Telecom Customer Churn Analysis Presentation

Title: *Customer Churn Analysis*

Subtitle: *Understanding Factors Influencing Churn*

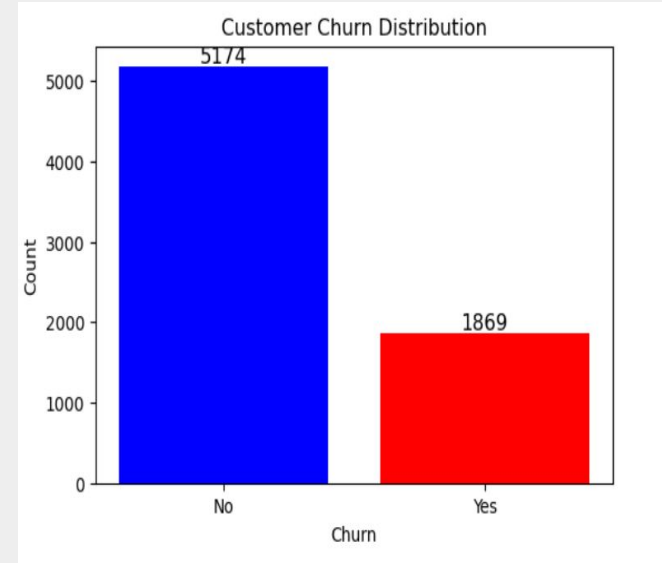*Presented by:* *Samuel Enyaude*

Date: *27/03/2025*

Project Overview

Objective:

Identify factors contributing to customer churn and propose solutions.

Dataset: 7043 customer records with 21 attributes.

Key Challenge: Imbalanced dataset with only 27% churned customers.

Customer Churn Distribution

```
Churn
No     5174
Yes    1869
```

Exploratory Data Analysis

Total Customers: 7043

Churned Customers: 1869 (27%)

Features Include: Demographics, service usage, contract details, billing information.

Data Cleaning: Converted 'TotalCharges' to numeric, handled missing values.

Data Summary

	SeniorCitizen	tenure	MonthlyCharges
count	7043.000000	7043.000000	7043.000000
mean	0.162147	32.371149	64.761692
std	0.368612	24.559481	30.090047
min	0.000000	0.000000	18.250000
25%	0.000000	9.000000	35.500000
50%	0.000000	29.000000	70.350000
75%	0.000000	55.000000	89.850000
max	1.000000	72.000000	118.750000

Visualizations & Findings
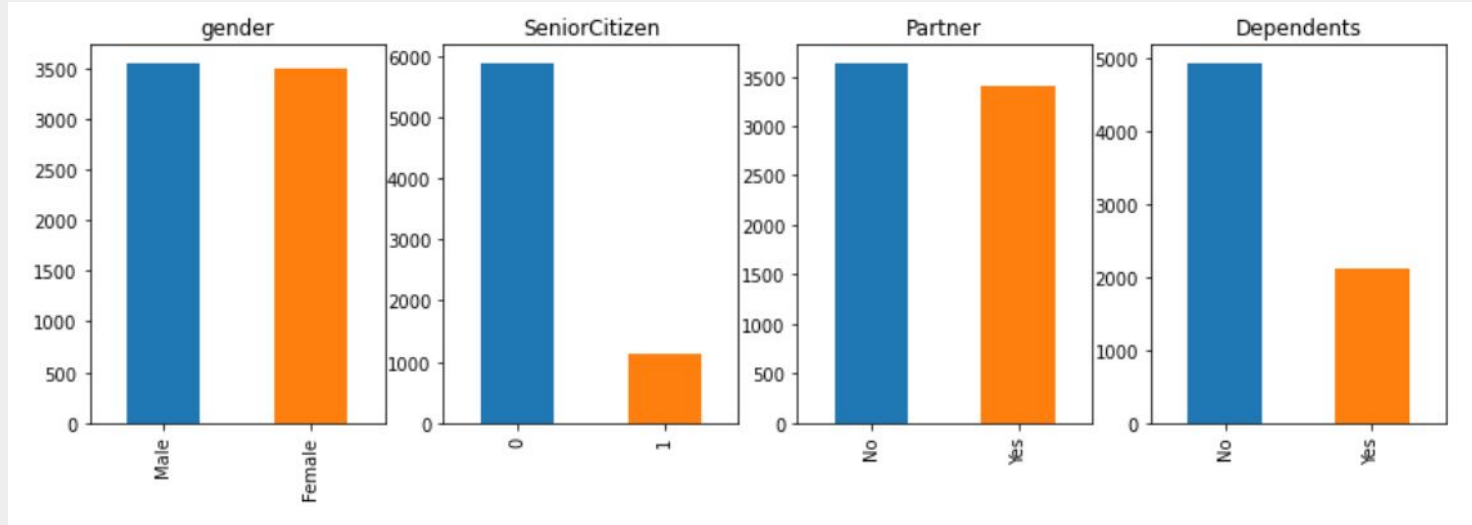
- **Demographics:** There is an equal distribution of user gender and marital status. The most customers are younger individuals without dependents.
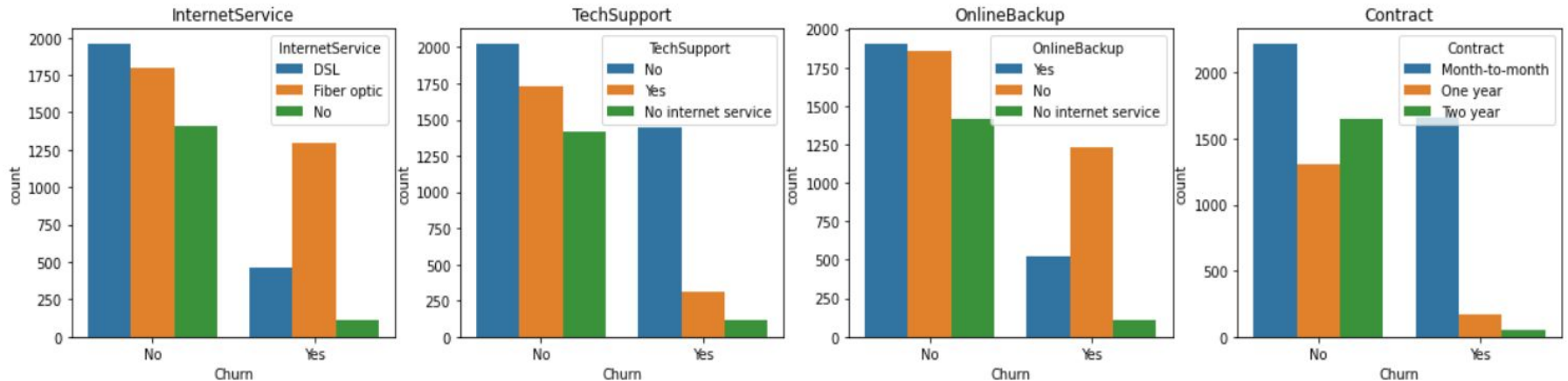
Visualizations & Findings
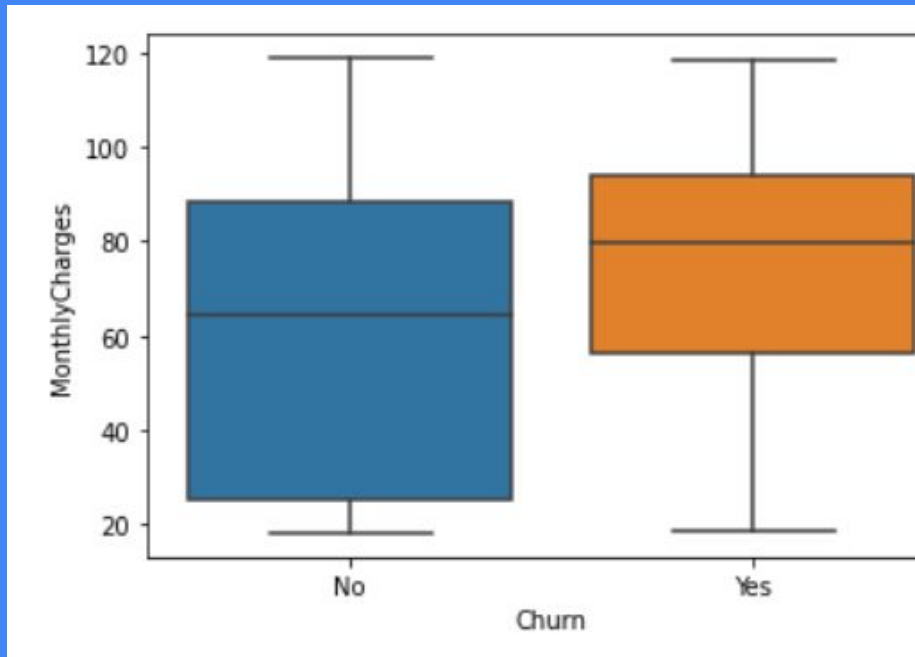
- **Monthly Charges:** Higher charges correlate with higher churn.

Visualizations & Findings

- **Contract Type:** Month-to-month contracts see the highest churn.

- **Internet Service:** Fiber optic users churn more frequently than DSL users.

- **Tech Support & Online Backup:** Lack of support services increases churn risk.

Key Insights from Exploratory Data Analysis

Internet Service:

- **Fiber optic users churn more frequently.**
- **Possible reasons: higher costs or poor coverage.**

Tech Support:

- **Many churned users did not subscribe   to tech support.**
- **Lack of technical assistance may have led to service cancellations.**

Online Backup:

Many churned customers did not use online backup services.

Contract Type:

- **Churn is highest among customers with monthly contracts.**
- **Monthly subscribers can easily cancel before the next billing cycle.**

Actionable Insights:

- **Offering complimentary tech support may reduce churn.**
- **Understanding churn drivers helps prevent customer loss.**

Data Preparation & Feature Engineering

- **Categorical Encoding:** Transformed categorical variables into numerical values.
- **Feature Selection:** Identified key predictors of churn.
- **Oversampling:** Used SMOTE to balance dataset.

	customerID	TotalCharges	MonthlyCharges	SeniorCitizen	tenure	gender	Partner	Dependents	PhoneService	MultipleLines	...	OnlineSecurity	OnlineBackup	Dev
0	7590-VHVEG	29.85	29.85	0	1	0	1	0	0	1	...	0	2	
1	5575-GNVDE	1889.50	56.95	0	34	1	0	0	1	0	...	2	0	
2	3668-QPYBK	108.15	53.85	0	2	1	0	0	1	0	...	2	2	
3	7795-CFOCW	1840.75	42.30	0	45	1	0	0	0	1	...	2	0	
4	9237-HQITU	151.65	70.70	0	2	0	0	0	1	0	...	0	0	

5 rows × 21 columns

```
0      3452
1      3452
Name: Churn, dtype: int64
```

There is 3,452 values in each class, which means that the training dataset is now balanced.

Predictive Modeling Strategy

- **Model Considered:** Building the Customer Churn Prediction Model. We now built a random forest classifier to predict customer churn. Therefore, RandomForestClassifier(random_state=46)

- **Evaluation Metrics:** Considering the Customer Churn Prediction Model Evaluation. We evaluated the model predictions on the test dataset with an Accuracy score of 0.77.

- **Preliminary Findings:** Contract type and monthly charges are strong churn predictors.

Business Recommendations

- **Reduce Monthly Churn:** Offer discounts or loyalty incentives for high-paying customers.
- **Improve Retention:** Encourage annual contracts instead of month-to-month.
- **Enhance Support:** Offer free tech support for new customers.
- **Customer Engagement:** Target at-risk customers with personalized offers.

Next Steps - Iteration

- **Model Optimization:** Fine-tune hyperparameters for better prediction.
- **Deployment:** Implement real-time churn prediction model.
- **Continuous Monitoring:** Track customer behavior and refine strategies

- **Thank you!**
- Questions & Discussion
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