

Engaging Politicians with Citizens on Social Networking Sites: The WeGov Toolbox

Abstract

This paper suggests that governmental policy makers can use social networking sites to better engage with citizens. On the one hand social networking sites are well accepted by citizens and a familiar environment where discussions are already taking place and on the other hand social networking sites are becoming also more and more important for politicians. There is thus a need for information retrieval (the policy maker gathering information), dissemination (the policy maker broadcasting information) and two-way dialog between the policy maker and citizens over these platforms. The idea is to connect both the policy makers and the citizens. In fact social media is a mass medium and it can be difficult to sieve through multitudes of comments to get to the crux of a debate. Our approach to address this is to use automatic analysis components to summarise and categorizing huge text. To be able to place successful tools that can be used in the policy maker's everyday life the engagement of policy makers within the design process is very important. This paper describes the phase of combining the policy makers' requirements with the technical feasibility to develop a software prototype, where the analysis tools can be validated within the domain of policy makers and policymaking. This paper sets up the environment for evaluating this approach and to address the question of usefulness with respect to a dialogue with citizens.

1 Introduction

This paper describes an overview of WeGov - Where eGovernment meets the eSociety¹. This is a three-year project supported by the European Commission under the FP7 ICT programme that aims to enable engagement between citizens and governmental institutions by utilising social networking sites as the communication channel. The project is currently in the latter part of its development phase, with evaluation about to start.

The target user for WeGov is a "policy maker": a governmental representative who is responsible for policy decisions and needs to understand citizens' reactions to policy and

¹ UR: <http://www.wegov-project.eu> (Retrieved 20 Nov 2011)

discussions on related issues. The aim of the project is to enable them to easily use the new social media to interact with citizens – to find out what citizens are discussing and so better to engage in dialogue with them.

We begin by describing the background and the problem the project aims to address. We follow this with our proposed solution (including justification and a case study), as well as technical details. An important aspect of our solution is that we wish to respect the privacy of citizens and we discuss our approach as part of the proposed solution. We then describe our methodology for eliciting requirements and making a design to address them, together with an iterative cycle with external end users to present prototypes and to gather feedback. We conclude with a brief section on impact and future developments.

2 Background

The explosion in use of social networking sites (abbreviated to “SNS” here) such as Twitter, Facebook, YouTube, LinkedIn and Flickr throughout society provides unprecedented opportunities for policy-makers (eGovernment) to engage with citizens (eSociety) using tools and channels the citizens already use and are familiar with. This is in stark contrast to a previous approach of using dedicated, bespoke, constrained and very often underused web-based opinion soliciting platforms. In a sense, these existing sites are very much like ‘walled gardens’: they are carefully constructed and can look very inviting, but they have rigid boundaries, limited admission, restrictive rules of use, and more often than not they are empty of visitors!

In contrast, WeGov uses existing and popular public SNS that function much more like municipal parks – large, unconstrained spaces where many people come together for a diverse set of reasons where discussion is far more open, wide reaching and representative of the community.

Some of the approaches already tried for eParticipation are reviewed in (Miller and Williamson 2008). In particular, the case study of No10 Downing Street is an exemplar of the problems that WeGov set out to address. This case study reviews what happened when a discussion website (DebateMapper) was set-up to support Tony Blair’s series of lectures when he left office. There were 309 invitees to the site (e.g. journalists), with 240 invited via Reuters and 69 invited by the Hansard Society. 7% of the invitees registered, including 25% of the Hansard Society invitees and 2% of the Reuters invitees. Only 2 of Hansard Society invitees contributed to the map – via

edits and comments. None of the media invitees contributed directly to the map. So, in short, almost nobody added information to the bespoke DebateMapper website. This was primarily because many of those invited to participate were from the media and already had alternative and favoured ways of airing their views, e.g. in newspaper columns. The comments and blogs attached or linked to these other established channels was where the discussion really took place. This is a prime example of discussion taking place where it is most natural and using the tools that are most familiar to those involved – with an attempt to move the location and structure of the discussion, i.e. to DebateMapper, resulting in little impact.

Just from the viewpoint of members of parliament there is a gap of engagement. Members of parliament claim a stronger engagement of citizens within the governmental decision process. That is a major result of the German parliamentarians' study (DEUPAS) where 33% of all the German parliamentarians of the German Bundestag and 16 state parliaments participated. Proposals or solutions how to engage citizens or how to get their opinions is however not part of the study and unanswered. (Kleves et al. 2010)

SNS are well accepted and used by citizens for communication, retrieval and mobilization purposes. The “Occupy Wall Street” or short “Occupy” movement is the biggest citizen movement within a parliamentary democracy on SNS. The central claim is “Social justice and less power to the banks”. For instance these movements are observed on Twitter to predict the geographical movement. Especially from a sociologically viewpoint the analysis of Twitter includes a high potential and can be used to answer questions that were not possible within this scale. One important aspect is the measurement of sentiments and opinions within the society concerning topics like “financial crisis”. (Savage 2011)

These movements are often initiated by the citizens and pushed by the press. That doesn't mean that policy makers avoid this technology. Especially Twitter is an important instrument for spreading information like press releases very quick (Waters and Williams 2010). After (Hrdinová et al. 2010) the social web is in general a high interesting technology for politics and provides policy makers many opportunities for their affairs. The process of the policy maker's formation of opinions and decision-making is even be influenced by SNS (Zhang et al. 2010). These beneficial effects are also valid for blogs and (Coleman 2005) mention the politics that listen to what citizens say.

The practical experience shows a harmonization of both roles on SNS – for instance the policy maker has a fan page on Facebook for the public relations and citizens submit the individual channel of their politician with the “like” functionality. Many pages include the functionality of commenting and rating the politician’s post. Interactive dialogue is in theory possible but fails due to the lack of time or other problems. Presswork for identifying topics and opinions from SNS is also a challenge. Within the German Bundestag these workflows are not institutionalized in contrast to the classical print media. (Wandhöfer et al. 2011b) These findings came from initial interviews with policy makers to get insights on their behaviour on information retrieval and dissemination on SNS. (Cp. section 4)

SNS as mass medium provide huge potential for both – citizens and policy makers. But is there any benefit of using automatic analysis tools to address the dialog with citizens with respect to e-participation or online communication platforms in general? The WeGov project addresses this answer and provides a solution that is in the process of validation within the environment of policy makers.

3 Proposed Solution

The project’s approach is to provide a toolbox to policy makers (governmental representatives) containing different tools that enable them to discover what citizens are saying on social networking sites, and to provide feedback to those citizens. A key challenge is that social networking sites contain vast amounts of data, and the policy maker needs informed summaries of the key issues being discussed. The project has overcome this through the development of specialized tools that determine the topics and opinions of discussions. Another challenge overcome by the project is to find influential social network users in the field of interest, and this is addressed by the creation of a tool that categorizes them into groups characterized by different properties.

Alongside the toolbox approach is the need for best practices to use the tools. Paramount amongst these best practices is the need to respect the privacy of citizens. To this end, the project has conducted a detailed study into the legal and ethical questions surrounding political engagement using social networking tools.

3.1 Case Study: “Gorleben”

The name "Gorleben" has become infamous both nationally and internationally because of plans to build a national deep geological repository for radioactive waste within a former salt stock along with interim storage units in the town of Gorleben in north-eastern Germany. The waste comes from Germany's nuclear power plants, is reprocessed in France at La Hague, and the unusable remains then sent back to Germany in spent nuclear fuel shipping casks for final storage. Today in Gorleben there are two interim storage units for radioactive waste.²

Nowadays there are strong debates with diverse groups of people with respect to this topic. The German Bundestag has especially launched a committee of investigation with 15 members of the Bundestag to find a solution how to proceed with the policy of Gorleben.³ From the citizens' perspective are also initiatives to debate this topic. Groups on Facebook and discussion threads on Twitter show that the debates are also exist on SNS. However the policy makers are the decision makers and need to decide within the citizens' interests. The WeGov stakeholder engagement has confirmed the policy makers' interest into citizens' opinions on topics like Gorleben.

Following are some questions that policy makers are interested to know for the case of Gorleben but the questions are not limited to this case. These questions are representative for many cases and build the policy makers requirements:

- What are citizens' opinions (sentiments) on Gorleben?
- What do people say that live near to Gorleben?
- What do people say within similar areas or the constituency?
- How strong is the influence of events like Fukushima?
- Is the topic Gorleben getting "hotter" or "colder"?
- Who to engage for dialogue, information and dissemination?
- What do people think on similar topics like "nuclear energy" or "nuclear phase-out"?

3.2 "High Level Approach"

Based on the questions from the case study above and interviews with real world policy makers (see Section 4 for more details on this), we derived the types of information the policy maker needs:

² Nuclear waste repository Gorleben. URL: <http://goo.gl/5TS2n> (Retrieved May 2012)

³ Committee of investigation. URL: <http://goo.gl/RBrg9> (Retrieved May 2012)

- What are people talking about? In general, what are the themes people are discussing? In addition, policy makers are often responsible for a particular subject (e.g. health or transport), so within these subject areas, what are people talking about?
- What are peoples' opinions on a particular subject? Are they positive or negative? What suggestions do they have?
- Who are the key people in a social networking discussion? Who is influential? Who do others listen to? This will enable the policy maker to better engage with citizens by finding the key people in a debate.
- What are people saying locally? A key requirement from the end users we interviewed was that we need to restrict information extraction to a geographical area, since many of the end users are MPs who have responsibility for a constituency, and they naturally want to find out what people are saying and interested in locally.

We also determined a model to describe the interactions the policy maker should undertake with social networking to provide the information they need, and to engage in dialogue with citizens. Figure 1 below shows the model.

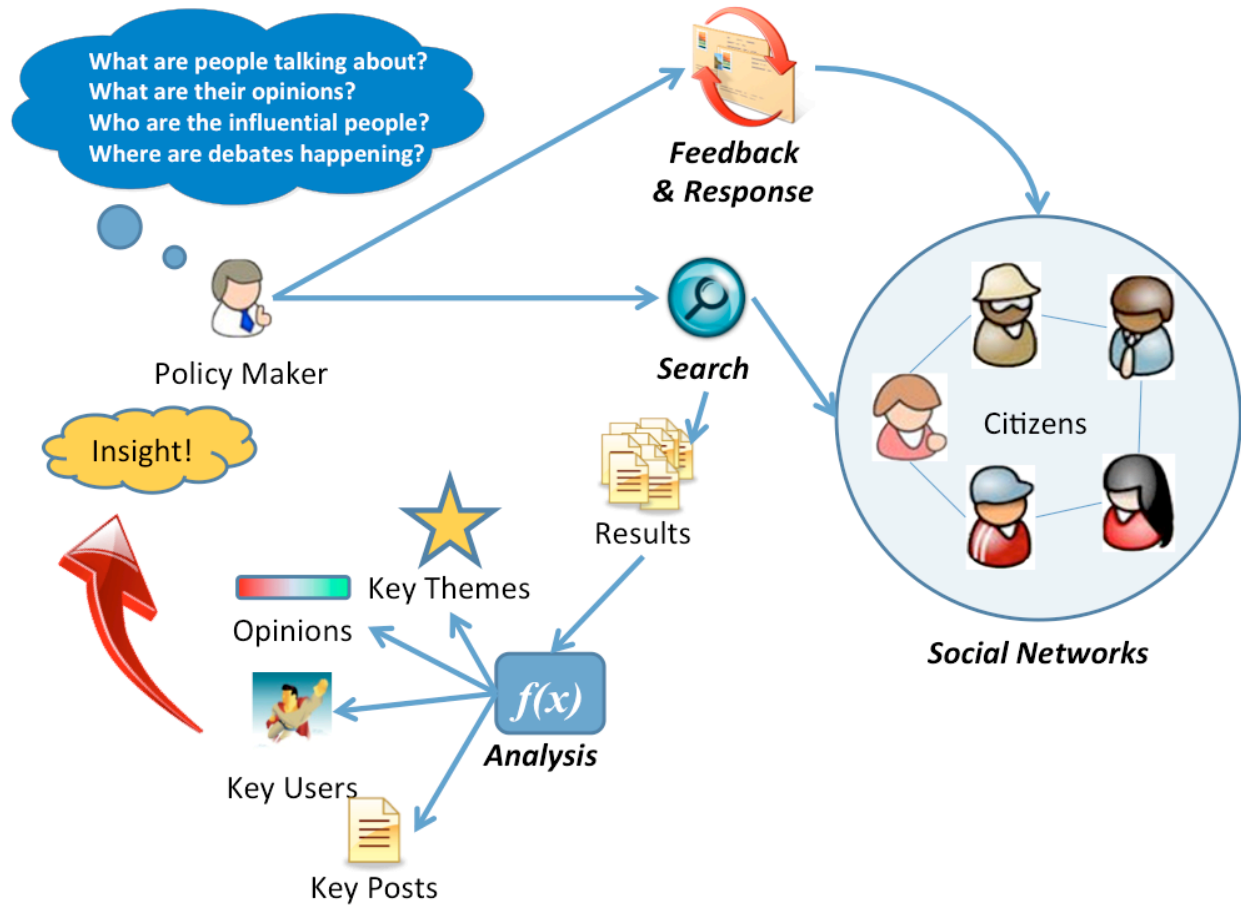


Figure 1: WeGov policy model

The policy maker needs to get information from the social networks. Social networks provide search tools and these can be used to extract information. The searches can take many forms, for example searches for keywords, or what are current hot (“trending”) topics. In addition, monitoring selected public groups on Facebook can be useful (for example there are many groups dedicated to a town or a city).

The searches can produce many results and it can be very time consuming to manually sift through all the results to determine the important points – most policy makers simply do not have this time, and the current theme of interest may have passed by the time the important points were determined manually. Therefore we have determined that automatic analysis of the search results is necessary - to automatically determine key themes and opinions, key users and exemplary posts from comments from debates on social networks.

Once the policy maker has access to the information they need, in a form that is easily accessible, they need to interact with the citizens on the social networks. For this we have

determined that the policy maker should be able to contact key users, reply to key posts or make posts into a Facebook group.

3.3 Technical Details

The approach taken by the project is of a “toolbox”, whose aim is to enable the user to interact with SNS users to find their opinions and provide feedback into SNS. To address this, the toolbox contains different tools that may be used separately or in combination to perform different functions. From our analysis of the different types of interaction the policy maker needs we have determined that the functions are in three broad categories:

- Search - find discussions, topics and opinions from different SNS;
- Analyse and summarise these discussions to determine the themes, important posts etc.;
- Inject information into the SNS.

The toolbox is so designed that if new tools become available, they can be added and used in conjunction with existing tools. An overview of the toolbox is shown in Figure 2.

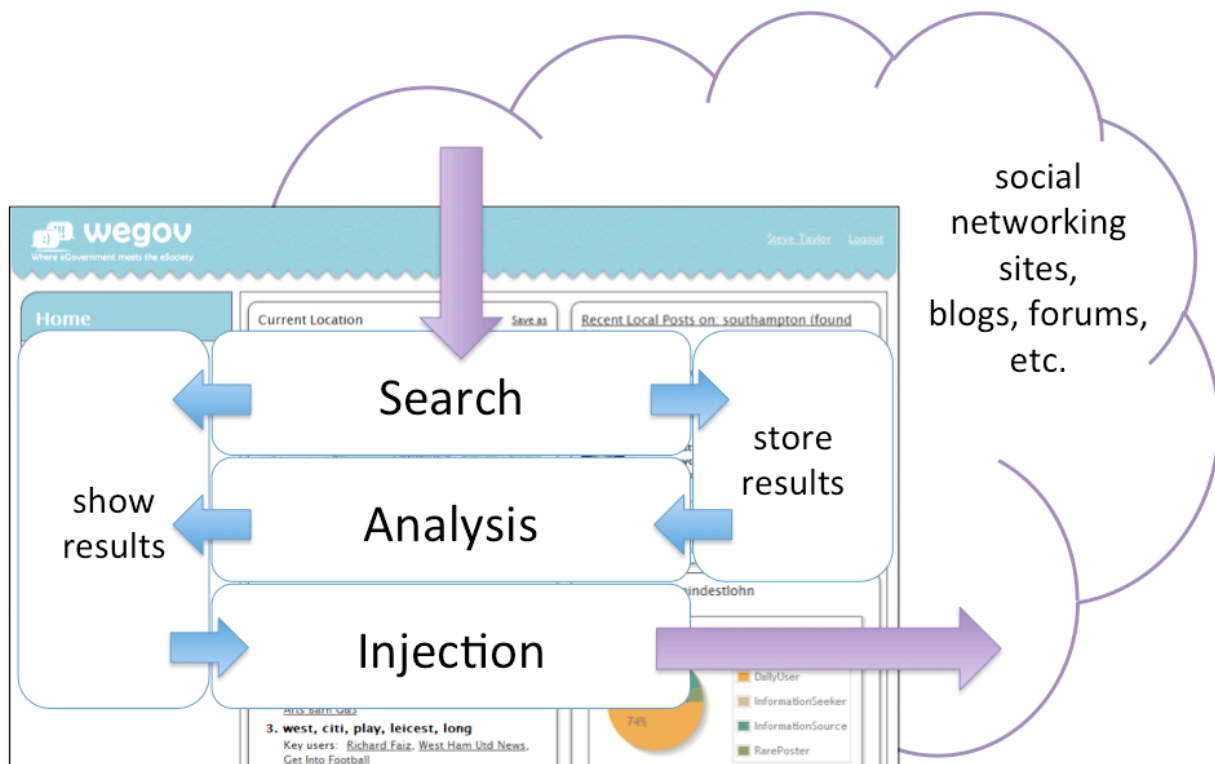


Figure 2: WeGov toolbox

The toolbox contains three types of tools, corresponding to searching, analysis and injection tasks described above. There is also a database that holds different types of data for tools - configuration, input and output. For example, if a search returns a set of SNS postings, these can be stored in the database alongside the configuration of the search that generated them.

An important feature of the toolbox is that, where appropriate, one tool's output can be used as input for another tool, for example the search results can be used as input to analysis tools. This means that tools can be chained together to form "workflows" (in effect, simple programs) that may be saved and re-executed at a later date.

The toolbox also incorporates an execution control component. This enables the user to create schedules that automatically execute tools periodically or at a given time and date. For example, the user can create a search on Twitter for a particular set of keywords and have this executed every day at the same time. This gives the user a fairly powerful capability to configure tasks that produce results with no further intervention from them.

Three major tools for the toolbox are different types of analysis. Firstly there is the prediction of discussion activity that purpose is to predict which posts are expected to generate more attention. Secondly there is the modelling of user behaviour that purpose is to classify users according to their behaviour and interactions within the SNS. Thirdly there is the analysis of topics and opinions that identify groups of words that represent several areas of discussions that arise within a wider debate. These are discussed in more detail in the next sections after a short introduction into the field of user features and content features that is important for the analysis. Also the topic opinion analysis will be introduced with language models and sentiment models.

3.4 User and Content Features

With billions of users generating information in online communities, it is becoming increasingly important to distinguish those users who are likely to generate more activity than others. The aim is to help policy makers to focus their attention on users who have higher potential of elaborating or influencing public opinion. To this end we carried out two pieces of work. Firstly, on identifying features of users and posts that is likely to attract higher levels of attention, and secondly on associating users with roles that describe their behaviour. For these two pieces of work we collected a set of features to describe the users and their content (posts):

- User features describe the author, U, of a post by capturing his standing and engagement in the system. These features are: in-degree (number of users following U), out-degree (number of users U follows), post count (number of posts U has made), user age (the length of time U has been a member of the community), and post rate (number of posts made by U per day)
- Content features define quality measures of a post P such as novelty of language, sentiment and time of posting. These features are: post length (number of words), complexity (cumulative entropy of P's terms to gauge the concentration and dispersion of language), readability (Gunning fog index (Gunning 1952), gauging how hard the post is to parse by humans), referral count (number of hyperlinks within the post), time in day (number of minutes through the day), informativeness (the novelty of the post's terms with respect to other posts), and polarity (average polarity of the post using Sentiwordnet (Esuli and Sebastiani 2006))

3.5 Toolbox Component: Prediction of Discussion Activity

The objective of this work is to distinguish which features of users and posts help to generate high levels of activity in an online community, and therefore maximising the engagement of the public with the policy maker. Identifying important features and predicting high-attention posts offer two benefits to the policy maker. Firstly, it assists the policy maker in focusing his attention where the largest participation occurs therefore maximising his own involvement to the community. Secondly, it provides the policy maker with recommendations on where and when to make their own posts (content placement strategies) for provoking high activity around his own posts.

3.5.1 Method

Predicting the discussion activity a given post is likely to generate is carried out in two steps.

Identifying seed posts

We define as seed a post, P, that will obtain a reply. The goal of this step is to understand which of the User and Content features render P as a seed. The first task is to perform model selection by testing three different classifiers (Naive Bayes, Maximum Entropy and J48 decision tree) using three sets of features, the User's, the Content's and their combination. The second task is to identify which features are the most important in identifying seeds by removing one feature at

a time from the best performing model and measuring the reduction in accuracy. We split the datasets into a 70/20/10% split for training/validation/testing, using the training and validation splits for our the first task, and the training and testing splits the second. We use F-measure, precision, recall and the area under the ROC curve to measure the accuracy of our predictions, and therefore judge the best performing model. The outcome of this step is the ranking of the features that helps us identify seed posts from non-seed posts.

Predicting Activity levels

In addition to understanding which features are important we also want to obtain a ranking over a set of seed posts. The ranking of seed posts is done using a linear regression model using the same two tasks as in step 1. We first perform model selection using the three different feature sets (User, Content and combination of the two). Then we assess the features based on their coefficients in the best performing model and how they are associated with an increase in activity. To evaluate the accuracy of our predictions we use Normalised Discounted Cumulative Gain (nDCG), predict a ranking using a linear regression model and compare this ranking against the actual rank based on activity volume (number of replies). The outcome of this step is the ranking of a given set of posts based on our predicted value on number of replies they will generate.

3.5.2 Validation

We performed this analysis on different datasets collected from online communities (Rowe et al. 2011a, Rowe et al. 2011b). In the scope of the WeGov Project we analysed a large (1.5M posts) randomly collected dataset from Twitter. For identifying discussion seeds the most important features are (in order of importance), time in day (posts that get replies are made earlier in the day, 6am to 9am), out-degree (authors of posts who get replies follow more users, on average, than non-seed post authors), polarity (posts with a lower polarity, more negative, are more likely to yield a reply) and informativeness (posts with lower informativeness, more familiarity with the language norm, are more likely to get a reply). When evaluating which features of posts that get replies affect the levels of activity the features are ranked as follows. Increase in readability and reduction in complexity and referral count heighten the number of replies, while early time in day produces heightened attention.

3.5.3 Toolbox Integration

Figure 3 shows the translation of the prediction of the discussion activity into the WeGov toolbox. The top-5 posts to watch are these posts that are expected to generated more attention with respect to a particular monitored theme. The top-5 users to watch are these users, which posts are often in the list of top-5 posts to watch. The input data for the analysis outcome is a local Twitter search for “Hawk-eye”, which is a hot topic in Southampton at the moment. This is television cameras monitoring the goal line for football to see whether the ball has crossed the line and they are testing it at Southampton.



Figure 3: Top posts to watch, top users to watch

3.6 Toolbox Component: Modelling User Behaviour

The motivation behind this work is to identify the citizens that are mostly active and citizens who are generally inactive. The aim of this is to draw the attention of the policy maker to a smaller, more manageable, set of users, with whom he may want to engage more closely (read their contributions, monitor their opinion, answer their questions, invite to participate in further discussions, surveys etc.). This analysis is particularly useful when there are a large number of participants that the policy maker cannot possibly pay equal attention to.

3.6.1 Method

Users are classified into different behavioural types. This is carried out in the following steps.

Modelling users

The association of users with behavioural types is done based on similarity of the user features to the behavioural type. Using the ontology described in (Angeletou et al. 2011) we model each user's activity and describe each user with the set of features explained above.

Identifying appropriate roles (behavioural types)

Different communities with different idiosyncrasies allow for the emergence of different roles and largely influence the association of these roles with features. Using existing role sets, suggested for different online communities, e.g. (Chan et al. 2010, Java et al. 2007), we select the ones that better apply to the online community of reference taking into consideration the availability of user features. For each of the roles selected, we build a role classifier that contains the distinguishing features of this role. For example an "Information Source" is someone who is followed by many people and usually posts frequently. Translating this description into feature-value association we see that the available features are the User in-degree and the post-rate. The descriptions of high/low are translated into exact values by calculating the averages of these features in the community.

User-Role Association

This is the last step of our approach where the features of each user are compared against the features of each role classifier and then associated to the most appropriate role. In the previous example, in order for a user to be classed as an Information Source he should have high values of post-rate and in-degree. The outcome of this step is the classification of a given set of users into roles that best represent their behaviour.

3.6.2 Validation

For representing users in Twitter we selected the roles of Broadcaster (users who post a lot, and are followed a lot but rarely follow anyone), Information Source (users who post a lot, are followed by many people but they also follow many people themselves), Information Seeker (users who follow many users but do not post frequently themselves), Rare Poster (users who post very rarely) and Daily User (users who follow a lot of other users, are also followed themselves by others but also post on a daily basis). We applied this method to the aforementioned randomly selected dataset of Twitter with 800K users and obtained more than 90% of equally balanced Information Seekers and Daily Users, 12% of Rare posters and less than 2% of Broadcasters and Information Sources. As the role-user association does not only count on mere post-count but also on community following, it shows that the distribution of

users follows the general trend of online communities (Preece 2000) in which users who generate the majority of the content in online communities are few (Information Source, Broadcaster), while the majority of users post with a lower degree (Daily Users, Information Seekers, Rare Posters).

3.6.3 Toolbox Integration

Figure 4 shows the translation of the modelling of user behaviour into the WeGov toolbox. The cake diagram visualizes the percentage of the five user roles “Broadcaster”, “DailyUser”, “InformationSeeker”, “InformationSource” and “RarePoster” with respect to a particular monitored theme.

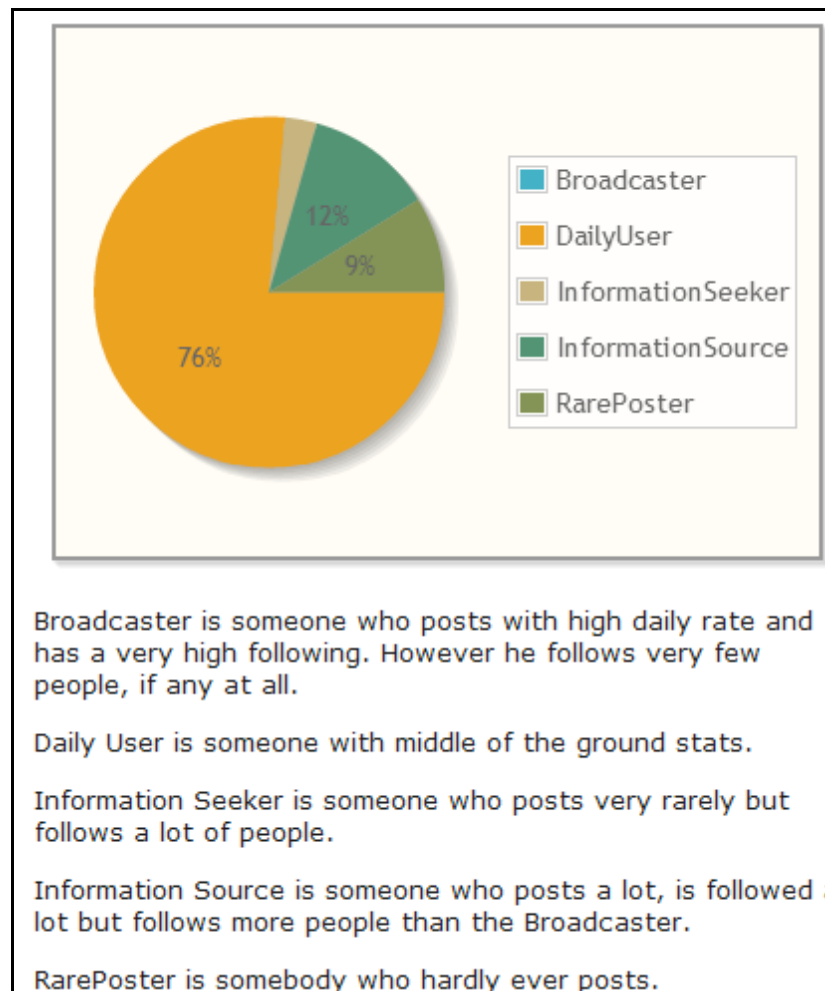


Figure 4: User roles

3.7 Introduction Language Models and Sentiment Analysis

While search has almost become a metaphor to the modern information age, semantic- and opinion analysis used in WeGov require some more introduction. To do so we will begin with the concept of Language Models; next, Opinion Analysis will be addressed; last, the state of the art on joint analysis of latent semantics and opinions will be discussed.

Language Models are vector space representations treating a document as a “Bag of Words” independent of the order they are appearing in the text. Latent semantic Analysis (Deerwester 1990), one of the first Language Models, extracts vectors of words having semantic similarity.

Latent Semantic Analysis is an application of Singular Value Decomposition, decomposing a document-term matrix into one containing the latent semantic dimensions per document and another one containing the representative words for each semantic dimension. Such matrix decompositions are known as Topic Models constructing a "semantic" space that puts terms and documents that are closely related next to each other. Topic Models proved extremely useful to a variety of applications (e.g. query expansion or result diversification in Information Retrieval) and evolved by the introduction of Machine Learning and Bayesian Inference to a framework for automatically detecting latent semantic dimensions called Topics (Blei et al. 2003).

Equally important to the detection of topics in documents is to find sentiments people are expressing towards them. The area of Opinion Mining and Sentiment Analysis offers the promise of automatically extracting the subjective points of views from documents that haven't been machine-readable so far. Such harvesting provides potentially great value to governmental and non-governmental organizations alike. A common application is given by the automatic analysis of movie reviews for hints on “thumbs up” or “thumbs down” (Pang and Lee 2008).

In recent years there has been an increasing interest in extracting this subjective dimensionality along with the topics in a collection of documents. (Mei et al. 2007) have been the first to present an empirical study demonstrating that a Topic-Sentiment Mixture model is capable of revealing topics along with the associated sentiments within social media. Technically such mining of opinions boils down to integrating prior knowledge on subjectivity from a lexicon (e.g. words bearing sentiments) into the analysis of documents.

Joining the analysis of sentiment and topics allows for example to differentiate between positive reviews of a book that are likely to boost its sales and criticism not necessarily boosting sales. Opinion mining together with Topic Models have proven their usefulness in numerous experimental settings (Lin et al. 2010), and are up to be integrated in a real world prototype.

3.8 Toolbox Component: Topics and Opinions

In many cases, discussion tracks in social media become quite long and complex. Stakeholders of WeGov technology (such as politicians, political researchers, active users) are often interested to gain a quick overview over such discussion, including understanding its thematic aspects, identifying key pro and contra arguments, finding most influential users. However, completely reading hundreds (or even thousands) postings is a time-consuming enterprise. The Topic-Opinion Analysis toolbox of WeGov aims to serve appropriate summarization techniques by identifying latent themes of discussion (topics), most relevant contributions and arguments for each topic, as well as most active users that influenced a certain aspect of discussion.

3.8.1 Method

The topic-opinion toolbox employs state of the art methods of Bayesian learning and opinion mining for finding most relevant pieces of information that should be presented to the user.

Modelling topics

Probabilistic Bayesian models are used for mining of the latent semantic structure of the online discussion. The WeGov approach can be seen as an extension to the state-of-the-art method coined Latent Dirichlet Allocation (LDA). The collection of postings is represented by means of probabilistic distributions over terms (words) that appear in particular discussion postings with different frequencies. The Bayesian learning process provides estimates of multinomial distributions over terms for a limited number of topics (themes). In other words, each topic can be characterized by its most relevant terms. Consequently, postings are represented by means of distributions over topics. Postings that belong to a certain topic with high probability, are considered as most characteristic examples for the certain aspect of online discussion.

Modelling opinions

The WeGov toolbox employs state of the art techniques for mining user opinions and affect states. Conceptually, they are based on structured vocabularies of affect-specific terms (including ANEW, LIWC, ADU, WordNet-Affect) that indicate a certain emotional state of the posting writer (e.g. scepticism, positive or negative emotions, anger, etc.). Consequently, postings with strong, characteristic opinion/emotion expressions are selected for presentation to the user.

Topic-opinion summarization

Results of topic and opinion analysis are combined for achieving suitable diversification of content that will be presented to the user. First, candidate postings are chosen with respect to

their high relevance regarding particular discussion aspects (i.e. topics). Second, for each pre-selected posting the opinion/emotion analysis is performed. The output is constructed in such a way that a) all topics identified in the dataset are appropriately reflected, and b) postings chosen for each topic reflect different opinions and emotions. As a result, the output contains a limited number of “must-see-first” contributions from the online discussions, covering a broad spectrum of its contextual and emotional facets. Furthermore, the toolbox output contains most characteristic terms for each topic that can be presented to the user as an explanation of the latent discussion structure.

3.8.2 Validation

The topic-opinion toolbox has been evaluated in various realistic settings, including summarization of Twitter tracks of postings, comments to editorial articles on Yahoo News, and commented online blogs of political parties. In all mentioned cases, the diversified summaries of discussion tracks have been positively evaluated by test users as a helpful tool for gaining a quick and systematic overview over long and fragmented discussion tracks. Quantitative evaluations have shown that the use of topic-opinion toolbox allows for statistically significant reduce of time necessary for reading and analysing online discussions.

3.8.3 Toolbox Integration

Figure 5 shows the translation of the topic analysis into the WeGov toolbox. Here the topics derived from User comments from the last post on the fan page of David Cameron. The “Key Users” and “Key Posts” are those, which strongly refer to the topics.

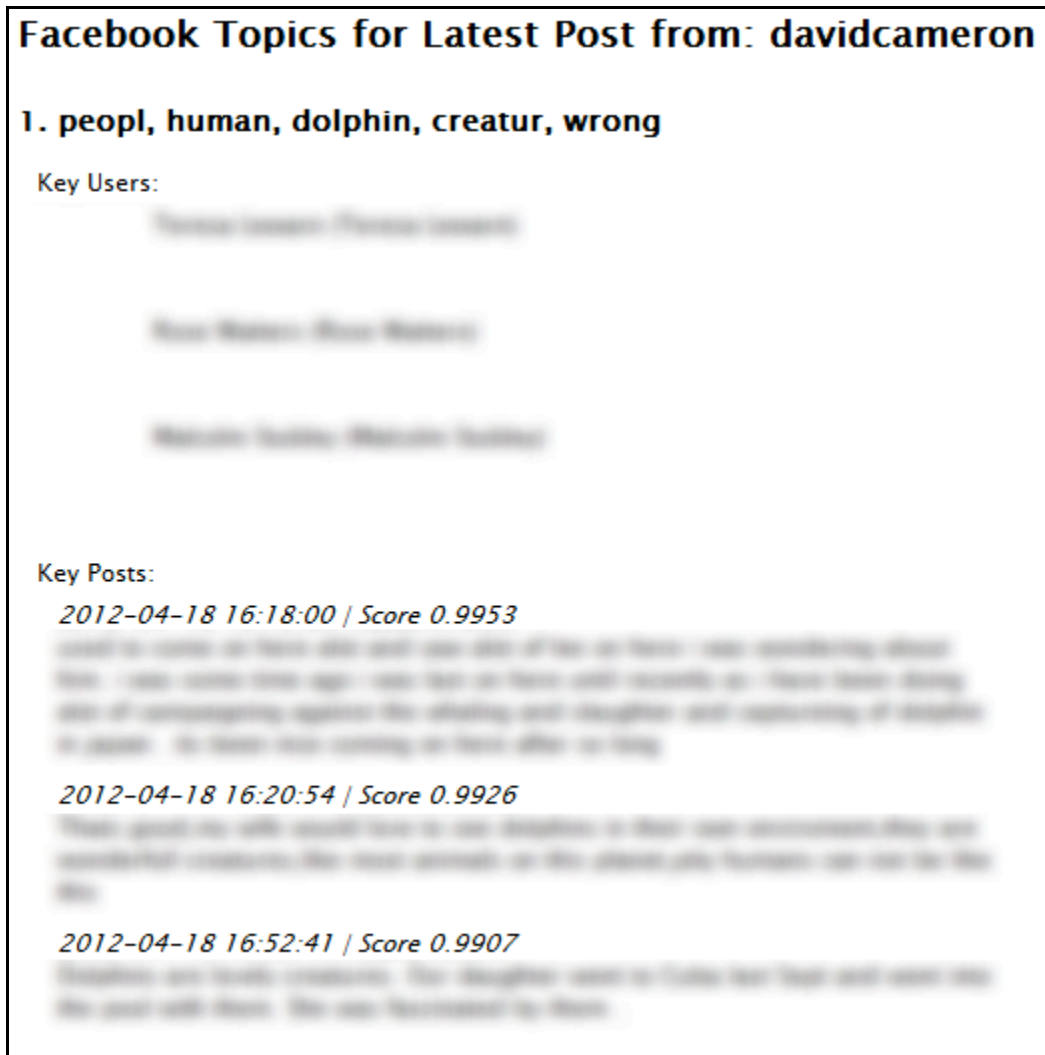


Figure 5: Topics derived from Facebook comments

3.9 Legal and Ethical Analysis & Recommendations for Best Practice

The project is concerned with collecting the opinions of citizens, as expressed through social network sites, in order to make summaries of opinions available to policy makers who wish to have a better understanding of the key issues in society. The collection and analysis of this kind of information has implications on the privacy of individual citizens, and so protection of privacy, legal limitations and ethical considerations should all be taken into account. To this end, the project conducted a review of relevant legislation, and attempted to determine an appropriate ethical standpoint. This work has been reported elsewhere [Addis et al. 2010, Joshi et al. 2010], and here we present a brief summary of our main conclusions concerning data protection. This

summary should not be regarded as exhaustive, but is intended to give an indication of the legal and ethical issues addressed in the project.

- “Personal data” has a very broad definition, and since policy makers are concerned with avoiding any damage to their public reputation, we consider that the safest position to take is to consider that, in almost all circumstances, any information collected and processed within WeGov should be considered to be “personal data” (as defined by data protection legislation, and which is subject to special processing regulations). We have considered anonymisation of data as a way to remove personal references, however, we have concluded that this technique is impractical for the following reasons:
 - The data may contain arbitrary unstructured information containing personal information, making it difficult *a priori* to determine what content needs to be deleted to ensure an SNS post is can no longer be regarded as ‘personal’
 - Removal of information for the purposes of de-personalisation severely reduces the value of the information for analysis, generally rendering it useless
 - Since anonymisation cannot be performed at the SNS site itself, it needs to be performed by a third party. This means that the third party organisation needs to be certified to handle personal data, with the attendant problems of data handling restrictions.
- The policy-maker is considered to be a “data controller” and hence they have corresponding obligations, for example (in the UK) to follow the 8 principles of the Data Protection Act in England and Wales. This limits how they can legitimately collect and process data.
- Where there is an expectation of privacy on the part of the SNS user, there is a need to seek explicit informed consent from them in order to allow collection and analysis of comments, which they make. Expectation of privacy is deemed to exist where it is not explicitly obvious that comments and posts made by a user are publicly available. One practical implication of this is that to seek explicit consent for every comment on a social network is in most cases impractical, so collection is most likely to be restricted to publicly accessible sources.

The way that the project has developed has been fundamentally influenced by our conclusions. The toolbox design is consistent with these limitations because it should be possible to use the WeGov toolbox without violating the principles of data protection. We have ensured throughout the project that all decisions affecting the design of the toolbox, and all end user trials, have been consistent with the conclusions from the legal and ethical analysis.

At the end of the project, we are planning to issue a best practice guide to assist future users of the toolkit to operate it in a manner that respects the privacy of the citizens whose comments and opinions we are collecting.

4 Methodological Approach and Preliminary Findings

4.1 Stakeholder Engagement Model

A long-term research and development project of course runs the risk of losing its stakeholders' interest if the engagement process is not managed properly. This is further exacerbated by the fact that our end users are policy makers and members of parliaments who are extremely busy with their daily engagements and workload. With internal shifts in the political climate of Europe and regional/local elections it becomes all the more challenging to sustain engagement with the same group of people throughout the project's lifetime.

We thus built into our methodology a process for stakeholder engagement that would facilitate a sustainable model in response to the constraints mentioned above. This model of engagement is sustainable because it stresses highly on the need for frequent reporting to the stakeholders on project outcomes, as well as the arrangement of face-to-face and virtual conferences or symposia, where project findings could be debated with the immediate and wider expertise stakeholder group. The rationale behind this was to encourage involvement and initiative from the stakeholders whose participation we sought within the project. Also this would enable us to feed back to them how their suggestions, comments and views were integrated in the evolving prototype of the tool-kit. Finally a key concern that our stakeholders shared with us reflects in the question: “what happens after the close of the project?” To address this fear of a 'pilot-effect', it is essential within our engagement framework to brief our stakeholders in a clear and transparent manner about issues ranging from the IP (intellectual property) status of tools and resources developed within the project, to the built-in sustainability and continuity measures that

would allow them to exploit project outcomes long after the close of the project. In particular the knowledge transfer and engagement with the WeGov toolkit, we believe would enable the end users to integrate social networks and citizen-centric policy making into their everyday work life.

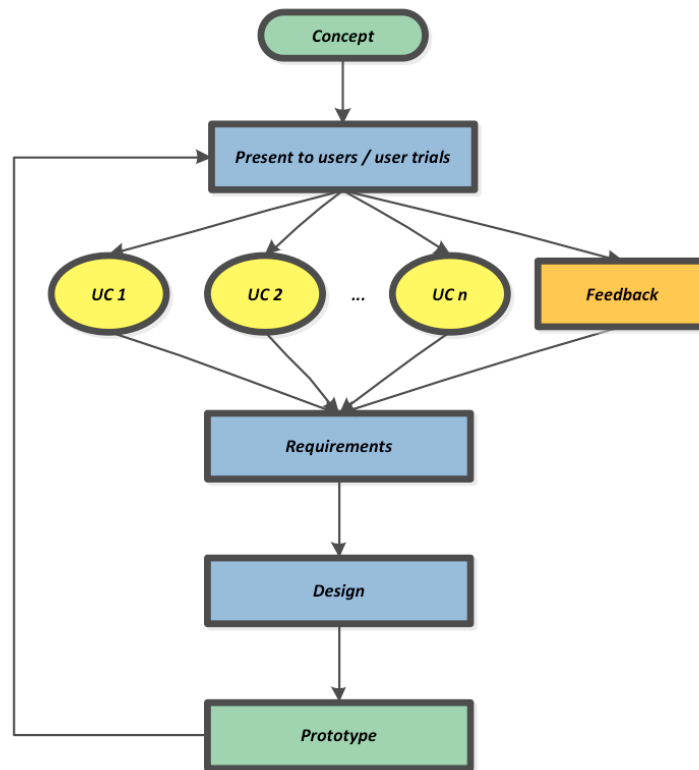


Figure 6: WeGov stakeholder engagement model

This iterative engagement with stakeholders on the projects evolution, progress and outcomes will enable the final results to be more grounded and externally verified by the current concerns of policy makers, their needs and expectations. The WeGov stakeholder engagement model considers the good stakeholder engagement principles of transparency, meaningful dialogue, expectation-management, feedback and analysis within its practical execution.⁴

4.2 Development Plan

The development plan of the WeGov toolbox is organized within four iterations each producing a software version of the WeGov toolbox - one initial prototype, two more improved prototypes

⁴ Good Stakeholder Engagement - Key Components of Stakeholder Engagement. URL: <http://goo.gl/hoq2L> (Retrieved May 2012)

and the final version of the toolbox. At each iteration, the prototype is presented to the end users and feedback sought to improve the next version. The original project plan included two main stakeholder iterations for the development process, but with the launch of the initial prototype the consortium decided to present two further prototype versions to end-users before launching the final toolbox. The addition of two iterations allows more effective engagement and increases the chance for developing functions that fit into the policy maker's everyday life, and ensuring the toolbox is useful will go a long way to determining the effectiveness of the WeGov toolbox. Hence the project needed to establish some kind of continuous stakeholder engagement in order to quickly verify upcoming questions and ideas for realization.

Our set of end users was in effect self-selecting: of those approached, the ones that wished to engage with us were those with interest in social networking. However our end user group includes members from different kinds of parliaments as well as their office members responsible for public relation and presswork issues. These stakeholders come from the EU Parliament, the German Bundestag and from the State Parliament of Nordrhein-Westfalen in Germany. In addition the group includes stakeholders from parliamentary parties and other public organizations. Most of the stakeholders were recruited in public meetings and conferences where the WeGov approach was presented and discussed with the number of participants. For example the PolitCamp⁵ and the Open Government Camp⁶, which took place in Germany, are two excellent events for this purpose because their overall aim is to connect stakeholders, economy and sciences.

Stakeholder engagement therefore was an on-going process in which the requirements had to be identified and the progress of software versions needed to be examined. Hence a semi structured interview was designed that allows both, verifying the underlying assumption about the stakeholder's daily work as well as considering how the current software satisfies the already defined requirements. For each interview there were about 30 minutes scheduled with no need of preparations from the interviewees. One part of the interview was designed to figure out what efforts are already being taken to work with social network sites. In addition, the needs and problems in dealing with the social network sites had to be determined. After getting a better idea of the current online engagement of politicians, the WeGov solution will be consistent with

⁵ PolitCamp. URL: <http://politicamp.org/> (Retrieved May 2012)

⁶ Open Government Camp. URL: <http://goo.gl/BVYYT> (Retrieved May 2012)

real needs. Another part was closer to the already developed prototype and included a short demonstration of the basic functionality. This part was mainly to demonstrate what kind of functionality generally can be provided.

4.3 Preliminary findings

Some of the major points that resulted from these interviews, but that are in no way representative for the total policy makers population, seen the number of interviewees (n=16):

- The interviewees have a Facebook page, an active Twitter account and some post videos on YouTube. Their main objectives are to communicate on their legislative activities and, mainly as far as Facebook is concerned, create dialogue with their constituencies. The statements posted on their Facebook pages however generate low and poor quality interaction.
- In terms of information extraction from social networks all interviewees mentioned the need to be able to do searches on blogs and further SNS like the local one www.wer-kennt-wen.de in Germany. Other source networks that were mentioned are Tumblr and Flickr.
- In general the staff of the interviewed MEPs do not spend much time per day and do not use advanced tools to search information on the social networks. At most they daily perform simple searches based on a number of keywords related to their thematic interests, what is said about them and about other MEPs; It was reported the EPP has a full time collaborator in charge of managing the on line presence of its members.
- Two of the three interviewees mainly delegate the social network management to their staff, with exception of Twitter. They both also usually follow the social media via mobile devices or tablets.
- For most of the themes currently dealt with in the IMCO Committee the interviewees are not aware of important discussion on the social networks.
- In the case of the interviewees in Germany the MPs' personnel often interact with SNS (public relation, presswork, dialogue to citizens) instead of the MP himself. To deal with the problem of authentication the MPs staff is using hashtags like #officetweet or #teamtweet to identify themselves when they using the MPs digital profile for SNS interactions.

- In some cases the MPs are very familiar with SNS and experiment with new functionality (e.g. Facebook Ask for question polls) and how it could be used within their everyday life. These experiences have produced some best practice examples for the dialogue with citizens. “Today I am going to meet the minister for the environment. What should I ask the minister?” is one example how to engage with citizens on SNS.
- The initial use cases (inject into SNS and monitor SNS) of the WeGov toolkit workflow were both confirmed as very relevant by the interviewees, in that they wanted the option to both actively and passively engage with their citizens on policy issues. But for them to better understand all underlying analytical functionalities of the WeGov toolkit, they need to have a more hands-on interaction with a dynamic prototype.

A key concern that stakeholders share is about the software that will result from this research. This question has two implications:

- The first concerns the IP status of tools and resources developed within the project that would allow them to exploit project outcomes post closure of the initiative itself.
- The other concerns the possibility for the IT department of the related institutions to integrate the tools into their own IT framework

Furthermore, there was an articulated concern surrounding the Language issue. In other words would the analytical WeGov tools be ready to support social network activities going on in the three languages of the interviewees (German, French and Dutch) and possibly more to be involved?

4.4 Case Study: “Inject into SNS”

During initial meetings with external end users, a particular need of WeGov’s target users, governmental policy makers, was requested. This is the gathering citizens’ opinions as feedback to a particular statement by a politician. The first WeGov prototype covered this scenario as a basic use case. Here, the policy maker posts a statement into a social network, collects the citizens’ feedback (where it is publicly available) and runs the analysis components on the feedback. The result is a summary of the key themes and opinions over the sum total of the

citizens' comments. Initial use cases (Addis et al. 2010) and basic functionalities (Wandhöfer et al. 2011a) were identified and discussed with policy makers before.

The initial toolbox was presented to 29 office employees working for a parliamentarian of the German Bundestag with the aim of gathering feedback for the further development process (Joshi et al. 2011). During discussions with them, the consensus was that parliamentarians' posts are unlikely to solicit a large amount of feedback, unless the politician is high-profile: "ordinary" parliamentarians' posts typically generate below 100 comments. They confirmed that the requirement to test citizens' reactions to politicians' statements is important, but they need more comments to provide a statistically significant sample of opinions. A modification of the original use case was proposed by the Bundestag employees, where politicians' statements are covered on the internet through news articles, which are in turn disseminated and discussed by citizens. The Newspaper Story" which capitalises on the effect of "indirect injections" (Joshi et al. 2010) – this means the politician's statement is disseminated by citizens rather than the politician (Geana et al. 2012). For example, a news article is written around the statement, and this is discussed over many different locations by citizens.

4.5 Case Study: "Local Analysis"

A key recent requirement from policy makers is the need to address local issues. Many political topics are discussed on SNS, from local to international, and from the point of the WeGov stakeholders interviewed, their need for knowing local topics and opinions is higher than on the global level - especially the policy maker's constituency is one important geographical restriction as definition for a localisation. This is due to the fact that many WeGov stakeholders act for their electorate as a member of parliament. This is valid for members of State Parliaments and as well for lots of members of the German Bundestag as WeGov interviewees mentioned. (Wandhöfer et al. 2011b)

Some topics have international, national and local significance. Political issues like the "Occupy" movement or "nuclear phase-out" are regularly discussed on SNS. These topics have a global relevance and for instance citizens from the UK, France and Germany are involved in the same discussion thread. These topics also have a relevance to the geographical location where citizens are living. For instance a citizen who lives near the German community of Gorleben, where a

huge repository for nuclear waste is located, may be more interested in discussing “nuclear phase-out” with the additional focus on their local area.

To address the requirement for localised searches, we are investigating search methods that restrict the search results on a geographical basis. A possible method is to investigate the addition of search terms that represent the town, city or constituency onto a query that comes from the user, so that the results are biased to include the geographical terms. Another method could be identification of public Facebook groups or forums where local issues are discussed. Locality can be used as an additional configuration to a search. We imagine that the policy maker can have a static configuration of what is “local” to them (e.g. some keywords, hashtags or groups to monitor), and these can be used when a local search is required. Once we have a search result based on local criteria, we can use it as input to any of the analysis tools, in just the same way as any other search result.

5 Practical Implications and Future Directions

The project has focused on developing a kit of tools to enable governmental representatives to understand what is important to citizens via social media, so as to better engage with citizens as a result. End user trials of the final version of the toolbox are imminent, in order to gather feedback for future exploitation of the toolbox beyond the end of the project. This work has uncovered some research questions that are worth investigating as items of further work, and these are briefly discussed next.

The first question concerns the social impact of using social networking for e-participation. We have investigated the privacy aspects of the toolbox and understand the legal position on data protection, but further work needs to be done to investigate more general questions of public tolerance and perception: even if privacy and data protection are observed – how do citizens feel about governments interacting with them via social networking? For example, users make publicly accessible statements in social media on a wide variety of topics, and these are already collected and analysed for marketing and advertising purposes. How do citizens feel about governments gathering this data and analysing it?

The second question concerns the target users of the toolkit. WeGov has focused mainly on use cases addressing the particular needs of policy-makers. However, there is no reason why the same tools cannot be used by citizens engaged in political debates on Social Networking Sites

(eSociety). We believe that the tools currently provided by WeGov, such as topic opinion analysis, can be of substantial interest also for citizens. Detecting hot topics and opinions has a great potential to point citizens to relevant debates and the pivot nodes within a debate.

The major item of further work here is to develop use cases applying these tools from the perspective of the citizen. A use case of presumably high interest for citizens, for instance, could be using the potential of topic opinion analysis to get into contact with other citizens that are regarded as influential as regards the debate in question. This is a quite different use of topic opinion analysis compared to the currently implemented use case (of the same tool) which - by focusing on stakeholder needs - mainly meets monitoring demands.

A major direction of further work therefore is to develop particular use cases for the WeGov toolbox addressing citizen's needs. This has considerable potential to enhance the debates occurring on Social Networking Sites immensely, and its potential needs to be evaluated. Therefore more research of the effects of those models is scheduled.

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Authors

Wandhöfer, Timo; Taylor, Steve; Alani, Harith; Joshi, Somya; Sizov, Sergej; Walland, Paul; Thamm, Mark; Bleier, Arnim; Mutschke, Peter

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