CHURN PREDICTION EXECUITIVE SUMMARY

TOTAL CUSTOMERS

Total Customers

520

CHURN RATE

Churn Rate

0.67

BEST MODEL ACCURACY

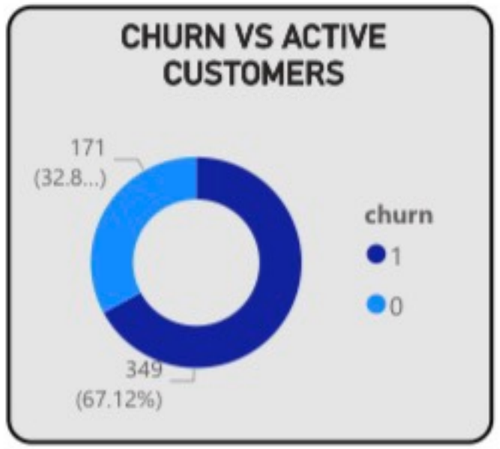
Best Model Accuracy

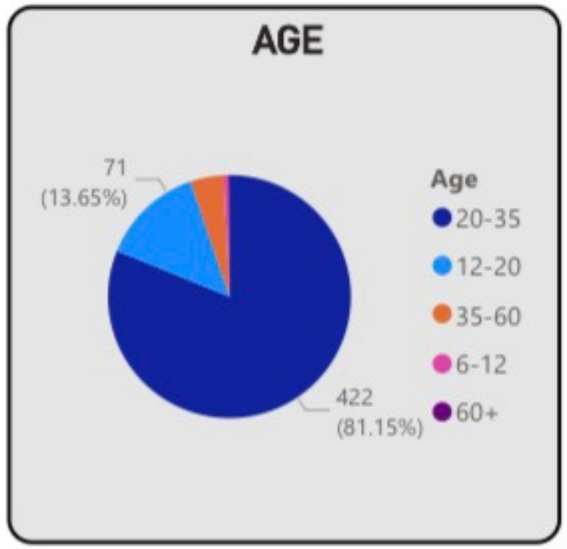
1.00

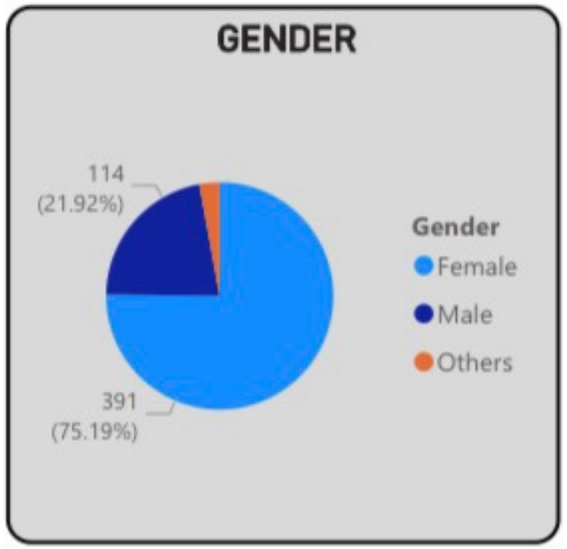
Sum of Logistic_Regression	Metric	Sum of Random_Forest	Sum of XGBoost
0.99	F1 Score	0.98	1
0.98	Recall	0.98	1
0.99	Accuracy	0.97	1
1.00	Precision	0.97	1
0.99	ROC AUC	0.97	1
4.95		**4.87**	**5**

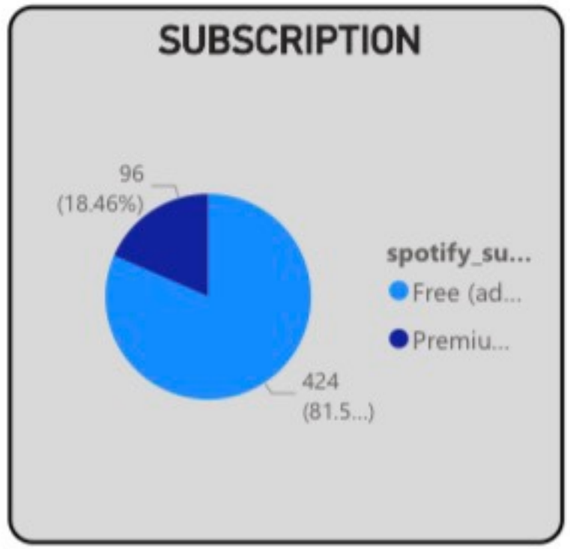
Our churn prediction analysis reveals a churn rate of 67%. XGBoost outperforms other models, achieving 100% accuracy, precision, and recall. The most influential drivers are premium subscription willingness and usage duration.

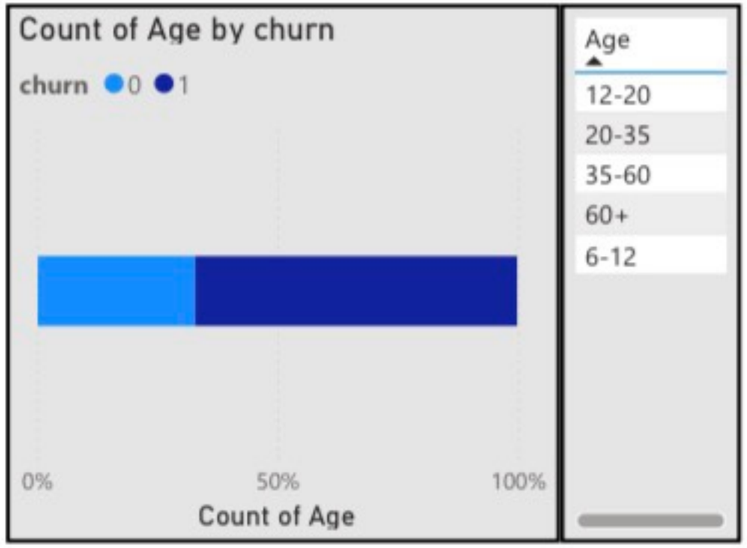
CUSTOMER DEMOGRAPHICS AND CHURN SEGMENTATION

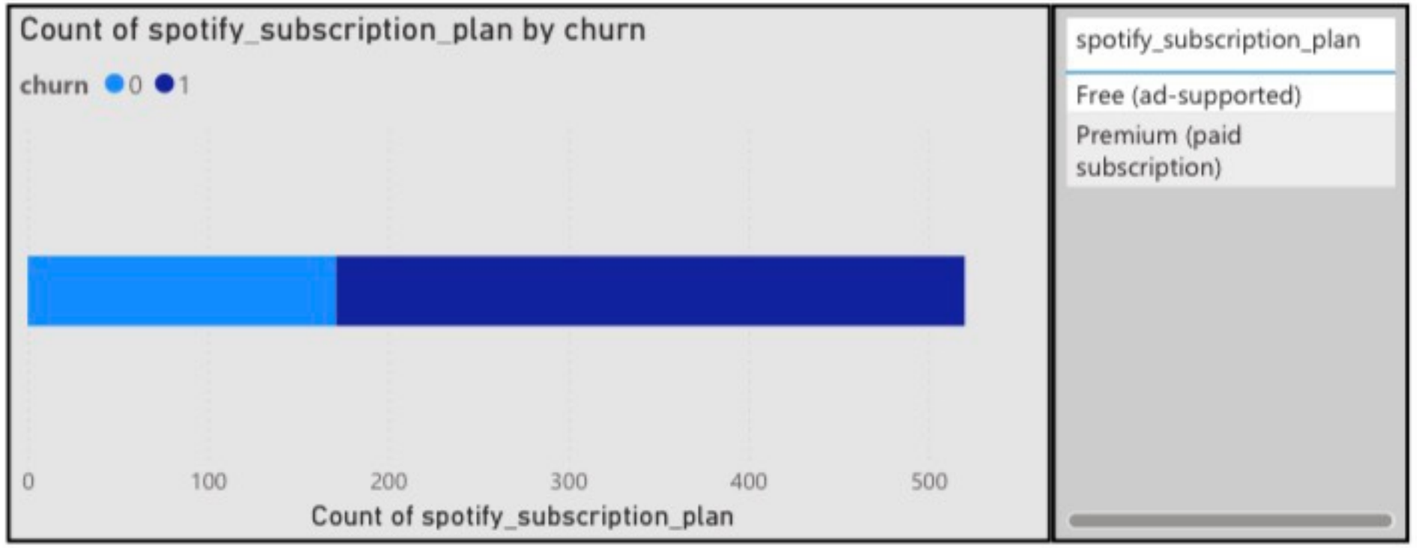








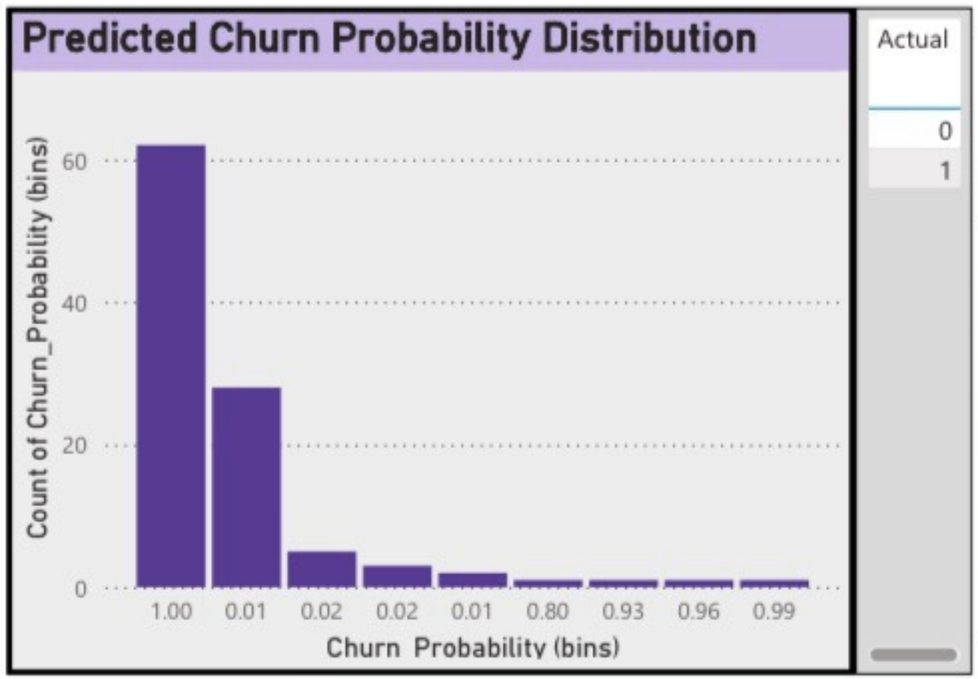




Churn rates are highest among users aged 12-20 and for those on ad-supported free plans. These segments require targeted retention efforts.

MODEL PERFORMANCE AND PREDICTIONS

Predicted_No	0		38		Total	
Actual	Sum of Predicted_No	Sum of Predicted_Yes	Sum of Predicted_No	Sum of Predicted_Yes	**Sum of Predicted_No**	**Sum of Predicted_Yes**
Actual_Yes	0	66			**0**	**66**
Actual_No			38	0	**38**	**0**
Total	**0**	**66**	**38**	**0**	**38**	**66**



ACTUAL VS PREDICTED VALUES

Actual	Predicted	Churn_Probability (bins)
1	1	1.00
1	1	0.99
1	1	0.96
1	1	0.93
1	1	0.80
0	0	0.02
0	0	0.02
0	0	0.01
0	0	0.01

ROC AUC – XGBoost

Sum of XGBoost

1

Metric	Logistic_Regression	Random_Forest	XGBoost
Recall	0.98	0.98	1
Accuracy	0.99	0.97	1
F1 Score	0.99	0.98	1
ROC AUC	0.99	0.97	1
Precision	1.00	0.97	1

The churn model makes highly confident predictions—most users are classified with probabilities close to 0 or 1, indicating clear separation between predicted churners and non-churners.

BUSINESS INSIGHTS

Insight Summary

The churn prediction solution, powered by machine learning models, demonstrates exceptional accuracy in predicting which customers are most likely to leave. XGBoost, in particular, achieved perfect scores (1.00) across all evaluated metrics—including Accuracy, ROC AUC, Precision, Recall, and F1 Score—allowing confident buiness action based on the model's outputs.

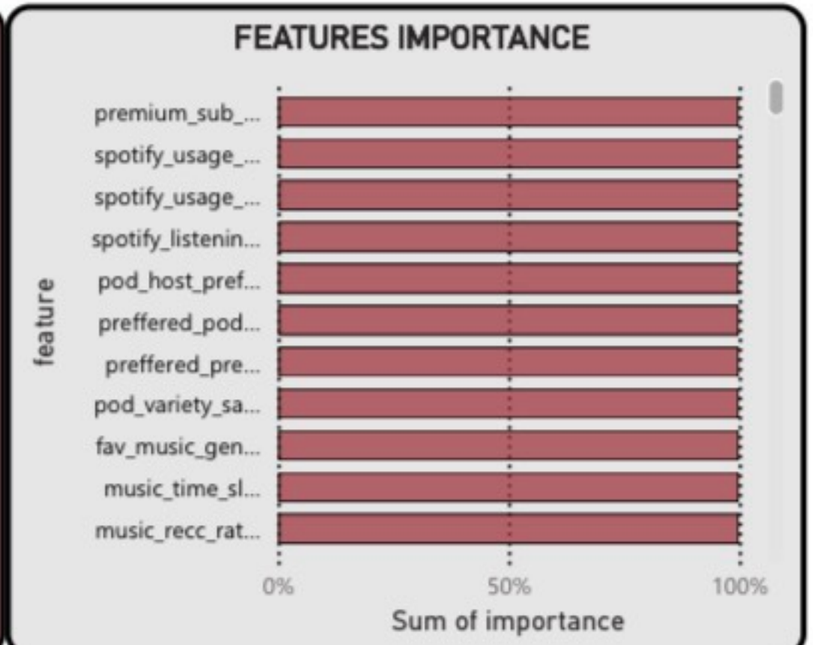
Key Findings

- The XGBoost model is the top performer, outscoring Random Forest and Logistic Regression on every key metric.
- Model predictions enable segmentation and prioritization of at-risk customers at the individual level.
- Business teams now have an opportunity to use data-driven insights to minimize customer loss and increase

1. Target High-Risk Customers:
Direct retention campaigns or personalized offers to customers flagged as high-churn risk by the model.

2. Proactive Customer Support:
Integrate model results into CRM/sales workflows to alert teams about at-risk customers for timely outreach.

3. Improve Onboarding & Experience:
Enhance the onboarding process and monitor customer journey touchpoints,



Business Value Statement

By applying these recommendations and using data-driven customer segmentation, the business stands to reduce churn, improve customer lifetime value, and focus resources where they will have the strongest impact on growth and retention.