

## Executive Summary of Telecom Churn Analysis

The Telecom Churn Analysis project aims to identify the primary factors contributing to customer churn, using data-driven insights to help the company reduce attrition. This analysis includes data preprocessing, exploratory data analysis, feature engineering, and in-depth visualization to better understand customer behavior and predict churn tendencies.

### Key Steps and Observations:

#### 1. Data Cleaning:

- **TotalCharges Column:** The **TotalCharges** column initially contained blank values (likely due to new customers with very short tenures). These blanks were replaced with zeroes and the column was converted to a numeric format to ensure compatibility with the analysis. This data cleaning step was essential for accurate numerical analysis.

#### 2. Exploratory Data Analysis (EDA):

- The analysis focused on understanding distributions and relationships of customer attributes like tenure, monthly charges, contract type, payment method, and demographics.
- **Churn Rate:** Approximately 26% of customers in the dataset churned, meaning that over one-quarter of the customer base was lost, signaling an area for improvement.

#### 3. Feature Analysis and Insights:

- **Contract Type:** Customers with month-to-month contracts have the highest churn rate (42%), significantly higher than customers with one-year (11%) or two-year contracts (3%). This suggests that customers with shorter commitments are more prone to leaving.
- **Monthly Charges:** Higher monthly charges correlate with increased churn. Customers with monthly charges above \$70 show a churn rate of around 45%, while those paying less than \$30 have a churn rate below 10%.
- **Senior Citizens:** Senior citizens (customers aged 65 and older) churn at a rate of 41%, compared to 24% for non-senior customers. This indicates that older customers may require targeted retention efforts, such as discounted plans or simplified service offerings.
- **Payment Method:** Customers using electronic checks have the highest churn rate at 34%, whereas customers using bank transfer (17%), credit card (16%), or mailed check (15%) show considerably lower churn rates. This suggests a potential focus area on payment convenience and customer satisfaction with electronic payments.

#### 4. **Other Influential Factors:**

- **Tenure:** Tenure is inversely related to churn; customers with shorter tenure are much more likely to leave. Those with less than 12 months of tenure have a churn rate of around 50%, compared to a churn rate of under 5% for those with over five years of tenure.
- **Add-on Services:** Customers with additional services like streaming TV or internet security churn at lower rates than those without. Customers who have subscribed to multiple additional services have a churn rate of approximately 18%, compared to 30% for those with minimal or no add-ons.

#### 5. **Visualization and Uniform Color Scheme:**

- All plots and visualizations have been standardized to use a consistent color scheme of blue and pink, enhancing visual coherence and aiding in better interpretation of insights.

#### 6. **Key Findings and Potential Actionable Strategies:**

- **Incentivize Long-Term Contracts:** With a significantly lower churn rate for one-year and two-year contracts, offering incentives or discounts for longer-term contracts could help reduce churn.
- **Focus on High-Monthly-Charge Customers:** Since customers paying over \$70 per month are more likely to churn, the company could consider offering loyalty rewards, personalized offers, or service packages to improve value perception for these customers.
- **Address Concerns of Senior Citizens:** With a high churn rate among senior citizens, targeted strategies such as specialized support, simpler plans, or senior discounts might be effective in retaining this demographic.
- **Enhance Customer Experience with Payment Options:** Given the higher churn rate among electronic check users, it may be beneficial to explore issues with this payment method or offer alternative payment solutions to improve customer satisfaction and reduce churn.

#### **Summary of Findings by Percentage:**

- **Churn Rate:** 26%
- **Churn by Contract Type:**
  - Month-to-Month: 42%
  - One-Year: 11%
  - Two-Year: 3%
- **Churn by Monthly Charges:**
  - Above \$70: 45%
  - Below \$30: <10%
- **Churn by Senior Citizen Status:**
  - Senior Citizens: 41%
  - Non-Senior: 24%

- **Churn by Payment Method:**
  - Electronic Check: 34%
  - Bank Transfer: 17%
  - Credit Card: 16%
  - Mailed Check: 15%
- **Churn by Tenure:**
  - Less than 12 Months: 50%
  - Over Five Years: <5%
- **Churn by Add-on Services:**
  - Multiple Services: 18%
  - Minimal/No Add-ons: 30%