Telecom Customer Churn — Executive Summary

Business Overview • Modeling & Evaluation • Recommendations

Overview

- Business Problem:
  - High Customer churn rate
    - Why it matters:
      - Cost of retaining existing customer or
      - Attempt to gain new customers

      *Which one is more cost effective.

Data Understanding

- Source: www.kaggle.com
- Dataset: Size. customers with usage, plan, and service interaction features.

Data Profile — Churn Distribution

- Churn rate and imbalance:
  - Non-churn: 2850 customers (0.855)
  - Churn: 483 customers (0.145)
- Implication: Precision/Recall/F1 and ROC-AUC are used alongside Accuracy.

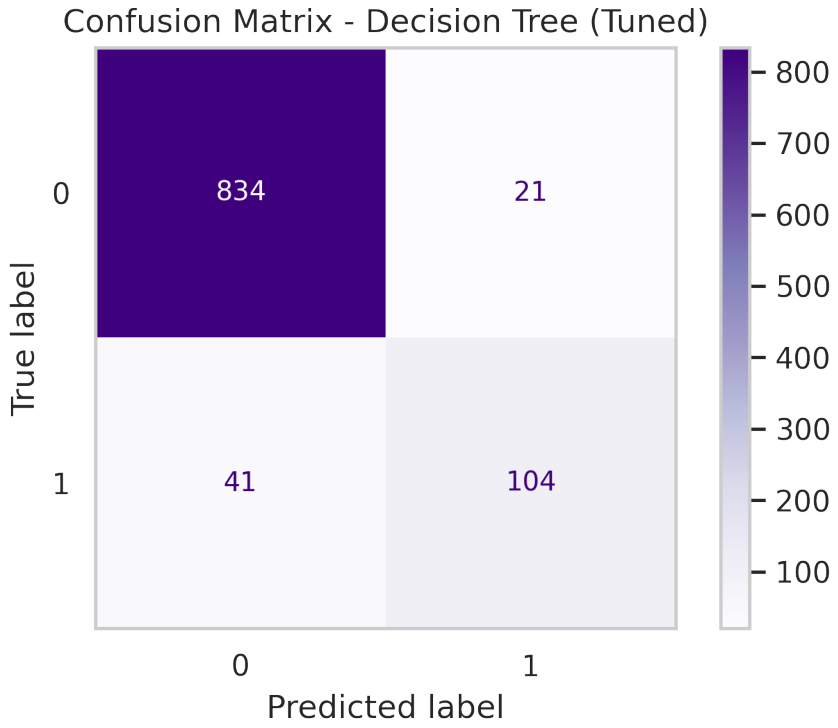
Modeling Approach

- Pipeline: Clean → Encode (OneHot) → Scale (numeric) → Train → Evaluate.
- Baseline: Logistic Regression to benchmark performance.
- Tree-based modeling: Decision Tree (baseline and tuned via GridSearchCV).
- Metrics reported: Accuracy, Precision, Recall, F1, ROC-AUC.

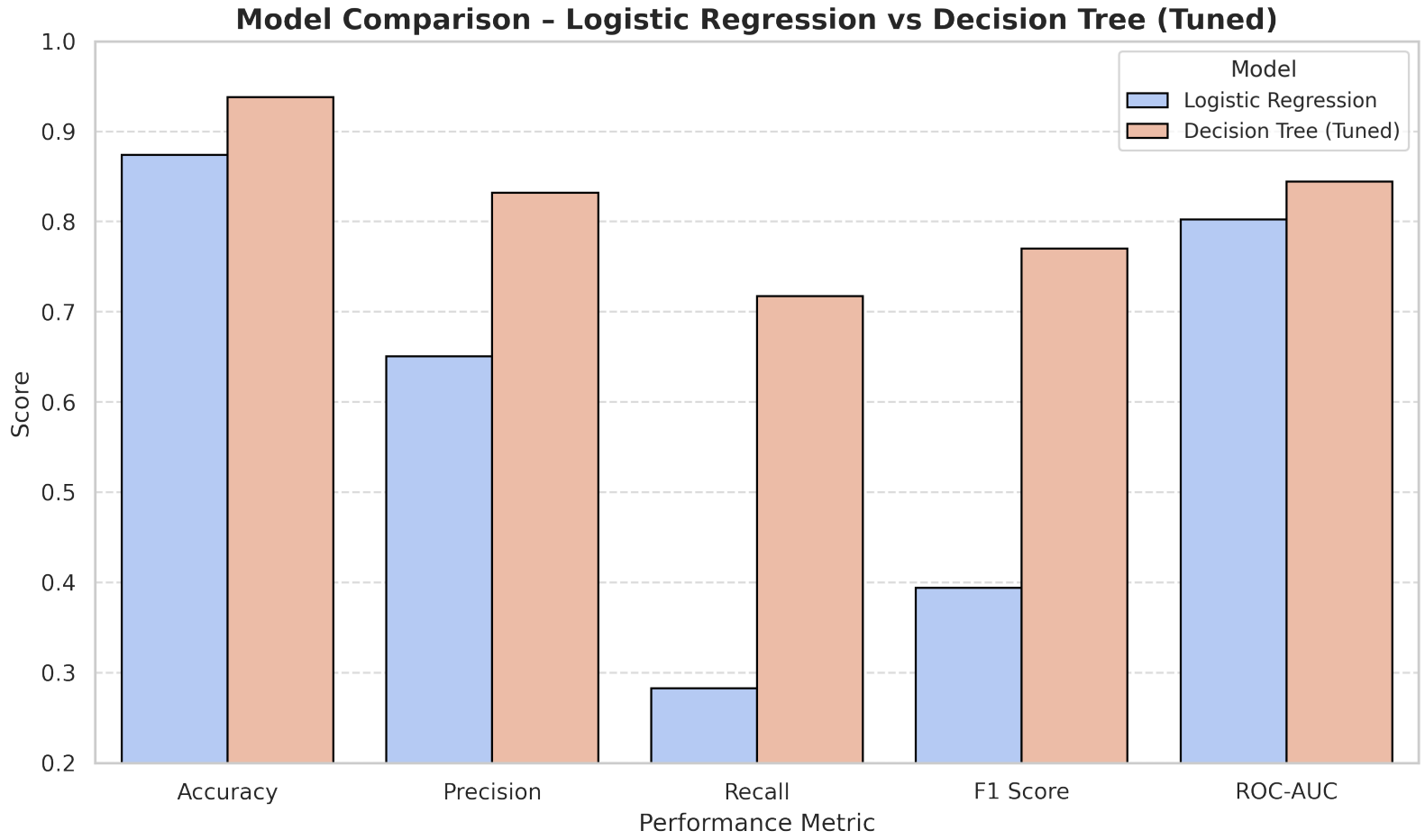
Decision Tree — Tuned (GridSearchCV)

Performance (Test Set)

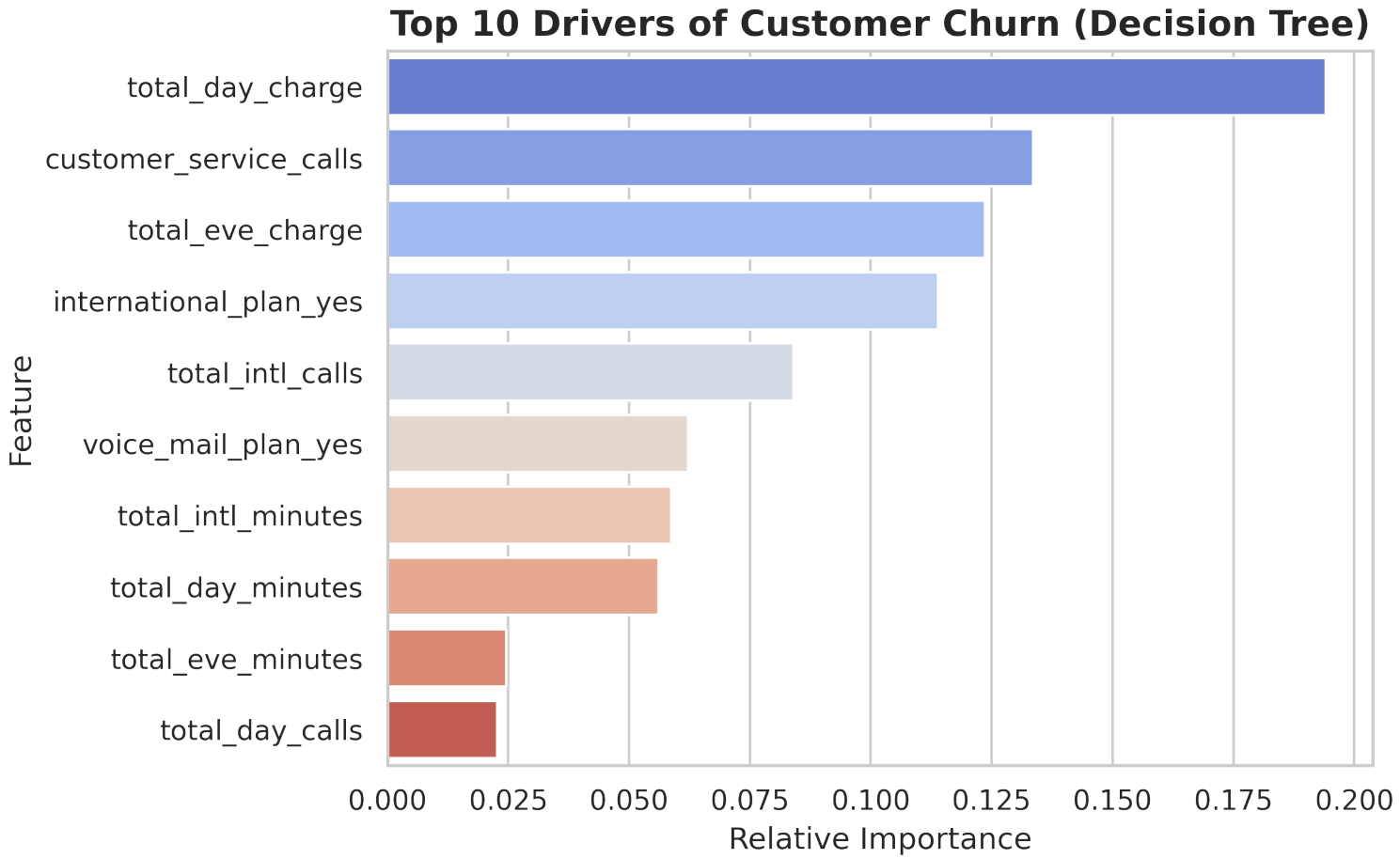
- Accuracy:
  - 93.8% correctly predicted customer status
- Precision:
  - 83.2% of churn predictions are correct
- Recall:
  - 71.7% of actual churners predicted correctly
- F1:
  - Score of 0.770 a balance btw recall and precision
- ROC-AUC: 0.844



Model Comparison — Results & Interpretation



Insights — Top Drivers of Churn (Decision Tree)



Recommendations

- Target high-risk segments with tailored offers (contract upgrade incentives, discounts).
- Prioritize customers with frequent support calls; reduce resolution times & repeat issues.
- Review pricing/experience for international plan users and high-usage customers.

Next Steps

- Operationalize: Monthly risk scoring; A/B-test outreach; track Churn, Offer Uptake, Revenue Retained.
- Future modeling: Evaluate ensembles (Random Forest/XGBoost) and calibration; monitor drift quarterly.