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Corporate Capstone Project

Boosting Customer Retention for a Telco Company

The authors Rafaella Jereissati, Mohamed Atwa, Yupeng Chen, Alessio Mastropietro, Bernardo Antunes dos Santos and Max Uebele declare:

This capstone project is guided by strict ethical principles, ensuring confidentiality, compliance, integrity, and respect for all stakeholders. We safeguard proprietary information, adhere to data protection laws, conduct research with honesty and fairness, and uphold professionalism in all collaborations. By embedding these values into our work, we affirm our commitment to transparency and responsible execution, ensuring a project built on trust and integrity.

Master of Science in Business Analytics and Data Science
IE School of Science and Technology

Corporate Sponsor: BCG X
Assigned Mentor: Gustavo de Carvalho Homem

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Executive Summary

It is vital to predict customer churn for telecom companies in order to keep the high-value customers and grow revenue. This paper proposes a framework for predicting customer churn using machine learning approach on customer information such as usage behavior, profile, and text feedback from complaints to understand the signs of dissatisfaction that lead to churn. The combination of textual analysis with the behavioral data makes our approach more effective and efficient for customer retention without the need of complex models that are difficult to interpret.

Our model is divided into three stages. First, it classifies customer complaints with the help of feature engineering and machine learning text classification models, enhanced by large language models for more precise semantic analysis. Second, it predicts the churn probability using ensemble machine learning algorithms that incorporate both categorical and textual data, and the SVM model for test data with 98% accuracy. Last, it translates the text pattern to practical actions that will not only prevent the at-risk customers from leaving the company but also migrate them to the appropriate service level within the company based on the data analysis.

Furthermore, we are proposing a framework for maximizing revenue by understanding price sensitivity and customer life cycle, combining the insights on churn with retention strategies. Unlike many conventional churn prevention measures which are mainly focused on the risk avoidance, we propose a strategy that aims at the customers' reactivation and products' optimization. It reveals the possibilities of personalized propositions for upselling and dynamic discounting across the full range of telecom services. Due to the lack of direct pricing data, we develop comparative business plans based on real-life references. Specifically, we contrast the returns from focused actions based on the model versus a heuristic approach, thus defining the costs for which further examination of any a potential lever and its sustainable impact on the revenue should be made plus 6

The following are some of the important methodological aspects: To this end, we address the problem of over-reliance on certain variables, such as phone usage behavior that is likely to be related to plan features rather than churn probability. There are several means of enhancing the robustness of the model to ensure that it can adapt readily to new data: feature selection and feature engineering to ensure that the model can learn to update itself each time new data is fed into it. The solution is developed with the premise of being independent of a specific platform and the dependencies and reproducibility of the experiments are managed in a virtual environment. Future work may include the application of reinforcement learning approaches and better model interpretability techniques to enhance the decision making process. The proposed approach can therefore be viewed as a clear progression of how best to manage long term customer value while in harmony with business growth strategies.