**ANALYSIS AND RECOMMENDATION**

**Telecom Customer Churn Analysis**

This Project analysis focuses on predicting customer churn in a telecom company by examining various features such as customer services, payment methods, senior citizen status, and internet services. The goal is to identify key patterns influencing churn and provide insights for improving customer retention.

**1. Data Preprocessing**

* **Data Inspection**: The dataset is loaded and checked using functions like df.head() and df.info() to understand its structure.
* **Missing Values**: Missing values in the 'TotalCharges' column are replaced with zero and converted to float for consistency.
* **Transformation**: The 'SeniorCitizen' column is converted from numerical values (0, 1) to categorical labels ("No", "Yes").

**2. Exploratory Data Analysis (EDA)**

* **Churn Distribution**: A bar chart and pie chart visualize the proportion of customers who churned vs. those who stayed.
* **Feature-wise Churn Analysis**:
  + **PhoneService**: Customers with phone service tend to have higher churn rates.
  + **MultipleLines**: Customers with multiple phone lines are more likely to churn.
  + **InternetService**: Fiber Optic internet users show lower churn rates.
  + **DeviceProtection, TechSupport, StreamingTV**: Customers without these services tend to churn more.
* **Additional Analysis**:
  + **Gender**: No significant churn difference between genders.
  + **SeniorCitizen**: Senior citizens have a higher churn rate.
  + **PaymentMethod**: Electronic check users are more likely to churn.
  + **Tenure**: Customers with longer tenure tend to stay longer.

**3. Visualizations**

* **Bar Plots**: Used to show churn rates for features like PhoneService, MultipleLines, and InternetService.
* **Pie Chart**: Displays the overall churn rate, showing the proportion of customers who churned vs. those who remained.

**4. Conclusion**

* **Key Findings**: Features like PhoneService, InternetService, and additional services like TechSupport influence churn. Senior citizens and electronic check users are more likely to churn.
* **Retention Strategies**: Improve services such as TechSupport and Fiber Optic internet, target senior citizens with customized offers, and encourage more stable payment methods to reduce churn.