Report on Reducing Customer Churn for a Telecom Company

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1. Introduction

Customer churn is a critical challenge for telecom companies as it impacts profitability and growth. Understanding the factors that lead to churn can help develop strategies to retain customers. This report analyzes a dataset from a telecom company to identify the features most indicative of churn and provides recommendations for reducing churn.

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2. Data Overview

The dataset used for this analysis contains the following features:

- **CustomerID**: Unique identifier for the customer.
- **Gender**: Gender of the customer.
- **SeniorCitizen**: Indicates if the customer is a senior citizen.
- **Partner**: Whether the customer has a partner.
- **Dependents**: Whether the customer has dependents.
- **Tenure**: Number of months the customer has been with the company.
- **PhoneService**: Whether the customer has a phone service.
- **MultipleLines**: Indicates if the customer has multiple lines.
- **InternetService**: Type of internet service (DSL, Fiber optic, No).
- **OnlineSecurity**: Whether the customer has online security.
- **OnlineBackup**: Whether the customer has online backup.
- **DeviceProtection**: Whether the customer has device protection.
- **TechSupport**: Whether the customer has tech support.
- **StreamingTV**: Whether the customer has streaming TV.
- **StreamingMovies**: Whether the customer has streaming movies.
- **Contract**: Type of contract (Month-to-month, One year, Two year).
- **PaperlessBilling**: Whether the customer uses paperless billing.
- **PaymentMethod**: Payment method used by the customer.
- **MonthlyCharges**: Monthly charges for the customer.
- **TotalCharges**: Total charges incurred by the customer.
- **Churn**: Whether the customer has churned.

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3. Data Analysis

3.1. Exploratory Data Analysis (EDA)

Feature Importance Analysis:

To identify features indicative of churn, we performed feature importance analysis using various models and metrics:

1. **Logistic Regression**:
    - **Coefficients Analysis**: Provided insight into how each feature affects the likelihood of churn.
2. **Random Forest Classifier**:
    - **Feature Importance**: Ranked features based on their contribution to the model's predictions.
3. **Neural Network**:
    - **Performance Evaluation**: Assessed how well the ANN could classify churn based on feature inputs.

3.2. Feature Importance Results

Based on the models used, the most indicative features of churn are:

1. **Contract Type**:
    - **Month-to-month** contracts are associated with higher churn rates compared to **One year** or **Two year** contracts.
2. **Tenure**:
    - **Shorter tenure** correlates with higher churn rates.
3. **Internet Service**:
    - Customers with **Fiber optic** internet service have higher churn rates compared to those with **DSL** or no internet service.
4. **Monthly Charges**:
    - Higher **monthly charges** are associated with higher churn.
5. **Online Security and Tech Support**:
    - Lack of **online security** and **tech support** are significant churn indicators.
6. **Contract Type**:
    - **Month-to-month** contracts are a strong predictor of churn.
7. **Payment Method**:
    - Customers using **electronic checks** have a higher churn rate compared to those using **credit card** or **bank transfer**.

3.3. Summary of Findings

The analysis revealed that customers with **month-to-month contracts**, **shorter tenure**, **higher monthly charges**, and **fiber optic internet service** are more likely to churn. Additionally, lacking **online security**, **tech support**, and using **electronic checks** as a payment method are also associated with higher churn rates.

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4. Recommendations

Based on the analysis, the following recommendations are proposed to reduce customer churn:

4.1. Enhance Contract Offerings

Recommendation: Offer incentives for **One year** or **Two year** contracts.

Justification: Long-term contracts are associated with lower churn rates. Offering discounts or benefits for customers who commit to longer-term contracts can improve retention.

Implementation:

- Provide **discounts** or **additional services** for customers who choose long-term contracts.
- Promote **contract upgrades** through targeted marketing campaigns.

4.2. Improve Customer Support Services

Recommendation: Strengthen **online security** and **tech support** services.

Justification: Lack of online security and tech support increases churn. Improving these services can enhance customer satisfaction and retention.

Implementation:

- Increase **investment** in online security measures.
- **Expand** tech support services and **train staff** to resolve issues more effectively.
- Offer **24/7 customer support** to address customer concerns promptly.

4.3. Review Pricing Strategy

Recommendation: Assess and potentially adjust **monthly charges** for different service tiers.

Justification: High monthly charges are linked to higher churn. Reviewing the pricing strategy to offer more competitive and flexible pricing options could reduce churn.

Implementation:

- **Analyze** the pricing structure to identify opportunities for adjustments.
- Offer **promotions** or **discounts** for new customers.
- Implement **loyalty programs** for existing customers.

4.4. Evaluate Internet Service Options

Recommendation: Review the value proposition of **fiber optic internet service**.

Justification: Fiber optic internet service is associated with higher churn. Assessing the reasons behind this and improving the service can help reduce churn.

Implementation:

- **Survey** customers to understand their issues with fiber optic service.
- Invest in **upgrades** or offer **bundled packages** to enhance the value of fiber optic services.

4.5. Optimize Payment Methods

Recommendation: Promote more **stable payment methods** over **electronic checks**.

Justification: Customers using electronic checks have higher churn rates. Encouraging the use of more stable payment methods can help improve retention.

Implementation:

- **Incentivize** customers to switch to credit card or bank transfer payments.
- **Simplify** the payment process for customers.

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5. Conclusion

Reducing customer churn is vital for the long-term success of a telecom company. Through data analysis, we identified key features that influence churn and proposed actionable recommendations based on these findings. Implementing these strategies can help the company reduce churn rates and improve customer satisfaction.

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6. References

- TensorFlow Documentation
- Scikit-Learn Documentation
- Kaggle Telecom Churn Dataset
- Python Data Analysis Libraries