification of high-churn-risk customers enables proactive measures to address customer concerns effectively and prevent potential churn.



# Data-Driven Proactive Support

01

## **Tailored Interventions**

Implementing personalized retention offers and resolving customer issues promptly based on predictive analytics can effectively mitigate churn risk and preserve valuable customer relationships.

02

## **Enhanced Customer Satisfaction**

Proactive customer support and issue resolution contribute to service quality improvements, enhancing overall customer experience and satisfaction.

03

## **Preserving Revenue Streams**

Early identification and intervention based on data-driven insights play a pivotal role in safeguarding revenue and fostering long-term customer loyalty.

# Proactive Retention Strategies

01

## Customer Relationship Preservation

Proactive customer support and personalized retention offers demonstrate attentiveness and dedication to addressing customer needs, preserving valuable customer relationships.

02

## Service Quality Enhancement

Resolving customer issues promptly contributes to service quality enhancement, potentially turning dissatisfied customers into loyal advocates for the brand.

03

## Revenue Protection

Early identification and intervention in potential churn scenarios effectively safeguard revenue streams, ensuring sustainable business growth and customer retention.



## Section 3

# Tailored Strategies for Customer Retention

# Identifying High-Value Customers



## Targeted Offer Customization

Identifying high-value customers based on specific revenue-contributing metrics allows for tailored offers, discounts, and custom packages, strengthening customer loyalty and retention.



## Recognition and Appreciation

Tailoring offers for high-value customers acknowledges their contribution to the business, fostering a sense of recognition and appreciation, which is crucial for long-term retention.



## Exclusive Benefits

Providing early access to new features or services for high-value customers creates a sense of exclusivity and appreciation, further solidifying customer relationships and loyalty.



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These authors also note that individuals' responses may be influenced by their personality. We add to this literature by

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Providing exclusive access to new features or services enhances the overall customer experience, creating a competitive advantage and increasing customer satisfaction.

# Tailored Retention Impact

01

## **Preserving Valuable Customers**

Targeted offers and discounts for high-value customers significantly impact customer retention, preserving valuable revenue streams and strengthening long-term customer relationships.

02

## **Personalized Service**

Designing custom packages tailored to high-value customer preferences demonstrates a commitment to personalized service, enhancing customer satisfaction and loyalty.

03

## **Competitive Differentiation**

Providing exclusive benefits and early access differentiates the brand from competitors, creating a compelling reason for high-value customers to remain loyal.

# Value-Added Services and Benefits

01

## Customer Loyalty Reinforcement

Exclusive offers and custom packages reinforce customer loyalty by providing tailored benefits and services, strengthening the bond between the customer and the service provider.

02

## Revenue Preservation

Targeted offers and discounts for high-value customers contribute to revenue preservation by retaining valuable customers who significantly impact the business's financial performance.

03

## Service Differentiation

Highlighting value-added services and benefits through targeted offers differentiates the brand, positioning it as a provider of premium and exclusive services, further solidifying customer relationships.



**Thank You**