

TELECOMMUNICATIONS CUSTOMER CHURN PREDICTION

Date: March 13, 2024

1. Telecommunications Customer Churn Prediction

1.1 Problem Statement:

In the dynamic telecommunications landscape, customers are presented with many options to fulfill their communication and internet needs. Customer satisfaction stands as a cornerstone in this domain, given that individuals often formulate holistic perceptions of a company based on singular interactions. The omnipresent role of communication services in daily routines renders even a brief maintenance lapse of just 30 minutes capable of inducing user anxiety, emphasizing the critical nature of these services. Against the backdrop of substantial expenses associated with customer acquisition, scrutinizing churn rates emerges as an imperative endeavor.

Churn rate, a pivotal performance metric, serves to quantify the volume of customers who have terminated or declined to renew their subscriptions with the company. A heightened churn rate invariably corresponds with a larger cohort of customers disengaging from patronage, thereby exerting a detrimental impact on revenue streams. Consequently, distilling actionable insights from churn analysis assumes paramount importance for companies aiming to craft strategic interventions, target precise market segments, and elevate service standards to enrich overall customer experiences and cultivate enduring trust.

Thus, the development of predictive modeling frameworks and the generation of exhaustive churn analysis reports serve as linchpins in propelling business expansion and fortifying market positioning.

1.2 Objective:

The objective of this initiative is to conduct binary classification on an imbalanced dataset to identify potential churn customers. This classification task will leverage a combination of numerical and categorical features to enhance the predictive accuracy and robustness of the model.

1.3 Dataset Attributes:

1. customerID: Unique identifier for each customer.
2. gender: Gender of the customer (Male, Female).
3. SeniorCitizen: Indicator for whether the customer is a senior citizen (1 for Yes, 0 for No).
4. Partner: Indicator for whether the customer has a partner (Yes, No).
5. Dependents: Indicator for whether the customer has dependents (Yes, No).
6. tenure: Number of months the customer has been with the company.
7. PhoneService: Indicator for whether the customer has a phone service (Yes, No).
8. MultipleLines: Indicator for whether the customer has multiple lines (Yes, No, No phone service).
9. InternetService: Type of internet service provider for the customer (DSL, Fiber optic, No).
10. OnlineSecurity: Indicator for whether the customer has online security (Yes, No, No internet service).
11. OnlineBackup: Indicator for whether the customer has online backup (Yes, No, No internet service).
12. DeviceProtection: Indicator for whether the customer has device protection (Yes, No, No internet service).
13. TechSupport: Indicator for whether the customer has tech support (Yes, No, No internet service).
14. StreamingTV: Indicator for whether the customer has streaming TV (Yes, No, No internet service).
15. StreamingMovies: Indicator for whether the customer has streaming movies (Yes, No, No Internet Service).

- 16.Contract: The contract term of the customer (Month-to-month, One year, Two years).
- 17.PaperlessBilling: Indicator for whether the customer has paperless billing (Yes, No).
- 18.PaymentMethod: The payment method used by the customer (Electronic check, Mailed check, Bank transfer (automatic), Credit card (automatic)).
- 19.MonthlyCharges: The amount charged to the customer monthly.
- 20.TotalCharges: The total amount charged to the customer.
- 21.Churn: Indicator for whether the customer churned (Yes, No).

8. STRATEGIES FOR REDUCING CUSTOMER CHURN AND INCREASING REVENUE:

- **Targeting Specific Customer Segments:**
 - SeniorCitizen Segment: Despite being a minority, SeniorCitizen customers exhibit a willingness to pay premium rates. Therefore, it's crucial to tailor services to meet their high expectations.
 - Partnered and Solitary Customers: These segments prefer services with MonthlyCharges below \$65, indicating a price sensitivity that should be considered in service offerings.
- **Building a Strong Customer Base:** Initial 6-Month Tenure Focus: During this critical period, prioritize features such as OnlineSecurity, OnlineBackup, DeviceProtection, and TechSupport to establish trust and loyalty. Efforts should aim to reduce churn between 40 to 50 months for these essential services.

- **Enhancing Affordable Streaming Services:** Streamlined Content and Payment: Make StreamingTV and StreamingMovies more accessible and appealing to diverse customer segments. Simplify payment processes to ensure seamless transactions and customer satisfaction.
- **Optimizing Payment Methods:** Payment Method Transformation: Phasing out Electronic check payments due to high churn rates and promoting Bank Transfer (automatic) and Credit Card (automatic) options. However, challenges lie in reducing the median churn tenure, which is currently double that of Electronic check payments.
- **Pricing Strategy:** Price-Consciousness Threshold: Recognize that customers become significantly more price-conscious once MonthlyCharges exceed \$70. Therefore, emphasize service quality as a primary differentiation factor to retain customers beyond this threshold.

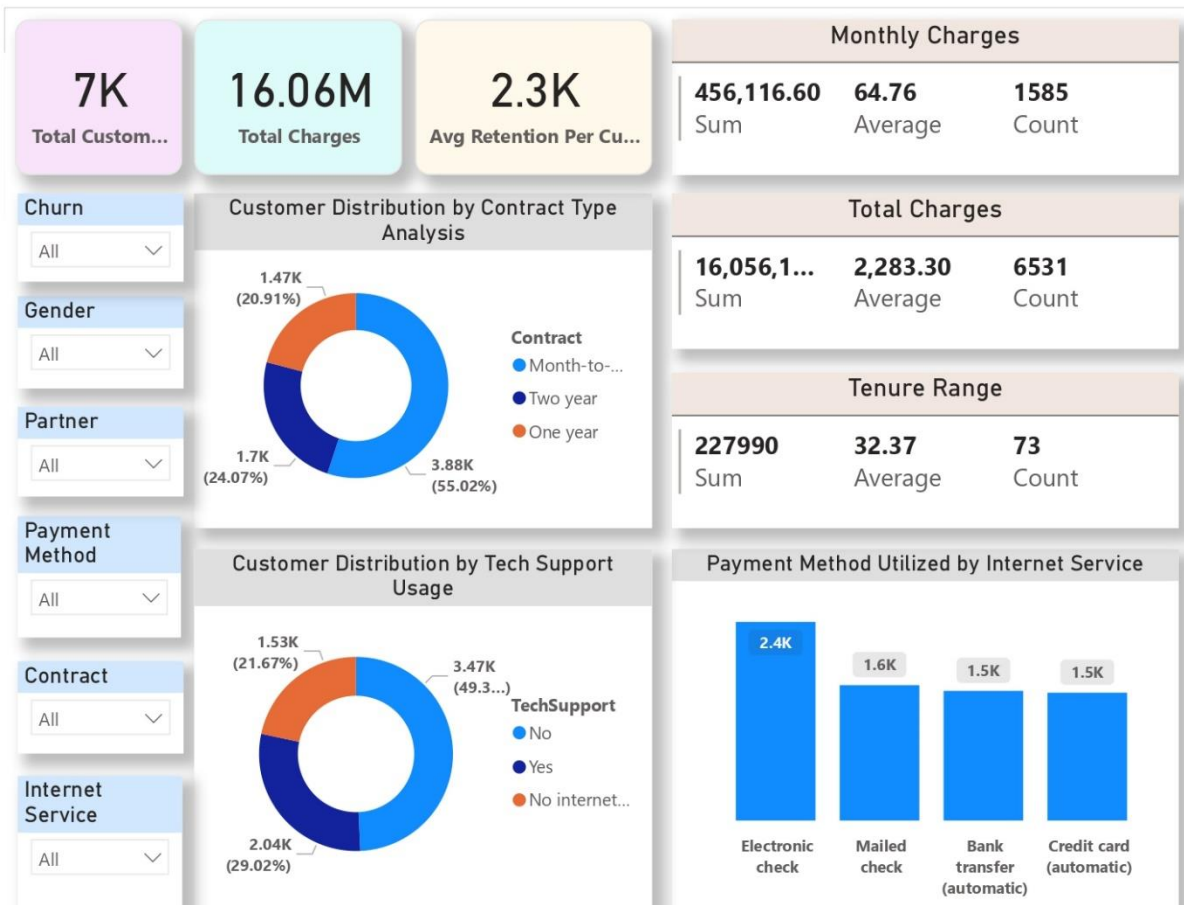
These strategic initiatives aim to not only reduce churn but also enhance revenue streams through targeted customer engagement and service optimization.

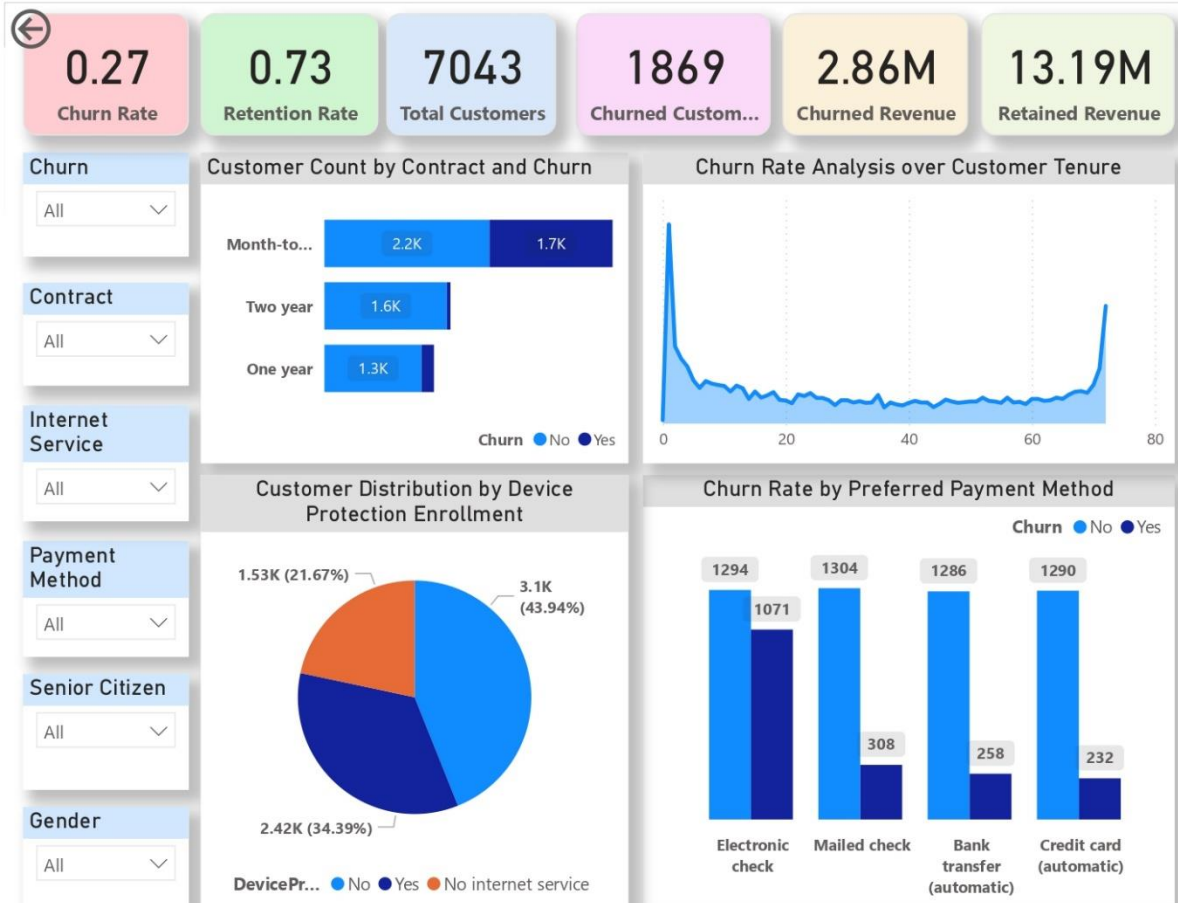
9. Conclusion:

- **Utilizing Valuable Business Insights:** Leveraging the dataset presents a unique opportunity to tackle real-world business challenges using cutting-edge data science techniques. Insights derived from thorough Exploratory Data Analysis (EDA) serve as a cornerstone for evaluating existing systems and devising strategic improvement plans.

- **Implementing Effective Data Balancing Strategies:** Employing advanced techniques like SMOTE analysis for data balancing enhances the reliability and accuracy of predictive models. While initial attempts at undersampling were made, further exploration of alternative methods may yield even more optimized results.
- **Continuously Enhancing Model Performance:** Iterative refinement through meticulous feature engineering, hyperparameter tuning, and outlier detection is essential for maximizing the predictive power of models. Continued exploration of feature combinations holds promise for further improving model accuracy and robustness.
- **Addressing Business Challenges:** The insights from the data analysis pave the way for addressing critical business challenges, particularly in customer churn prediction and revenue optimization. Businesses can adapt and thrive in dynamic market environments by leveraging data-driven strategies, ensuring sustained growth and competitiveness.
- **Fostering a Culture of Continuous Improvement:** Businesses can cultivate a culture of continuous improvement by emphasizing the importance of ongoing evaluation and enhancement. By embracing data-driven decision-making and actively seeking opportunities for innovation, organizations can stay ahead of the curve and achieve long-term success in the telecommunications industry.

POWER-BI DASHBOARDS





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