CUSTOMER CHURN ANALYSIS AND PREDICTION

Understanding Customer Churn and Building Predictive Models for Business Retention

Presented by:
Riska Amylatul Askiyah

Riska Amylatul Askiyah riskamylatulaskiyah riskamylatulaskiyah@gmail.com

TABLE OF CONTENT

1. INTRODUCTION

BACKGROUND

Customer churn is a critical issue for businesses as it directly affects revenue and growth. Understanding the factors leading to churn and developing strategies to mitigate it is essential for retaining customers and sustaining business growth.

URGENCY

Reducing churn rates can significantly improve profitability. Identifying at-risk customers and addressing their concerns proactively can enhance customer satisfaction and loyalty.

DEFINITION

Customer churn refers to the percentage of customers who stop using a company's products or services within a given period.

TOP POSTS

2. PROBLEM STATEMENT

Why are customers churning, and what strategies can be implemented to reduce churn rates?

3. OBJECTIVES

- Identify key factors influencing customer churn.
- Develop predictive models to identify at-risk customers.
- Propose strategies to improve customer retention.

4. SCOPE OF STUDY

The study focuses on analyzing customer data from a telecom company to understand churn patterns and develop strategies for retention.

5. METHODOLOGY

Analysis Plan

- Data Cleaning and Preparation
- Exploratory Data Analysis (EDA)
- Feature Analysis
- Model Building and Training
- Business Insights and Recommendations

Statistical Techniques

- Descriptive Statistics
- Correlation Analysis
- Logistic Regression
- Decision Trees
- Random Forests

5K 5K 5K

DATASET DESCRIPTION

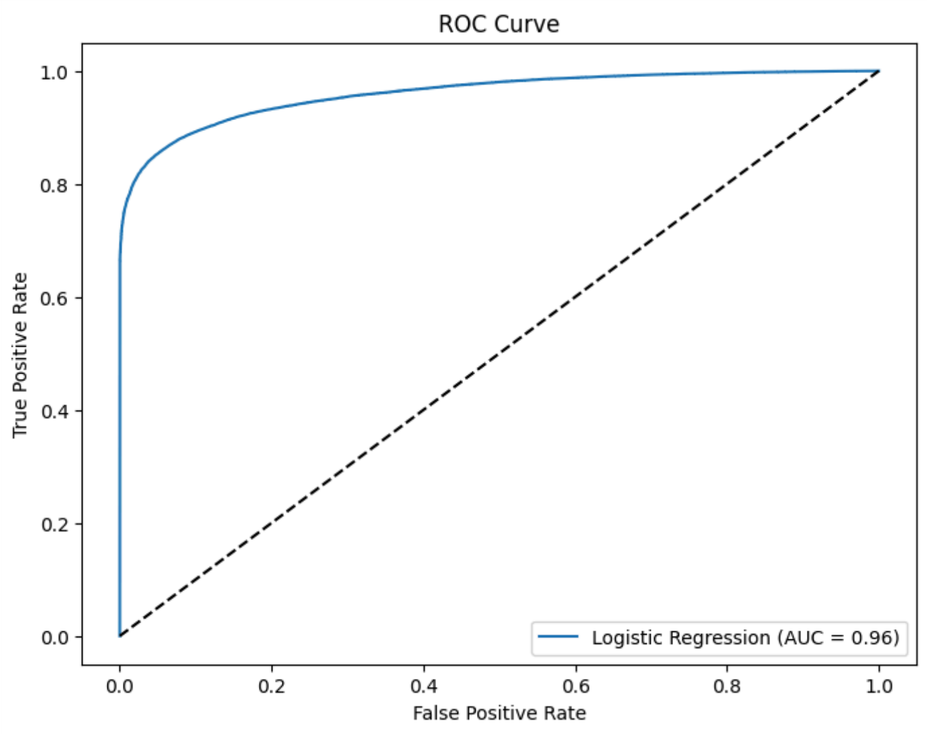
CONTENT:

The dataset contains information about customers and their interactions with the company. It is used to analyze customer churn and build predictive models.

COLUMNS DESCRIPTION:

Column	Description	Data Type
CustomerID	Unique identifier for each customer.	float64 / int64
Age	Age of the customer.	float64 / int64
Tenure	Number of months the customer has been with the company.	float64 / int64
Usage Frequency	Frequency of customer usage of telecom services.	float64 / int64
Support Calls	Number of calls made by the customer to support services.	float64 / int64
Payment Delay	Number of months the customer was delayed in making payments.	float64 / int64
Total Spend	Total amount spent by the customer over their tenure.	float64 / int64
Last Interaction	Number of months since the last interaction with the customer.	float64 / int64
Churn	Whether the customer has churned (1) or not (0).	float64 / int64
Gender	Indicator for female customers (1 for female, 0 for male).	bool
Subscription Type	Indicator for Basic subscription type (1 for Basic, 0 for other).	bool
Contract Length	Indicator for Annual contract length (1 for Annual, 0 for other).	bool

RESULTS AND INTERPRETATION



Model Performance	Value
ROC-AUC Score	0.96
Precision for Churn (1)	0.93
Recall for Churn (1)	0.89
F1 Score for Churn (1)	0.91

Confusion Matrix	Pred. No Churn (0)	Pred. Churn (1)
Actual No Churn (0)	34610	3533
Actual Churn (1)	5594	44430

- ***High ROC-AUC Score:*** Indicates excellent model performance in distinguishing between churned and non-churned customers.
- ***High Precision and Recall:*** Suggests that the model is effective in identifying customers likely to churn with minimal false positives and false negatives.

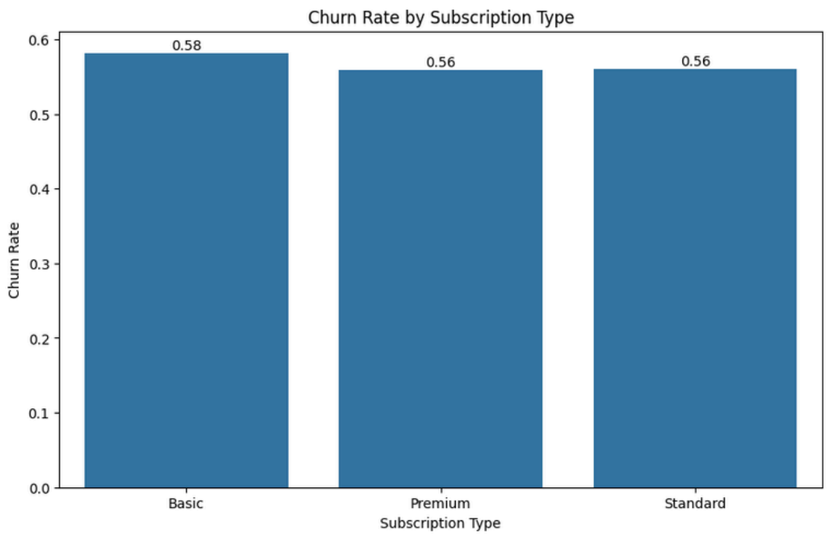
STATISTICAL INTERPRETATIONS:

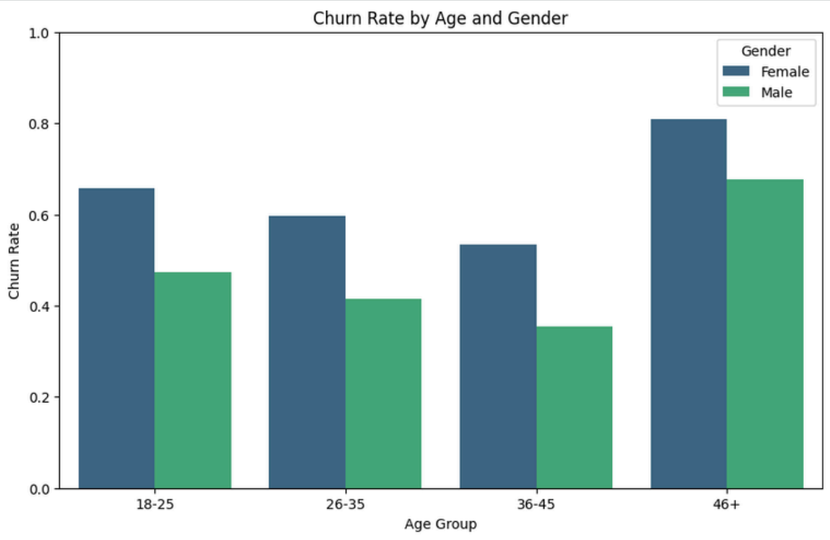
Feature Importance	Importance
Contract Length_Monthly	3.609454
Support Calls	2.295077
Payment Delay	0.931164
Last Interaction	0.518852
Age	0.443954
Gender_Female	0.283710
Subscription Type_Basic	0.037841
Subscription Type_Standard	-0.018389
Subscription Type_Premium	-0.019055
Usage Frequency	-0.123195
Tenure	-0.135802
Gender_Male	-0.283710
Total Spend	-1.453166
Contract Length_Quarterly	-1.462880
Contract Length_Annual	-1.467178

FEATURE IMPORTANCE:

- ***Contract Length (Monthly):*** *Customers with monthly contracts are more likely to churn, indicating a need for more flexible or attractive contract terms.*
- ***Support Calls:*** *Higher number of support calls is associated with higher churn, suggesting potential issues with customer satisfaction or service quality.*
- ***Payment Delay:*** *Customers with delayed payments are more prone to churn, highlighting the importance of managing payment processes and providing timely reminders or support.*

STATISTICAL INTERPRETATIONS:



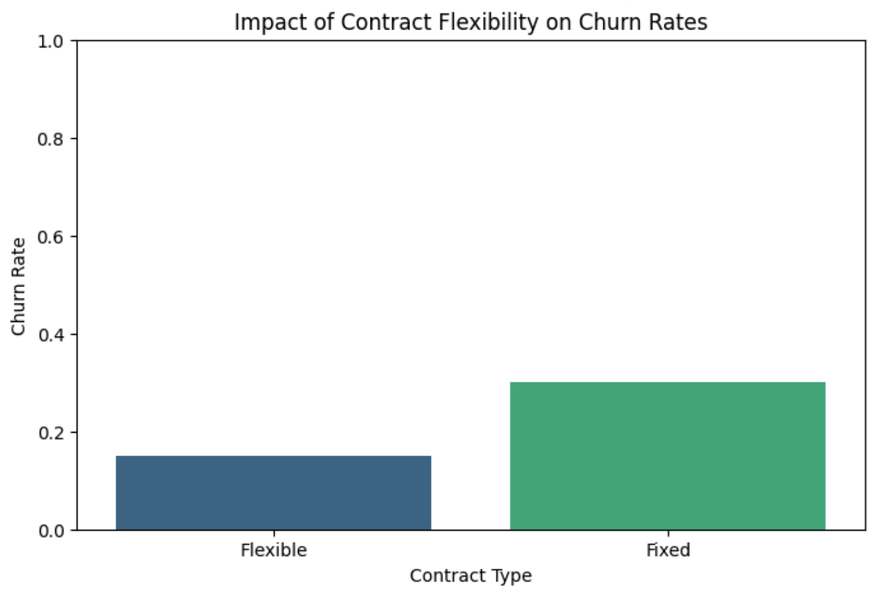


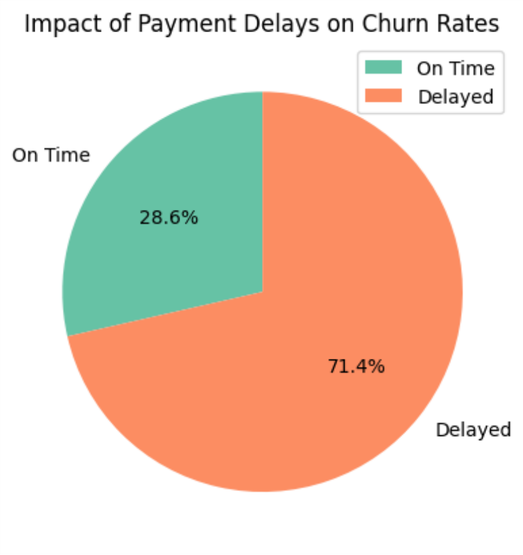
SEGMENTATION ANALYSIS:

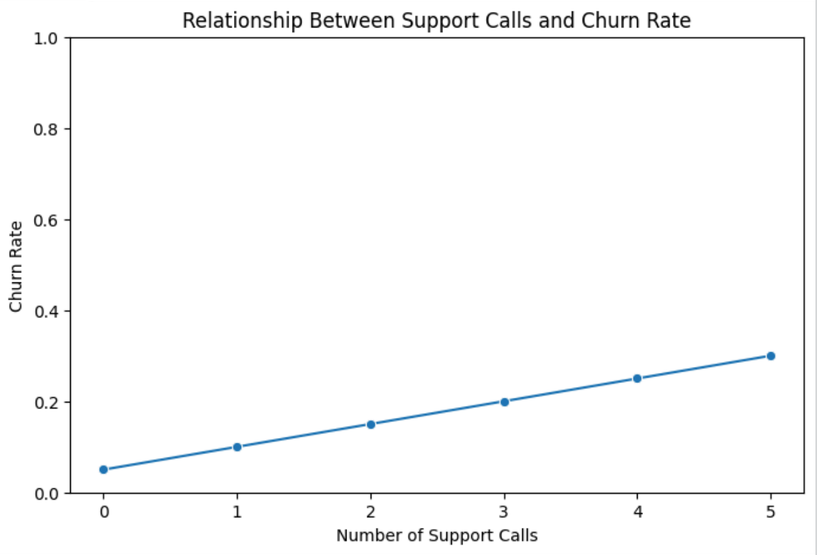
- *Subscription Type: Premium subscribers have lower churn rates.*
- *Age Group: Younger customers show different churn patterns.*
- *Gender: Gender differences affect churn rates.*
- *Contract Length: Monthly contracts show higher churn rates.*
- *Support Calls: Higher support calls correlate with higher churn.*
- *Payment Delay: Delays in payments are linked to higher churn rates.*

BUSINESS IMPLICATIONS:

RETENTION STRATEGIES:







- *Contract Flexibility: Implement more flexible contract options or loyalty programs to retain monthly subscribers.*
- *Payment Management: Develop better payment tracking and reminder systems to minimize delays and associated churn risks.*
- *Service Improvement: Enhance customer support services and address common issues to reduce the need for support calls.*

BUSINESS IMPLICATIONS:

TARGETED INTERVENTIONS:

	Customer Segment	Personalized Offer
0	Young, Low Usage	Discount on Premium Plan
1	Middle-Aged, High Usage	Free Additional Services
2	Senior, Medium Usage	Extended Support Hours

- ***Personalized Offers:*** *Utilize insights from demographic and usage patterns to create personalized retention offers and campaigns.*
- ***Customer Feedback:*** *Regularly gather and act on customer feedback to identify pain points and improve overall satisfaction.*

CONCLUSION:

URGENCY AND RELEVANCE:

- *Predicting customer churn is crucial for maintaining a stable and growing customer base.*
- *Effective retention strategies can lead to significant cost savings and revenue growth by reducing churn rates.*

ACTIONABLE SOLUTIONS:

- *Focus on improving service quality and customer satisfaction.*
- *Implement targeted retention programs based on customer segmentation and predictive insights.*
- *Regularly monitor and refine predictive models to adapt to changing customer behaviors and market conditions.*

CHALLENGES AND SOLUTIONS

01

Class Imbalance: Churn is less frequent than non-churn, affecting model performance.

- *Solution: Applied SMOTE (Synthetic Minority Over-sampling Technique) to balance classes.*

02

Feature Selection: Identifying the most influential features from many variables.

- *Solution: Used feature importance techniques to select relevant features.*

REFERENCES

01

CUSTOMER CHURN DATASET

02

TOOLS AND LIBRARIES USED

- PYTHON: PANDAS, NUMPY, MATPLOTLIB, SEABORN, SCIKIT-LEARN
- TECHNIQUES: DATA EXPLORATION, FEATURE ENGINEERING, MACHINE LEARNING MODEL BUILDING

THANK YOU