

APPROVAL RATING DASHBOARD FOR U.S. PRESIDENTS

Project Proposal

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Github Repo Link

Project 4 GitHub Repo

Research Question

To what extent can a predictive model, using key economic indicators (like inflation and unemployment) and major political event data, accurately forecast near-term U.S. approval ratings? Furthermore, how do simulated changes in these economic indicators proportionally impact future approval scenarios?

This research question seeks to quantify the economy's role in a leader's public perception, while also examining the time lag before economic shifts actually impact approval ratings. Furthermore by building a simulative model, it aims to create a practical, forward-looking tool for testing "what-if" scenarios, moving beyond simple historical analysis to show how hypothetical future economic conditions could shape public opinion.

Existing Work

Past work on presidential approval is in two main areas. The first is public-facing data dashboards. The most famous was Nate Silver's (and later owned by ABC) FiveThirtyEight, which was a statistical product in itself. Its "work" was running a proprietary weighted-averaging model on polls, giving more credibility to pollsters with better historical accuracy. Other dashboards, like The Economist's approval tracker, RealClearPolitics, and Gallup's Presidential Job Approval Center, serve as aggregators or historical archives. These present demographic breakdowns or simple rolling averages to show how support differs by group and to track the most current trends.

The second area is the academic statistical modeling that provides the blueprint for these predictions. This research, from pioneers like Edward Tufte and Ray Fair, established that approval is not random. It is overwhelmingly driven by the economy (like inflation and GDP growth). These models evolved to include other key, non-economic variables. For instance, John Mueller's work identified the "rally 'round the flag" effect (a temporary spike in approval after a crisis), while Alan

Abramowitz's "Time for a Change" model quantified the predictable "erosion of support" that a president experiences over time.

Work Outline

The Data

Programming Paradigms

- Functional Programming
- Supervised Machine Learning

Software and Packages

- Tidyverse (data wrangling and visualization)
- Tidymodels (ML)
- RShiny
- ML engines (e.g. glmnet, ranger, kknn, kernlab)
- DT, knitr (for tables)

Our Product

Dashboard

- Home Page (Summary of Product/Tutorial)
- Historical Data

Here, the user can select a president of interest and view the approval ratings over the course of their time in office. Moreover, the user can also select variables of interest such as inflation, cost of healthcare, median salary, etc.

The dashboard will then display these in multiple. The top panel will show the president's approval rating, and separate panels will appear beneath it for each selected economic variable. All charts will share the same x-axis (time), allowing the user to easily compare trends vertically across the different metrics, each with its own clear and independent y-axis.

- Prediction and Modelling

This page will focus on applying a pre-trained statistical model to recent data to generate a near-term forecast for the current president. It will display a chart showing the model's prediction for the next 3-6 months, which is calculated by feeding the latest available data into the model.

The core of this page is the interactive simulation tool. Here, the user can adjust sliders corresponding to key economic variables (e.g., “Set future inflation to...”) to run their own “what-if” scenarios. As the sliders are moved, the model will instantly re-calculate and display the proportional impact of these hypothetical changes on the president’s approval forecast. This section will also briefly show the model’s key drivers, highlighting which features, such as unemployment or inflation, the model found to be the most significant predictors.

- Reference Page

Timeline

Task Distribution

- Home Page & Summary of Product (Everyone)
- UI (Mia)
- Prediction and Modelling (Oliver and Mia)

- Historical Data and Interactive Approval Rating Plots
(Louise and Lidio)
- Reference Page (Everyone)