



# SYRIATEL CUSTOMER CHURN ANALYSIS PRESENTATION

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# BUSINESS UNDERSTANDING

- **Problem:** High customer churn → revenue loss & increased acquisition costs.
- **Objective:** Develop a **predictive model** to identify customers at risk of churning.
- **Approach:** Analyze customer **behavior, usage trends, and demographics** to apply targeted retention strategies

# DATA OVERVIEW

## Dataset Includes:

- Customer details (account length, service plan)
- Service usage (minutes, calls, charges)
- Churn indicator (Yes/No)

## Key Variables:

- Numerical: Total minutes, Total calls, Charges
- Categorical: Contract type, Payment methods

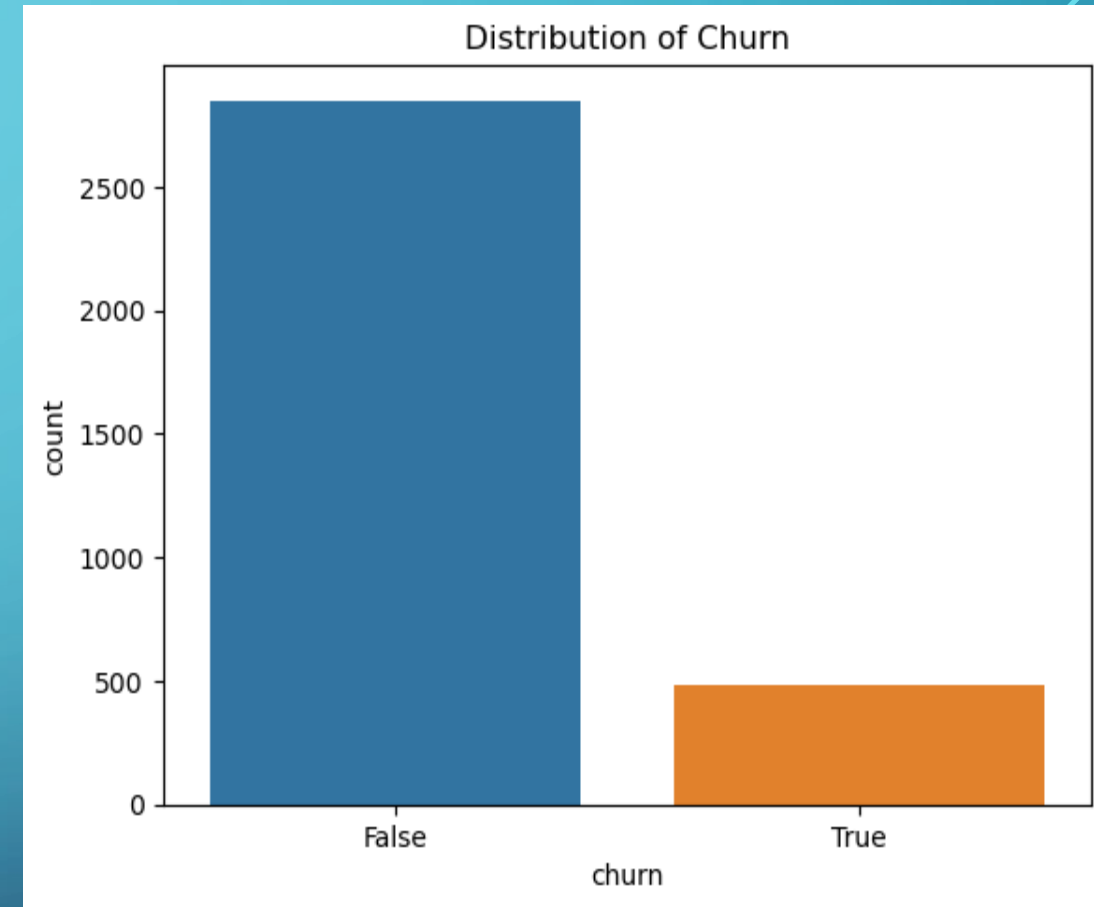
# EXPLORATORY DATA ANALYSIS (EDA)

Churn Rate: 85.5% of customers stayed; 14.5% churned (class imbalance).

Key Insights: Higher usage & charges → Higher churn risk

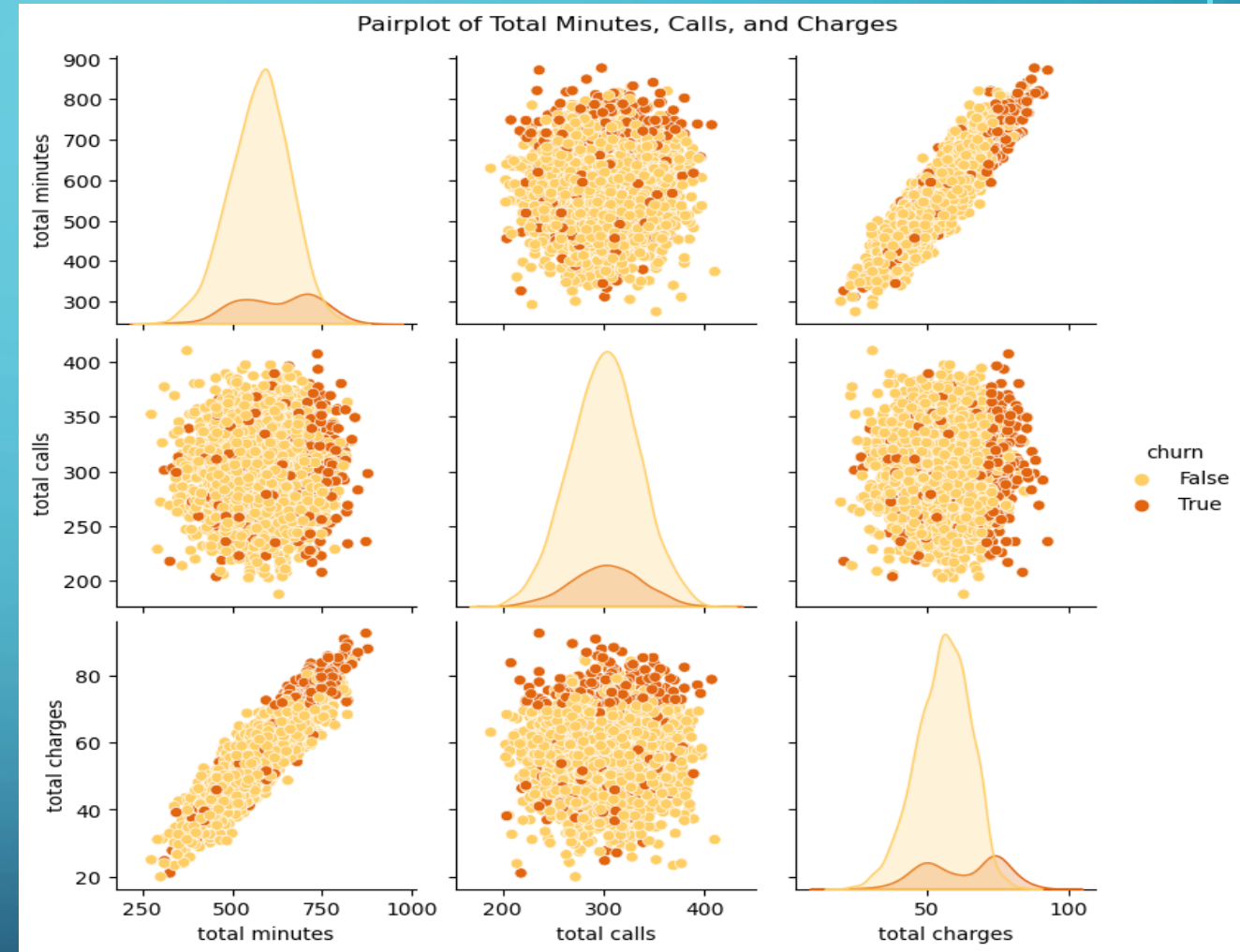
Customer service calls strongly linked to churn

Longer account length → More stable customers



# FEATURE ENGINEERING

- Created **Total Minutes**, **Total Calls**, **Total Charges** features.
- Removed highly correlated features to avoid redundancy.
- One-hot encoded categorical variables for model compatibility.





# MODEL SELECTION & PERFORMANCE

- Models Tested:
- Logistic Regression
- Decision Tree
- Random Forest (Best Model)
- Final Model: Random Forest  
Accuracy: 93%  
Recall (Churn): 86% (Captures more churn cases)  
Precision (Churn): 71% (Some false positives, but good overall balance)

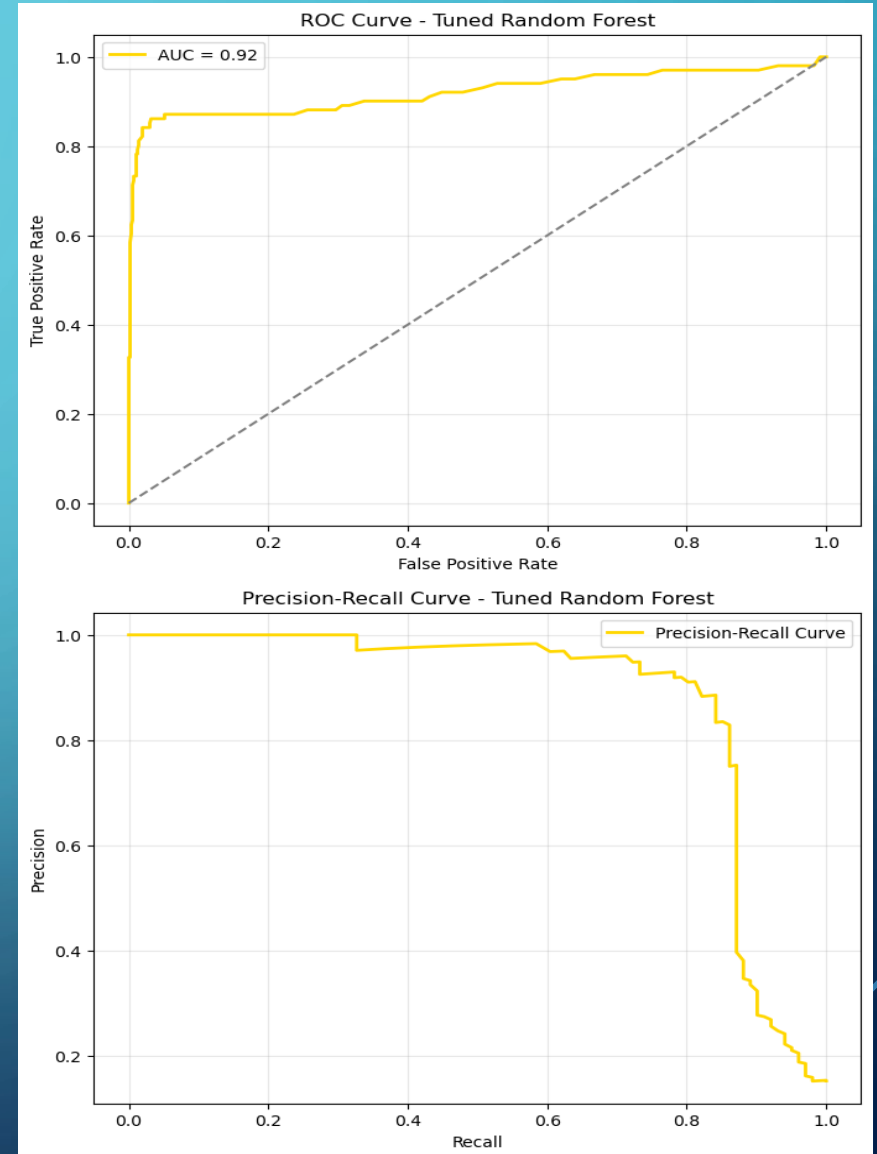
Model	Precision (Churn)	Recall (Churn)	F1-Score (Churn)	Accuracy
Tuned Decision Tree	70%	85%	77%	92%
Tuned Random Forest	71% ▲	86% ▲	78% ▲	93% ▲

# MODEL OPTIMIZATION & HYPERPARAMETER TUNING

Used GridSearchCV & RandomizedSearchCV to optimize:

- Number of trees (n\_estimators)
- Maximum depth (max\_depth)
- Minimum samples split (min\_samples\_split)

Threshold tuning: Adjusted for better precision-recall balance.



## KEY FINDINGS

- **Random Forest performed best**, with high recall (captures most churn cases).
- **Total minutes & charges strongly influence churn.**
- **Customer service calls & international plan dissatisfaction impact churn.**





# STRATEGIC RECOMMENDATIONS FOR REDUCING CUSTOMER CHURN

1. Leverage Predictive Analytics for Proactive Retention
  2. Enhance Customer Experience & Service Quality
  3. Optimize Pricing & Plan Offerings
  4. Expand Data-Driven Insights for Better Predictions
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