

Data-Driven Prediction of Customer Turnover in the Telecommunications Sector: A Case Study of SyriaTel

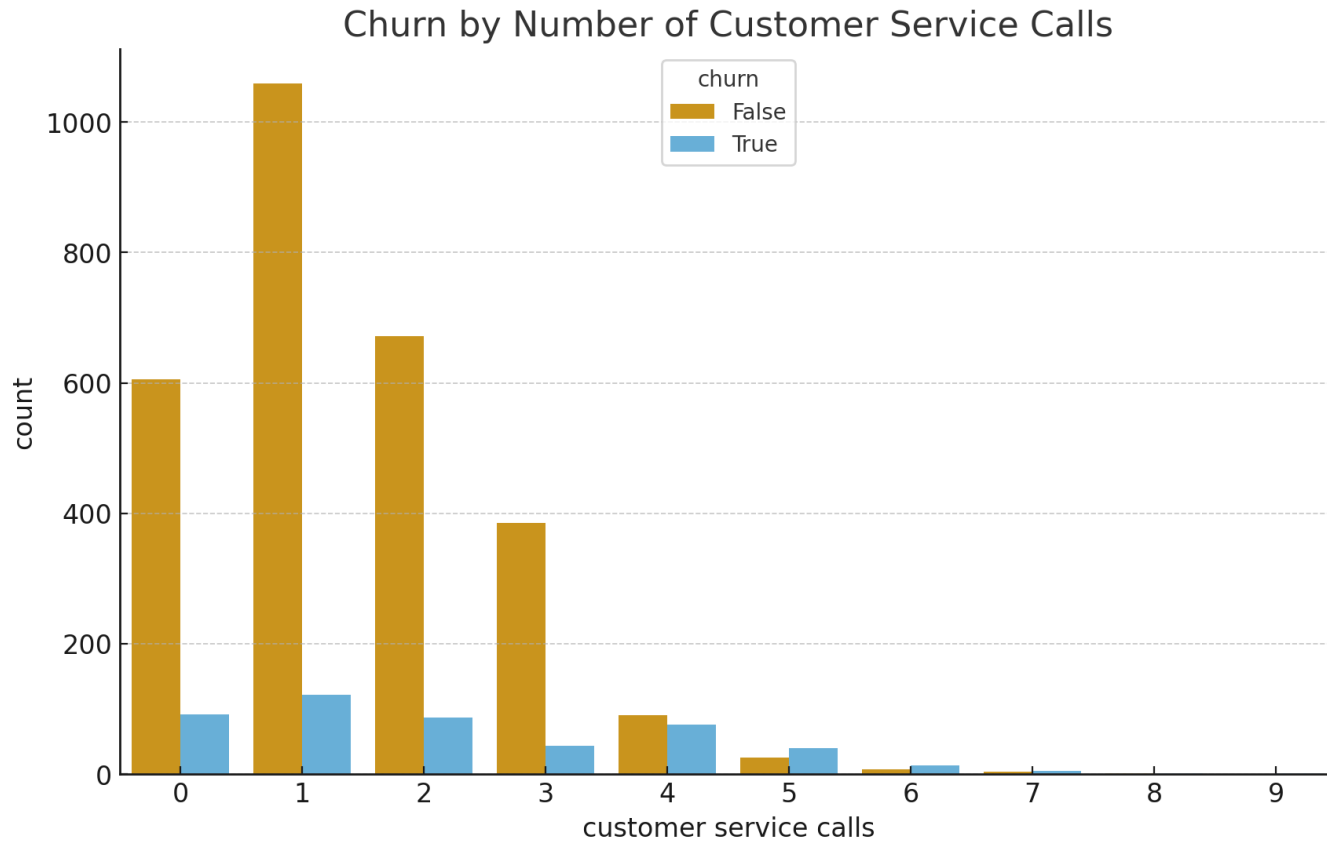
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Why Customer Turnover Matters

- High competition and customer acquisition costs in telecom industry
- Churn = customers leaving for competitors
- Retaining customers is 5× cheaper than acquiring new ones
- SyriaTel aims to predict and prevent churn using data analytics

Churn vs Customer Service Calls



Project Objective

- Goal: Build a predictive model to identify likely churners
- Enable proactive retention actions
- Objectives: Analyze data, build models, generate insights

Data Overview

- Source: SyriaTel customer database (CSV)
- Records: 3,333 customers
- Features: 21 (usage, plans, calls, charges, demographics)
- Target: churn (True = left, False = retained)

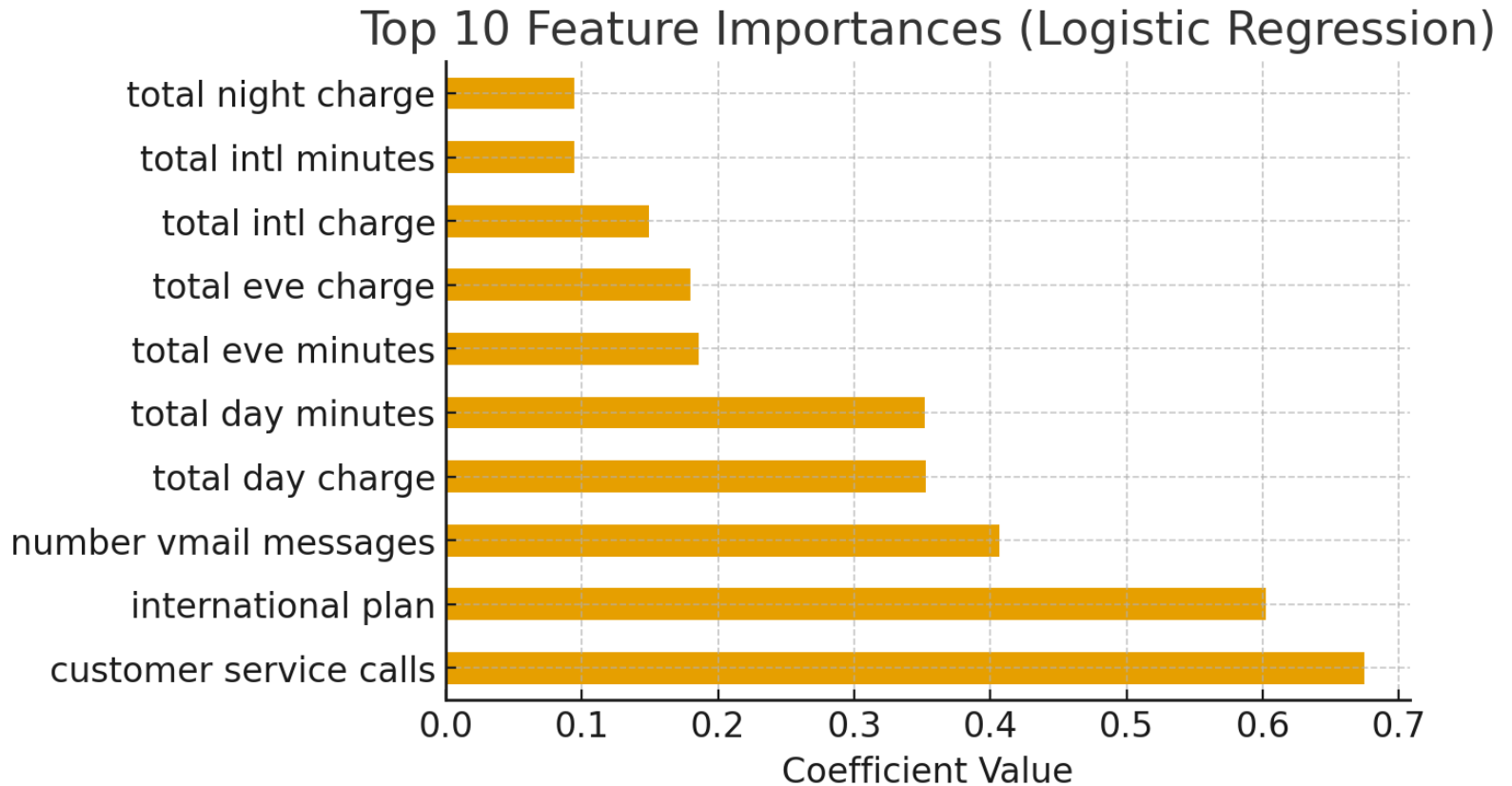
Data Preparation

- Removed duplicates and missing values
- Encoded categorical variables
- Scaled numerical features
- Split data: 80% training / 20% testing

Exploratory Data Analysis (EDA)

- Churn is imbalanced (most customers retained)
- High churn among international plan users and frequent callers
- Strong correlations between total charges and total minutes

Top Feature Importances



Modeling Approach

- Models: Logistic Regression, Ridge Regression (L2), Lasso Regression (L1)
- Evaluation metrics: Accuracy, Precision, Recall, F1-score
- All achieved Accuracy = 0.856

Key Insights

- Ridge Regression showed best stability
- Lasso highlighted most important predictors
- Top predictors: customer service calls, international plan, total charges

Conclusion

- Predictive churn model achieved 85.6% accuracy
- Identified behavioral and service factors influencing churn
- Supports data-driven customer retention for SyriaTel

Recommendations

- Proactive Retention: loyalty offers for high-risk customers
- Improve Customer Service: reduce repeat calls
- Monitor churn indicators regularly