# PRODUCT ANALYTICS CAPSTONE PROJECT – MILESTONE 1

Customer Segmentation and Churn Pattern Analysis


## Abstract

This report presents the first milestone of a Product Analytics capstone project focused on analyzing customer churn for TeleConnect, a telecommunications service provider. The objective of this milestone is to perform customer segmentation and identify key churn patterns using historical customer data, laying the foundation for predictive modeling and targeted retention strategies.

Company: TeleConnect (Telecommunications Provider)
Tool Used: Microsoft Excel



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## 1.Introduction and Business Overview

This report presents **Milestone 1** of the Product Analytics Capstone Project, focusing on customer segmentation and churn pattern analysis for **TeleConnect**, a telecommunications service provider. The primary objective of this milestone is to analyse customer behaviour, identify key churn drivers, and generate actionable insights that can support proactive retention strategies. This analysis lays the groundwork for predictive churn modelling and targeted customer retention programs in subsequent milestones.

TeleConnect currently faces a high customer churn rate, leading to significant revenue loss and increased customer acquisition costs. Existing retention efforts are largely reactive, with limited differentiation across customer segments. Therefore, a data-driven understanding of churn patterns is critical for improving customer lifetime value and overall business performance.

## 2. Dataset Overview

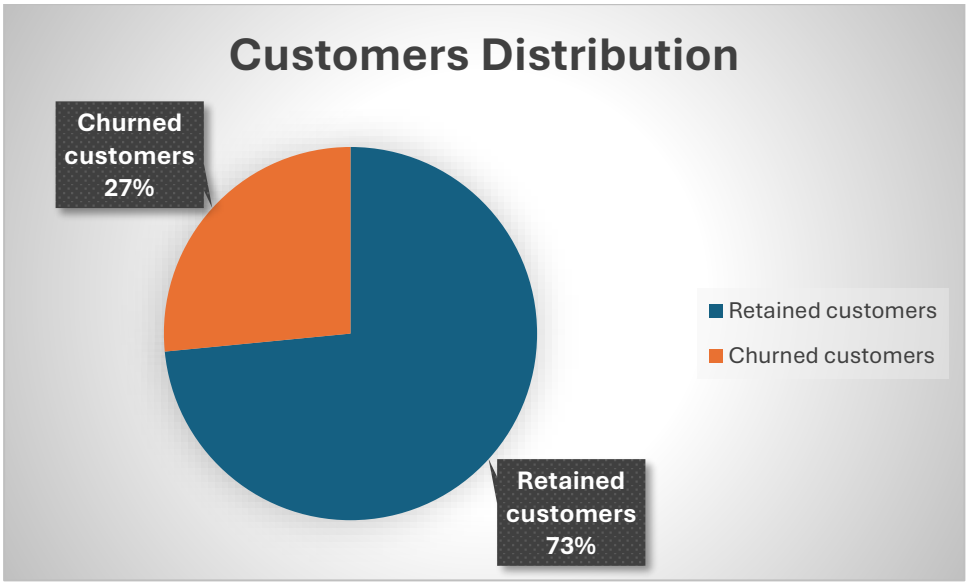
The analysis is based on the Telco Customer Churn dataset, which contains **7,043 customer records** and **21 variables**. The dataset includes information related to customer demographics, service subscriptions, tenure, contract details, payment methods, and billing amounts. The target variable is customer churn, indicating whether a customer has discontinued services.

To support segmentation analysis, additional features were engineered, including service count, engagement level, tenure segments, pricing segments, payment grouping, and churn flags. Data cleaning steps included handling missing values in total charges and ensuring consistency in categorical variables.

## 3. Overall Churn Rate and Revenue Impact

Out of the total 7,043 customers analysed, **1,869 customers have churned**, resulting in an overall churn rate of **26.54%**, which is significantly higher than the industry benchmark of approximately 20%. The remaining **5,174 customers** have been retained.

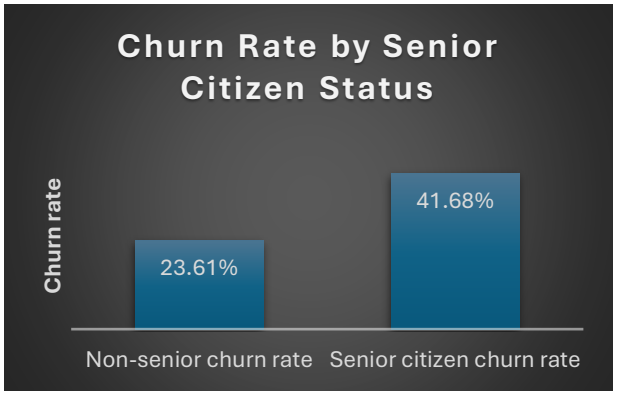
From a revenue perspective, churned customers account for a **lost monthly revenue of ₹139,130**, which translates into an estimated **annual revenue loss of ₹16.7 lakh**. Given the high cost of acquiring new customers, this level of churn represents a substantial financial risk and highlights the importance of proactive churn management.

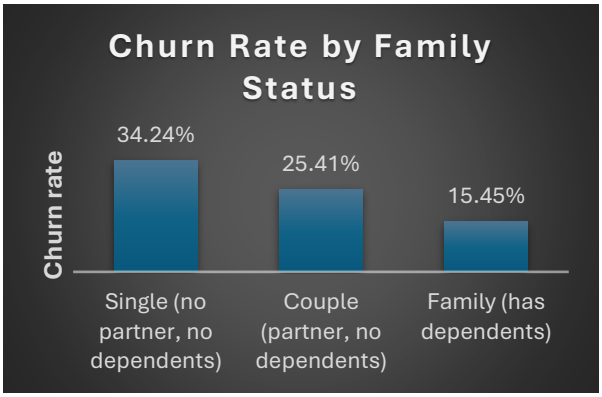


## 4. Demographic Segmentation Analysis

Demographic analysis indicates that **gender does not significantly influence churn**, with male and female customers showing nearly identical churn rates (26.16% and 26.92%). In contrast, **senior citizen status is a strong churn driver**. Senior citizens exhibit a much higher churn rate of **41.68%**, compared to **23.61%** among non-senior customers, highlighting this segment as high risk.

Family structure also impacts churn behaviour. **Single customers** show the highest churn rate (**34.24%**), while **customers with dependents** have the lowest churn (**15.45%**). This suggests that family customers are more stable due to higher service dependency and switching costs. Overall, demographic churn is influenced more by life-stage factors than by gender.



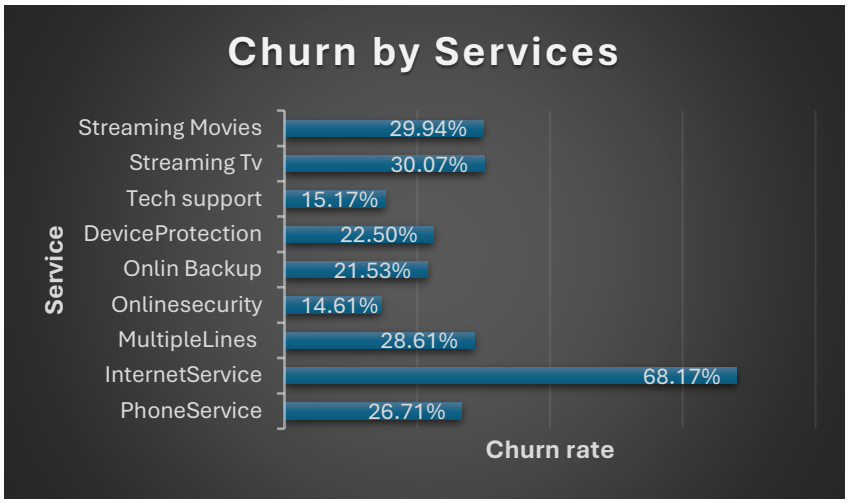




## 5. Service Usage and Churn Analysis

Service usage analysis highlights clear differences in churn behaviour across various services. **Core connectivity services**, such as Phone Service, Multiple Lines, and Internet Service, are associated with **moderate to high churn**, indicating that basic service availability alone does not ensure retention. **Entertainment services** like Streaming TV and Streaming Movies also show relatively higher churn, suggesting limited effectiveness in reducing customer attrition.

In contrast, **value-added services** including Online Security, Tech Support, Online Backup, and Device Protection are consistently associated with **significantly lower churn rates**. These services increase customer dependency and perceived value, making customers less likely to switch.

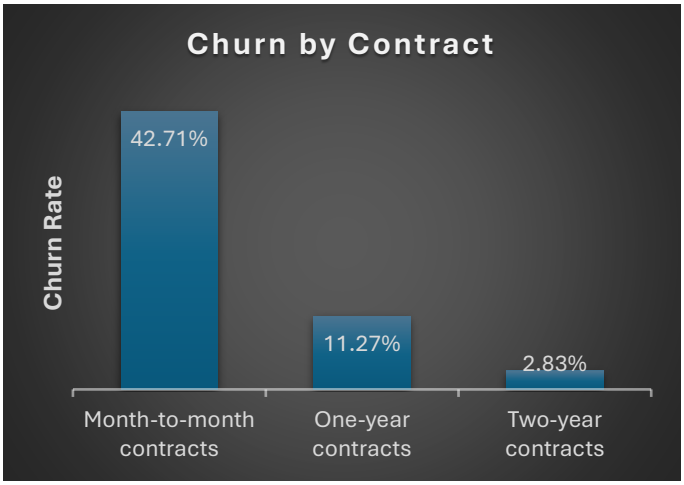
Overall, the analysis indicates that **support and protection services play a stronger role in retention than connectivity or entertainment services**.

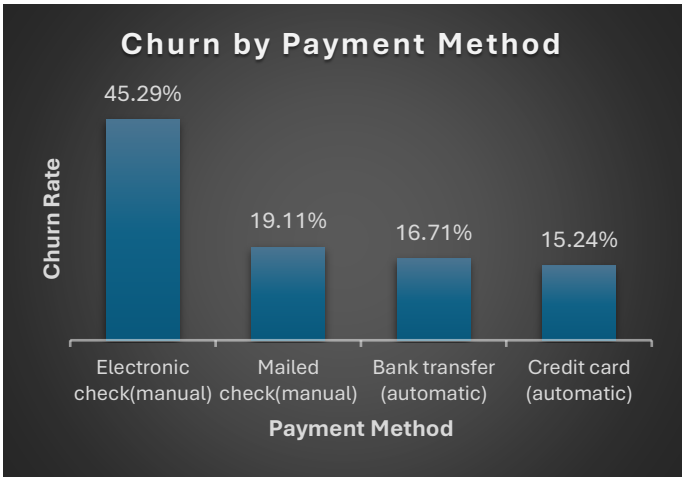


## 6. Contract and Payment Method Findings

Contract type is one of the strongest predictors of churn. Customers on month-to-month contracts exhibit the highest churn rate (42.71%), while customers on two-year contracts show minimal churn (2.83%). Longer contract durations significantly improve customer retention.

Payment behaviour further influences churn. Customers using manual payment methods (electronic and mailed checks) churn at much higher rates than those using automatic payment methods (bank transfer or credit card). This suggests that payment friction increases churn risk.

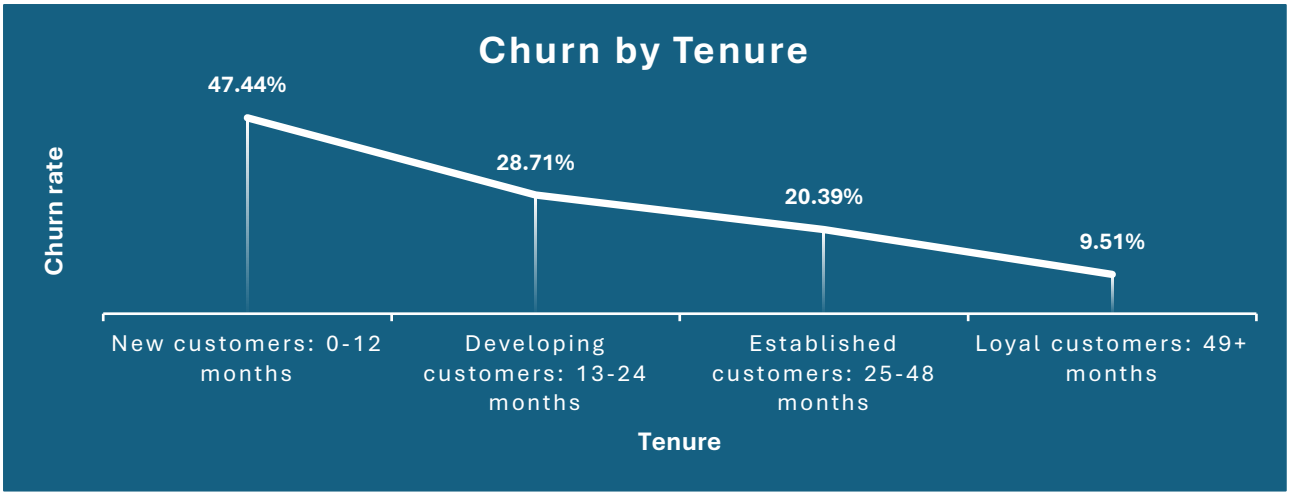



## 7.Tenure Cohort Analysis

Tenure-based cohort analysis shows that churn is heavily concentrated in the early stages of the customer lifecycle. New customers (0–12 months) exhibit the highest churn rate at 47.44%, which steadily declines as tenure increases. Loyal customers (49+ months) show the lowest churn rate (9.51%) and higher average monthly charges.

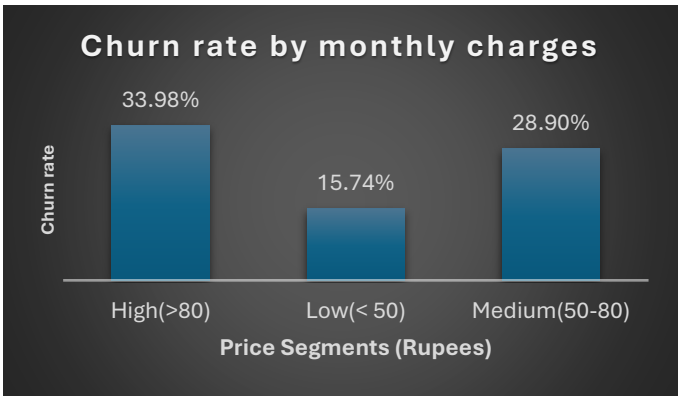
This pattern highlights the first year of tenure as a critical retention window, particularly the early onboarding phase.

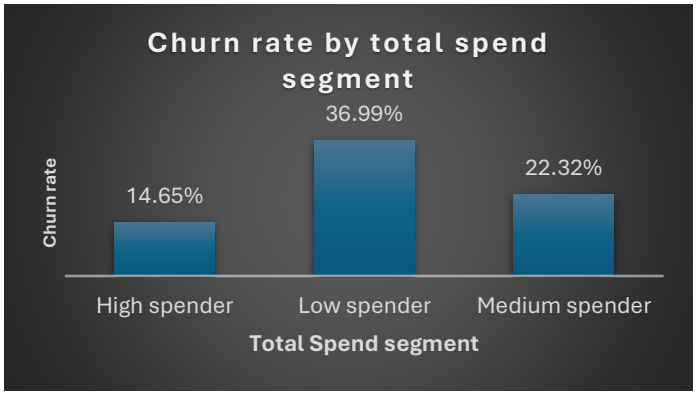



## 8. Price Sensitivity Analysis

Pricing analysis reveals that customers with higher monthly charges churn more frequently than those in lower price segments. Additionally, customers with low total spend exhibit the highest churn, while high spenders show the lowest churn and stronger loyalty.

This indicates that churn is driven not only by price, but by a price–value mismatch, where customers do not perceive sufficient value relative to what they are paying.




**9.Key Patterns Identified**

The key churn patterns observed from the analysis are:

- High churn among month-to-month contract customers
- Elevated churn for senior citizens and single customers
- Higher churn during early tenure (0–12 months)
- Lower churn among customers using support and security services
- Increased churn among medium-engagement and high-price customers

**9. Initial Hypotheses about Churn Drivers**

Based on the analysis, the following hypotheses are proposed:

- Customers churn when perceived value does not justify the price paid
- Lack of proactive onboarding during early tenure increases churn risk
- Absence of support and protection services reduces customer stickiness
- Manual payment processes increase friction and churn likelihood
- Uniform retention offers fail to address segment-specific churn drivers

These hypotheses will be tested further in the next milestone using predictive modeling techniques.