

RUN SEVERAL MODELS, CHOOSE THE BETTER FITS YOUR DATA, GOAL

models	AUC-ROC	F1 score	Recall
Random Forest	87.88%	32.75%	67.75%
Logistic Regression	86.48%	32.65%	77.57%
LightGBM Classifier	90.12%	41.54%	77.72%
CatBoost Classifier	89.93%	46.68%	70.61%

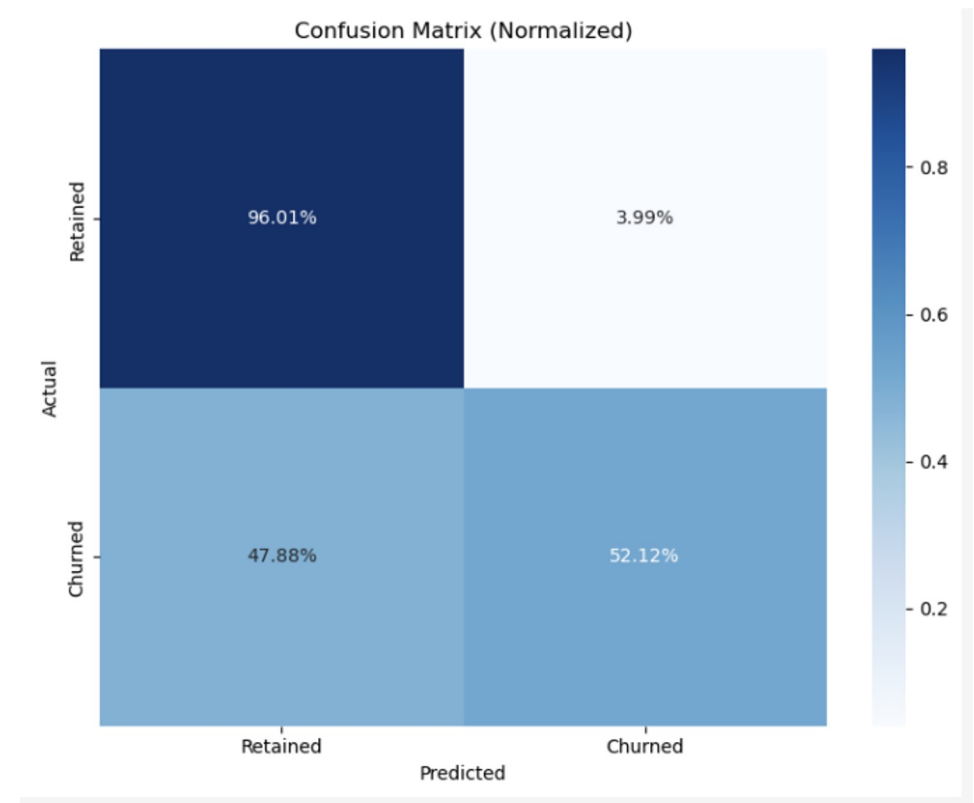


CatBoost Classifier model evaluation on unseen test data

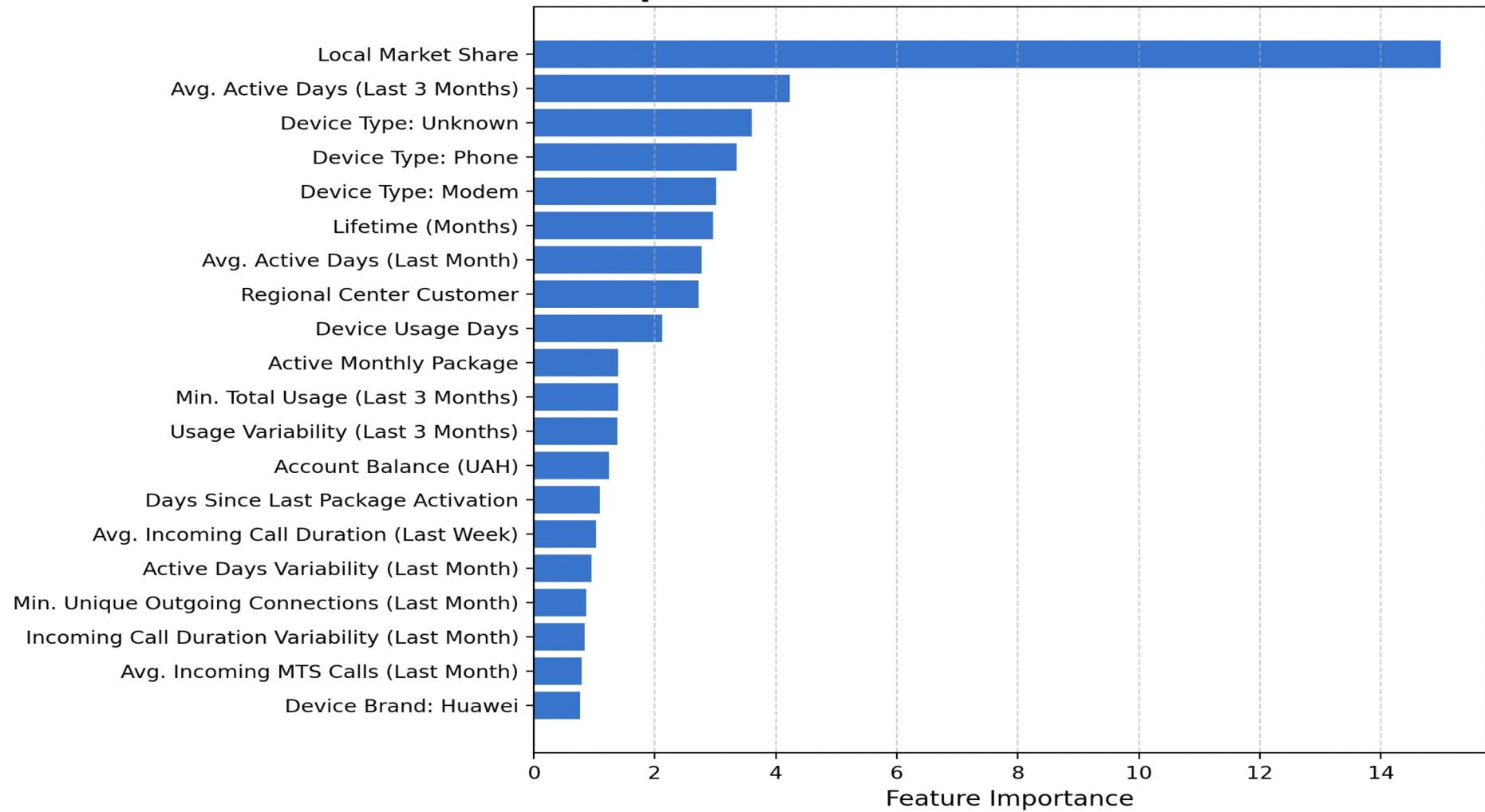
- **ROC AUC: 88.03%**
- **F1 score: 49.24%**
- **Recall: 52,12%**

- **Confusion Matrix**

- TN (Correctly identified retained): 134,994
- FP (Incorrectly flagged as churn): 5,603
- FN (Missed churners): 4,502
- TP (Correctly identified churn): 4,901
- Support data: 150 000



Top 20 Business Drivers of Customer Churn



ROI plan for an marketing campaign

Input data for retain campaign	Values
Total customers analyzed:	150,000
Predicted churners (model): (7.0%)	7%
Target for retention campaign (TP + FP)	10,504
Retention campaign cost per customer: (\$)	20
Total campaign cost: (\$)	210,080
Correctly identified churners:	4,901
Retain rate	10%
Retained customers	490
Average annual customer value: (\$50/month)	600
Campaings return: (\$50/month)	294,060
ROI	40%

Once retention rates exceed approximately **7%**, the campaign flips from a cost center to a **positive ROI initiative**.

It's a compelling proof point for combining data-driven customer segmentation with targeted marketing.

