

An Automated Voter Guide based upon Customer and Editorial Ranking of Campaign Issues.

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Abstract

Each election cycle voters must judge which candidates represent their political beliefs. Often the process involves reading material in an effort to determine how closely each candidate's opinions match the voter's. There may be an imperfect match between the voter's opinions and those of a candidate for an important office. This may lead the voter to search for candidates for other offices which compensate for the unshared beliefs of another favored candidate. We show a quantitative approach to this process, complete with two automatic implementations.

Summary

The current process of a representative democratic system is carried out by elected representatives formulating and voting upon legislative affairs as proxies for the general population. At election time, rather than voting purely upon a referendum, each citizen is presented with a choice consisting of a set of candidates. This set of choices is usually arrived through a two party nomination process, with expense of the candidates' promotion funded through a combination of government and public financing.

Before election time, the state publishes the statements of all approved candidates for each office. It is up to each voter to study these statements, and make a judgment about the character of the candidate. This may be related to the tenor of the statement, the personal appearances of the candidates, or may simply be the result of an analysis of the candidates' stated positions with an eye toward their agreement with the voter's own. To the extent that the process is the later, we employ quantitative methods in an attempt to save each voter the effort of performing the same work.

Sometime near election time, most newspapers present their choices on their editorial page. These are presented as the unequivocal choices for each open seat in the election, with the implicit bias of the editorial staff. Presumably, the act of reading a particular paper implies that the reader agrees with that paper's opinions in total. We attempt to match this process, with the additional flexibility of allowing the specification of a quantifiable set of biases, with the attendant flexibility in editorial recommendation.

Another similar approach is here implemented which consists of software prompts for any number of questions of opinion. A record of each candidate's responses for the same questions is kept in a database accessible to the prompting software. The set of candidates which simultaneously represents the closest fit to the customer's responses is then presented as a service, as well as a suggested budget for any campaign contributions which might be offered.

Customer Experience

The design of any media piece is governed by at least two facets. First, the audience for which the piece is intended strongly influences the product content, and second, the level of attention required for the typical audience participation determines product size. We are attempting to maximize individual usage where any voter is the potential customer, and the expected duration of customer interaction is less than five minutes.

Statistical Preparation

The process of feeding the software is begun by first choosing a particular legislative body. In our prototype, we use the United States Government. Next a set of defining issues must be chosen. Some examples are:

- Environmental Preservation vs. Economic Production.
- Free Speech vs. National Security
- Military Production vs. Social Programs
- Reproductive Rights vs. Rule of Law over Life

To begin with, each candidate is given a sample rating. Now, the website is open to customer rating. As opinions are received, they are processed for authenticity, and a moving average is kept for each candidate on each issue.

The selection of the issues to be treated is itself an editorial decision. The statistical model employed is very sensitive to its inputs, and will tend to amplify errors made in the analysis phase. In our defense, it should be noted that the best alternative to a voting record aggregator is the static editorial voting recommendations of the major newspapers, which themselves provide opaque voting programs. At least, with a software approach, it is possible for the customer to explore the piecemeal judgments that were used to formulate a voting program.

Analysis of political issues is conducted through customer opinions, and every attempt is made to avoid campaign rhetoric. A candidate may have such a shallow history in politics, however, that analysis is only possible through deconstruction of the candidate's campaign promises. A high degree of uncertainty is associated with this type of analysis.

Links to the candidate's web site where a contribution may be executed are provided for the web page implementation. The telephone implementation allows for the selection of additional audio information on each point. In no case are contributions passed through Voter-Guide. Rather, the software simply points the motivated contributor in the direction of the candidate's own contribution receptacle.

Example Calculations

By now it should be clear that while the statistical analysis used to as partial input to our voter advice product contains implicit biases, the actual calculation method is formal and completely quantifiable. First off, a panel of issues is presented to the customer for ranking and for position selection. This represents a weighted vector of issue preference. The solution for the best candidate selections for that voter may be quantified as a minimization problem, as follows.

We begin with a method for comparing a candidate and a voter. We assume that the voter has answered the same set of questions as the candidate, and we simply need to compare the two. Note that the answers for the candidate are simply arrived at by tallying

the average estimate provided my visitors to the web site, or by an editorial review. In equation E(x), we then compare each of the candidates answers to the voter's, and sum the result.

$$f(x) = \sum_{i=1}^n \sqrt{(c_i - t_i)^2} \quad \text{E(x)}$$

This gives us a meaningful statistic for how a single candidate's opinions differ from the voter's target. A larger number indicates a greater distance, or disagreement. If the opinions match exactly, the lower bound of E(x) will be reached, at the zero value.

A voter is likely to have a disagreement over the importance of different issues. This is expressed in E(x) as a vector of rankings for the issues, so that distances in opinion are weighted more heavily for the voters expressed weighting of the issues. In fact, the difference in opinion between the voter and the candidate once certain issues may be no importance to the voter whatsoever.

$$f(x) = \sum_{i=1}^n w_i \sqrt{(c_i - t_i)^2} \quad \text{E(x)}$$

This model is extended to include a penalty term in E(x). This second term amounts to a uniform inflation for the candidate's score, and might be reserved for use when a candidate seems to vacillate the issues. This term lends a powerful bias between two otherwise indistinguishable candidates.

$$f(x) = \sum_{i=1}^n w_i \sqrt{(c_i - t_i)^2} + \mathbf{a} \quad \text{E(x)}$$

Now, perhaps most importantly, the voter must simultaneously decide the best candidates for a set of elective offices at each election cycle. In the United States, these include a President/Vice President pair, senators, congressional representatives, and various local offices. These are not necessarily independent selections, as inevitably there is some difference of opinion between each candidate selected and the voter's own views. A voter may easily be saddled with a set of undesirable traits when choosing a candidate for one office, and might wish to mitigate these differences in choosing amongst the available candidates for the remaining offices. For example, if a voter is a "hawk" (she favors an increase military activity) but is also pro-choice (she believes in legally available abortion) she might find a split in the issues in a conservative republican

candidate. Once having chosen the conservative republican for the first office, she might seek to balance out her choice by voting for liberal democrats for other offices in order to maintain representation for her pro-choice beliefs. This selection process is quantified in $E(x)$.

$$\min f(x) = \sum_{i=1}^n \sum_{j=1}^m w_i \sqrt{(c_{ij} - t_i)^2} - \sum_{i=1}^n a_i \quad E(x)$$

Conclusion

The purpose of the voter guide is to perform the same function as a typical newspaper editorial page does when it publishes its choices for representative government during an election cycle. The issues are explored, and the candidates are judged on their faithfulness to these issues. Then, a ranking of the issues and a selection process are performed. The automated voter guide, however, allows for the simultaneous presentation of any possible candidate set in a manner which directly reflects the editorial exploration of the issues, and is thus of better use to the editorial reader.