

# The social mood reader: Mapping citizen engagement using the semantic web and supercomputing

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## Abstract

*Actual experiments in e-government and participatory online decision-making have, however, often proved disappointing. Traditional forms of government policy making and political organization, based upon centralised and hierarchical structures, one-to-many communications, and 'push' models of state-citizen interaction, have struggled to adapt to the decentralised, many-to-many forms of interaction of the Internet (Flew & Young 2005).*

*Flew and Young's quote above gets straight to the point. Participatory online decision-making involves more than consultation or sophisticated ways of delivering information to citizens, although these of course are important. Online decision-making presupposes a social-organisational structure that makes real decision-making possible. In this paper the author provides an overview of the use of sophisticated semantic web tools to calculate citizen mood and the kinds of organisational structure emerging in local government jurisdictions that allow for actual decision-making.*

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## Participatory decision-making

Carson and Hartz-Karp (2005) argue that there are three minimum conditions for setting up procedures for deliberative democracy:

1. Influence: The process should have the ability to influence policy and decision making;
2. Inclusion: The process should be representative of the population and inclusive of diverse viewpoints and values, providing equal opportunity for all to participate;
3. Deliberation: The process should provide open dialogue, access to information, respect, space to understand and reframe issues, and movement toward consensus.

It is now impossible to ignore the role of the internet in decision-making and the sharing of information and, in particular, any design of deliberative engagement. Twitter itself has grown: in the past year alone, it has grown from 25 to 175 employees. Twitter as of February

2011 has 105,779,710 registered users. New users are signing up at the rate of 300,000 per day. One hundred and eighty million unique visitors come to the site every month. Seventy-five percent of Twitter traffic comes from outside Twitter.com (i.e. via third party applications). Twitter gets a total of 3 billion requests a day via its API. Twitter users are, in total, tweeting an average of 55 million tweets a day. Twitter's search engine receives around 600 million search queries per day. Of Twitter's active users, 37 percent use their phone to tweet. Over half of all tweets (60 percent) come from third party applications ([http://www.huffingtonpost.com/2010/04/14/twitter-user-statistics-r\\_n\\_537992.html](http://www.huffingtonpost.com/2010/04/14/twitter-user-statistics-r_n_537992.html)).

At one point, Egyptian authorities severed internet connections and almost all digital communications in and out of Egypt came to a sudden stop. As was the case in Tunisia, Egyptian internet circumvented the Egyptian government's shut-down by accessing internet services by satellite, or a foreign SIM card. Egyptian Twitter users rely on proxy services outside of Egypt for access. Instead of typing a standard Web address such as [www.twitter.com](http://www.twitter.com), Egyptian users enter the numbers 128.242.245.148 in an address bar. This accesses the external proxy server.

The events in Egypt might seem remote compared with the slower pace of life in Australia. However, Twitter and all the social networking services have the same role that they do in the Egyptian polity – conversation and information about policies and politics as well as a myriad other things. Senior officials of the City of Geraldton-Greenough may try to hide plans from the public, for example, but in a Twitter world the odds are that those plans will become public. This is not to say that the City of Geraldton-Greenough hides its plan. Indeed, the author and colleagues from Curtin University are part of a project team collaborating with the City of Geraldton-Greenough to achieve the minimum conditions in deliberations about climate change outlined by Janette Hartz-Karp (2005) above. Climate change in particular is the focus of research because the Geraldton-Greenough area, particularly, has been the subject of rising temperatures and, consequently, the close of farms and the loss of occupations.

## **Technologies of co-operation**

Although the national and international focus to decarbonise the economy has been on economic instruments, sustainability and climate change scientists have argued that we will only be able to effectively address climate change and sustainability if we can find new 'technologies of cooperation' (McGibben, 2006; Newman & Jennings, 2008). Concomitantly, deliberative democracy researchers and practitioners have argued that new forms of cooperation between government and citizens capable of resolving large and complex problems can be achieved through the institutionalisation of deliberative democracy (Fung 2006; Gastil & Levine, 2005; Warren 2007). This paper describes a major collaborative governance initiative in a remote city in Western Australia – Geraldton-Greenough – that creates and researches new technologies of cooperation that can assist in transitions to sustainable cities. It combines small scale face-to-face deliberations, including world cafes

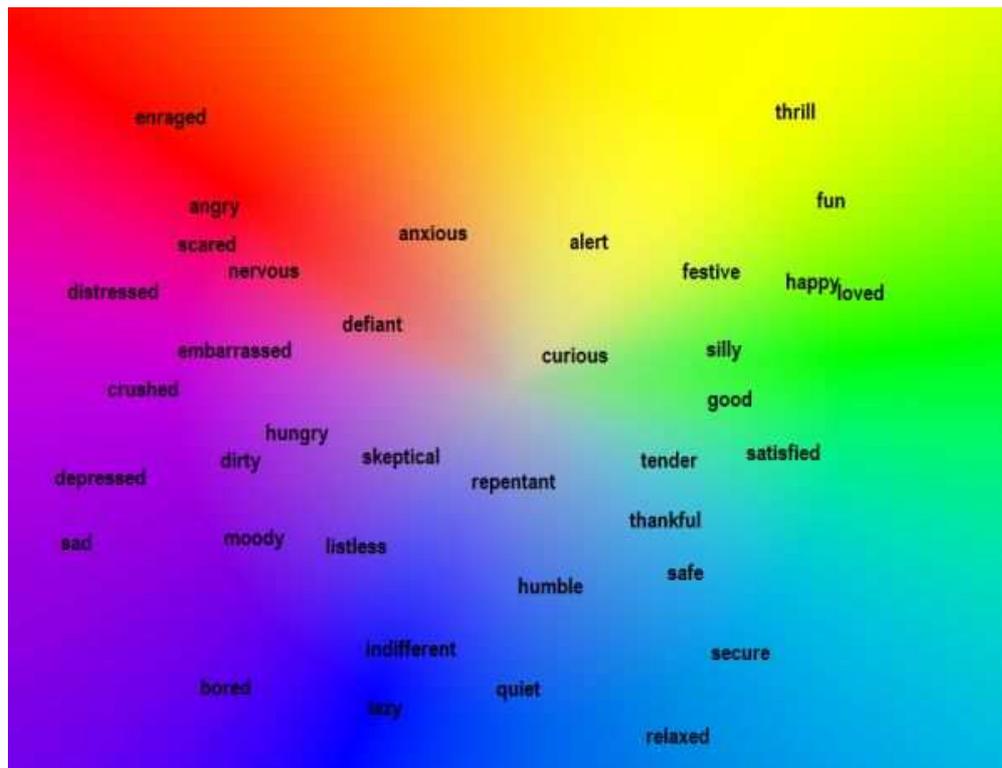
scenario building workshops and open space technology, with two large scale in-person deliberations – a deliberative poll of 300+ participants and a 21<sup>st</sup> century town meeting of around 1,000 participants. This paper looks at the role of social media in those deliberations and special tools that have been created for it.

In the City of Geraldton-Greenough project, a dedicated and innovative social media network has been created and assists with the deliberations by presenting scientific findings on impacts of the local on the global ecosystem for the Geraldton-Greenough area as well as acting as a research tool for discerning the local community's values, preferences, judicious agreements and willingness to act; and in collaboration with the local government, bringing about change. The project contributes to the most difficult modeling problem in modern e-government, of how to include citizens in actual policy deliberation in the everyday operation of government, as distinct from limited consultation, with the associated problem of how to translate complex scientific or policy findings into the public domain for reasoned debate and action (Coursey & Norris, 2009). Citizens are also expecting participation: "Citizens are developing the capacity to engage online, and are increasingly expecting to engage online with government agencies and representatives" (Lundy, 2009). Modern citizens are highly educated and their collective intelligence and expertise is valued by modern policy makers but difficult to harness in practical ways.

Having participatory decision-making, say direct involvement in the City of Geraldton-Greenough budget, is not a simple matter. The representative governmental structures and their bureaucracies in Australia are not designed for a sudden transition to direct democracy or its variants. What is different from the past is the willingness of local governments in Australia to explore the possibilities of collaboration in matters like budget and policy. To this end, the project partners created tools that started a collaboration with the City. Given the potential scale of participation and delivery of information – upwards of 35,000 people in Geraldton and the region – the project drew on iVEC supercomputing resources and expertise in the semantic web.

iVEC provides access to high performance computing and visualisation labs to researchers and industry. The iVEC and associated programming costs will by the end of the project come to over half a million dollars (<http://www.2029andbeyond.com.au/index.php>). While decision-making is the end-point of the project, it is equally important to have means by which to address how people feel about topics in their everyday conversations. For this purpose, Brett Adams's social mood reader has been adapted for the Geraldton-Greenough project. The mood reader was originally developed by Adams for autistic groups who wanted to be able to check, quickly, the feelings of the different people within their network, not only in terms of text but in terms of pictures. Google and other companies provide social network analyses or indeed 'buzz' metrics of data using computational semantics. However, this program is based on linking data and pictures to psychological mood. Each group and individual is as a result mapped according to colours chosen to represent mood – yellow for exciting, for instance. Figure 1 provides an overview of the spectrum.

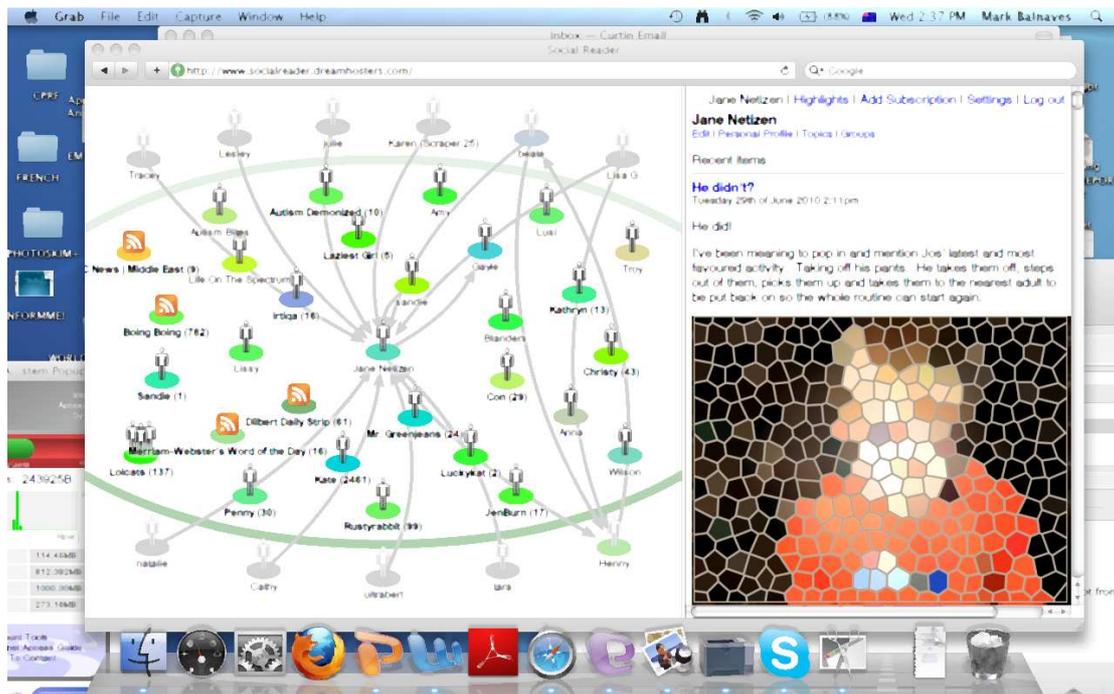
**Figure 1:** Range of moods within the mood reader



Adams has checked the group moods against what people actually feel. The mood reader, however, is a general tool to get a general sense of mood and is not used as a predictor. People using the mood reader are also advised on obvious limitations. The pilot work has given the researchers the opportunity to work jointly with the City and to plan systematically the testing and delivery of the mood reader. Individuals are able to see their own mood reader, but their data is de-identified at aggregate level and played back to citizens in their deliberations or in other discussion on what is happening in Geraldton. This will enable the Council to see the mood of the community on particular issues, without involving intrusive data gathering measures or modern surveys that do not get good response rates.

Figure 2 below shows a real picture of the network that is derived by the reader and can be seen by the citizen, distorted in this picture for privacy purposes as it belongs to the researcher. What the social mood reader does is to allow individuals to add their subscriptions and networks, individuals and groups, and the system tracks the conversations and evaluates 'mood'. The reader and its architecture will be held on the iVEC servers and aggregated data, as noted, is accessible only to the project researchers. The mood reader provides the modern citizen the opportunity to express mood in civic deliberations as well as on other topics, in this case climate change.

Figure 2: A person's mood reader results



<http://www.2029andbeyond.com.au/index.php>

## Capturing data on deliberation

Deliberative democracy has now moved from political theory into innovation in the real world. This deliberative revolution in institutional practice has involved practitioners in many countries devising innovative ways to involve citizens in effective deliberation and joint decision-making. Relevant innovations include consensus conferences (invented in Denmark), citizens' juries (invented in the USA, widely used in the UK and sometimes in Australia), planning cells (Germany), participatory budgeting (Brazil), participatory technology assessment of different kinds (Denmark and NZ), deliberative polls (USA, China and Australia), citizen panels (UK), citizens' assemblies (Canada), citizens parliament (Australia) and 21<sup>st</sup> century town meetings (USA, Australia and Europe). There is now a strong record of achievement by governments and organisations using these methods to solve complex public problems, and a growing research field that evaluates and critically compares and assesses these exercises (Abelson & Gauvin, 2006; Cornwall, 2008; Fung, 2003; Leighninger, 2006; Levine et al., 2005; Warren & Pearce, 2008).

In terms of deliberative democracy being applied to climate change and sustainability, there have been a few recent initiatives that have shown great promise. On a global level, World Wide Views, coordinated by the Danish Board of Technology held deliberative initiatives of around 100 randomly sampled citizens in approximately 40 countries across the globe on the same day (25-26 September) with the same agenda to be addressed by COP15,

Copenhagen, December 2009. The resolutions have been given to the media and are being distributed to all Copenhagen delegates (WWViews, 2009). Using a different way of convening a multi-national deliberation, the Ideal EU Pan European Town Meeting, Europe in November 2008 gathered together 470 young people in a one-day deliberative town hall meeting to provide input to updating the UN policy agenda on climate change (Ideal EU, 2009). On a regional level, the NSW Consensus Project ran a series of deliberative initiatives with randomly selected residents in local forums, followed by a regional forum, with the aim of developing ways to address climate change and improve sustainability. A number of the local councils involved have adopted the recommendations of their local deliberative forum (Nature Conservation Council of NSW, 2009). However, most of these deliberative initiatives on climate change and sustainability have been pioneering efforts without a strong research base.

This project will demonstrate how a deliberative community can be generated as well as just how far it is possible to push the role of informed and competent citizen deliberation in policy development and decision-making. The project will:

1. *Provide a focus on end users and how they can work with governments to influence policy and decision-making and change and, in so doing, change individual and community behaviour.* This approach has so far not been seriously tested. While there have been many examples of one-off deliberative initiatives, there have not been sustained processes to develop a deliberative community in order to address complex problems such as sustainability and climate change (Hartz-Karp, 2009). Prior efforts have been singular initiatives, often only loosely coupled with decision-makers and frequently quite narrowly defined. To solve this problem, the research uses an innovative multi-step process over several years that begins with creating a broad stakeholder steering team, gathering the relevant scientific evidence, building potential future scenarios, then using innovative social media to engage everyday citizens in understanding the data, and continuing with ongoing civic engagement through both in-person deliberation and social media to determine future plans and actions

2. *Link in-person deliberation with modern social networking technology.* Largely, these strategies have been developed independently and despite the recent focus in the USA and Australia on linking citizens with government through the internet, these have mostly been disappointing (Kamal, 2009). Online deliberation will also be pioneered, using innovative software to enable self-managed teams to develop proposals through a range of deliberative online processes.

3. *Test citizen capacity to cope with complexity.* The research is designed to shed light on the degree of issue complexity that deliberating citizens can handle. The test will be direct: citizens will be given a complex set of issues to deliberate. Much existing research on these questions is indirect, surveying individuals outside deliberative contexts and presenting them with hypothetical scenarios, or drawing conclusions from 'deliberation' that actually gives citizens little time and opportunity to engage in thought and discussion (Görsdorf, 2006).

4. *Link research and evaluation to civic engagement and deliberation.* Evaluation of deliberative initiatives has tended to be simplistic using participant feedback to discern the success of a project (Abelson & Gauvin, 2006). This research will use quantitative and qualitative research methodologies in a longitudinal design that will also incorporate specific measures such as individual, family and community carbon footprint and pre- and post-social impact assessments.

## Conclusion

The City of Geraldton-Greenough has called its strategic plan for deliberation engagement *2029 and Beyond*. The mood reader is not the only tool that is being developed. On its website, tools are being developed to allow people to estimate their energy use, compared with others in the region or, through Civic Evolution, to proposed projects or ideas that go through a formal process. The methodology for the project is designed to develop an ongoing deliberative community rather than one-off events, and the capacity for sustained citizen deliberation on complex issues that influence policy development and decision-making. The mood reader is one step in this process, a process that joins citizen and the City together in a joint project on the path to more complex deliberation. It is an assessment of the effectiveness of this approach to transitioning to a more sustainable ecosystem as well as the techniques used to get there.

There are several research questions that frame the study. Gastil (2009) recommends that all evaluations of public deliberations assess the quality of participants' deliberations. By definition, deliberation involves careful, reasoned, informed, and respectful discussion; we need to assess these aspects to even know that a deliberation took place. The project will measure the deliberative quality of our discussion with three indicators recommended by Gastil—presence of disagreement, emergent directionality of opinions, and informed and coherent post-deliberation views—through surveys conducted prior to the deliberations, field observations of the deliberations, and finally, surveys conducted post-deliberation. The project will compare variation in the quality of deliberation across each case to clarify the impact of deliberation design features on the quality of discussion, and as explanations of other outcomes. These outcomes include the extent to which deliberations encourage individuals to articulate common interests and converge toward common policy positions, (Kadlec & Friedman, 2008) as well as effects on participants' and public officials' motivation and action.

The deliberations should change sustainability behaviours and encourage greater activism, i.e., attention to sustainability and climate issues and participation in activities to address them. The challenges of changing these behaviours are well documented (Moser & Dilling 2006; Stone, 1989; Vogel et al., 2007). Intermediate steps toward altered behaviour include changes in values, priorities, identities, internalisation, political interest, political efficacy, and knowledge about climate change. The project will measure long-term motivation and behaviour using long-term follow-up online surveys in addition to the pre- and post-surveys

for each deliberation. Participants will be encouraged to engage in continued online discussions and organising efforts, which will provide data about energy use, and carbon footprint. Multiple contacts (emails, phone calls, mail) will be used to encourage participants to respond to surveys one month before, one month after, and one year after each deliberation. We intend to use Dillman's (2007) Tailor Design Method to guide survey design.

Civic skills such as experience in public speaking, writing letters, planning, participating, and chairing a meeting are a crucial factor promoting political engagement (Brady, Verba, & Schlozman, 1995). But so are skills on the internet and being able to get a sense of the thinking of others in your community. Participation in deliberations could build skills and capacities that promote engagement in sustainability and climate change. Our research will measure whether deliberations enhance comfort with these civic skills, as well as changes in knowledge about sustainability and climate change, and discussion and action networks that build greater local sustainability (Adger 2003; Adger et al., 2005). Strong networks ties are also a key predictor of political engagement (McAdam & Paulsen 1993; McLeod et al., 1999).

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