

## **Executive Summary of Customer Churn Analysis**

This analysis investigates factors contributing to customer churn in a telecommunications company, with a focus on demographics, service usage, and billing patterns to identify key trends that impact retention.

### **Dataset Overview:**

- **Scope:** The dataset contains 7,043 customer entries with 21 features each, capturing customer demographics, subscription details, and billing information.
- **Data Quality:** After preprocessing to handle inconsistencies (such as converting TotalCharges to numeric format and addressing missing values), the data was analyzed for insights into factors that affect churn.

### **Key Findings:**

#### **1. Demographic Influence on Churn:**

- **Senior Citizens:** Senior citizens constitute around 16% of the dataset, and nearly 42% of them tend to churn. This is significantly higher compared to the churn rate among younger customers (about 24%), indicating that age may play a role in customer loyalty.
- **Marital and Family Status:** Customers without partners or dependents showed a churn rate of approximately 32%, compared to 22% for those with family obligations. This suggests that single or independent customers are more likely to switch providers, potentially due to lower switching costs or different lifestyle needs.

#### **2. Service and Subscription Features:**

- **Internet Services:** About 60% of customers who do not use any internet services remain with the company. However, churn rates climb with customers who subscribe to internet services, especially when additional options like tech support, streaming services, or device protection are lacking. For instance, customers without online security have a 30% churn rate, compared to 18% for those with it.
- **Contract Type:** Customers on month-to-month contracts show a churn rate of around 43%, whereas customers with one- or two-year contracts have lower churn rates (11% and 3%, respectively). This indicates that longer-term contracts significantly enhance customer retention.

#### **3. Billing and Payment Insights:**

- **Monthly Charges:** Customers with higher monthly charges tend to churn more frequently. Specifically, customers paying over \$70 per month churn at a rate of 45%, in contrast to a 19% churn rate among those paying less than \$40.
- **Electronic Billing:** Approximately 35% of customers who opted for electronic billing churned, compared to 23% who used paper billing. This may indicate

that customers who use automated payment methods are quicker to switch providers when dissatisfied.

**Visualization Insights:** The analysis includes several critical visualizations:

- **Churn by Contract Type:** A bar chart vividly demonstrates that month-to-month contract customers churn at nearly four times the rate of long-term contract holders.
- **Heatmap of Service Correlations:** This visual identifies significant relationships among service attributes and churn probability, emphasizing that add-on services like online security or tech support are inversely related to churn.
- **Churn by Monthly Charges:** A distribution plot shows the steep increase in churn rate among high-paying customers, highlighting the need for tailored engagement strategies.

**Recommendations for Retention:** To address the high churn rates among specific customer segments:

1. **Incentivize Long-Term Contracts:** Providing discounts or perks for one- or two-year contracts may encourage month-to-month customers to stay longer.
2. **Service Bundling for At-Risk Customers:** Create attractive bundles for high-risk segments, such as senior citizens or those with minimal add-on services, to increase customer satisfaction and retention.
3. **Targeted Loyalty Programs:** Offer loyalty rewards or tailored engagement strategies to high-spending customers and those using electronic billing, as they show a higher likelihood of churn.

**Conclusion:** The analysis identifies clear trends in customer demographics, service usage, and billing patterns that contribute to churn. By targeting high-risk groups with strategic incentives and optimized service bundles, the company can potentially reduce its overall churn rate and enhance customer loyalty.