

# Telco Customer Churn

## Exploratory Data Analysis

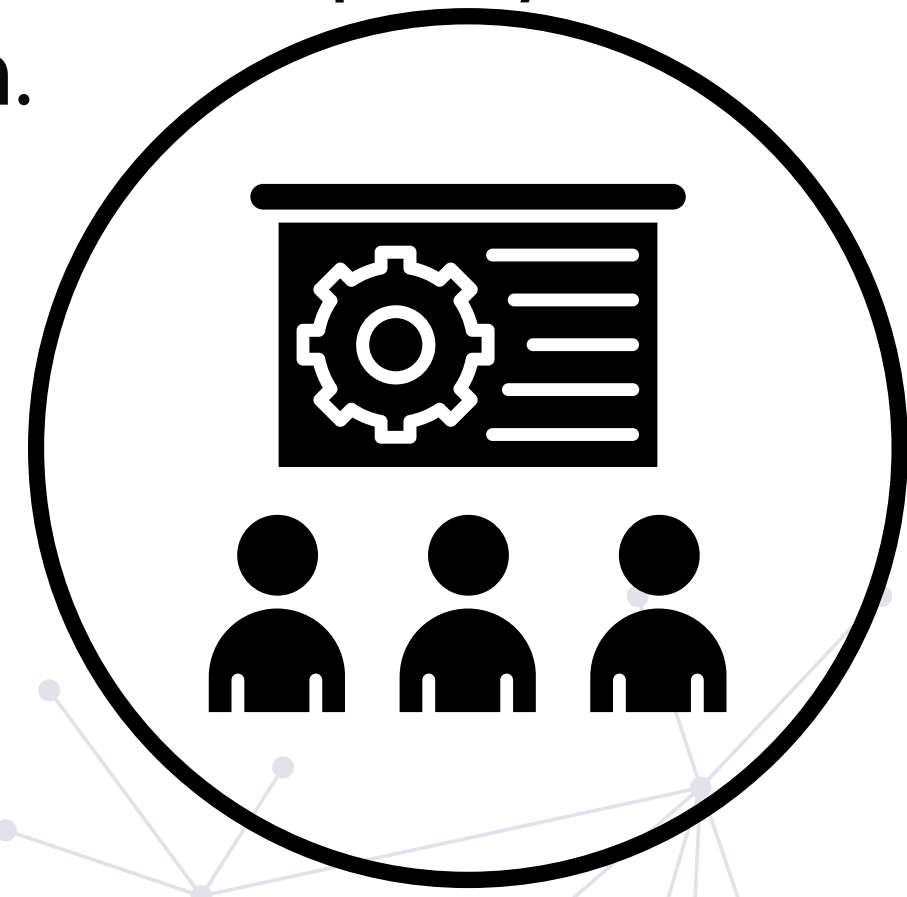
Presented By:  
**Iftanul Ibnu Rochman**



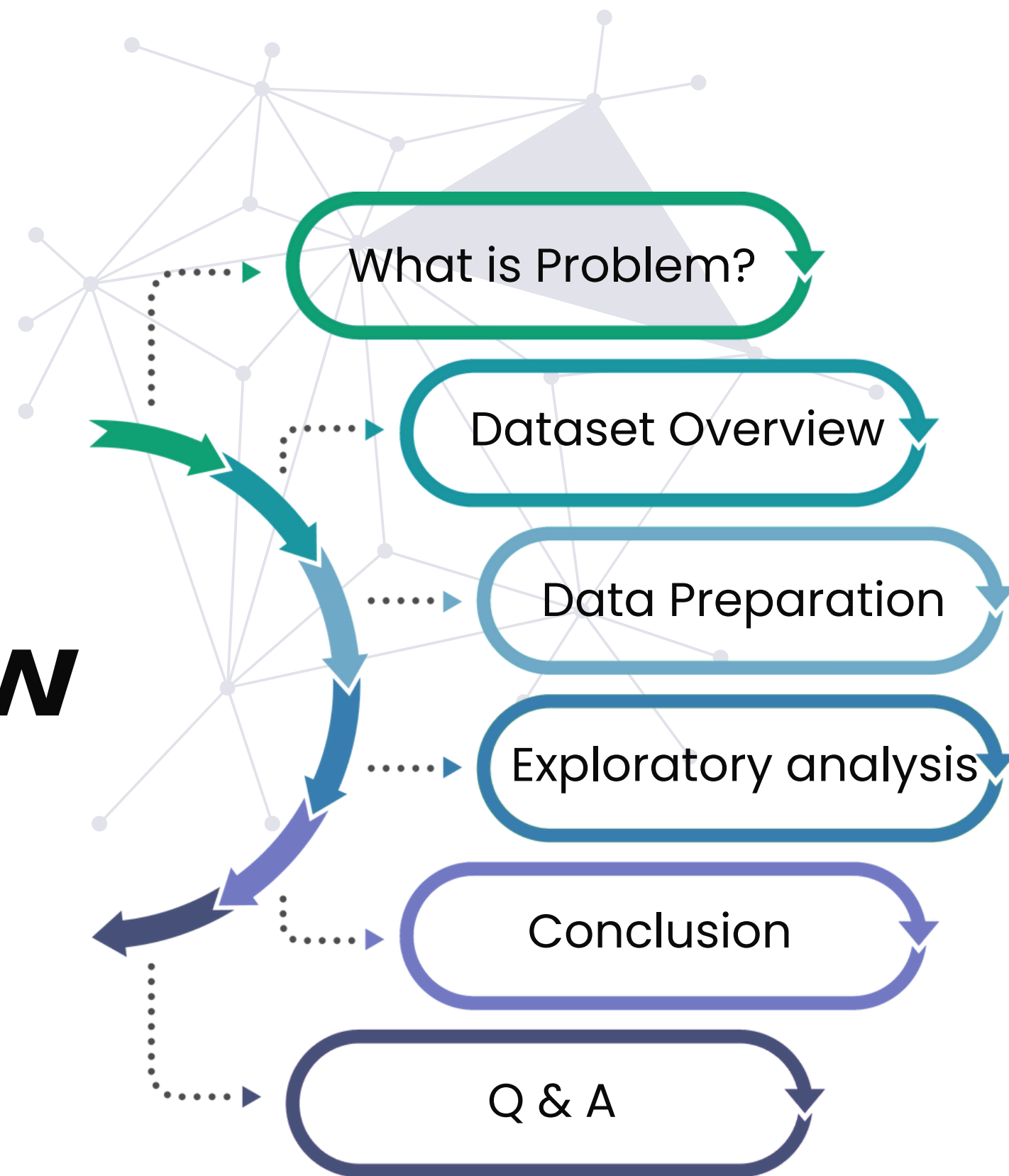


# Introduction

Exploratory Data Analysis (EDA) was performed on the Telco Customer Churn dataset in the state of California, United States. The main focus of the analysis is to understand customer behavior patterns, churn causes, and the characteristics of customers most at risk of leaving the service. This can provide insights that the company can use to reduce churn and improve customer retention.



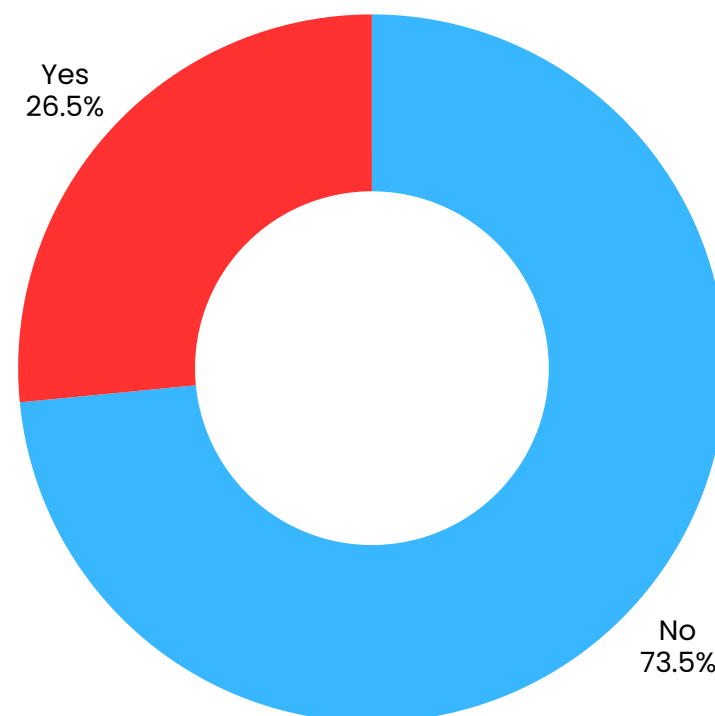
# Overview



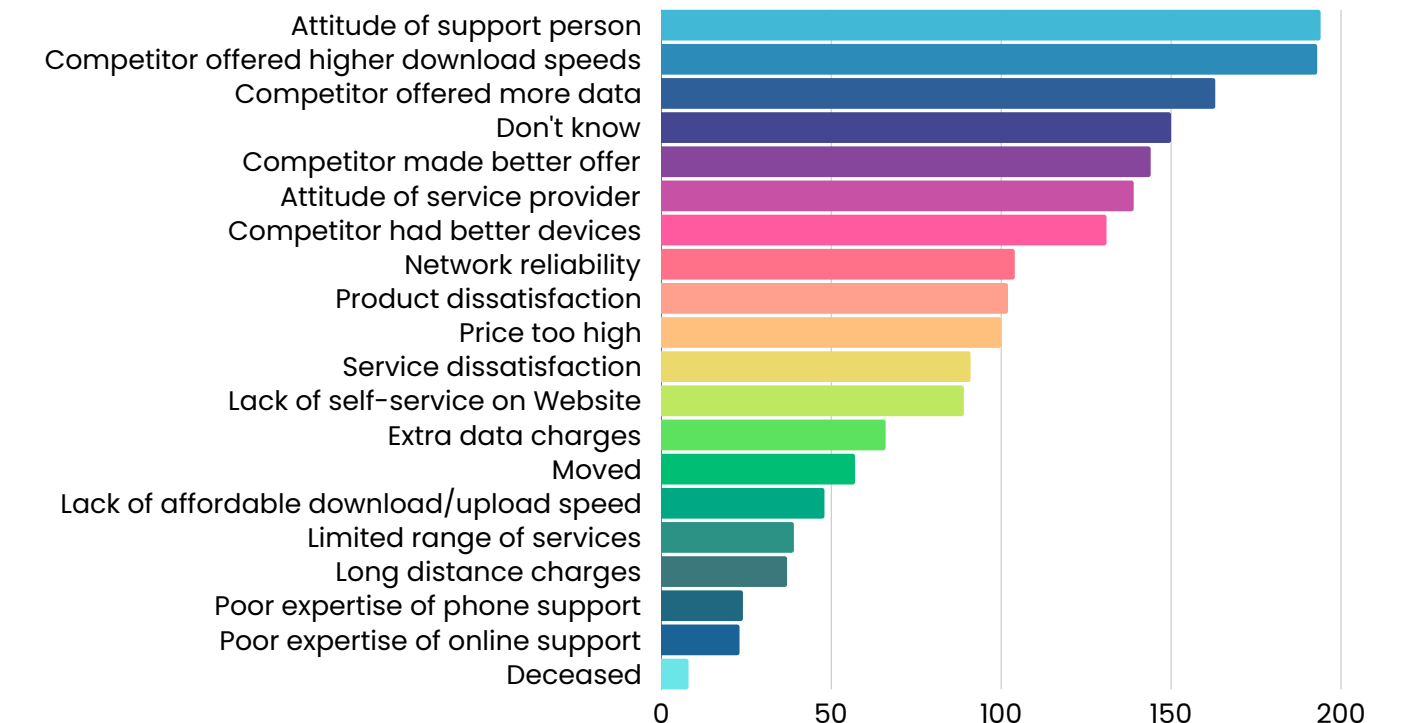
# What is Problem ?

**High churn rate (26%) is causing significant revenue loss, driven mainly by service dissatisfaction and competitive offers.**

Proportion of Churn vs No Churn



Most Frequent Churn Reasons



The churn rate is relatively high (26%), resulting in an estimated yearly revenue loss of USD 1.37M. The dominant churn reasons indicate issues related to service experience and competitive pressure, confirming that churn is strongly driven by customer dissatisfaction.

# Dataset Overview

The dataset contains 7043 customers and 33 features.  
In general, the data includes:



Customer Demographics



Internet and Telephone Services



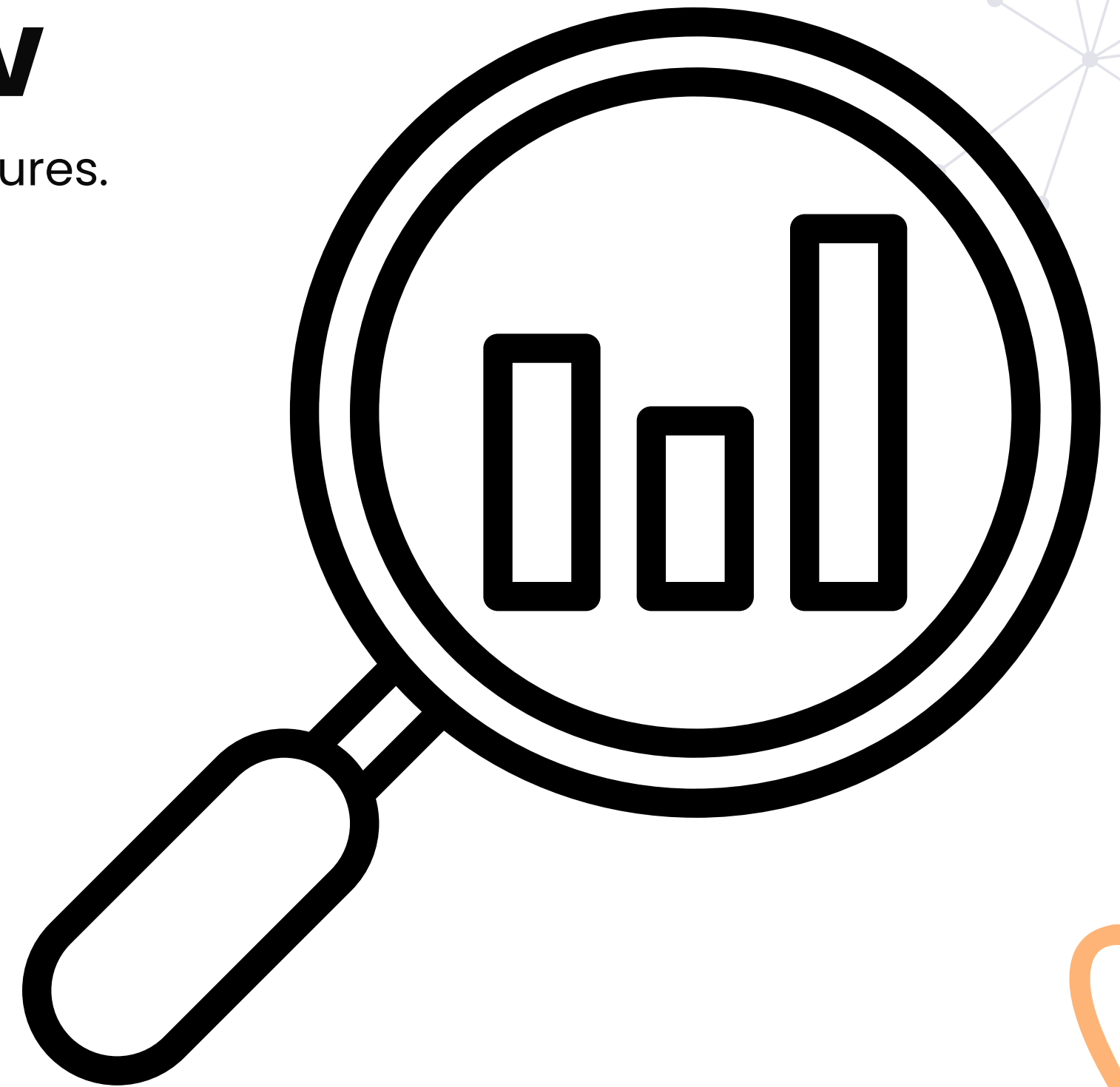
Contract and Payment Information



Monthly Charges and Total Charges



Churn Status



# Data Preparation



Removed duplicates → None found



Fixed inconsistent type: Total Charges → numeric



Check and Fix Data: No Internet Services and No Phone Services → No



Checked missing values & outliers



Basic preprocessing for visualization



# Factors Analyzed in This EDA



## Eksploratory Data Analysis

### Demographics

Knowing whether demographics affect churn.

### Services

Identifying whether service type and service quality affect churn.

### Contract and Payment

Customer behavior factors that influence stability (loyalty)

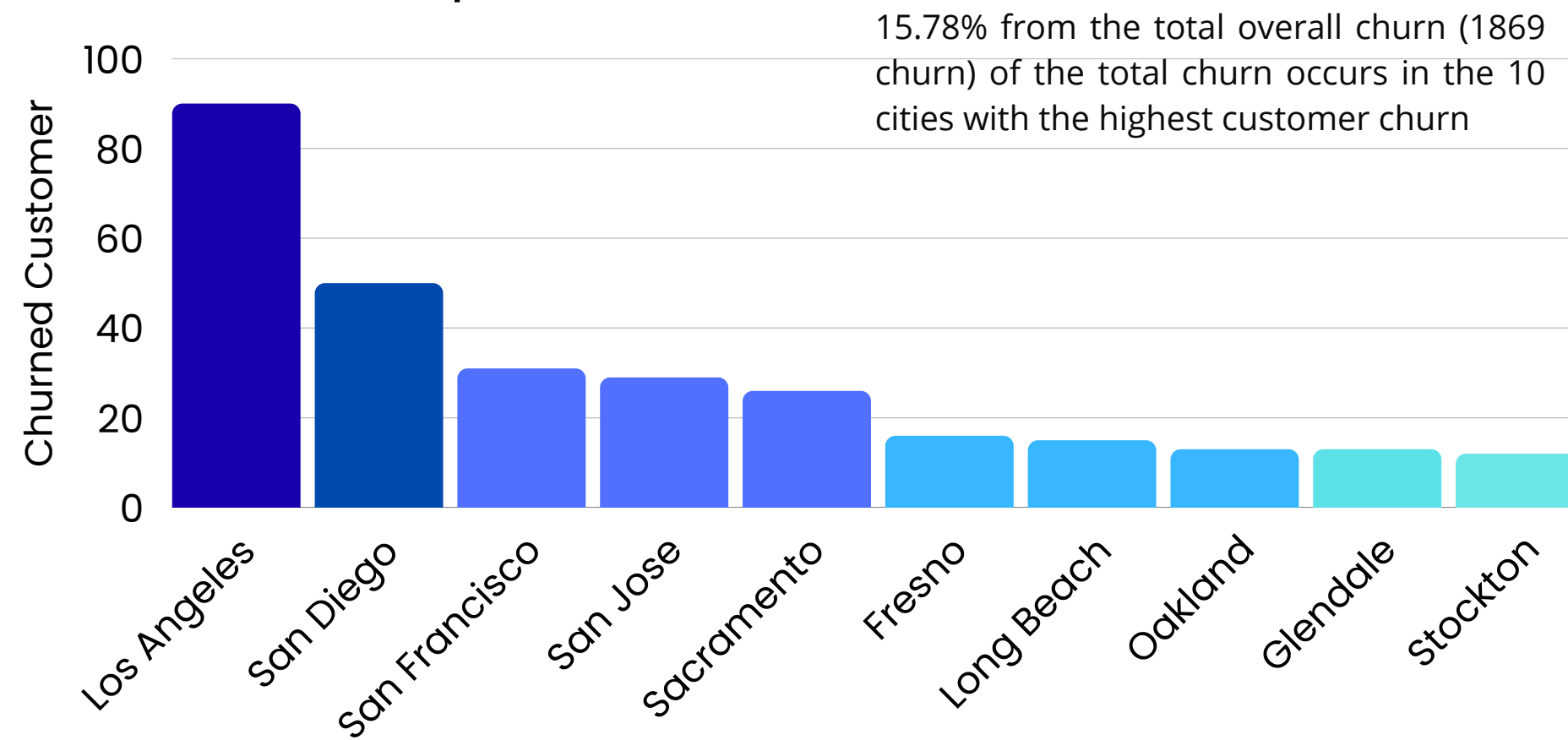
### Financial

Considering the cost sensitivity and financial impact of churn

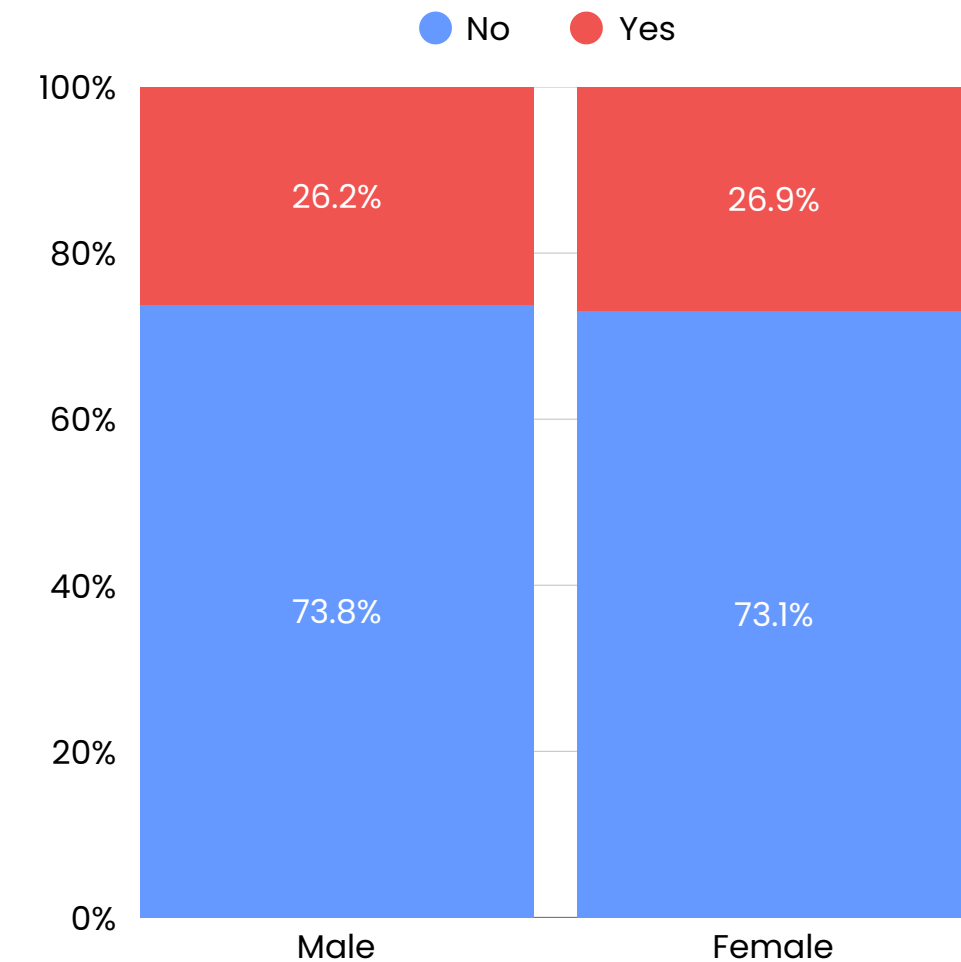


# Demographic Factors: Do They Influence Churn?

## Top 10 Cities of Churned Customer

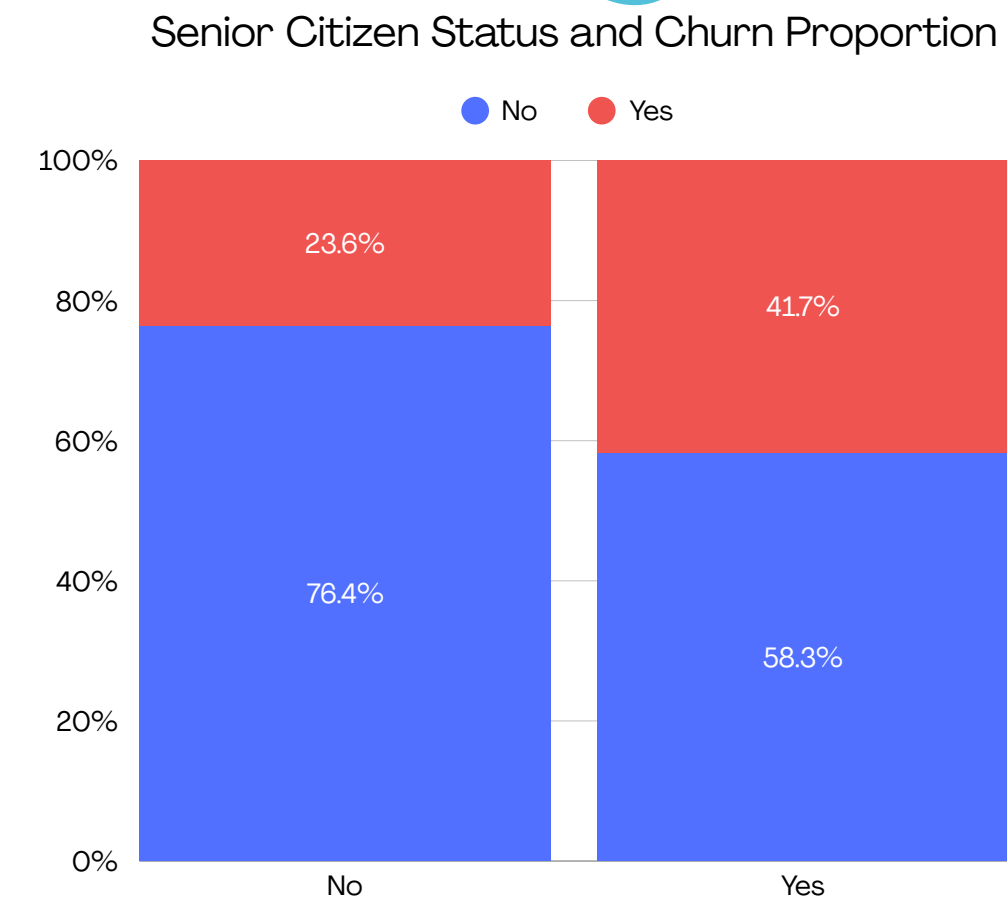
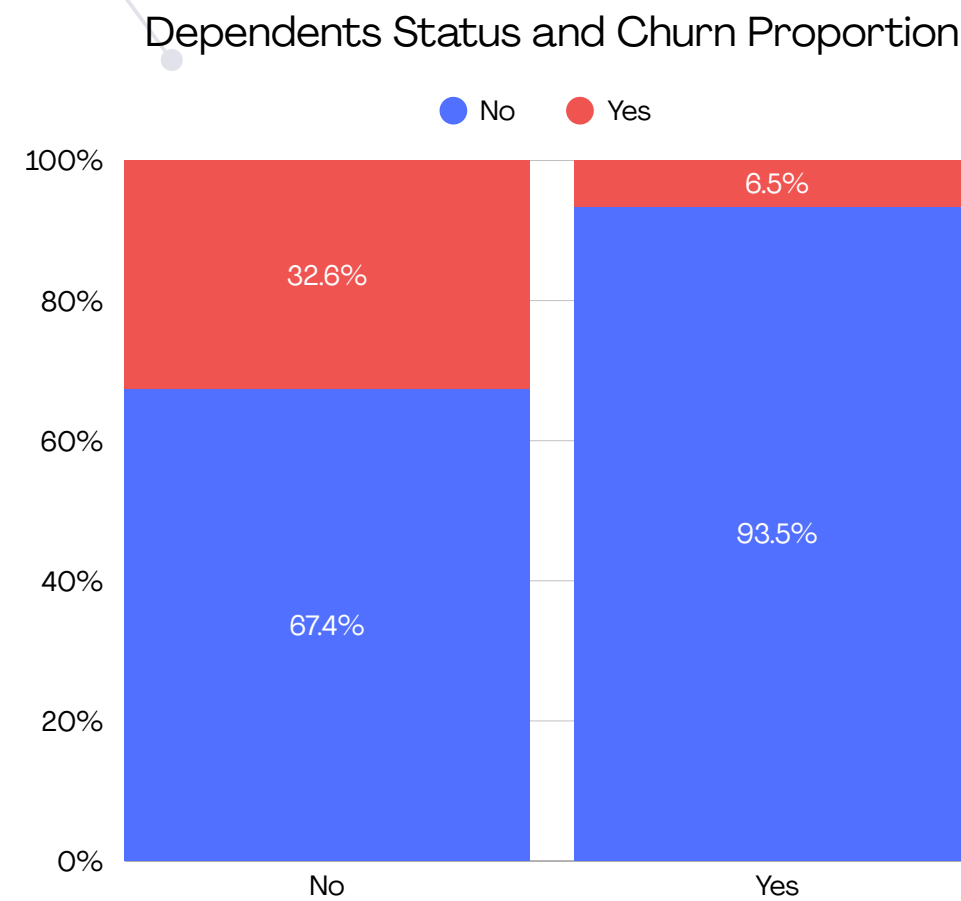
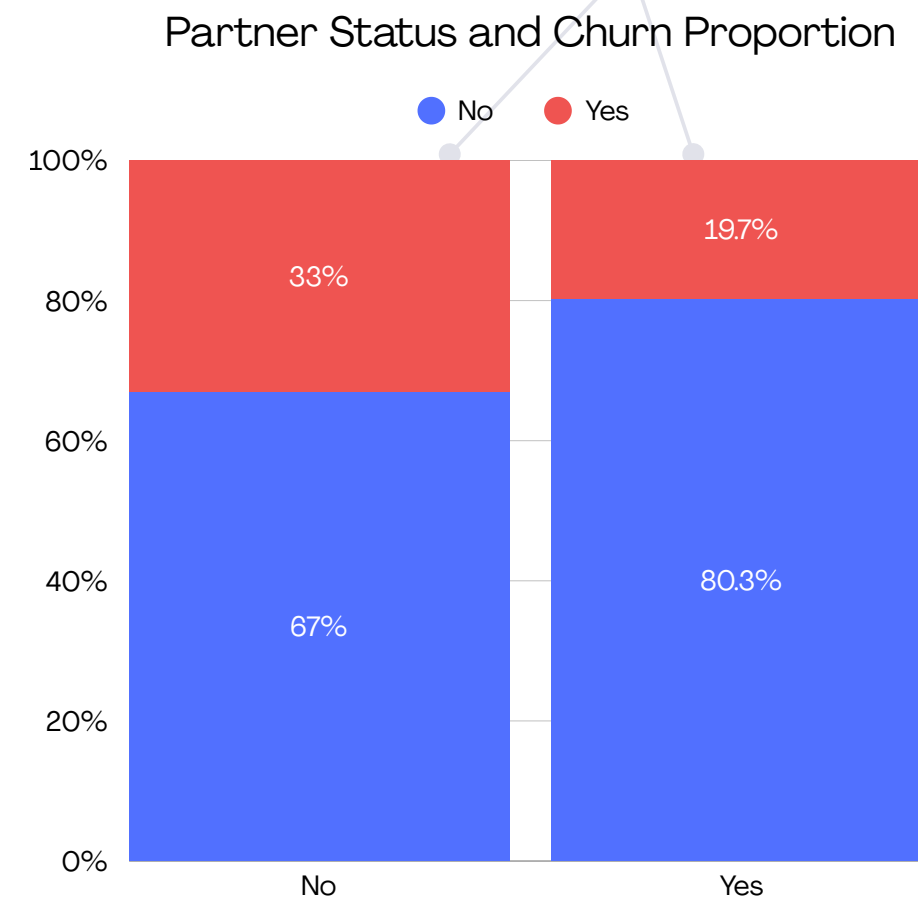


## Gender and Churn Proportion



Of all the customers who churn, the top 10 cities account for only about 15%, and these cities are simply those with the largest number of customers. This means that geographical location is not a cause of churn. The churn rate between men and women is almost the same, so gender is not a factor influencing churn.

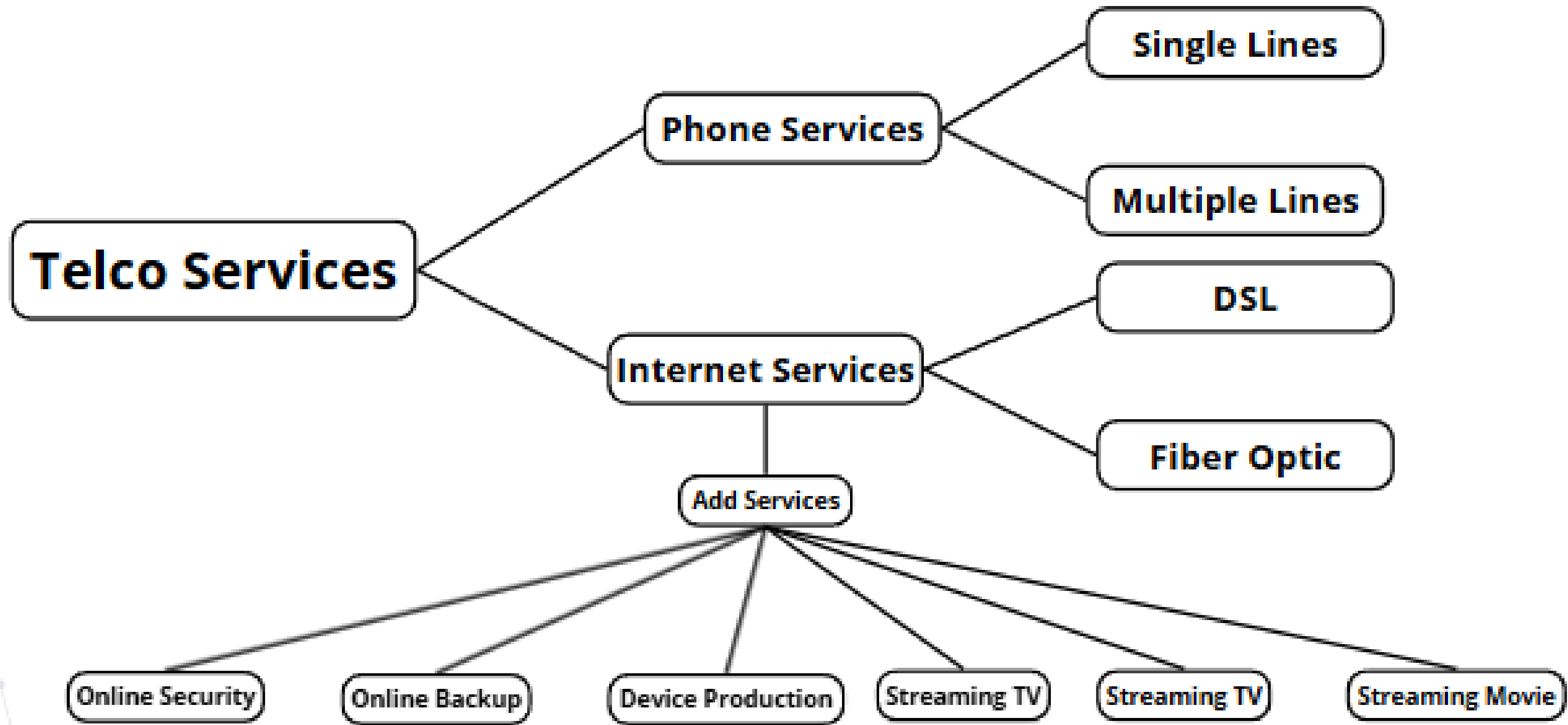




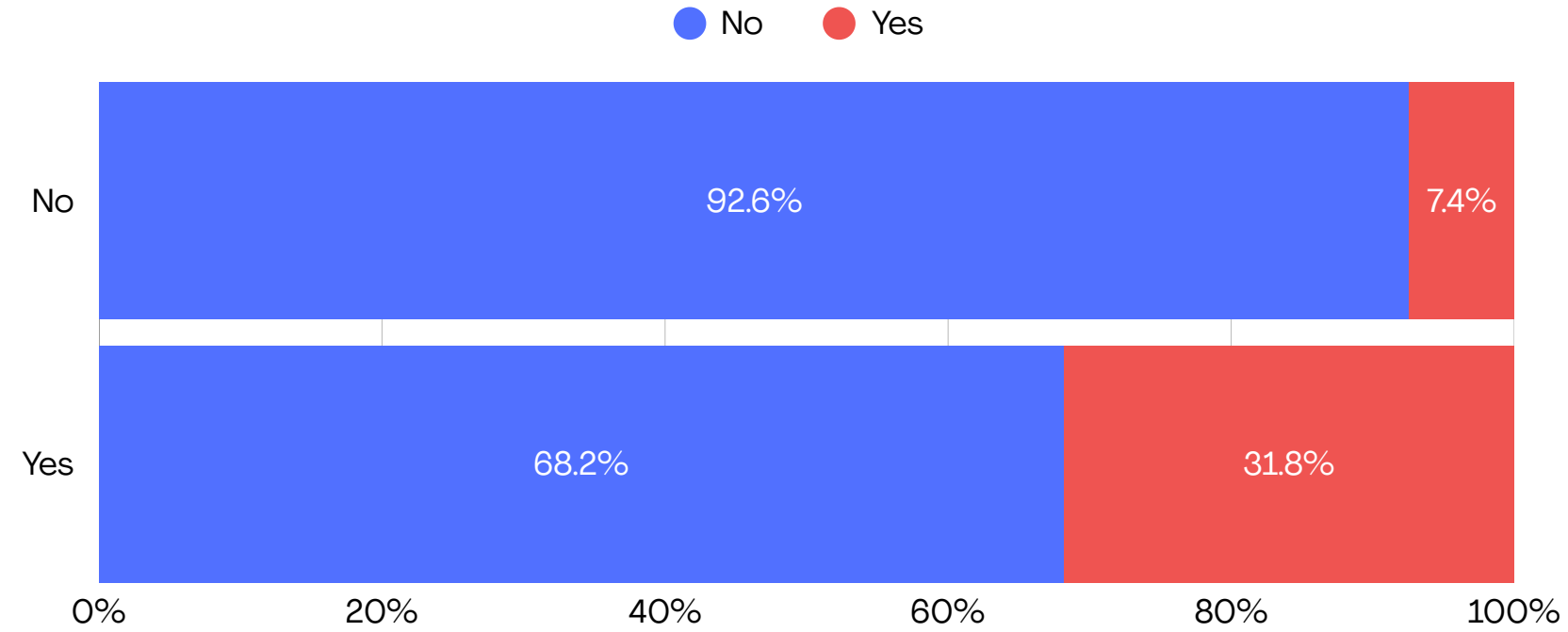
Uji Hipotesis	Partner	Dependets	Senior
Chi-Square	P-Value < 0,05	P-Value < 0,05	P-Value < 0,05

Customers without partners have a higher churn rate. Customers without children are more at risk of churning. The senior group has a higher churn rate.

# Service Usage Factors

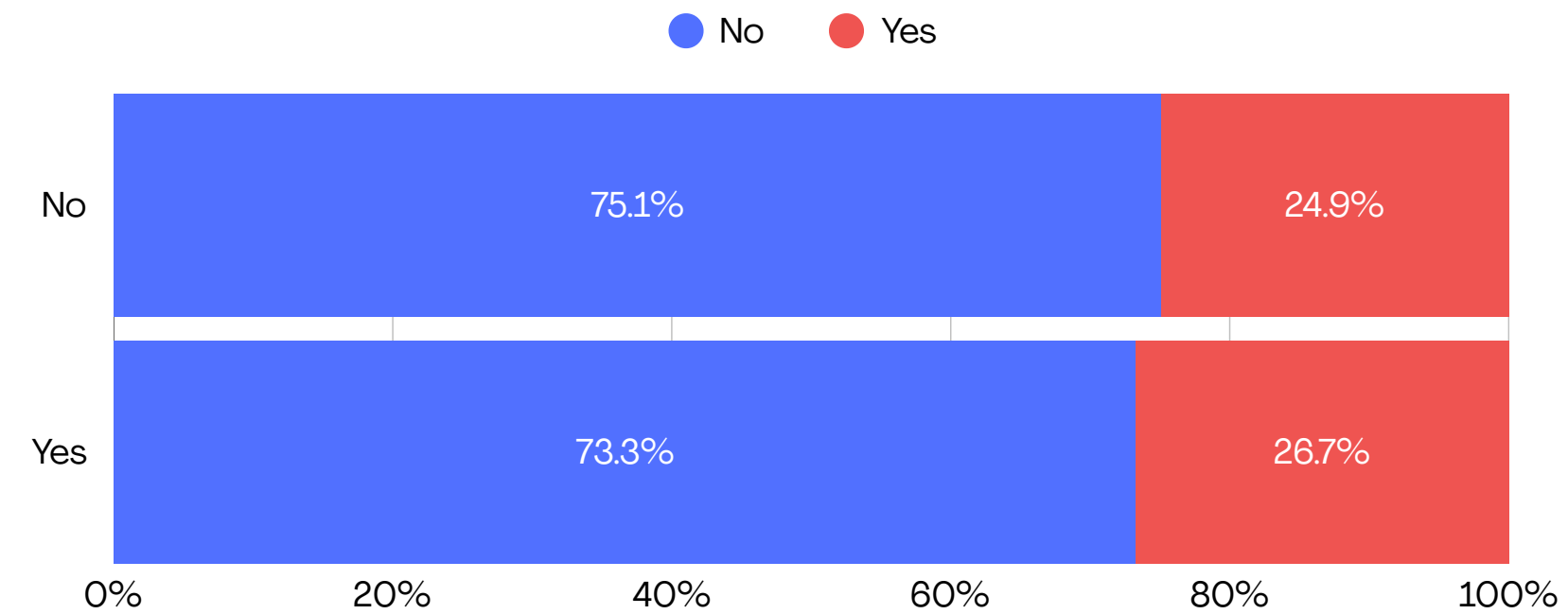


Churn Proportion by Internet Service



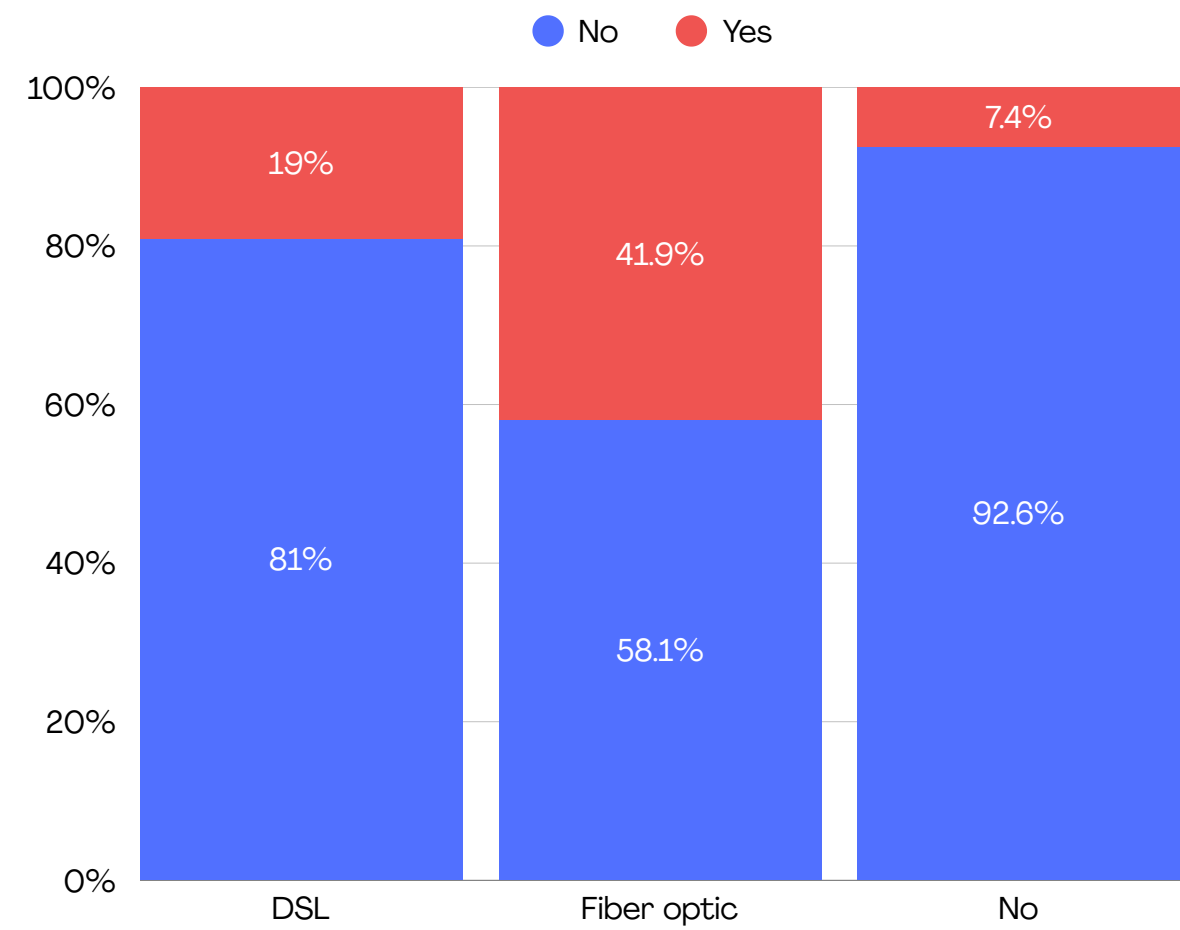
Customers without internet service tend to be more stable (churn rate is only 7.4%). Customers with internet service have a higher churn rate (41.9% overall).

Churn Proportion by Phone Service



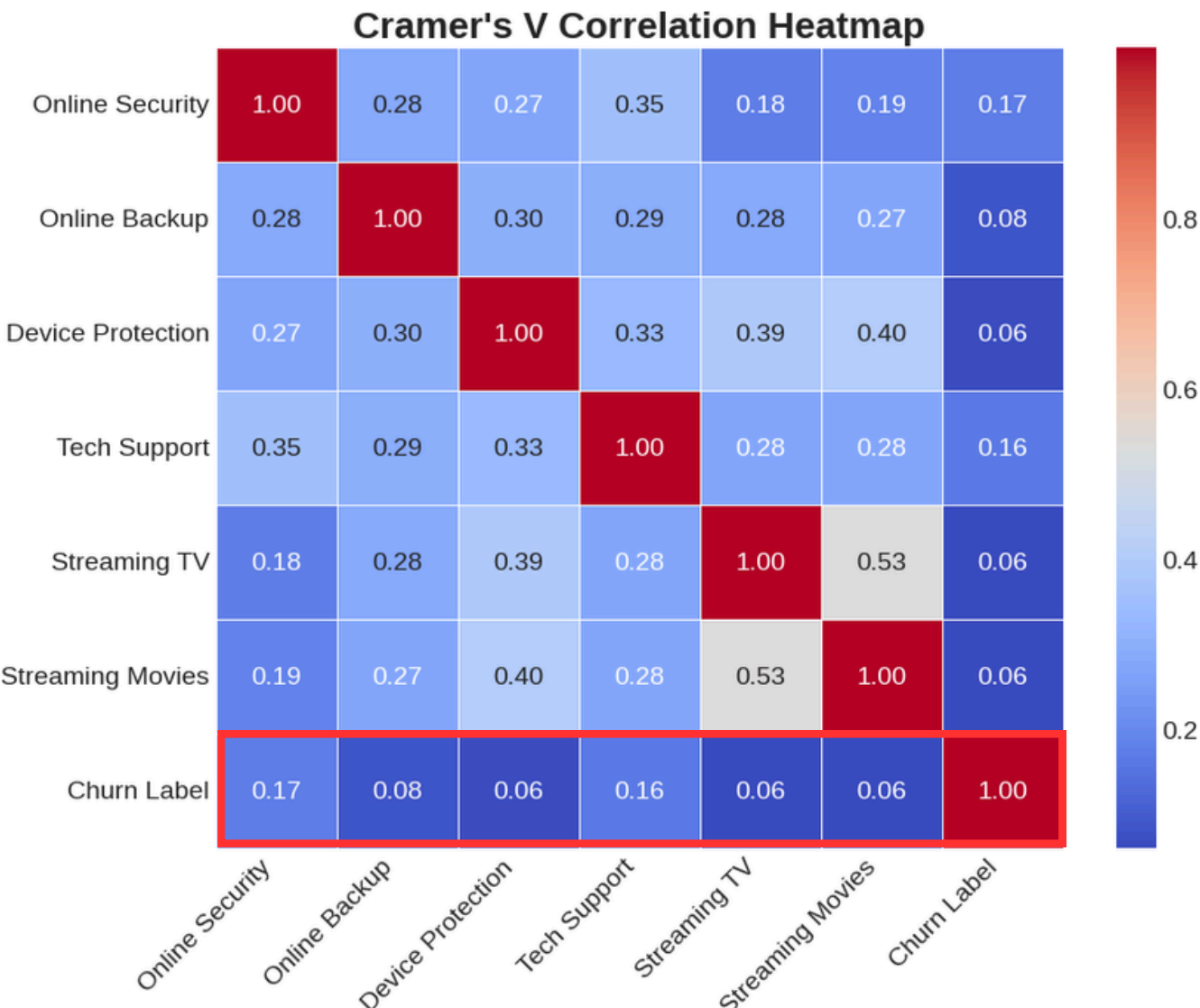
The churn rate for customers with or without phone service is almost the same (around 24–26%).

Churn Proportion by Internet Service



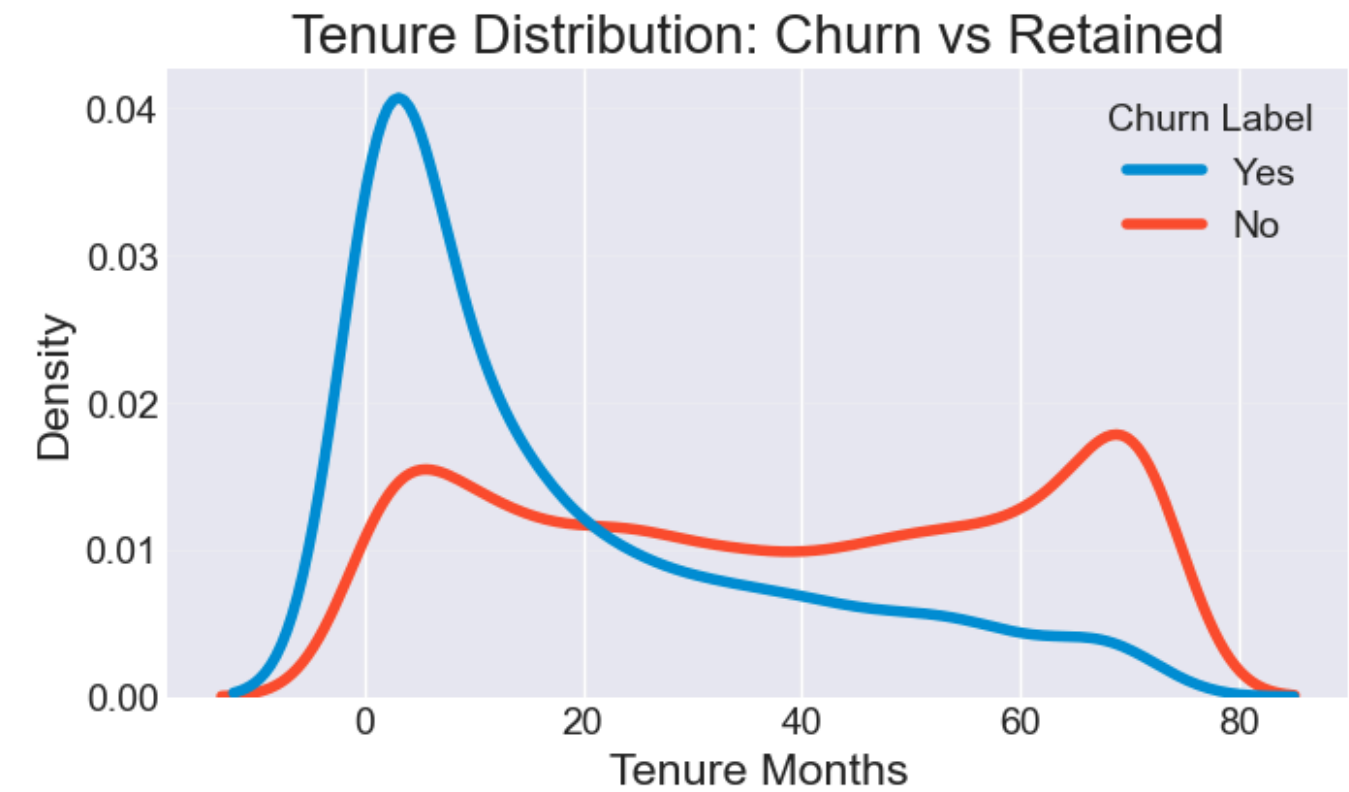
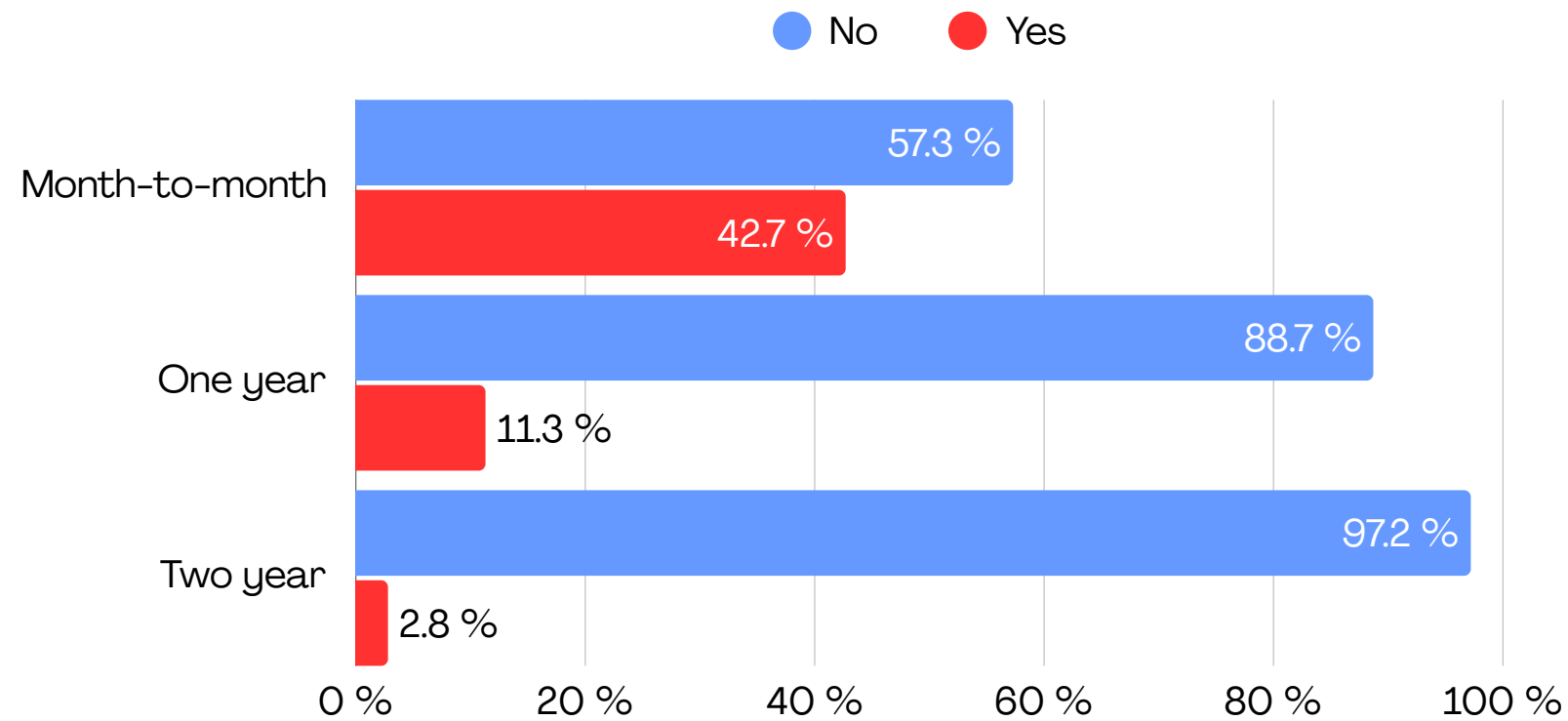
Services like Online Security and Tech Support seem to have a slightly higher correlation compared to other services. Although the numbers remain small, these two services still deserve attention because they are also cited as reasons for customer churn.

Fiber optic customers have the highest churn rate (41.9%), while DSL is much more stable (19%). Customers without internet show the lowest churn rate (7.4%). In other words, customers who use fast internet usually have higher expectations, so they switch more quickly if the service is less than satisfactory.

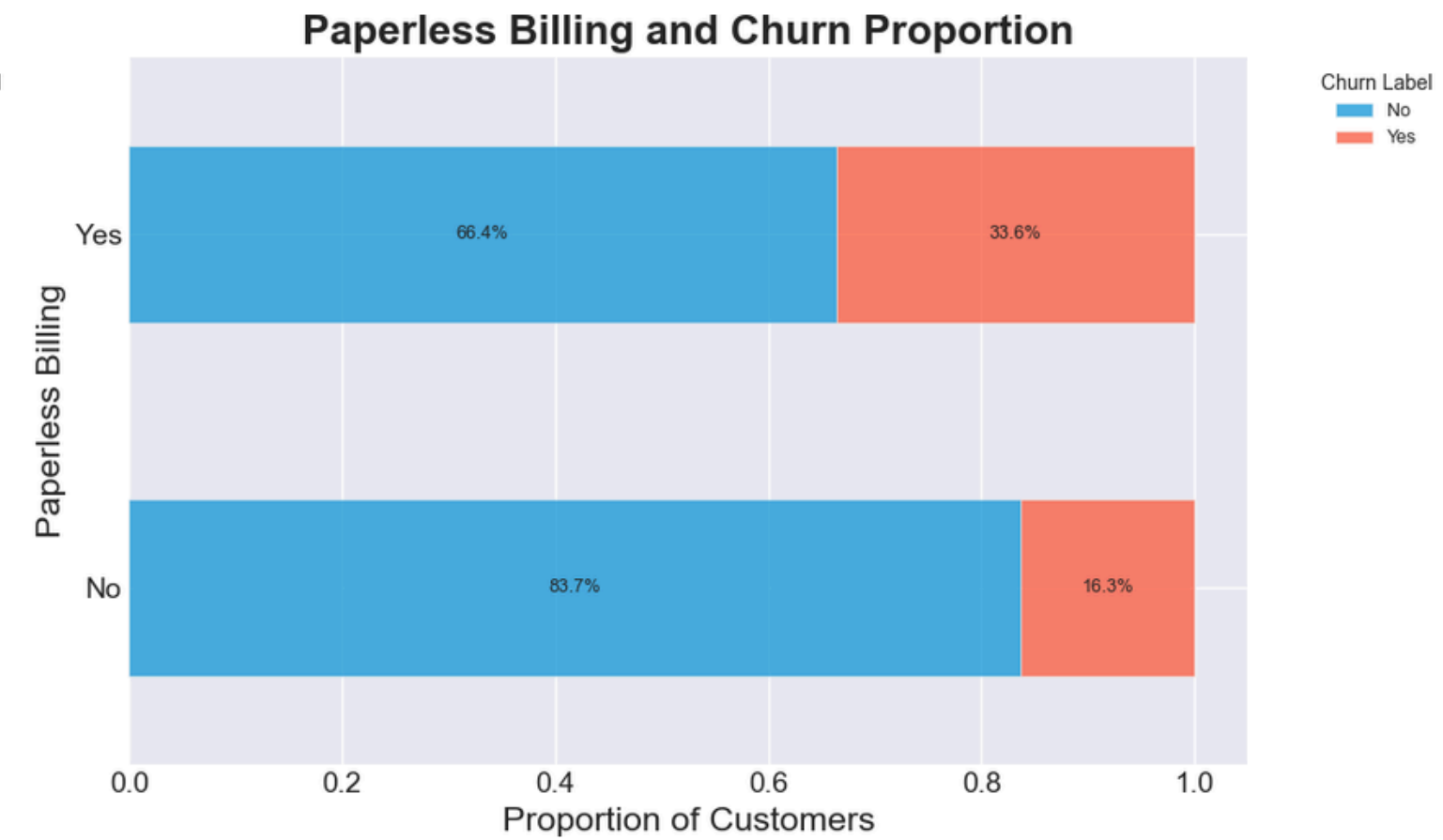
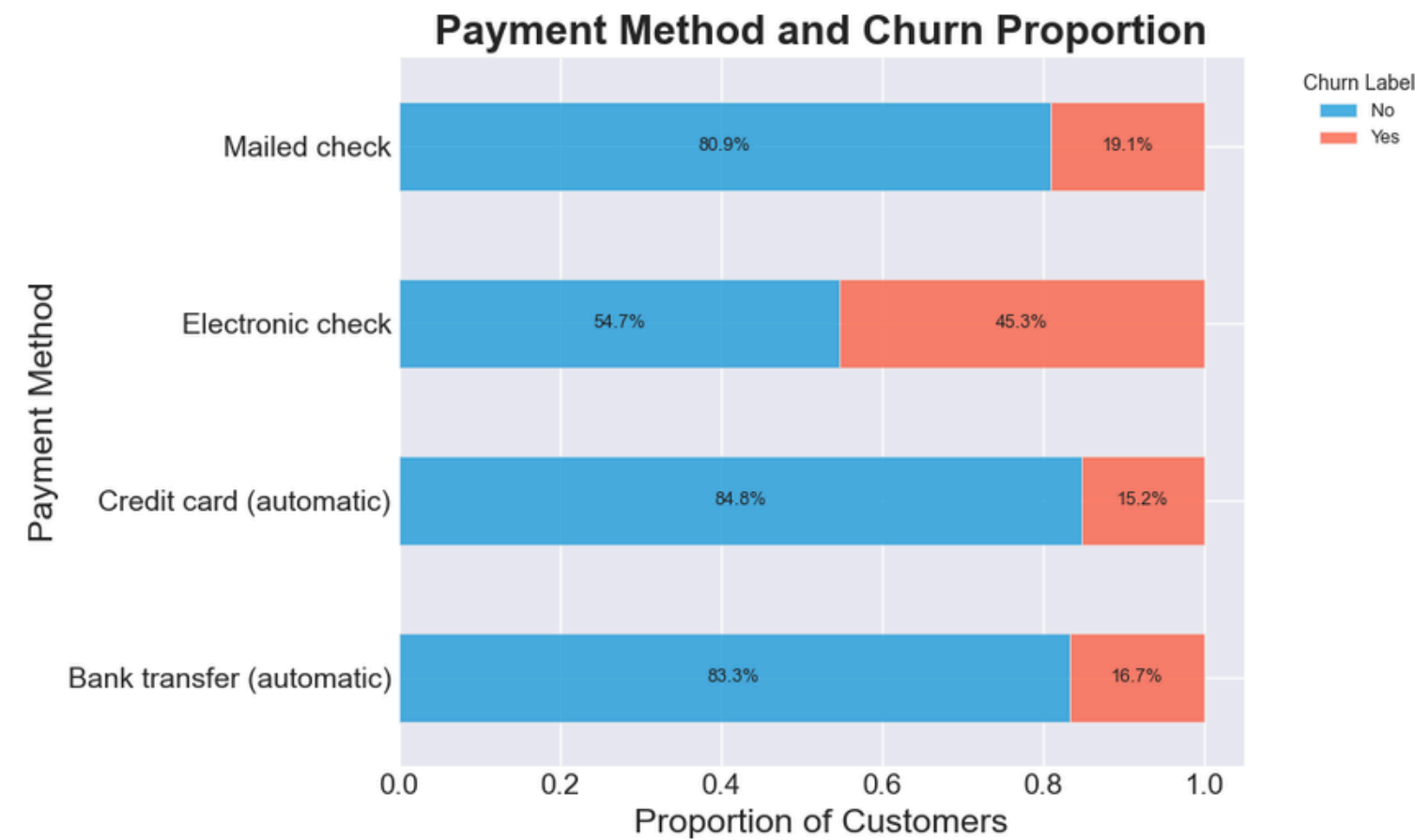




# Contract & Payment

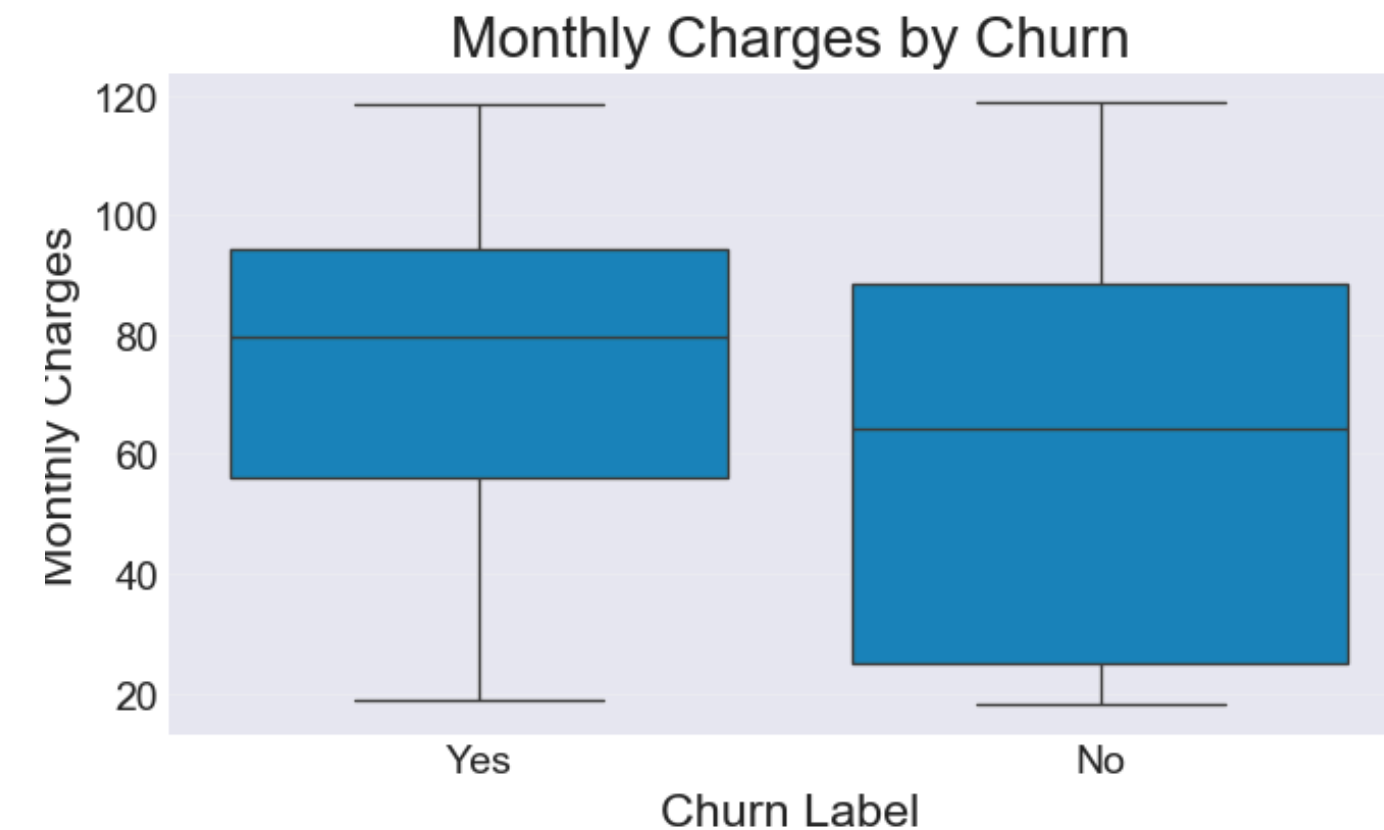
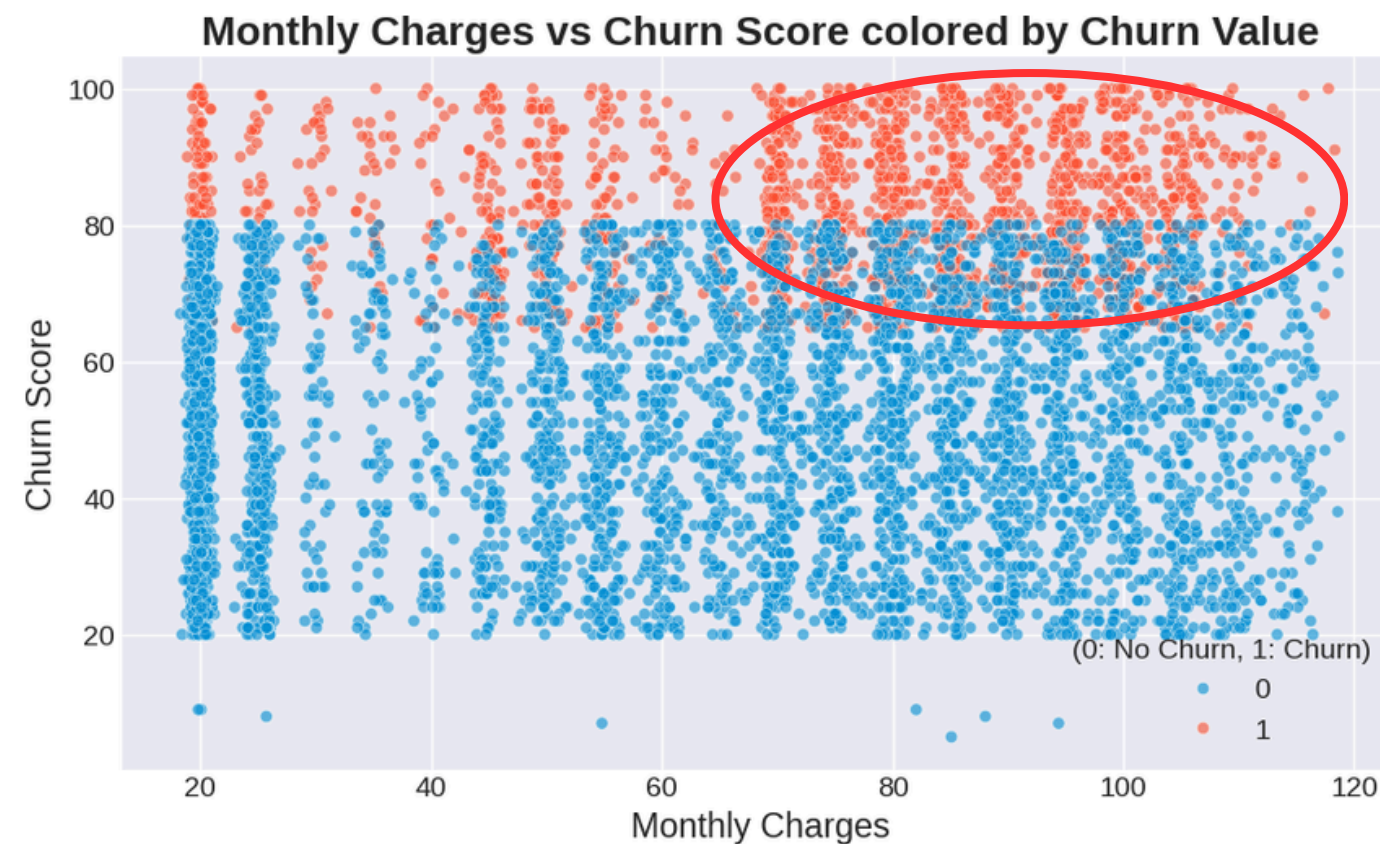


Month-to-month contracts have the highest churn rate, while one and two-year contracts are much more stable. The pattern aligns with tenure, where churn is most prevalent in the first 1–6 months. This indicates that new and non-contracted customers are the most vulnerable group for churn.



Customers using Electronic Check show the highest churn rate, while automatic payment methods are much more stable. Additionally, customers with Paperless Billing are also more likely to churn compared to those who do not use paperless billing.

# Financial Factor



Uji Hipotesis	Monthly Charges
t-test	p-value < 0,05



The t-test results show that churned customers have significantly higher Monthly Charges compared to retained customers (p-value < 0.05). This means that high monthly costs also contribute to churn risk, although they are not the only factor.





# Conclusion



Overall, customer churn is influenced by a combination of demographic, service, contract, and financial factors. From a demographic perspective, single customers without dependents, as well as elderly customers, have a higher risk of churn. Regarding service factors, churn is most prevalent among Fiber Optic users and customers with month-to-month contracts, indicating that service quality and contract strength play a significant role. From a financial perspective, the t-test results show that churned customers have significantly higher monthly costs, especially when the service quality received is not commensurate with those costs. This finding aligns with the dominant reasons for churn, namely service dissatisfaction and competitor offers. Thus, churn primarily occurs when the perceived value to the customer is not balanced by the cost they incur, especially for new customers who are not bound by strong contracts.







# Recommendation

1. Prioritize improving the quality of Fiber Optic services and providing a quick response to customer complaints in this segment.
  2. The company is also advised to build an Early Retention Program for new customers thru active onboarding, service education in the initial months, and regular follow-ups to ensure customer satisfaction from the start. To strengthen loyalty, companies need to encourage migration to long-term contracts thru discount incentives or service bundling.
  3. From a financial perspective, the pricing strategy needs to be aligned with the value of the service received by customers, especially for segments with high monthly charges.
  4. Companies can enhance customer engagement by converting manual payment methods to auto-payment and implementing segment-based retention strategies, particularly for single customers and senior citizens, thru an approach that emphasizes service stability and ease of use.
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THANK YOU!

