

Modeling social media support for the elicitation of citizen opinion

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ABSTRACT

Social media can be employed as powerful tools for enabling broad participation in public policy making. However, variations in the design of a social media technology system can lead to different levels or kinds of engagement, including low participation or polarized interchanges. The complex motivations, expectations, and actions among various actors in political communication need to be considered as ‘make-or-break’ factors in the design of such systems.

This paper uses the i^* modeling framework to analyse the impact that alternative configurations of a social media technology can have on the goals and relationships of the actors involved. The framework is applied to a website devoted to the deliberation of climate change issues. The intentional qualities that guide the actors in these discussions are derived from a review of the literature on e-government, on means for eliciting citizen opinion, and on the social aspects of online discussion.

Categories and Subject Descriptors

H.4.3 [Information Systems Applications]: Communications Applications; D.2.1 [Software Engineering]: Requirements/Specifications—*goal-orientation*

General Terms

Human Factors, Design

Keywords

Conceptual Modeling, istar, Social Media, e-Government, Goal-based Analysis

1. INTRODUCTION

Town hall meetings, radio call-in shows and citizen surveys have been traditionally used by politicians to learn of the issues facing their constituents. The goal of this process is often to aid government policy conceptualization [2,

16, 21] or policy feedback [7]. Increasingly, politicians are using social media as channels to support this citizen opinion elicitation. For example, YouTube has been employed by a number of politicians who answer most of the popular questions posed to them by their online audiences. In this regard, it is the collective opinion of social media users that help to set a political agenda [4].

Participatory policy making [19] can be supported by social media when a community collectively ranks the most popular and important issues. Users assign a positive or negative valuation (a “vote”) on each other’s comments. This arrangement results in a ‘collaborative filter’; the highest-valued comments are shown prominently, while content of low value is hidden from view¹. Ideally the highest-valued comments would represent the rationally-determined important issues facing the community. However, scholars and policy makers are finding that variations in the arrangement and organization of the user-generated content result in changes to user contribution and ‘democratic’ debate [12, 13]. These variations thus help to shape the system’s underlying social values [16].

Design choices tacitly embedded in a technology help to determine user behaviour, participant goal achievement and interdependent relationships. Analysing the impact of various system configurations on these goals and dependencies at an early stage can help guide the design process.

Models support this kind of reasoning by abstracting the domain into a depiction of elements that aid in answering an analysis question. For example, a designer can model how different configurations may contribute to the success or failure of a system. This can be demonstrated in a model of the alternatives available to the designer of a collaborative filter. Such a system can benefit from precise, model-supported analysis of its complex sociotechnical domain.

2. DESIGNS, GOALS AND POLITICS

A well-designed system supports the satisfaction of stakeholder goals. By conceiving of the system in terms of goals to be achieved, rather than solutions to implement, designers can effectively consider the granular impacts of various design choices [5]. The utility of this approach increases alongside the complexity of the setting; a rigorous methodology can aid in understanding the relationship of interdependent stakeholders with competing goals.

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¹see the comment sections of www.youtube.com, www.reddit.com, www.digg.com for popular examples

The designer of a collaborative political comment filter can benefit from analysing the goals of the client politician supporting the project, and also those of the citizen users whose contributions are essential to the system. A basic functional requirement could be that the system organize the user-created content in such a way that the most important comments are the highest-ranked. However, there are various ways of interpreting what is meant by the “most important comments”, and correspondingly, different possible configurations of the collaborative filter that would help to fulfil the requirement.

2.1 Goals and Design Decisions

In the collaborative filter, the criteria that outline what is an important comment depend on the goals of the stakeholders, in particular the client political institution. Based on the literature, politicians often desire to advertise themselves [2] and advantageously frame a publicly discussed issue [15] in order to manage citizen expectations on what is plausible [11]. Therefore, depending on the issue, the politician may desire that elicited citizen opinions be framed either as a consensus or as an open debate.

Based on recognition of the above goals, the system designer can choose to configure the collaborative filter either to highlight popular and agreeing opinions or conversely, diverse and conflicting views. The former design alternative, hereafter referred to as the “complementary filter” would compare user comments and profile information with those of other users in order to display familiar content and ideas to the user. This would likely encourage users to consolidate and clarify existing positions [3]. The latter alternative, the “contestatory filter” would compare the same items, but display unfamiliar and potentially challenging content, likely inciting debate [9]. These alternative designs of a collaborative filter would have variable impacts on the goals of multiple stakeholders.

Concurrently, important comments must fuel the sustained activity of the community of citizen users. Otherwise, there would not be enough activity on which the collaborative filter could base its processing; it would consequently not be able to present a comprehensive overview of citizen opinion to the politician stakeholder. As such, a designer’s definition of an important comment must also consider the concept’s relationship to citizen goals.

The literature suggests a wide range of motivating factors that encourage or discourage a citizen’s opinion expression in a web-based political setting. An active citizen is interested in and feels connected to the topic issue [16, 20, 22]. These motivations may be encouraged by the ability to personalize an information system and filter information based on interest [17, 21]. The degree to which the citizen has faith in and a connection with government [16, 17], a sense of citizen identity [20], and the sense that participation generates meaningful outcomes [17, 23, 18] are all shown to encourage citizen involvement.

Based on an analysis of the domain, the designer may then conceive of how potential design choices deriving from one stakeholder’s goals affect those of other, interdependent stakeholders. In the particular case of the collaborative filter, the designer would consider how the employment of either a complementary or contestatory filtering mechanism might affect the participation of citizens. High-level system requirements could then be derived from this analysis.

2.2 Modeling the ‘Why’ Questions

Goal- and agent- oriented requirements engineering techniques have been recognized as effective means of eliciting organizational-level requirements based on stakeholder needs [6, 8]. By employing such a technique, the designer may decide on specific configurations based on their efficacy in fulfilling the goals in question. A prominent goal- and agent-oriented modeling framework is i^* [24]. A modified version of the framework has previously been used in the modeling of an e-government service [8].

The central modeling construct in i^* is the actor, an entity whose autonomous behaviour is based on reasons and motivations. i^* models conceive of the social world as interdependent relationships; an actor may depend on another to fulfil a goal, furnish a resource, or carry out a task. If an actor depends on another and that dependency is not met, the actors own internal goals may fail.

In this manner, i^* can depict the relationship between individual actor intentionality and the broader social setting. Furthermore, an intentional ontology allows for the analysis of ‘why’ an actor may prefer one possible alternative action over another. This technique thus provides suitable support for the goal-based analysis of design choices.

3. APPLICATION TO CLIMATE DEBATE

This section employs i^* to model and evaluate the predicted effects of alternative collaborative filter configurations on the goals of stakeholders. The application setting is an online community where users debate climate change issues and create plans on how to mitigate its effects.

3.1 Stakeholders and Technology

The climate debate website employs a discussion forum with multiple subtopics, interactive plan creation tools based on a climate prediction model, and community-building features such as user profiles. Based on interviews with project staff, a major goal of the website is to become a resource for citizens to access and become informed about the various perspectives and plans that exist in the public sphere. Another identified need is to attract and retain users. Interviews with potential participants reflected what was found in the literature; some key goals include “feeling connected” to the issue and a sense that their participation has some kind of tangible effect.

Policy makers do not currently play an overt role in the website. However, as the above sections have shown, evoking a sense of citizen identity and providing a glimpse of a meaningful outcome is an important incentive for citizen communication. The modeled scenario supposes policy makers (modeled as “politician”) take on a more active role by asking questions to the community, who then may respond in a discussion forum.

A collaborative filter is proposed for introduction, in order to organize the resultant content. This technology has been chosen partially for demonstrational purposes and because the tool can leverage the collective opinion of the community and to present salient and relevant information to the politician [10]. Additionally, this tool is to be employed by users, who may easily respond to relevant or provocative posts.

The i^* strategic rationale model of the setting, shown above in Figure 1, attempts to answer the question “How does the configuration of a collaborative filter recommendation system affect the elicitation of citizen opinion by a

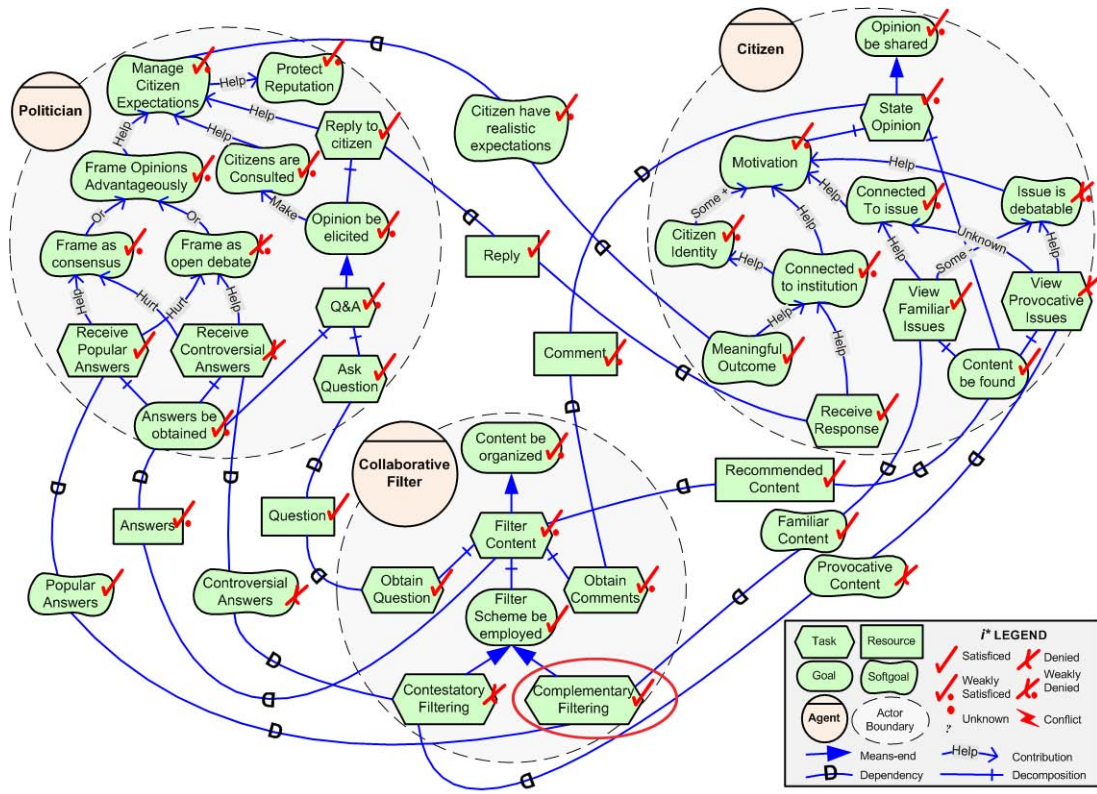


Figure 1: Evaluating a Collaborative Filter Design Alternative for a Climate Change Debate Community

politician?” The modeled goals build upon the discussion of the literature in Section 2.1 with some extrapolations for the purpose of illustration. It is important to consider that design choices may impact the citizen’s goal achievement in variable ways; one individual may prefer to debate and another to discuss the familiar [20].

The model considers the two alternative configurations of the collaborative filter suggested in Section 2.1 (shown in the lower centre of the figure). Each are presented as distinct means of accomplishing the goal “filter scheme be employed” (shown in the lower area of the filter agent). The leftmost function presents users and politicians with contesting views and provocative content; it would be a “contestatory filter”. Alternatively, the technology could be configured as a “complementary filter”, whereby the filtered questions and citizen answers would be largely in accordance with user views.

3.2 Evaluating Alternatives

The figure depicts the result of a qualitative evaluation procedure based on [14]. This methodology supports the iterative analysis of the effect of alternative choices upon stakeholder goals. In this evaluation scenario, the “complementary filter” is chosen (circled and checkmarked in the model) while the “contestatory filter” is not (marked with an ‘X’).

The effects of choosing the alternative propagate throughout the model via the dependency and contribution links originating from it. For example, the “Citizen” agent may view either “Familiar issues” or “Provocative issues”, determined by the configuration employed in the filter. In this scenario, the citizen views familiar issues which may “help”

the citizen feel connected to the issue, but may have “some negative” impact on the amount of debate that can be generated. These two goals, “Connected to issue”, and “Issue is debatable” both help the citizen’s motivation to express his/her opinion. Since the contestatory filter is not selected, the recommendations do not directly help to encourage debate.

The “Politician” actor may similarly “receive popular answers”, dependent upon the “complementary filter”, which will help the actor to frame the issue as a consensus but “hurt” the ability to frame the issue as an open debate. As the alternative, contestatory filter is not employed, the politician will not “receive controversial answers”; thus nothing clearly helps to frame the issue as an open debate nor hurts the ability to frame the issue as a consensus.

The model also shows that the politician may choose to reply to the community’s answers. The citizen depends on the politician to present issues that generate realistic expectations and also to reply to his/her comments. If these are not fulfilled, then the citizen may not feel as connected to the political institution and thus motivation to contribute may suffer. This relationship is independent of the alternative configurations of the collaborative filter; yet it is instructive to account for related means by which a politician may influence a citizen’s motivation.

Depending on the goals of the politician—whether the issue is framed as an open debate or a consensus—the designer may select the alternative that contributes most beneficially towards the accomplishment of those goals. The i^* modeling technique thus supports reasoning about how configuration choices of the collaborative filter would impact high-level

stakeholder goals. In this example, the climate community is loosely based on the Climate Collaboratorium [1].

4. CONCLUSIONS

This paper demonstrates the application of goal-oriented analysis techniques to support reasoning about design alternatives. The application scenario considers citizen opinion elicitation in the context of the climate change debate. Varying configurations of a social medium – a collaborative filter – were analysed and evaluated based on the goals of various actors derived from the literature. By considering the impact of such configurations at an early requirements determination stage, the designer may ensure that the implemented system satisfies stakeholder goals more effectively than various alternatives.

A limitation of the modeled scenario is that it is largely based on the literature, and thus should only be considered as illustrative of the design technique described. Future work would include testing this method on a social media design problem that can be empirically measured and validated.

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