MORINGA

Future-Ready Tech Skilling

PROJECT 3

DSF-PT13

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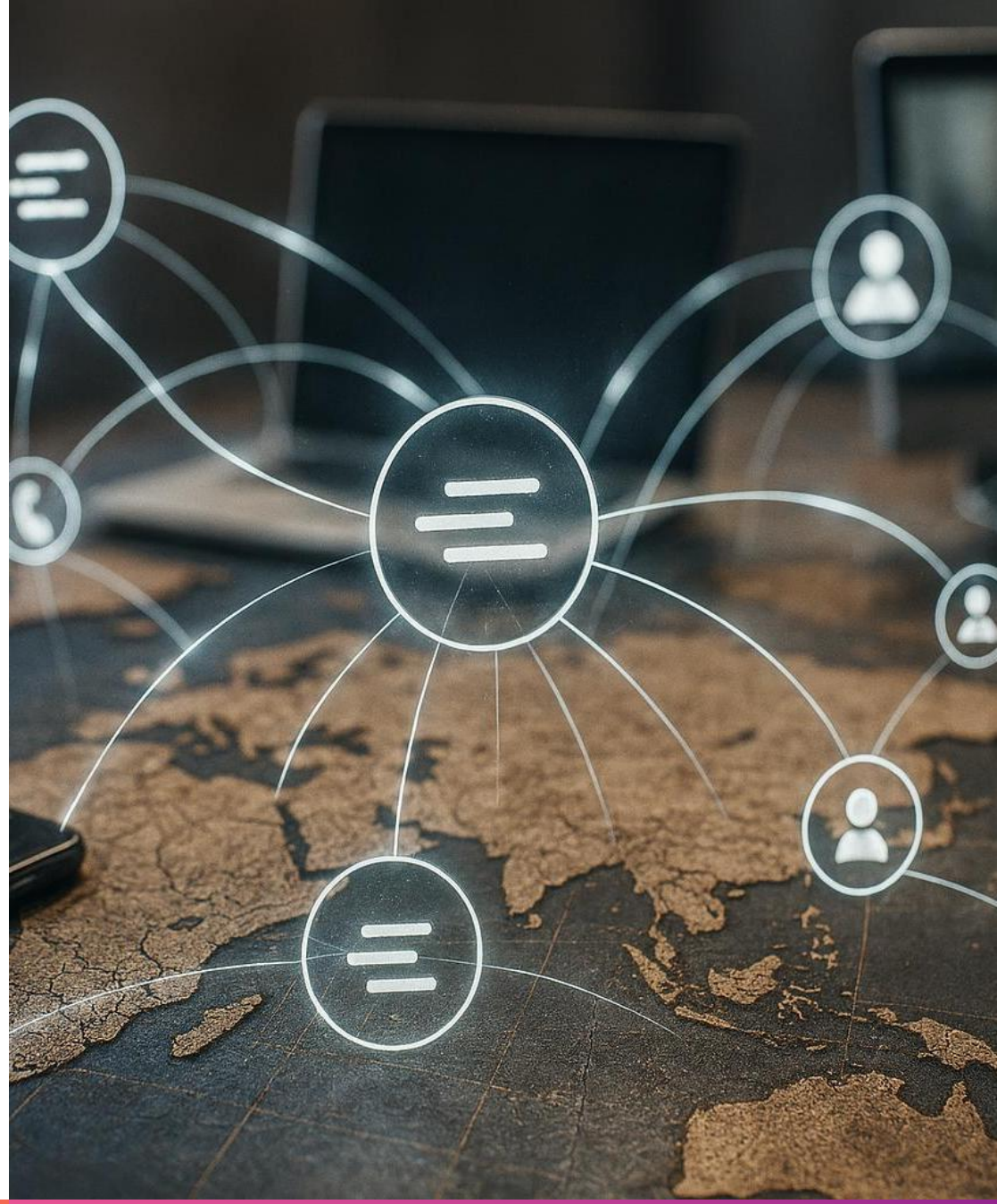
Purpose of the project

Objectives

- Increase Churn Detection Accuracy
- Improve Churn Recall Rate
- Enable Targeted Retention Campaigns
- Reduce Revenue Loss from Churn
- Establish Continuous Model Monitoring

Data Source : SyriaTelCustomerChurn



Executive Summary

Customer churn is a major concern for SyriaTel, as losing subscribers impacts revenue, market share, and long-term profitability. This project applied predictive analytics to identify customers at high risk of leaving.

- Two models were developed and analyzed: **Logistic Regression** and **Random Forest**. Based on key performance metrics, the **Logistic Regression emerged as the preferred operational model** due to its superior ability to correctly identify at-risk customers (high recall), capture non-linear relationships, and deliver robust overall classification performance.

Implementing this model will allow SyriaTel to:

✓ Target retention campaigns effectively

✓ Optimize marketing spend

✓ Reduce revenue leakage due to churn

Data Preparation – feature & target selection

Target Variable

- **Churn** (Binary: 1 = Churn, 0 = No Churn)
- Defines a supervised binary classification problem aimed at predicting customer attrition.

Predictive Features

All relevant customer attributes were used as independent variables, including:

I. **Account Details:** Account length, International plan, Voice mail plan

II. **Usage Metrics:** Day, Evening, Night, and International minutes, calls, and charges

III. **Customer Interaction:** Customer service calls

IV. **Location Information:** State, Area code

Excluded

- **Phone number** (unique identifier with no predictive relevance)

Purpose

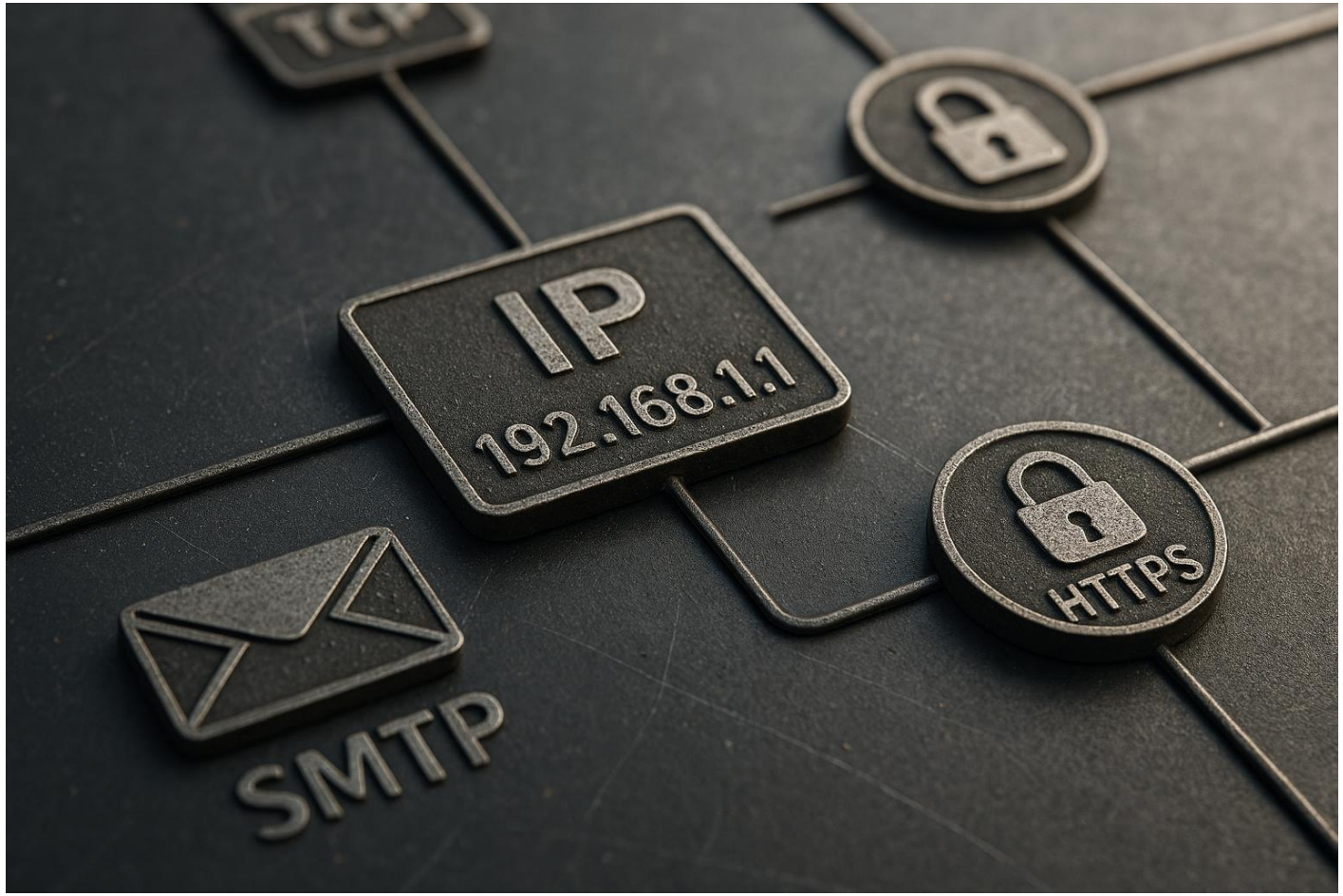
To enable the model to learn behavioral and service-related patterns that influence customer churn while ensuring proper model structure and avoiding data leakage.

Business Problem

Customer attrition directly affects SyriaTel's revenue and market competitiveness. Currently, customer retention efforts are reactive, which limits their effectiveness.

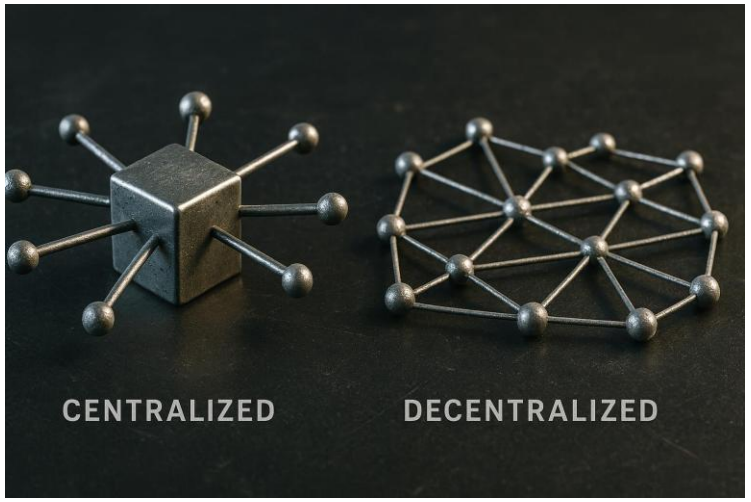
Predicting churn proactively enables

- Identification of high-risk customers before contract termination
- Focused retention strategies to improve loyalty
- Data-driven allocation of marketing and service resources



Data Preparation

- Encoded categorical variables (e.g., plans)
- Scaled numerical features for Logistic Regression
- Conducted exploratory analysis to identify correlations and distribution patterns
- Structured dataset for supervised learning to avoid data leakage



Modeling Strategy

Models Evaluated

Logistic Regression

- Baseline model
- Interpretable
- Linear assumptions

Random Forest

- Ensemble learning method
- Combines multiple decision trees
- Captures complex non-linear patterns
- Reduces overfitting
- Provides feature importance

Evaluation Metrics

- Accuracy | Precision | Recall | F1 Score | ROC-AUC

Model Performance

Metric	Logistic Regression	Random Forest
Accuracy	76%	37%
Precision (Churn)	0.35	0.16
Recall (Churn)	0.70	0.80
F1 Score (Churn)	0.46	0.27
ROC-AUC	0.81	0.61

Model Performance Comparison

Key Findings

- Random Forest achieved slightly higher recall (80%)
- However, it generated 398 false positives
- This would significantly increase retention campaign costs

Business Impact Assessment

Logistic Regression Model

- Identifies 70% of churners
- Maintains manageable false positive rate
- Provides stable operational accuracy (76%)

Random Forest Model

- Over-predicts churn
- Would trigger excessive unnecessary retention campaigns
- Significantly increases marketing and operational costs

Conclusion

Logistic Regression offers better cost-efficiency and strategic value.

Strategic Recommendations

1. Deploy Logistic Regression Model

Use it to generate churn risk scores monthly.

2. Target High-Risk Segments

Focus retention efforts on

High day-minute users

Customers with 3+ customer service calls

International plan subscribers

Strategic Recommendations cont...

3. Improve Customer Service Experience

- Frequent service calls are a major churn indicator.

Action

- Reduce complaint resolution time
- Implement proactive customer support follow-ups
- Analyze service interaction quality

4. Review Pricing Strategy for High Usage Customers

- Heavy usage customers may feel price pressure.

Action

- Offer loyalty discounts
- Introduce bundled pricing plans
- Provide personalized usage optimization plans

Strategic Recommendations cont..

5. Implement Early Warning Retention Campaign

- For customers flagged as high-risk:
- Offer targeted incentives
- Proactive outreach
- Personalized engagement

6. Expected Business Value

- If churn is reduced by even 5–10%:
- Increased customer lifetime value
- Reduced acquisition cost
- Improved revenue stability
- Stronger competitive positioning
- Predictive churn modeling enables proactive retention instead of reactive damage control.

Next Steps

- Deploy Logistic Regression as the production churn model.

Simultaneously

- Improve service quality
- Reassess pricing for high-usage segments
- Implement targeted retention campaigns
- This strategy balances predictive accuracy, operational efficiency, and financial impact.

END
THANK YOU ALL