Contents

Contents
Hold Steady: Keeping Your Donors
- Problem Statement
- Context
- Criteria for Success
- Scope of Solution Space
- Constraints
- Stakeholders
- Integrated Data Sources
- Approach
- Deliverables

Hold Steady: Keeping Your Donors

Problem Statement

Enhance donor engagement and increase contributions for a nonprofit organization by analyzing donor lifetime value, predicting churn, and optimizing interactions based on donor history and demographics.

Context

Nonprofit organizations operate in a multifaceted environment where donor contributions, outreach efforts, and supporter engagement form the foundation of sustained impact. The complexity of this landscape can greatly benefit from strategic data analysis and predictive modeling to navigate and tailor interactions with donors effectively.

Traditional methods may fall short in offering a comprehensive view of donor dynamics. The challenge lies in elevating our approach, integrating data science techniques to predict churn, identify factors contributing to supporter churn, and develop personalized retention strategies. This proactive strategy aligns with the goal of not just acquiring donors but fostering enduring relationships based on data-driven insights.

Criteria for Success

The success of this project will be measured by the accuracy of the predictive model in estimating churn, identifying key churn factors, and providing actionable insights for retention strategies. Evaluation metrics, such as accuracy, precision, recall, and F1-score, will be employed to assess the model's performance.

Scope of Solution Space

By applying data science and statistical principles to comprehensively analyze donor data, including contribution history and demographics, the goal is to predict churn, pinpoint factors causing supporter churn, and craft personalized retention strategies. Success rests on the precision of a predictive model, gauged by metrics like accuracy, precision, recall, and F1-score. This initiative seeks to equip organizations with predictive tools and strategic insights, propelling donor relationships into a new era of effectiveness while fostering enduring connections.

Constraints

- The accuracy of the predictive model is subject to the availability and quality of data. Incomplete or inconsistent data may impact the model's effectiveness, emphasizing the need for robust data collection and cleaning processes.
- Adherence to data protection laws and ensuring that the data used for analysis complies with privacy regulations, which may restrict the type or use of certain information.

- The existing technology infrastructure may impose limitations on the scale or complexity of the predictive model, affecting its implementation and real-time processing capabilities.
- Depending on the complexity of the predictive model, achieving a balance between accuracy and interpretability may be a challenge, particularly if the model needs to be easily understood by non-technical stakeholders.
- The success of implementing personalized retention strategies may also depend on the acceptance and cooperation of stakeholders within the organization, including staff, donors, and management.
- Donor behavior can evolve over time, and unforeseen external factors may influence contributions and engagement. The model may need periodic updates to remain relevant and accurate.
- The application of bootstrapping to datasets for this project, while enhancing robustness, may simultaneously limit the scalability and application ability of the model. Careful consideration of this constraint is essential for optimizing the model's utility.
- Ethical concerns related to the use of data, potential biases in the model, and the impact of personalized strategies on individual donors should be carefully considered and addressed.

Stakeholders

- Those focused on acquiring financial support and improving fundraising strategies.
- Teams promoting the organization's mission, interested in using the model for targeted communication and marketing.
- Teams managing finances, keen on how the model influences budgeting, resource planning, and financial sustainability.
- Teams interested in using the model to optimize program development and resource distribution.
- Teams cultivating relationships with donors, aiming to use the model for personalized and effective donor communication..

Integrated Data Sources

- Donor contribution history, including donation amounts and frequency.
- Campaign and outreach data.
- Donor demographics and engagement data.
- Supporter interaction data, including event attendance, volunteer activity, and communication engagement.

Approach

1. Data Integration - Aggregate and unify diverse data sources, including donor contribution history, campaign data, donor demographics, and supporter interaction details, establishing a consolidated overview of donor dynamics.

2. Data Exploration - Conduct in-depth analysis to discern patterns, relationships, and potential outliers within the integrated data. Visualize insights to uncover meaningful trends that can inform subsequent steps.
    a. Time series analysis for forecasting future donor contributions.
3. Data Preprocessing - Clean the data by addressing missing values, correcting errors, and standardizing formats, ensuring its accuracy and reliability for further analysis.
4. Feature Selection - Identify key features crucial for predicting donor lifetime value and supporter churn, emphasizing aspects such as donor demographics and relevant interaction details.
5. Model Selection - Choose a suitable predictive model, leveraging advanced data science techniques that can effectively capture the intricate relationships between selected features and the targeted outcomes.
    a. Supervised regression for predicting donor lifetime value.
    b. Supervised classification for predicting supporter churn.
6. Model Training - Train the selected model using preprocessed data, allowing it to learn and derive insights from the integrated dataset.
7. Model Evaluation - Assess the model's accuracy and effectiveness through metrics like Mean Absolute Error (MAE) and Mean Squared Error (MSE), ensuring its reliability in predicting donor lifetime value, supporter churn, and the 'Last Gift Date.'
8. Strategic Insights - Analyze the model's predictions to gain strategic insights into donor behavior, contributing factors to supporter churn, and determinants of effective retention strategies.
9. Empowerment Tools - Develop tools and resources that empower organizations with predictive capabilities, offering strategic insights and facilitating informed decision-making.
10. Implementation - Implement the predictive model and insights to propel donor relationships into a new era of effectiveness, fostering enduring connections. Apply these insights to refine staffing, optimize fund allocation, and inform program development for sustained impact.
11. Documentation - Document the entire process comprehensively, including data integration methods, preprocessing steps, model selection rationale, training details, evaluation metrics, and strategic insights gained.

Deliverables

- A final report that includes:
    - A detailed description of how the data was collected and aggregated for analysis.
    - Key findings and insights obtained through exploratory data analysis, highlighting important trends and patterns in the data.

    - A comprehensive explanation of the process used to develop predictive models, including steps such as testing, predictive power analysis, and model selection.
    - Evaluation and analysis of the predictive models' performance, providing strategic insights into donor behavior, factors influencing supporter churn, and recommendations for personalized retention strategies.
    - Detailed documentation on the selected predictive model, including its suitability and effectiveness in capturing relationships within the dataset.
    - A thorough overview of the entire project, covering data integration methods, preprocessing steps, rationale behind model selection, training specifics, evaluation metrics used, and strategic insights gained throughout the project

- Visual representations and insights derived from data exploration, showcasing patterns, relationships, and relevant trends within the integrated dataset.
- A refined dataset with addressed missing values, corrected errors, and standardized formats, ensuring accuracy and reliability for subsequent analysis.
- The finalized, trained predictive model ready for implementation including final performance metrics for tuned models.
- A GitHub repo containing the work you complete for each step of the project, including:
- A slide deck for presenting