**Task 2 Report: Churn Prediction Model Evaluation**

**Problem Representation:**

The problem at hand is best represented as a classification task. We aim to predict whether a customer will churn or not, a binary outcome.

**Model Performance Goals:**

The appropriate model performance depends on business priorities. We should aim for a balance between precision and recall, considering the business implications of false positives and false negatives.

**Performance Metrics:**

Using key metrics such as accuracy, precision, recall, and F1 score provides a comprehensive understanding of the model's effectiveness. Additionally, AUC-ROC score gauges the model's discriminatory power.

**Business Metrics Integration:**

Tie model performance to business metrics by conducting a cost-benefit analysis. Consider the financial impact of false positives (unnecessary retention costs) and false negatives (customer churn costs). Optimize the model's threshold to align with business objectives.

Adjust the threshold based on the business's risk tolerance and the relative costs of retention efforts and losing a customer. Striking the right balance will maximize the overall benefit to the business.

This approach ensures that the model aligns with business goals, optimizing the trade-off between precision and recall based on the tangible impact on the company's bottom line.