CUSTOMER CHURN PREDICTION

DSF –PT9

PHASE THREE

BUSINESS UNDERSTANDING

- SyriaTel is a Telecommucations company facing a customer churn challenge leading to revenue loss and increased acquisition costs. This report presents a predictive analysis using machine learning models to identify customers at risk of churn and suggests actionable strategies for retention.
- Data analysis will help to the organization describe customer's behavior, understand their habits, develop appropriate marketing plans.
- SyriaTel has to identify sales transactions and trends in order to build a long-term loyalty relationship with its customer base.

BUSINESS OBJECTIVES

- Improve retention through targeted retention strategies.
- Increase customer lifetime value by keeping customers longer.
- Use cost-effective retention strategies
- Targeted Marketing campaigns and promotions to acquire more Customers
- Enhance the customer experience
- Minimize churn rate by identifying at-risk customers.

Model Evaluation Summary

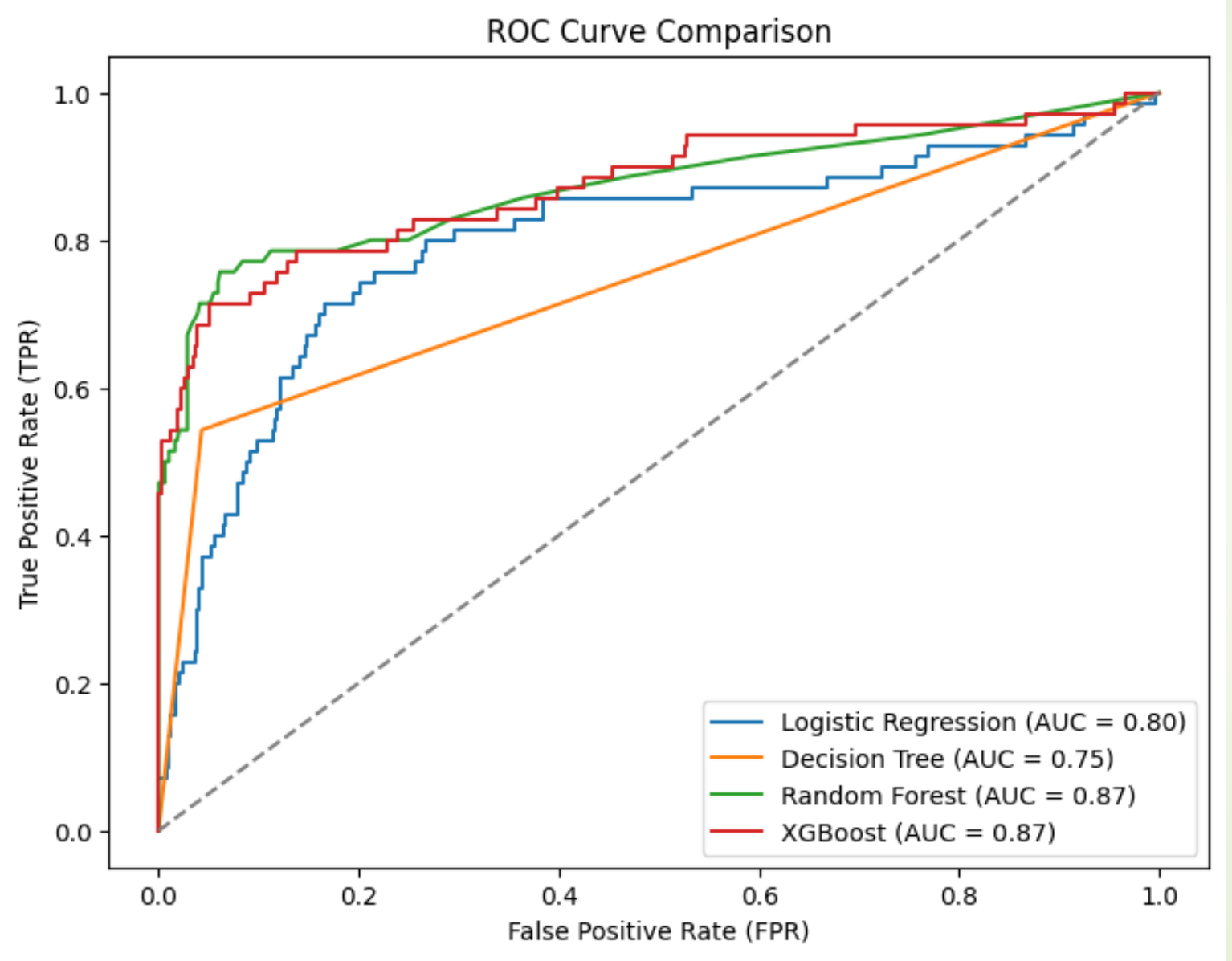
The following machine learning models were evaluated:

Model	Accuracy	Precision	Recall	F1 Score	ROC-AUC
Logistic Regression	0.882	0.625	0.143	0.233	0.799
Decision Tree	0.905	0.644	0.543	0.589	0.750
Random Forest	0.929	0.875	0.500	0.636	0.872
XGBoost	0.932	0.864	0.543	0.667	0.875

Key Findings

- **XGBoost and Random Forest** are the most effective models, with the highest ROC-AUC scores (0.87).
- **Logistic Regression** has lower recall (0.14), meaning it fails to capture many churn cases.
- **Decision Tree** is prone to overfitting, as indicated by its relatively lower AUC score (0.75).

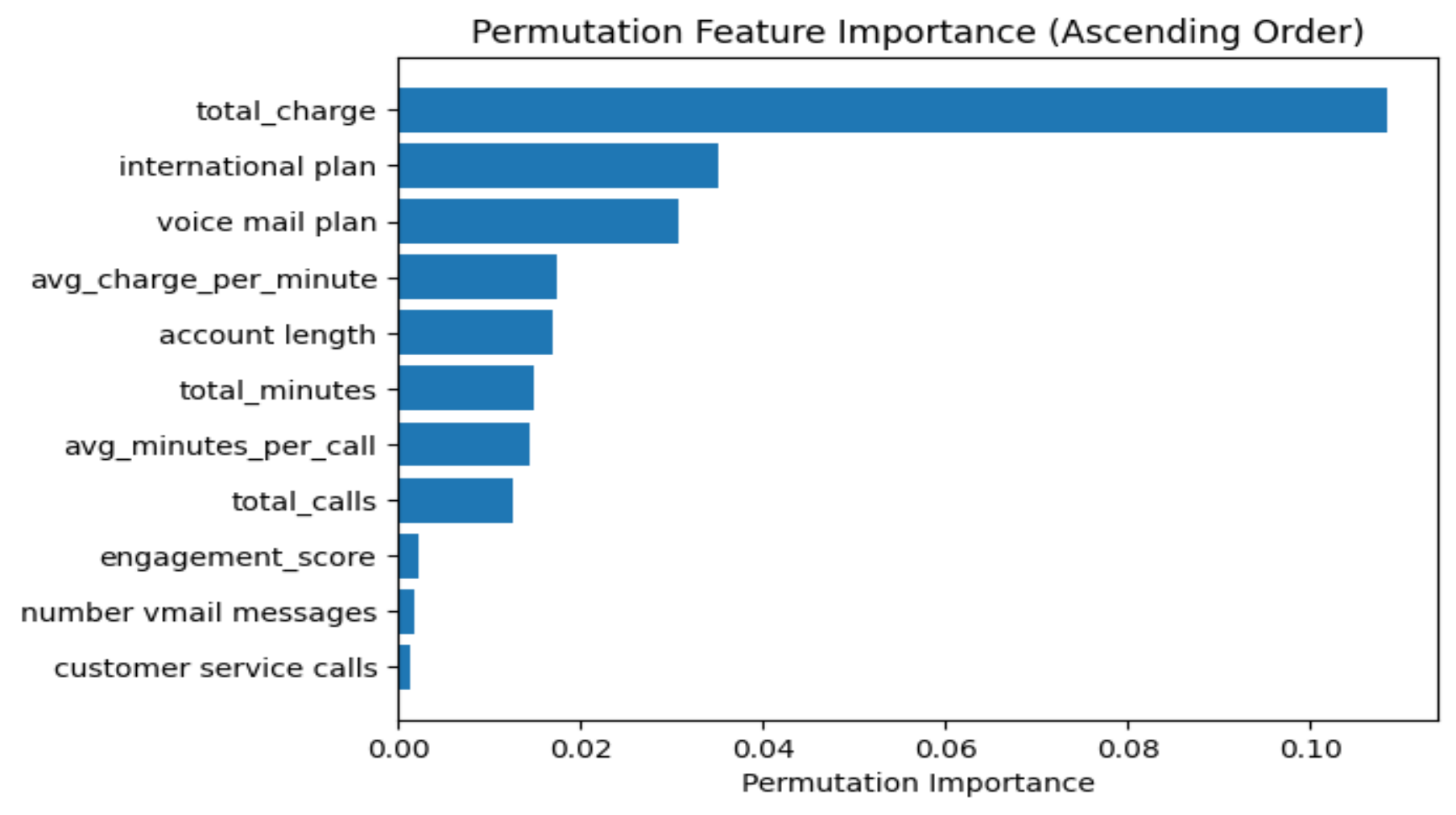
ROC CURVE



- An **AUC of 87%** suggests that the model is doing a great job in predicting customer churn and provides **Syriatel** with a solid basis for effective churn prevention strategies.
- **87% AUC** in essence denotes the model's ability to separate churners from non-churners based on the predicted probabilities.

Business insights from Churn prediction

The most influential factors driving customer churn include:

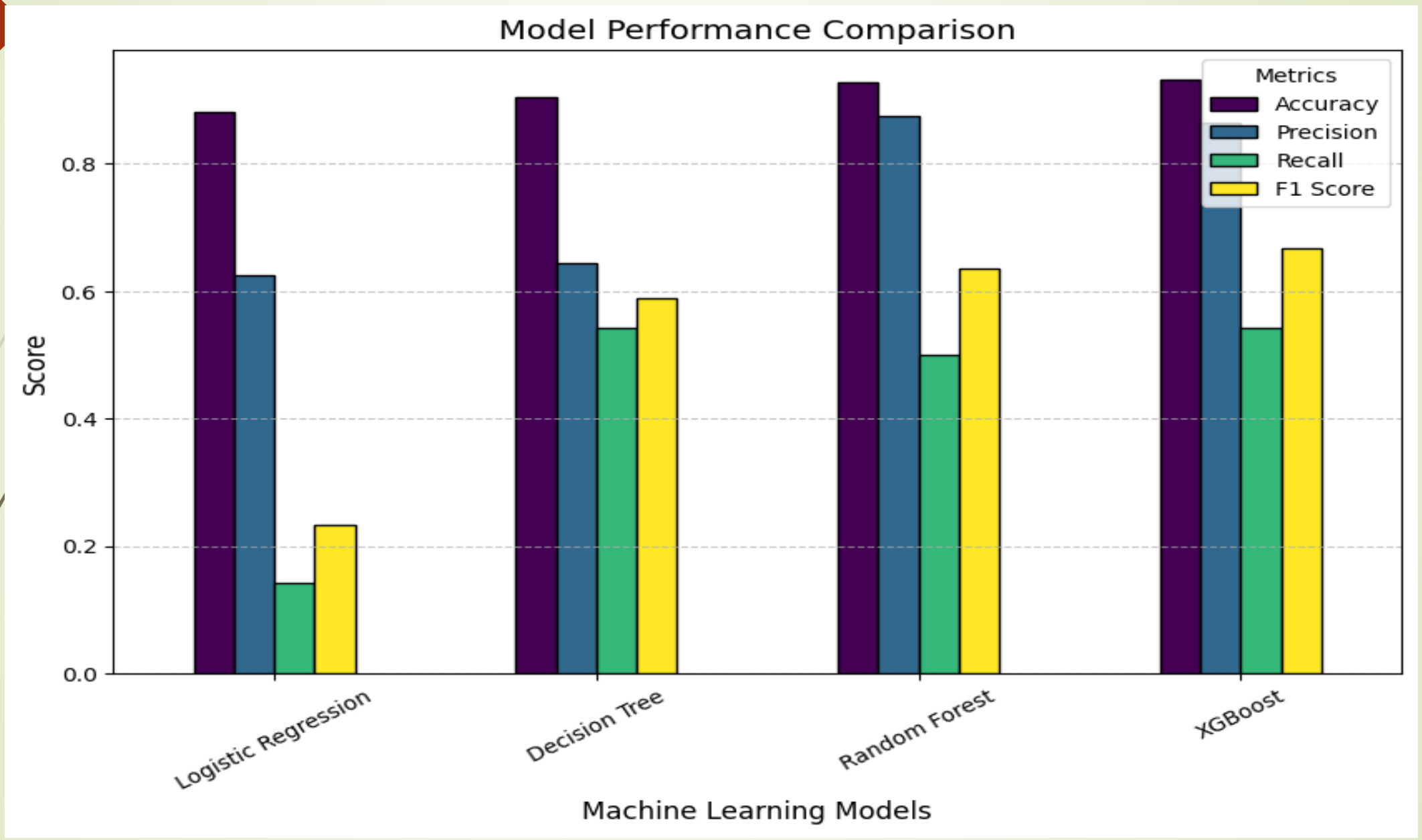


Retention strategy recommendations

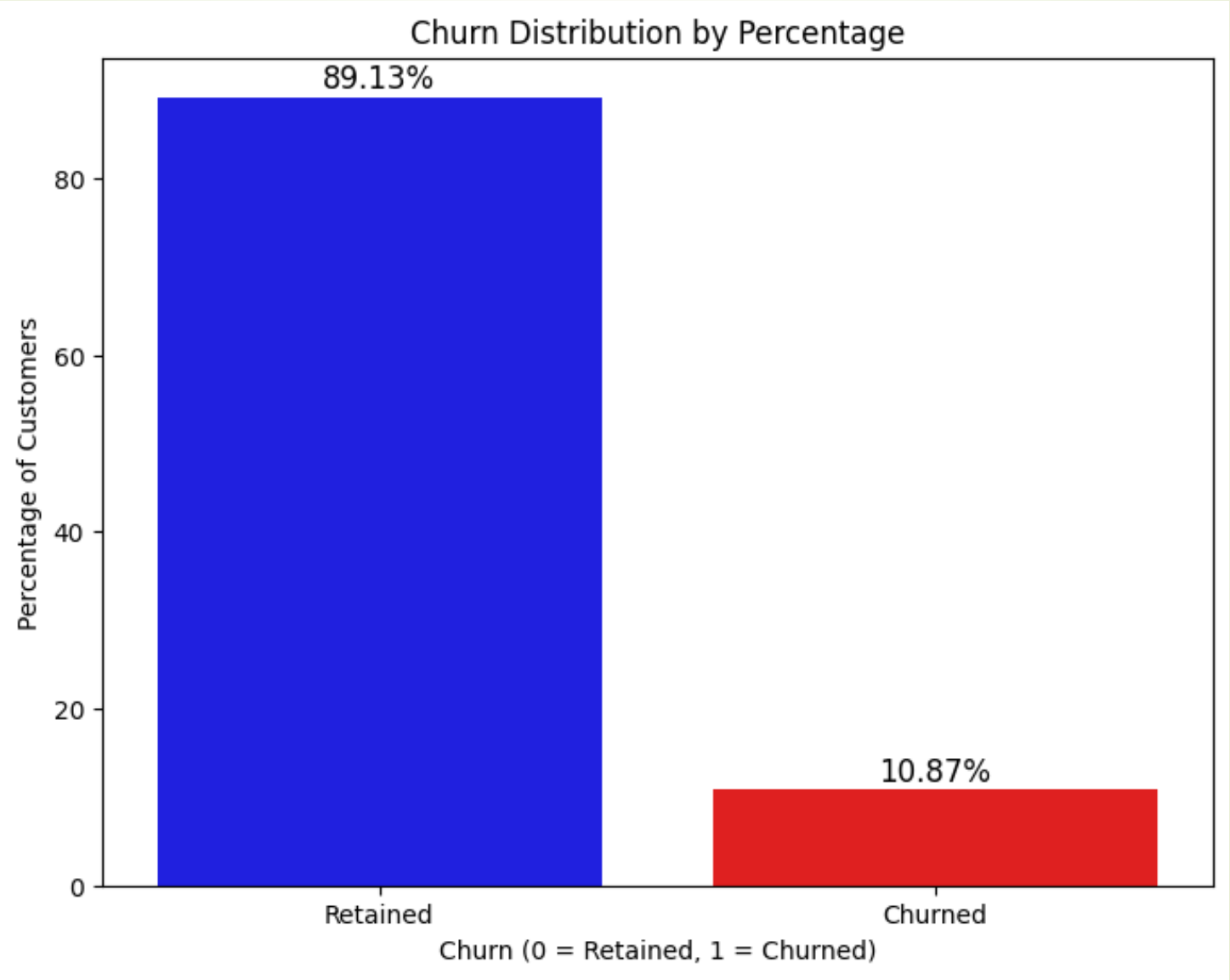
Based on the predictive insights, businesses should:

1) **Proactively Engage High-Risk Customers** – Target customers flagged by XGBoost and Random Forest with personalized retention offers.
2) **Improve Customer Service Response Times** – Address complaints efficiently by developing a timeframe for complaint resolution to reduce churn.
3) **Offer Tiered Pricing Plans** – Provide customized pricing to retain price-sensitive customers.
4) **Enhance Customer Loyalty Programs** – Reward loyal customers and encourage long-term engagement.
5) **Automate Predictive Alerts** – Integrate churn models into CRM systems to provide real-time intervention strategies.

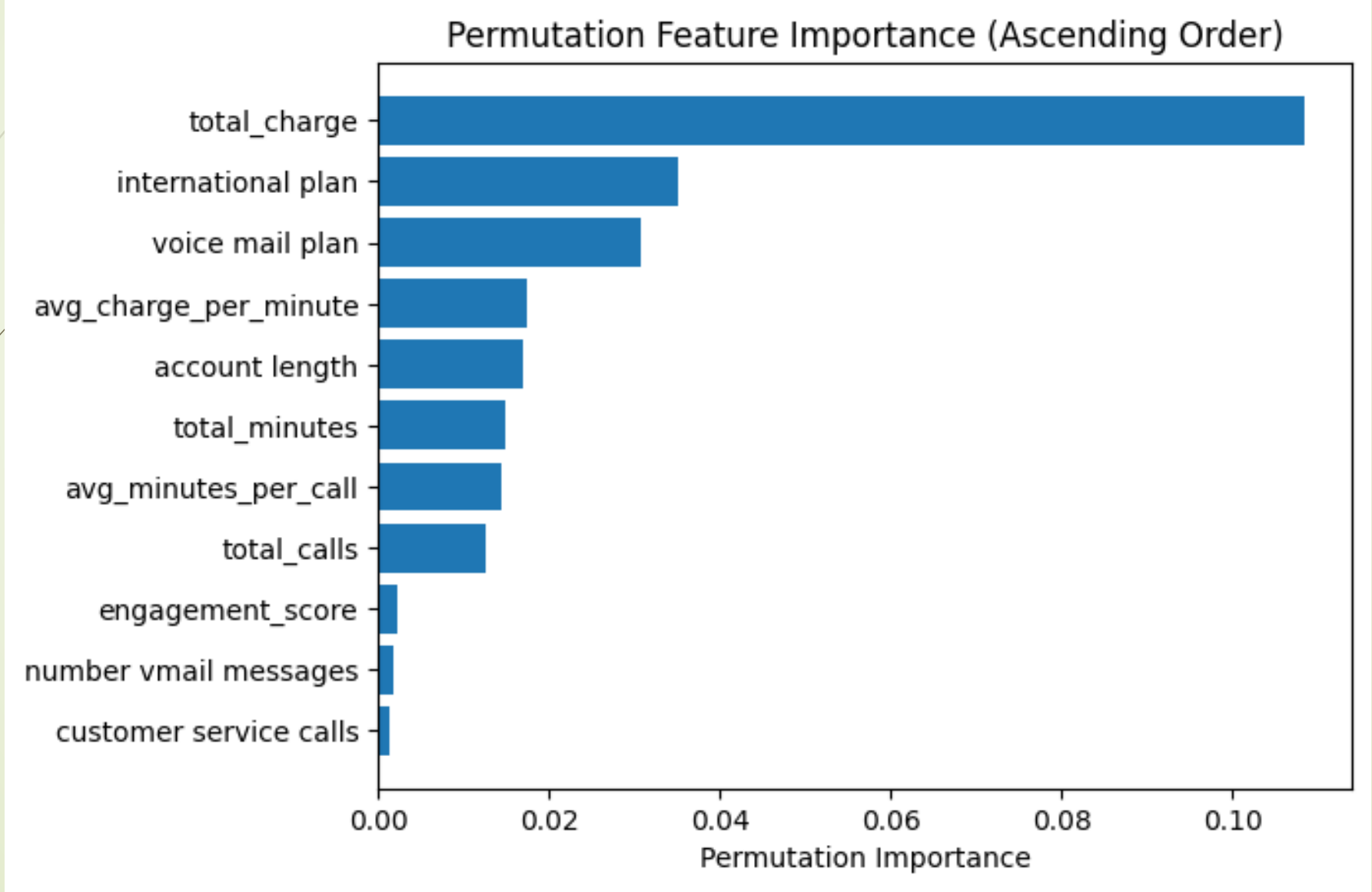
Model Performance



Churn Distribution in the Dataset



Feature importance for churn prediction



Conclusion

- **Deploy XGBoost or Random Forest** for real-time churn prediction.
- **Monitor customer behavior continuously** to update the model with new insights.
- **Implement A/B testing** to measure the effectiveness of retention strategies.
- **Refine marketing campaigns** based on churn predictions to optimize budget allocation.

Recommendations

- Integrate the churn prediction model into the company's CRM system for automated alerts.
- Develop personalized customer engagement strategies based on churn risk levels.
- Monitor and improve model performance periodically using updated customer data.

Thank you!

Presented by: Jael Kirwa