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 analysing 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 modelling 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.

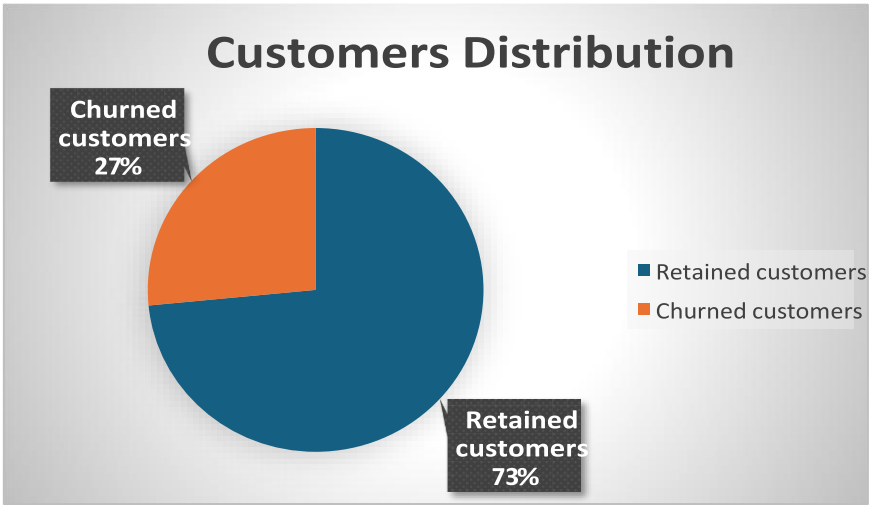
2. DATASET OVERVIEW

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.

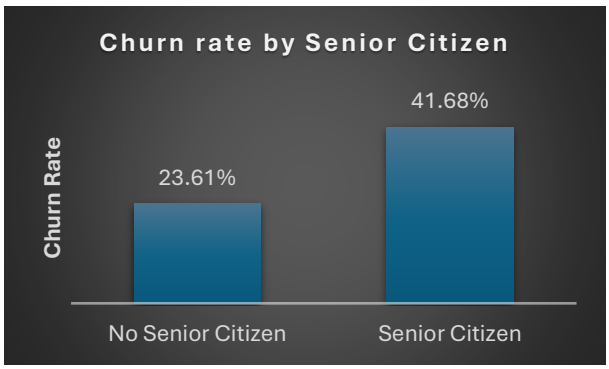
3. OVERALL CHURN RATE AND REVENUE IMPACT

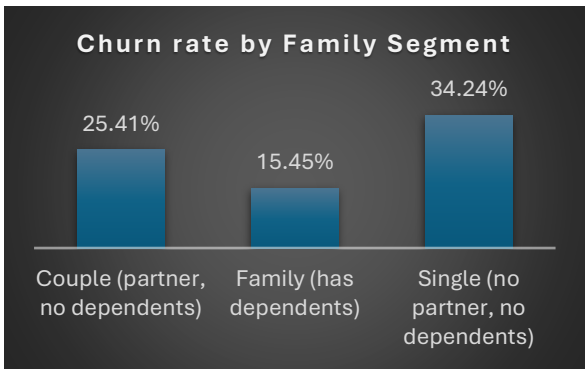
Out of the total 7,043 customers analysed, **1,869 customers have churned**, resulting in an overall churn rate of **26.54%**, which is significantly higher than the industry benchmark of approximately 20%.
The remaining **5,174 customers** have been retained.
From a revenue perspective, churned customers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

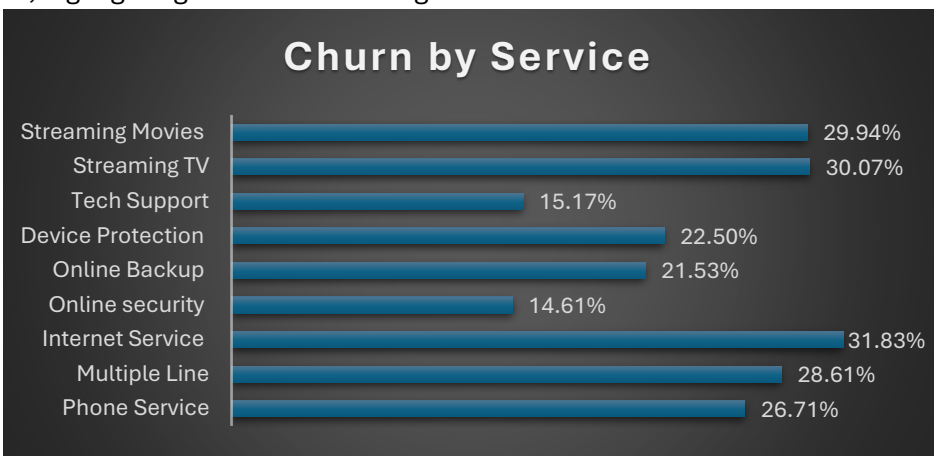




5. SERVICE USAGE AND CHURN ANALYSIS

Churn rates vary significantly across services. Core services such as **Phone Service (26.71%)**, **Multiple Lines (28.61%)**, and **Internet Service (31.83%)** show moderate to high churn, indicating that basic connectivity alone does not ensure retention. Entertainment services like **Streaming TV (30.07%)** and **Streaming Movies (29.94%)** have limited impact on reducing churn.

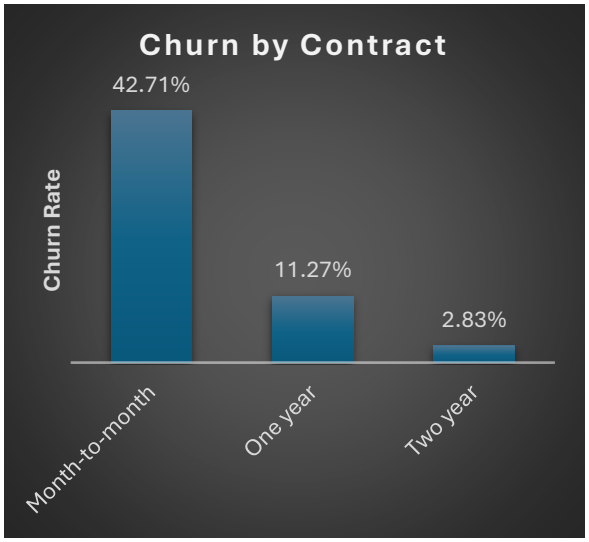
In contrast, value-added services including **Online Security (14.61%)**, **Tech Support (15.17%)**, **Online Backup (21.53%)**, and **Device Protection (22.50%)** are associated with substantially lower churn, highlighting their role as strong retention drivers.

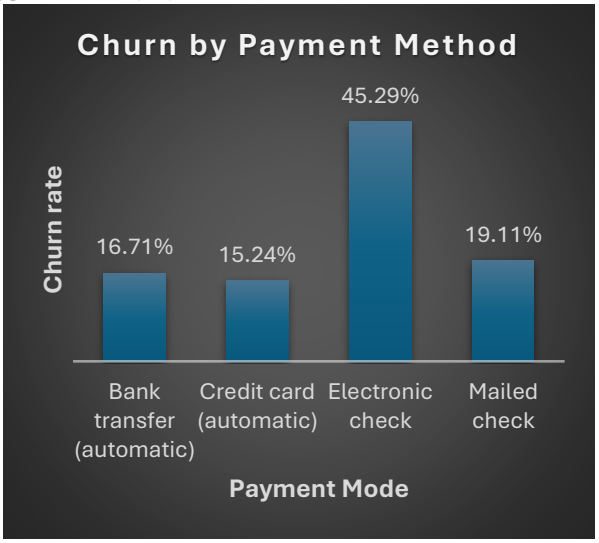


6. CONTRACT AND PAYMENT METHOD FINDINGS

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.

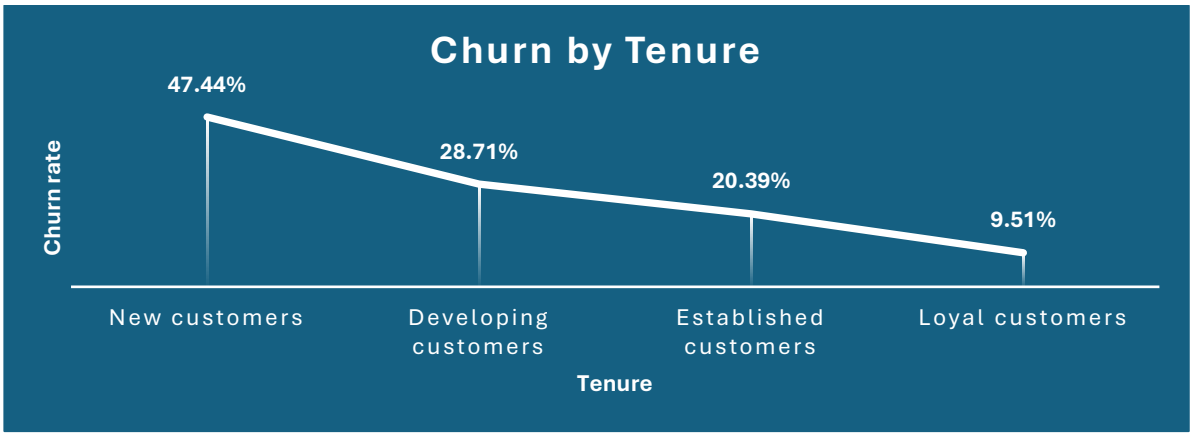




7.Tenure Cohort Analysis

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.

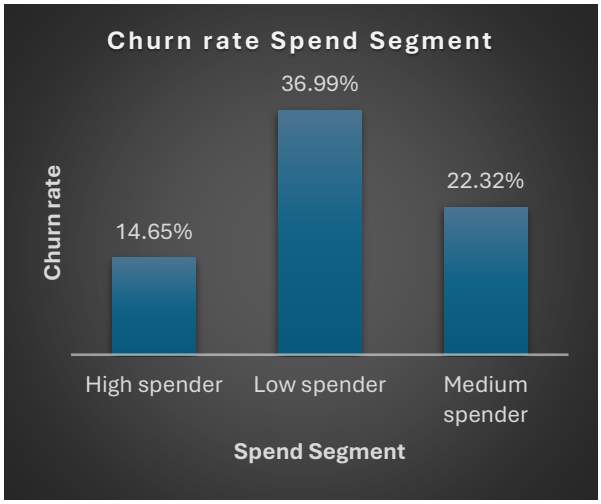
This pattern highlights the first year of tenure as a critical retention window, particularly the early onboarding phase.

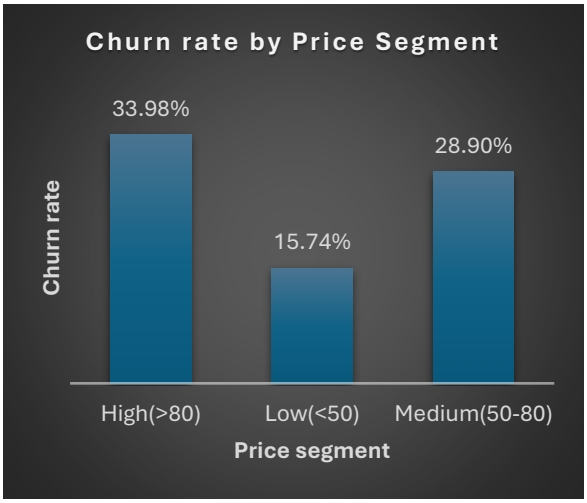


8. PRICE SENSITIVITY ANALYSIS

Pricing analysis indicates that **customers in the high monthly charge segment (>₹80) exhibit the highest churn (33.98%)**, while **low-price customers (<₹50) show the lowest churn (15.74%)**, suggesting that higher recurring charges increase churn risk when perceived value is insufficient. Medium-priced customers fall in between with a churn rate of **28.90%**.

From a total spend perspective, **low spenders have the highest churn (36.99%)**, whereas **high spenders show the lowest churn (14.65%)**, reflecting stronger loyalty among long-term, high-value customers. This pattern suggests that churn is influenced by a **price–value mismatch**, where customers paying higher monthly charges but with lower cumulative value are more likely to leave.





9. Key Patterns Identified (Corrected)

The analysis reveals several consistent churn patterns across customer segments. **Month-to-month contract customers exhibit significantly higher churn** compared to customers on long-term contracts. **Senior citizens and single customers** show elevated churn rates, indicating higher vulnerability among these demographic groups. Churn is **highest during the early customer lifecycle (0–12 months)** and declines steadily with tenure, highlighting the importance of early engagement.

Customers using **value-added services such as Online Security, Tech Support, and Backup** demonstrate notably lower churn, while **medium-engagement customers** show the highest churn, suggesting incomplete value realization. Additionally, **high monthly charge customers and low total spenders** exhibit increased churn, indicating sensitivity to perceived price–value alignment.

10. Initial Hypotheses about Churn Drivers (Corrected)

Based on the observed patterns, the following hypotheses are proposed. Customers are more likely to churn when **perceived value does not align with monthly pricing**, particularly among high-charge and medium-engagement users. **Insufficient onboarding and engagement during the first year** increases churn risk, especially for new customers.

The **absence of support and security services** reduces customer stickiness, while **manual payment methods** introduce friction that may accelerate churn. Finally, **undifferentiated retention strategies** are ineffective, as churn drivers vary significantly across demographic, contract, engagement, and pricing segments. These hypotheses will be further validated in the next milestone using statistical testing and predictive modelling techniques.