Waze PACE Strategy Document I

High-level Planning

Introduction

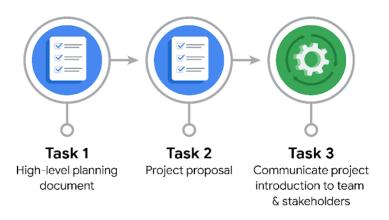
PACE stands for Plan, Analyze, Construct and Execute. It is a framework that illustrates the foundation and structure for data analysis projects and each letter represents an actionable stage in a project. The stage "Plan" involves the definition of the project scope, the research of business data and the workflow development. The stage "Analyze" involves data scrubbing, data conversion and database formatting. The stage "Construct" involves building models and machine learning algorithms and selecting a modeling approach. The stage "Execute" involves the presentation of results to decision-makers, stakeholders and others in order to receive feedback. This framework is built upon an iterative cycle where each stage may reveal new insights, requiring the return to earlier



stages. A PACE strategy document is used to record decisions and reflections at different stages of the data analytical process. It typically includes the definitions of roles and actions to ensure clarity and accountability.

Purpose

Waze's free navigation app makes it easier for drivers around the world to get to where they want to go. We want to analyze user data and develop a machine learning model that predicts user churn on the Waze app. Churn quantifies the number of users who have uninstalled the Waze app or stopped using the app. The project focuses on monthly user churn. Developing a churn prediction model will help prevent churn, improve user retention and grow Waze's business. An accurate model can also help identify specific factors that contribute to churn and answer questions such as "Who are the users most likely to churn?", "Why do users churn?" and "When do users churn?". For this stage of the project, we identify three main tasks that are presented in the following visual.



Considerations



Who is the target audience for this project?

The primary audience for this project is the Waze data team and cross-functional team members.

What is the objective or problem we aim to address?

The problem we are trying to solve is developing a machine learning model to predict user churn.

What are the key questions that must be addressed?

Key considerations include:

- What is the quality and condition of the available dataset?
- Which variables will have the most significant impact on fare predictions?
- Are there identifiable trends within the data that can guide our analysis?
- How can we mitigate potential bias in the data and analysis process?
- What resources are essential for completing this project?

We will need Python scripts and notebooks, the project dataset and ongoing stakeholder input.

What deliverables must be produced during the project lifecycle?

Deliverables include:

- Cleaned and prepared dataset for exploratory data analysis (EDA)
- Data visualizations to highlight insights
- Statistical model
- Machine learning model
- What is the timeline for the project?

The project is expected to be completed within 7 weeks, with specific milestones.

Who are the key stakeholders involved in decision-making?

The stakeholders include the Waze data team and cross-functional team members.

What risks might impact project completion?

Potential risks include data quality issues and model performance falling short of expectations.

How will the project success be measured?

Success will be measured by:

- Accuracy of the user churn predictions
- Quality of the insights generated from the data
- Stakeholder satisfaction with the final results

Tasks

The following group of tasks needs to be completed within the project. We identify which stage of the PACE workflow each task would best fit.

1. Draft the project proposal: Plan

Creating a detailed project proposal is foundational as it sets the direction for the entire project.

2. Design project workflow structure: Plan

Establishing a project workflow early with an initial PACE document ensures that processes are well-defined, roles are clear and timelines are realistic.

3. Summarize key data characteristics: Analyze

Summarizing the data is an early step of the analysis phase to gather initial understanding of the dataset's composition, types and sources.

4. Initiate data exploration: Analyze

The analysis phase provides a deeper understanding of the dataset and the information within it. We want to assess its potential, identify patterns and recognize any obvious challenges in the dataset.

5. Clean and analyze the data: Plan and Analyze

Planning takes place when we make choices about the methods needed. Data cleaning and deeper exploration happen concurrently, where the raw data is refined for analysis and patterns are investigated.

6. Create data visualizations: Analyze and Construct

Visualization begins with data assessment and is created during the construction stage, summarizing key insights in a more understandable format for both the data team and stakeholders.

7. Calculate descriptive statistics: Analyze

Descriptive statistics help quantify and summarize key features of the data, providing a basis for further analysis.

8. Perform hypothesis testing: Analyze and Construct

A statistical test is chosen and prepared during the analysis phase, but the test is carried out during the construction stage.

9. Develop regression model: Analyze and Construct

A detailed model examination is done during the analysis phase. Building the regression model is a core task of the construction stage.

10. Assess model performance: Execute

Evaluating the model after its construction involves checking its accuracy, fit and validity, which is crucial to ensure it meets project objectives.

11. Develop machine learning model: Construct

Using advanced algorithms to generate predictions or classifications would take place in the construction phase, typically after simpler models like regression have been evaluated.

12. Deliver final insights to stakeholders: Execute

Communication is important at various points throughout a project, but presenting the findings and their implications to decision-makers and stakeholders for approval and action is part of the execution phase.