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PREDICTING CUSTOMER CHURN AT SYRIALTEL

Start

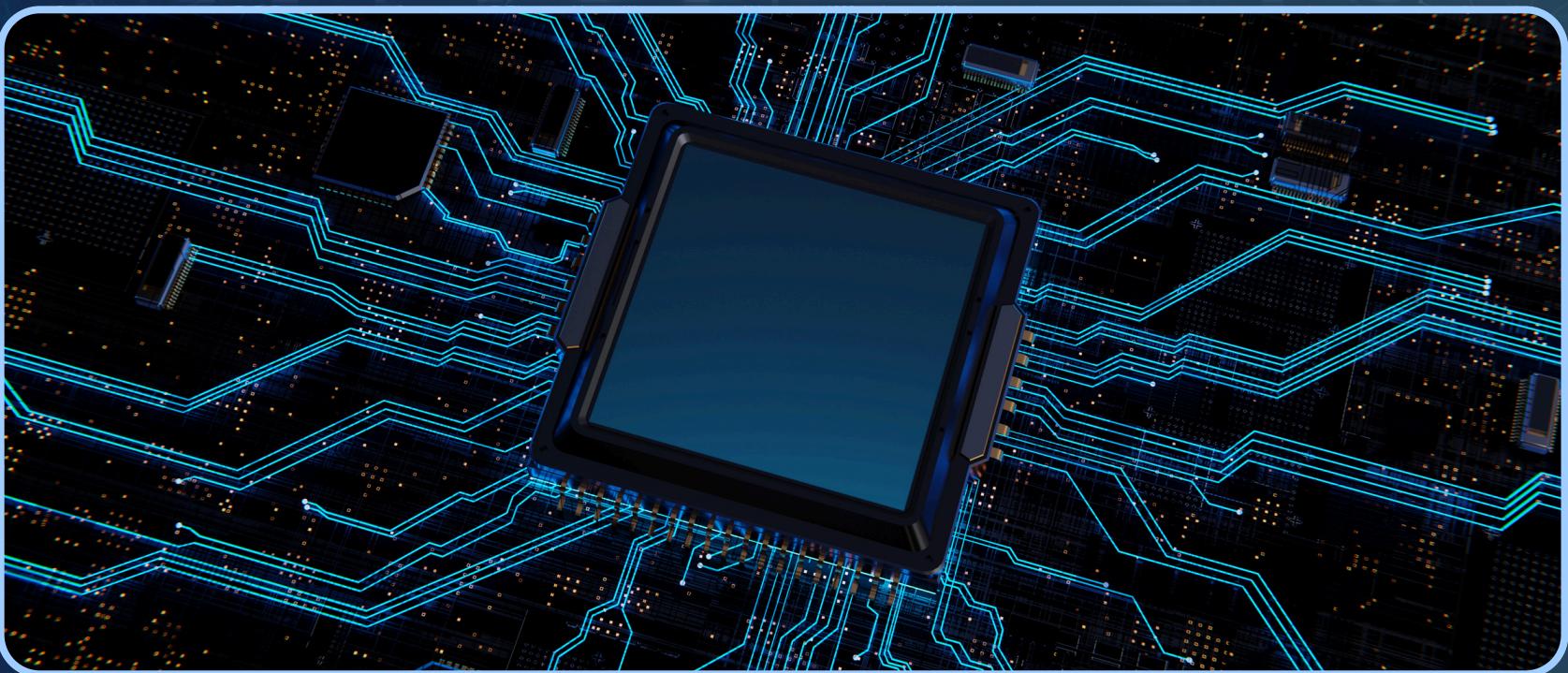
phase 3 project
By Angela Cheshire



OVERVIEW

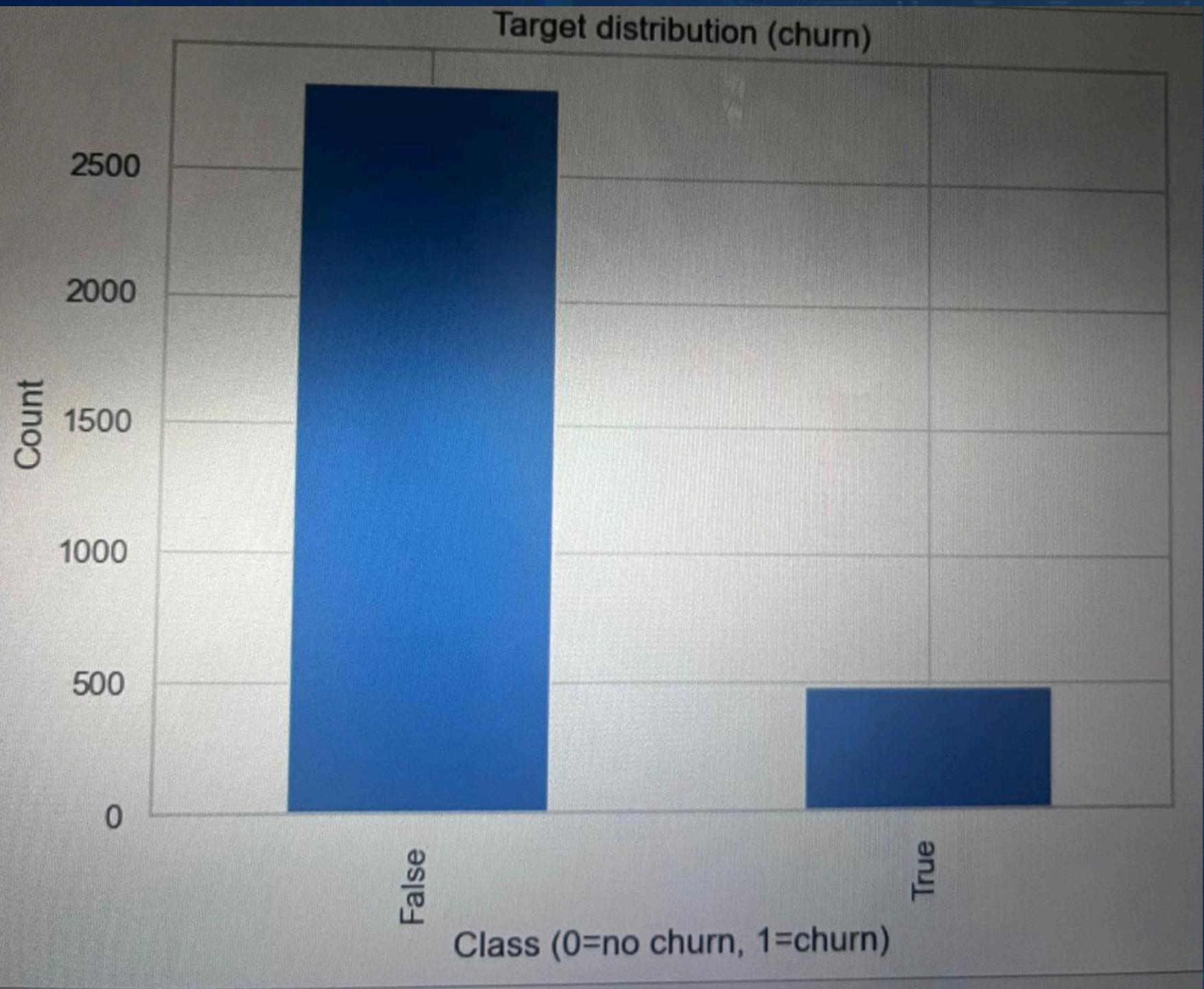


- Target: churn 0 = stayed, Stakeholder: SyriaTel, a telecom company.
- Problem: Customers leaving (churn) = lost revenue + high replacement cost.
- Goal: Build predictive models to identify churn-prone customers.
- Method: Classification models (Logistic Regression & Decision Tree)



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DATA UNDERSTAN DING



- Dataset - 3,300 customer records
- Target: Churn (Yes/No)
- Features include: usage (day/night mins), plans (intl, voicemail), customer service calls
- Key challenge: Identify churn-prone customers

A bar chart of churn distribution (Churn 14%, Non-churn 86%)



DATA PREPARATION



Dropped identifiers: phone number, area code, state.

- Dropped redundant features: charges (kept minutes).
- Encoded categorical features: International plan, Voice mail plan.
- Handled duplicates & missing values (rare).
- Train-test split: 80/20.





MODELING APPROACH

Built two baseline models:

1. Logistic Regression (LR)
→ interpretable
2. Decision Tree (DT) →
nonparametric, flexible
 - Scaled numerical features
for LR.
 - Evaluated with Accuracy,
Precision, Recall, F1, ROC
AUC.





LOGISTIC REGRESSION

1.

Performance (Test Data)

- Accuracy: 0.81
- Precision: 0.64
- Recall: 0.43
- F1-score: 0.52
- ROC AUC: 0.76

3.

Interpretation Interpretation

Interpretation:

- Positive coefficients: international plan, customer service calls → increase churn risk.
- Negative coefficients: voice mail plan, longer account length → protective.





DECISION TREE RESULTS

1.

Performance (Test Data)

- Accuracy: 0.92
- Precision: 0.80
 - Recall: 0.68
 - F1-score: 0.74
- ROC AUC: 0.89

3.

Waste Management

Interpretation:

- Top splits:
customer service calls, international plan, total day minutes.
- More complex but captures non-linear churn patterns.



Model Regression Comparison

Model	Accuracy	Precision	Recall	F1	ROC AUC
Logistic Regression	0.864	0.565	0.268	0.364	0.802
Decision Tree (baseline)	0.900	0.660	0.639	0.649	0.792
Decision Tree (tuned)	0.927	0.816	0.639	0.717	0.803



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RECOMMENDATIONS



Retention strategy:

- Customers with international plans & frequent service calls are high churn risk → provide discounts/support.
 - Proactive actions:
 - Monitor high day-minute users (usage spike signals churn risk).
 - Improve customer service responsiveness.
 - Deploy DT model to flag churn-prone customers weekly.



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NEXT STEP

Tune hyperparameters further (GridSearchCV).

- Test ensemble models (Random Forest, Gradient Boosting).
- Integrate churn predictions into SyriaTel's CRM system.
- Track KPIs (reduced churn %, increased retention).





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THANK YOU!

As we look to the future, these technologies will play a crucial role in shaping a better world for generations to come.



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