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Visualization Tool for Collective Awareness in a Platform of Citizen Proposals

Pablo Aragón,[*†] **Vicenç Gómez,**[*] **Andreas Kaltenbrunner**[†]
[*] Universitat Pompeu Fabra, Barcelona, Spain
[†] Eurecat, Barcelona, Spain

Abstract

Online debate tools for participatory democracy and crowdsourcing legislation are limited by different factors. One of them arises when discussion of proposals reaches a large number of contributions and therefore citizens encounter difficulties in mapping the arguments that constitute the dialectical debate. To address this issue, we present a visualization tool that shows the discussion of any proposal as an interactive radial tree. The tool builds on *Decide Madrid*, a recently created platform for direct democracy launched by the City Council of Madrid. Decide Madrid is one of the most relevant platforms that allows citizens to propose, debate and prioritise city policies.

Introduction

In 2015 the City Council of Madrid (Spain) opened *Decide Madrid*[1], a website to discuss and decide the city model through citizen proposals. Citizen proposals have been designed to allow citizens to publish petitions, receive support from other citizens and then force a public voting of the entire population of Madrid. The process follows these steps:

1. *Generation*: A citizen publishes a proposal.
2. *Support*: Citizens from Madrid are able to sign the proposal. To advance to the next step, proposals must be approved by more than the 2% of citizens older than 16.
3. *Decision*: Once a proposal receives the required number of supporting citizens, it gets announced on the website to increase its visibility among citizens and, after 45 days, the proposal is voted in order to be approved or rejected.
4. *Implementation*: If the proposal is approved, the Council must accept the decision and execute it. To this end, the Council produces technical reports on its legality, feasibility and cost, taking into account the affected sectors.

To promote the idea of deliberative democracy by "discussion among free and equal citizens" (Elster 1998), every proposal can be discussed during the three first steps. Proposals are presented in a hierarchical thread view and citizens are able to post comments to the initial post or the nested comments, that can be positively/negatively voted by any citizen.

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[1] See: https://decide.madrid.es/

Collective Awareness Platforms for Sustainability and Social Innovation

The design of online platforms for collective awareness is attracting increasing interest. For example, in 2012 the European Commission launched a research initiative called *Collective Awareness Platforms for Sustainability and Social Innovation* (CAPS) to explore the confluence of knowledge and social networks[2]. For awareness to be leveraged in practice, the way in which people acquire information is crucial (Passani et al. 2014). Deliberative democracy requires citizens to be aware of the argumentative structure of every proposal. Therefore, argument mapping in large discussions becomes essential for the decision-making process. The tool presented in this article is a result of the CAPS principles in Decide Madrid. In particular, our tool allows a deeper understanding of the argumentative structure of proposals, which improves collective awareness of citizens and provides useful hints for the refinement of Decide Madrid.

Visualization of proposals

We visualize the hierarchical discussion as an interactive thread in which the root node corresponds to the proposal and the rest of the nodes correspond to the comments, e.g. (Pascual-Cid and Kaltenbrunner 2009). To highlight the arborescence of the discussion and to distinguish the arguments of every branch of the thread, the tool applies a flexible force-directed graph layout that accelerates charge interaction through the Barnes-Hut approximation (Pfalzner and Gibbon 2005). In addition, to identify the messages that receive more attention, the size of the nodes is proportional to the number of votes. Furthermore, the colour of the nodes is determined according to the ratio of positive/negative votes:

- Black: Root (proposal)
- Grey: Comment with no votes
- Green (scale): Comment with majority of positive votes
- Red (scale): Comment with majority of negative votes
- Orange: Comment with no strong preference of positive or negative votes

[2] See: https://ec.europa.eu/digital-agenda/en/collectiveawareness

Figure 1: Example of visualization: Proposal "Eliminar los festejos taurinos y las subvenciones" (*Remove bullfighting and its subsidies*). Left side shows the discussion as an interactive thread. Right side displays the content of a selected comment.

The visualization also includes an informative panel with the description of the tool and the metadata of a node (author, message, date and number of positive/negative votes) when the user rolls the mouse over it. Technical details of the implementation (e.g. layout parametrization) can be found at https://github.com/elaragon/decideviz.

The reliability of the tool has been qualitatively evaluated by DemIC (Lab of Collective Intelligence for Democracy), an interdisciplinary lab for the study of digital citizen processes boosted by the Council. As an example, Figure 1 illustrates the interface using an example of a proposal about banning bullfighting[3]. We observe a large number of orange nodes, reflecting the strong controversy generated by this topic in Madrid. Among the most voted comments (the largest nodes), both positively and negatively voted comments appear. The best rated ones consist of contributions from animal rights organizations and feedback from citizens that suggest merging all the anti-fighting proposals posted in Decide Madrid. Indeed, the existence of multiple proposals for the same goal is one of the patterns that has been identified with this tool and future versions of Decide Madrid will address this issue. In contrast, the comments that receive a majority of negative votes in this proposal are usually messages that define bullfighting as an artistic discipline.

Discussion

In this article we have presented a tool for argument mapping in order to bring collective awareness to one of the most recent direct democracy platforms. On the one hand, although many tools for collective intelligence through citizen discussion have been released in the last years (eg. Deliberatorium[4], Assembl[5]), most of them do not present the argumentative structure of the discussion. On the other hand, tools which include network visualizations (eg. Incoma[6], EdgeSense[7]) are devised to explore online forums with little impact in policy making in comparison to Decide Madrid. In this context of binding proposals, we believe that our tool provides a clear picture of the discussion of citizens in order to promote effective deliberative democracy.

[3]See: https://decide.madrid.es/proposals/105

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[4]See: http://deliberatorium.mit.edu/
[5]See: http://assembl.org/
[6]See: http://incoma.org/
[7]See: http://wikitalia.github.io/edgesense/