Building Interpretable Discussions
for effective public engagement

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Abstract
Shifts in the culture of civic engagement, technologies and practices surrounding social media, and pressure from political leaders have ignited a movement amongst gov't agencies to extend their efforts for obtaining input on public issues. These projects face serious challenges related to scale of participation and political capture, though collaborative efforts elsewhere suggest we may be able to support interactions amongst large numbers of people. Instead of emphasizing the exchange of individual messages and voting, I propose that systems should be designed to support the cooperative *production* of discussions.

Keywords
Political communication, collaboration, labor, deliberation, advocacy, sensemaking, translucence

ACM Classification Keywords
H.5.3 Group and Organization Interfaces: Computer-supported cooperative work, Web-based interaction

General Terms
Design, Human factors

CHI 2010, April 10–15, 2010, Atlanta, Georgia, USA.
ACM 978-1-60558-930-5/10/04.

Introduction
Toward the turn of the century, trust in government reached critical lows with the shift from a group-based society (civic associations, unions) toward a networked society (participatory media, social networking) that governments were ill equipped to engage [1]. Early attempts to forge digital links were largely rejected by publics who found them lacking credibility and impact. But there is some indication that governments are awakening to the need to seek relationships with more loosely networked publics for their support, as well as for gaining legitimacy for their actions (Figure 1).

While these efforts are encouraging, they reveal serious challenges (Table 1). Existing strategies proliferate discussion, relying on a division of communicative labor where citizens speak individually and government officials synthesize the frequently high volume of comments. It becomes difficult to understand what has been said and build on it in a coherent fashion. Policy advisors must sort through the comments, find points of consensus, and identify innovative ideas. When present, mechanisms for synthesis are weak, and filtering is typically accomplished through voting.

Figure 1: Example Government 2.0 experiments for public input.

1. Open For Questions
2. Dialog on Open Government
3. Citizen Briefing Book
4. Downing Street e-Petitions

1-3 were initiated by the Obama Administration and largely employed systems where people submitted answers to a question and others voted on them. The last is an open petitioning site embedded on the UK Prime Minister's website.

Table 1: Challenges for engagement*

- **Knowing the range of positions**. It becomes difficult to get a sense of the scope of input. People leave or post redundant content, adding noise.
- **Understanding who and why**. It is challenging to know *who* is agreeing with something and *why*. What does it mean for an action to be popular?
- **Building on other ideas and opinions**. There are few ways to improve ideas submitted by others. Comments become unwieldy. Changing someone's expressed opinion via wiki can be uncomfortable.
- **Moderating content**. Some content will be inappropriate, off-topic, or redundant. Managing this can be burdensome.
- **Handling strategic activity**. Interest groups sometimes capture the input process, e.g., by flooding the system with duplicates to give the impression of wide support.

*These challenges are derived from our analysis of open government experiments, experiences studying Wikipedia [5][6], and review of social science literature [7].

To address these shortcomings, I believe we need to build discussion systems that maintain structure and that are contextualized with cues that guide citizens and decision makers in making joint sense of what is being stated, by whom, and why. I call this property *interpretability.* If we can improve interpretability, we may in turn create a clearer basis for individuals to engage in deliberation and political advocacy, and thus improve efficacy. Research on collective sensemaking shares similar goals, but those approaches tend to focus on formalizing argumentation and disciplining users to act in those terms [11,10]. This approach may unnecessarily trade efficacy for interpretability.

Instead, I hypothesize that we can leverage the scale of participation to augment the individual-message/vote paradigm with more synthetic mechanisms that tap people's productive capacities. I propose that we build interfaces that enable citizens, moderators, and computational agents to cooperate in the production of interpretable discourse using individual messages as the raw material. This reframes the design task: discussions are a good to be produced and maintained in order to achieve higher-orders of communication that transcend time-bounded, single-sender messages.

The user centered design of practical systems will be my primary method for developing a theory to guide the design of communication channels that connect institutional authorities and their loosely networked publics. Toward this end, our team is partnering with the Seattle City Council and Dept. of IT in the design of a web portal for public engagement on policy issues. This will enable experimentation under real-world constraints, as well as access to policy makers to understand their needs. Our collaboration includes a startup whose product was used by Obama in the recent Dialog on Open Gov't. This provides a vector for experimentation and deployment elsewhere. Finally, we are partnering with CityClub, a non-profit that involves citizens in complex policy discussions. They will help gather diverse participants for user studies and encourage use of our systems.

Platforms for Effective Communication

The research questions for my dissertation focus on identifying the distributed work processes and labor sources that can be drawn upon to maintain interpretability, the interfaces and interactions to support this work, and how to make them robust in the presence of strategic communication by interest groups. Here I sketch a few ideas I am pursuing. Given the work perspective, a key concern is to carefully articulate the work to be accomplished[9], engage, and leverage the motivations of diverse participating individuals with the work they are invited to perform [4], and use other participants, moderators, and computational agents to reintegrate the work.

Collaborative authoring of position statements

Position statements in political discourse are often either strictly limited in number (e.g. pro/con on voting guides for referenda), or at the individual level, such as emails and letters. This design invites participants to collaboratively author and endorse position statements. It empowers (and depends on) participants self- organizing. The synthetic burden is placed on advocates, who can put their best arguments forward and mobilize support, rather than on readers.

Idea pool

The Idea Pool embraces the fact that many statements of varying quality will be submitted. But it does not give these

statements prominent display. Instead, the collection of submitted statements (the idea pool) is separated from a representation of the input received thus far (the dynamic summary). Submitted statements are treated as raw material from which other participants and moderators can extract, assemble, and insert useful bits into the dynamic summary, like unique ideas, new rationale, and relevant anecdotes.

The idea pool is internally represented as a similarity graph, using various methods for calculating pair-wise similarity along different dimensions (e.g. near- duplicate detection and sentiment analysis). This graph is used in the browsing interface. Participants are invited to "dive" in and navigate the sea of submitted comments. Users can see only a few of the statements at a time. To navigate to different areas of discourse, users can click to "see more statements like this one." This interface supports search, but also serendipity in coming across the opinions of others. As users browse, a system articulator may automatically present them with optional tasks (e.g. determine if there is a unique idea in a post). The tasks that participants are matched with should be intelligently chosen to leverage individual interests and system need[2]. The results of these tasks are reviewed and integrated into the dynamic summary by moderators, other participants, and/or through human algorithms executed in a microtask market[8].

Signals for sensemaking and social translucence

A major challenge for interpretability is getting more information about who supports some utterance and why. This has consequences not just for interpreting the discourse, but for enabling participants in online deliberations to be able to better make judgments about who to trust, a key theme in the literature on social translucence [3].

I am experimenting with an interaction technique— *Signal-Prompt / Aggregate-Drilldown* (SPAD)— to approach these problems. It can be used in concert with the platforms described earlier. Signaling refers to the ability to send a quick message about an arbitrary piece of text. For example, users might highlight text that they have an opinion about, whereupon they are asked to make a quick vote on that text (Figure 2). The user is then *prompted* to give a short, optional message about why they felt that way. The Aggregate- Drilldown aspect handles how others interact with the signals. In our initial designs, signals are *aggregated* and visualized by coloring the background of text. For example, the magnitude of the background coloring of a piece of text reflects how many people have sent a signal about it, while its color indicates the polarity of the signals. If a reader is interested in getting more information, they can *drill down*. For example, they can hover over an annotation to get a summary of who sent signals and probe the answers to the prompts.

Embedding in state and publics

For successful public engagement, it is also important to design for how the communication platforms are institutionally positioned. Most e-government systems have tended to ignore the consequences of weak embedding, both in terms of how they attract participants and how the institution commits to interacting and utilizing the dialog.

Government-side development

Those who provide input expect their concerns to be accounted for in the decision-making process. Disingenuous calls for input can be more damaging than

Outset 1: The Idea Pool approach is related to systems that support *incremental formalization* and iterative summarization. However, the emphasis is on continually maintaining the state of interpretability, rather than achieving it during post-processing.

Ackerman, M. et al. I-DIAG: from community discussion to knowledge distillation. *CT '03.*

Nam, K. et al. Arkose: reusing informal information from online discussions. *GROUP '07.*

Shipman, F. et al. Incremental formalization with the hyper– object substrate. ACM trans. on info sys.

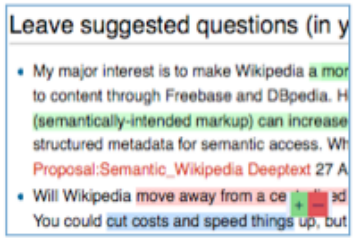

Figure 2: A SPAD prototype running on a proxy of Wikipedia. A user has just finished selecting some text and is given the option of sending a signal by clicking the green + or red -. They will then be prompted for a reason. SPADs are in the tradition of showing the *computational wear* that a document accumulates over time as it is read. It is also a method for anchoring discussions.

Brush, A.J. et al. Anchored Discussions vs. Discussion Boards. *CSCL '02*.

Hill, W. et al. Edit Wear and Read Wear. CHI '92.

not asking at all. Without investing some amount of power in the voices of the people they seek to consult, the incentive to participate will be minimal. I see two types of commitments that might be secured: (1) providing interactive feedback (e.g. staff might commit to commenting on a few statements per day) and (2) how the input will be incorporated into a larger policy cycle (e.g. authors of popular ideas might participate in special public meetings). These commitments should then be made actionable in the interface, so that participants have clearer expectations about possible interactions and outcomes.

Enabling the participation of publics

Few will attend a public hearing held in an inconvenient location; likewise, few will participate in a digitally isolated platform. While social media has expanded the opportunities for diverse publics to form, it has also made it easier to engage with people through social networking sites. I will research how to integrate the communication platform tightly with social networking sites. For example, publishing actions taken in the platform to an individual's news feed on Facebook can help penetrate that individual's personal social network and draw them in as well. Social networking sites are not the only outreach methods I am pursuing, but are the least explored.

Expected Contributions

Effectively harnessing the political energies of large numbers of people in communicating with government is an understudied but important domain for HCI, both with respect to understanding users and to interaction design. My dissertation work investigates key challenges in this arena, in particular how to improve the interpretability of discourse without sacrificing individual and group efficacy. My background studying discussions and work articulation in Wikipedia, as well as public participation surrounding urban simulation give me a fresh perspective on this problem.

Acknowledgements

A. Borning, D.W. McDonald, L. Bennett, and J. Fogarty.

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