Crowdsourcing Perspectives on Public Policy from Stakeholders

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ABSTRACT

Personal deliberation, the process through which people can form an informed opinion on social issues, serves an important role in helping citizens construct a rational argument in the public deliberation. However, existing information channels for public policies deliver only few stakeholders' voices, thus failing to provide a diverse knowledge base for personal deliberation. This paper presents an initial design of PolicyScape, an online system that supports personal deliberation on public policies by helping citizens explore diverse stakeholders and their perspectives on the policy's effect. Building on literature on crowdsourced policymaking and policy stakeholders, we present several design choices for crowdsourcing stakeholder perspectives. We introduce perspective-taking as an approach for personal deliberation by helping users consider stakeholder perspectives on policy issues. Our initial results suggest that PolicyScape could collect diverse sets of perspectives from the stakeholders of public policies, and help participants discover unexpected viewpoints of various stakeholder groups.

CHI'19 Extended Abstracts, May 4–9, 2019, Glasgow, Scotland UK

ACM ISBN 978-1-4503-5971-9/19/05.
https://doi.org/10.1145/3290607.3312769

KEYWORDS
Civic engagement; crowdsourcing; civic tech; stakeholder; personal deliberation

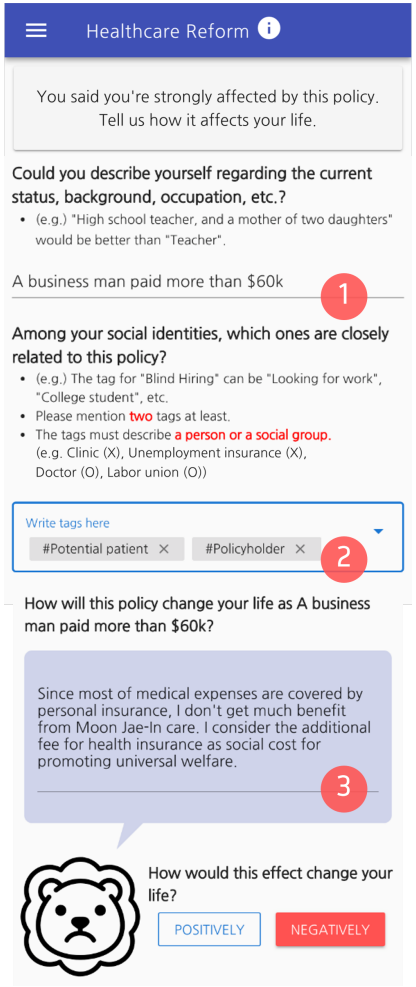

Figure 1: Initial design of PolicyScape for asking stakeholder's perspectives. The user identifies themselves as a stakeholder in the form of both (1) open-ended text and (2) tags. The user also shares their experience on the policy (3) and whether the experience is positive or negative.

INTRODUCTION

In democratic societies, public deliberation takes an increasingly important role in their decision making process. Its legitimacy comes from the consideration of a wide range of alternatives [12], which encourages the participants of the public deliberation to make rational arguments that regard diverse options. Personal deliberation is the process through which individuals ponder and reflect on the diverse and profound information [15]. By personal deliberation, citizens can create their own informed opinion on a public policy, which can lead to higher quality discussions and thus better public deliberation [5].

However, existing channels usually do not collect and show opinions of diverse stakeholder groups, thus failing to provide a diverse knowledge base for personal deliberation. News media serves as a primary channel for citizens to learn about social policies, but the bias of the media could lead to an under- or over-representation of specific stakeholder groups [9]. Social media is another channel that citizens increasingly rely on to share their opinions on political issues and see others' perspectives [14]. However, social media tends to limit access to diverse viewpoints, due to a combination of users' tendency to engage with views that confirm their own [15] and algorithmic filtering that reinforces similar views (i.e., filter bubble) [13]. Online platforms for aggregating citizens' opinions [3, 6, 13] mainly support open-ended discussion or comparison of personal views on policies to others'. However, these platforms do not explicitly present the identities of stakeholder groups and therefore may limit users' understanding of the overall effects of the policies.

We introduce an initial design of PolicyScape, an online platform for supporting personal deliberation on public policies based on diverse perspectives of stakeholders. We take a crowdsourcing approach to collecting and presenting specific stakeholders affected by a public policy and perceived effects of the policy on them. Based on lessons from literature on crowdsourced policymaking and policy stakeholders, we present our design choices to leverage the input from citizens as information about policy stakeholders, and to support deliberation on policy using collected information. We tested our initial version of PolicyScape with 45 participants to verify whether it could collect stakeholder perspectives on public policies. Results from the preliminary study suggest that our approach can (1) collect novel and valid perspectives from citizens and (2) help participants get a comprehensive understanding of the policies.

BACKGROUND

Understanding a Public Policy through Stakeholders. Understanding who the stakeholders are and how they are affected by public policy is important in assessing the effect of the policy [17]. Stakeholder analysis, a systematic method for investigating stakeholders, can identify a wide range of stakeholders, including marginalized groups as well as the key players [11, 17]. Incorporating the perspectives of each

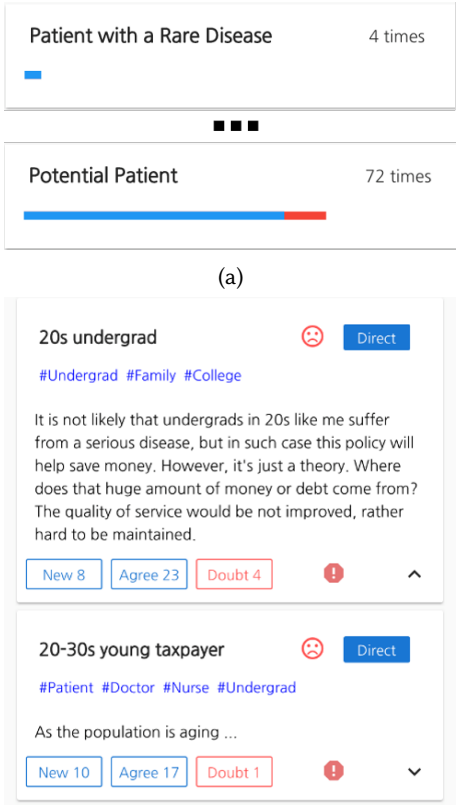

Figure 2: Interface for presenting (a) stakeholder groups and (b) posts tagged with each stakeholder group. As an overview for each tag, we show the ratio between positive effects and negative effects under each tag. A detailed view of each tag shows the list of effects.

stakeholder group, stakeholder analysis provides a comprehensive understanding of the relationship between stakeholder groups and their conflicts of interest [17]. Stakeholder-based analysis of a policy is conducted and used by policymakers and experts. In this work, we question if such an analysis can be done in a crowdsourced manner and serve as an effective resource for the public to get a comprehensive understanding of the issue.

Leveraging Knowledge of Citizens on Policy Issues. Crowdsourcing has been investigated in various stages of the policymaking process [10]. Examples include an experiment on crowdsourcing law on off-road traffic [2] and Regulation Room [4]. Citizens' knowledge of policies based on their experience can provide valuable insights on the issues such as disagreement within an interest group or unintended consequences of a policy in a complex environment [1, 5]. We propose the idea of collecting the effects of public policies from individual citizens represented as stakeholder groups and using the collected information for personal deliberation of the policy.

Enhancing Listening in Online Discussion. Listening to and respecting others' opinions is a key virtue of deliberation, which requires the participants to seriously consider each argument [15]. In an online discussion, however, self-selection and selective perception of information make such consideration difficult [8]. Previous systems introduced interactions that enhance listening to others' opinion. Reflect [7] asks users to summarize other users' comments to facilitate listening. ConsiderIt [6] asks users to construct a pros/cons list on issues based on the points from other users. Opinion Space [3] helps users discover and respect diverse opinions on controversial issues by visualizing each opinion based on the similarity of political stances between the author of the opinion and the user. Extending this line of research, we propose a new interaction for facilitating listening using stakeholder identities.

DESIGN CHOICES FOR POLICYSCAPE

We now introduce PolicyScape, a system for collecting stakeholders' viewpoints and supporting personal deliberation with the collected information. PolicyScape supports three main interactions. First, the user states how much a policy may affect their life. If they think they are affected by the policy, they are prompted to explain how they are affected with a description of the identity as a stakeholder as well as with a description of the effect (Figure 1). The user is then invited to the next step to think about the policy from the perspectives of some other stakeholders and compare their guesses with the effects posted by actual stakeholders. The user can then explore all the effects the system contains from a list of stakeholder tags (Figure 2(a)). When the user selects a tag from the list, a list of individual effects for the tag is displayed (Figure 2(b)). The user can see details about an effect, such as the full description, the list of associated tags, etc. Furthermore, the user can also rate an effect by clicking the buttons on the card. Now we discuss major design decisions.

Identifying Stakeholder Groups. Stakeholders are often identified iteratively, e.g., brainstorming by experts or snowball sampling [11]. Previous work, however, warns about two pitfalls: omitting relevant stakeholders and identifying too many groups as stakeholders [11]. We use user-generated tags to identify stakeholder groups (Figure 1), so anyone may add relevant stakeholder groups. To prevent groups with little relevance, we show tags mentioned by more than a certain number of people, which is three in our initial version. To encourage users to provide consistent tags, an autocomplete is provided for tag input.

Questions to Ask to Stakeholders. We ask users to report a policy's effect on them instead of their stance (Figure 1). By doing so, we aim to collect experience-based knowledge from the stakeholders [1]. We also ask about stakeholder groups relevant to the policy, both in free-form text and tags. For example, if a user is affected by the healthcare reform as her parents are suffering from a cardiovascular disease, she may describe her social status in an open-ended format, for example, "a taxpayer with parents suffering from a cardiovascular disease", and identify her social group by tags, for example, "family of a patient".

Presentation of Stakeholder Groups. The tag overview (Figure 2a) shows a bar graph with the ratio of positive to negative effects, which presents an opinion overview and a possible disagreement within each stakeholder group. In each group, users can find individual stakeholders' opinions with detailed descriptions of their social status.

Supporting Listening. Inspired by perspective-taking [16] for moderating extreme opinions, we provide an explicit interaction for users to guess the perspective of some other stakeholder groups. By perspective-taking, we aim to help the users understand and respect other stakeholders. We also let users check the actual inputs from the stakeholders after guessing, so they could reflect on their initial guess.

Quality Control. It is important to ensure and maintain the quality of the stakeholder input, as it serves as an information source for users. To prevent any misinformation, we allow users to vote whether a certain opinion is trustworthy (Figure 2b).

RESULTS FROM PRELIMINARY STUDY

We present key findings from the initial evaluation of PolicyScape. See Sidebar 1 for details on study conditions and participants. We present the quality of collected perspectives, participants' thoughts on reading others' perspectives, and the effect of perspective-taking.

Sidebar 1: Study conditions

Choice of policies

- Blind hiring: A policy that bans all public organizations from using job candidates' personal information.
- Health insurance reform: A policy that extends the coverage of insurance for treatments and medications.

Tasks given to participants

- Reading: Read two news articles about a policy, to simulate a common way citizens learn about a policy.
- Exploring: Freely browse the collected perspectives.
- Perspective-taking: Write down the impact of a policy on them, if any, and guess the impact on other stakeholders (at least two).

Participants We recruited participants by posting calls for participation in various online communities in South Korea. A total of 45 (27 female) participants completed the task. Age ranged from 18 to 66 with an average of 27.04 (SD = 8.09). Participants received a voucher worth approximately US$7 for their participation.

Sidebar 2: Measures for the novelty and validity of collected perspectives

Novelty For each policy, two external raters compared all stakeholder tags and 49 randomly sampled effects against six news articles, two used in the experiment and four collaboratively chosen by the raters.

Validity We took the effects covered in the articles as valid. For the effects not marked as fully covered in the article, we asked one government official from the ministry responsible for each policy to evaluate the validity. Effects that contain inaccurate, incorrect, or misleading description were labeled as invalid.

Sidebar 3: Quotes on pros and cons of collected perspectives (31 total)

Pros (24 total)

- New perspective: *"As a college student, I only considered the positive impact of health insurance reform policy. However, by reading collected perspectives, I realized that I am the future taxpayer who is negatively affected by this reform."*
- Diverse perspective: *"It is great to see the perspectives of various stakeholder groups at the same time."*
- Detailed and realistic perspective: *"It was nice to see realistic stories rather than theoretical ones."*

Cons (7 total)

- Narrow/biased perspective: *"Some contain insular views, which make me uncomfortable."*
- Limited credibility on speakers' identity: *"It is doubtful whether the person is an actual stakeholder as described."*

Quality of Collected Tags and Effect

We collected 110 effects and 59 tags on the blind hiring policy and 120 effects and 63 tags on the healthcare reform policy. We analyzed novelty and validity of the collected perspectives (see Sidebar 2). Our analysis shows that 26 (out of 59) tags and 14 effects (out of 49) are not covered by the media for blind hiring policy. For healthcare reform, 6 tags (out of 63) and 15 effects (out of 49) were novel. Out of the 31 novel effects from both policies, only one effect on blind hiring policy was rated invalid. This result suggests that PolicyScape can crowdsource novel and valid stakeholder information.

Perceived Pros and Cons of Collected Perspectives

We asked participants to optionally comment on the pros and cons of seeing collected stakeholder perspectives in PolicyScape (Sidebar 3). Participants appreciated that collected information provided new (8), diverse (6), and detailed and realistic (6) perspectives on the issue. However, they were concerned about the narrow or biased perspectives (4) and credibility of commenters' identity (3).

Effect of Perspective-taking

We asked participants to rate "How helpful was the task in understanding the effect of the policy?" on a 7-point scale (1: Not helpful at all, 7: Very helpful). The average scores were 5.58 (SD=1.20) for the blind hiring and 5.60 (SD=1.07) for the healthcare reform. One participant said, *"It was a great experience. When I take a look at the candidates' pledge, to be honest, I usually consider the benefits for me but do not put myself in others' shoes."*

DISCUSSION AND FUTURE WORK

In this paper, we presented an initial design of PolicyScape, which supports personal deliberation on the policy issues by collecting diverse perspectives of stakeholders. Our result from the preliminary study shows the potential of PolicyScape as a crowdsourcing platform that collects diverse and valid perspectives from citizens and promotes personal deliberation using the collected information.

Based on the lessons from the initial design and evaluation (see Sidebar 4), we plan to make several improvements on the tag generation, perspectives presentation, and quality control. Also, we plan to conduct a controlled experiment to verify whether PolicyScape can help users develop their opinions on policy issues considering other stakeholders.

ACKNOWLEDGMENTS

This work was supported by Institute for Information & communications Technology Promotion (IITP) grant funded by the Korean government (MSIT) (R7124-16-0004, Development of Intelligent Interaction Technology Based on Context Awareness and Human Intention Understanding).

Sidebar 4: Limitations of the current design

User-generated tags

- Semantically duplicate tags were created (e.g., *public official* and *government employee*).
- Hierarchical information between tags was missing. For example, having effects from *Doctors* but not tagged with *Medical staff* may make it difficult for users to check the comprehensive perspectives of *Medical staff*.

Presentation of perspectives

- The ratio of positive to negative effects does not provide enough insights into how each stakeholder group is affected by the policy. Additional information, such as frequently used phrases, may provide such insights about each stakeholder group.
- In each stakeholder group, similar perspectives are shown repeatedly to users.
- A plain list of posts prevents the user from understanding diverse perspectives within a stakeholder group.

Credibility of collected information

- Lack of a robust quality control mechanism to prevent false identity or false information.

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