Abstract
We developed a telecom-specific cascade for churn prediction that combines logistic regression, random forest, RNN, and an XGBoost meta-learner. By decomposing the problem into interpretable stages, the system captures linear patterns, non-linear interactions, and temporal lifecycle dynamics. Tested on publicly available telecom datasets, it achieves strong performance metrics (F2: 0.908, Recall: 0.913, Precision: 0.888), improving precision over single-stage models while retaining high churn detection. With real-time scoring and deep-dive explainability, the framework enables actionable, targeted retention strategies, demonstrating that domain-informed cascades can outperform generic AI models while delivering operational insight.