Investigating direct deliberative governance in online social media

Rean van der Merwe

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Department of Computing
Faculty of Mathematics, Computing and Technology
The Open University

Walton Hall, Milton Keynes, MK7 6AA
United Kingdom

http://computing.open.ac.uk
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Rean van der Merwe
*Computing Department*
*The Open University*

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Supervised by:
Anthony Meehan (Computing)
Engin Isin (CCIG)
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1. Introduction

Within the broader debate about the potential impact of the internet on socio-political governance, authors are particularly critical of what they see as the failed promise of e-government to democratise civic engagement (Vedel, 2006; Hindman, 2008). Heeks (2003) reports on the compound failures of uncritically transplanting e-government, under the "new public management" paradigm, to the southern African context where a recent report by the United Nations (Bertucci, 2008) rates governments significantly below the world average on an e-readiness index. In South Africa, one of the more technologically developed countries in the region, Farelo & Morris (2006) report that while government has the political will to improve and had developed a national roadmap, e-government is yet "in the formative stage of development." Reports such as these, by government analysts and independent agencies alike, focus on top down, national e-government initiatives that mainly target streamlined internal processes and improved service delivery through ICT. Where there is acknowledgement for the role of communication technology to facilitate participatory decision-making, it is implicitly presented that this too would be a government 'service', for example to improve transparency through information dissemination.

By maintaining centralised, citizen-state conceptions of governance through representative democracy, these views of e-government ignore key opportunities of the online medium, and constrain its promise as a tool for governance in southern Africa. An alternative approach, direct deliberative democracy (Cohen, 1999; Gutmann and Thompson, 2004), presents the basis for a form of localism (Schumacher, 1973) where citizens can make collective decisions through public deliberation, while their choices are examined in the light of relevant deliberations in comparable situations. This potentially combines the advantages of self-government and local learning with wider processes of social learning and heightened political accountability. As an alternative mode of engagement, direct deliberative democracy informs especially local, self-organised forms of governance: "[b]ecause of the numerosity and diversity of sites, we want a structure of decision-making that does not require uniform solutions … because of the complexity of problems, we want a structure that fosters inter-local comparisons of solutions" (Cohen, 1997).

Direct deliberative democracy, framed in this way, has different expectations of the internet in facilitating governance:

- To support governance which expresses itself in different types of action, in diverse contexts and across multiple networks.
- To allow exchanges between actors that focus on solving problems "where it matters" - in terms of potential impact and their personal interest.
- To facilitate governance which does not necessarily have traditional government or any particular political party at its centre.

My research investigates how direct deliberative governance, as it is described above, is enacted through, influenced by, and in turn influences what I provisionally refer to as online communities of interest (Wenger, 1998). The research is based on case studies from southern Africa, where such a decentralised, direct approach is attractive for several reasons. In some states political democracy exists only in weak form (Human Rights Watch, 2009), there are often multiple governance authorities to reconcile (e.g. traditional leadership in parallel to municipality, Ntzebeza, 2004), and in many cases national governments are unable to meet local governance needs because of logistical difficulty, a lack of funds, or limited human capital (Wunsch, 1998).

To approach the broader question in a systematic way, I have operationalised it in the
following more specific questions:

RQ1. How is direct deliberative governance enacted through online social media? In particular, what acts contribute to the deliberative process online, what roles do actors come to assume, and how can the environment of interaction be characterised?

RQ2. How does the environment afforded by online communities shape the process of direct deliberative governance, and in turn, how do the acts contributing to direct deliberative governance shape the evolution and effectiveness of the communities?

RQ3. How can online social platforms offer improved affordances, to be adopted by communities seeking to effect direct deliberative governance?

This report discusses the theoretical framing of these questions and presents preliminary work, as well as the planned development thereof, to inform my research agenda.

1.1 Outline of the report

In section 2 I outline the theoretical frame of the research, in particular to consider the notion of direct deliberative governance (DDG) as I use it, as well as to situate the inquiry within the literature relating to participative democratic process on the Internet. I also elaborate some of the key theoretical mechanisms employed in subsequent work.

Section 3 reports on three preliminary studies, conducted on a case that provides proof of concept for DDG online, and which will also be used in further research. I first briefly report on my M.Sc. dissertation, which investigated participation purely in terms of the online platform design. The shortcomings of this study - to be unable to account for the community as a socio-technical system - informs the design of the PhD research. The second study investigates the acts contributing to direct deliberative governance online, as well as the social network within which the acts occur. It serves as preliminary study of some aspects of research questions one and two, and contributes conceptually as well as methodologically to further design. The third study pilots the STIN methodology, which I plan to use in further work, and broadly informs the overall approach taken.

Section 4 describes my planned approach to the three research questions, in light of preliminary studies. It describes my overall approach, before outlining three stages of the proposed research project and how the outcomes of each feeds into the next. I discuss research design, methodology and expected outcomes of each stage.
2. Theoretical framing of the research space

2.1 Direct deliberative democracy as local governance

In the introduction, I proposed direct deliberative democracy (DDD) as alternative basis for understanding the role of the internet in democratic civic engagement, and described how a particular framing of DDD might inform e-governance at local scale. In this section I briefly consider the theoretical background to DDD, in particular focussing on its definition, common criticisms, and how the framing that I draw on potentially resolves some of the issues.

As two forms of democratic engagement, ‘direct’ and ‘representative democracy’ are frequently positioned as opposing practices within democratic theory (Gutman and Thompson, 2004). In contrast to ‘representative democracy’, where decisions are made by a set of elected representatives, ‘direct’, or ‘pure’ democracy lodges decision-making power in the assembly of all citizens who choose to participate (“pure democracy”, 2009, “direct democracy”, 2009). Authors refer back to the Athenian democracy in the 5th century BC as earliest written record of pure democracy (Manin, 1997), much as in practice it involved representative mechanisms such as the drawing of lots to appoint representatives. In a literature review of participative governance, Roberts (2004) concludes that as “democratic societies become more decentralized, interdependent, networked [and] linked by new information technologies” (p.1), direct citizen involvement has been on the increase since the mid twentieth century.

Dahl (1989, in Roberts, 2004) however criticises that large scale direct participation is not realistic considering the size and complexity of the modern nation state. Citizens have limited time to be involved, and do not have the specialist skills or expertise provided by a representative administration. However, as Manin (1997) points out, in reality the binary opposition of direct and representative democracy is artificial, since neither implies an absolute form and the practical implementation of ‘directness’ has multiple dimensions - as the Athenian example indicates. Barber (2004), a strong proponent of direct democracy, clarifies the intention not so much to replace representative with what he calls “strong democracy”, but to “thicken thin democracy with a critical overlay of participatory institutions” (p.xvi). In Barber’s view, citizens have the right to be directly involved in the decisions which most directly influence their lives. Similarly, my own research focuses on direct governance with the understanding that, while it is implicitly desirable in some contexts, it does not exclude, or necessarily oppose representative mechanisms of governance. One challenge will be to understand how direct and representative forms of governance interact, mediated by the online space, and how this might relate to the ultimate effectiveness of citizen participation.

As I outlined in the introduction, Cohen (1997) specifically combines the notion of direct democracy with deliberative process. Bohman (1998) cites Rawls, Habermas and Cohen in a compound characterisation of deliberative democracy, which holds that legitimate, broadly acceptable decisions are the result of a process organised around the ideal of political justification, requiring free public reasoning of equal citizens. In principle then, all forms of democratic governance are deliberative to the extent that they rely on reasoned evidence to support choices – much as their mechanisms may be more or less participatory, and more or less transparent. While Gutmann and Thompson (2004) outline deliberative democracy in terms that could equally apply to direct or representative forms, they present both practical and ethical concerns with more direct forms of deliberative democracy. Particularly targeted at the national level, they essentially recast the objections raised by Dahl (1989) in terms of deliberative process: It is not practical to include everyone in deliberation, and the public are not all skilled.
(equal) deliberators – they may not give the best reasons, nor make the most astute decisions.

There are a number of potential counterpoints to this criticism – for example that, particularly in local contexts, the expertise and commitment of civil participants is harder to question. Further, in practice not all acts contributing to a deliberative process are deliberative of themselves. While purist arguments consider deliberative democracy a form of dialogue, participants might for example contribute to an outcome by their mere presence, by providing an audience. The first research question, as it is presented in section 1, reflects a concern with exactly these factors - how a diversity of acts, as well as the context of interaction might be relevant to direct deliberative outcomes.

Finally, my discussion has repeatedly referred to ‘governance’, for example to discuss DDD as a form of governance. I use the term to indicate my interest in a process, much as it is local in context, which is broader in scope than citizen engagement with the institutions of government, and more grounded than abstract debates over policy or representation. Osborne (2002) defines governance in the socio-political context as “[a]ll those interactive arrangements in which public as well as private actors participate aimed at solving societal problems, or creating societal opportunities, and attending to the institutions within which these governing activities take place.” (p.46) In view of this, I propose to qualify my use of DDD, by rephrasing it as ‘direct deliberative governance’ (DDG). To further clarify - by this I do not mean so much internal governance of the online social systems I investigate, as the outward impact of actions mediated by the community on the external world. I recognise none the less that governance in the former sense will undoubtedly have a reciprocal relationship with the latter, an aspect that will partly be considered in the second research question.

2.2 The online public sphere and bottom up organisation

Having defined DDG in the previous section, and considered how some of the commonly cited shortcomings of direct deliberative participation might be mitigated, I discuss the literature related particularly to the internet and participative engagement in this section. I consider both opportunities and criticisms, and compare dominant online approaches to DDG as I have framed it.

Related to the notion that direct participation presents logistical problems in larger groups, Shirky (2008) and Benkler (2002) propose that online social media substantially reduce the co-ordination cost associated with collaborative action. They contextualise earlier work by Coase (1937, in Benkler 2002), who proposes that organisational forms are the result of attempting to institutionally minimise what is more broadly termed transaction costs. Because of changes in co-ordination cost brought about by the web, Benkler argues, collective governance and flat organisational hierarchy are becoming increasingly dominant forms of social organisation. Shirky (2008) claims that loosely co-ordinated online groups are supporting “... serious, complex work, taken on without institutional direction.” Castells (2007) similarly describes the development of a new communication sphere as the result of efficiencies in networked organisation. He refers to “mass self communication”, where communication is self produced as much as self directed in consumption, yet has the potential to connect a mass audience. His work is cautiously optimistic of the potential for direct deliberative governance involvement as a result.

Vedel (2006) however critically reviews “electronic democracy”, which he proposes is an evolution of two earlier models of ICT assisted government: the data driven governing machine of the 1950’s, and mass media driven teledemocracy of the 1970’s. In his view, electronic democracy is driven by the “Californian ideology” of thinkers such as Perry Barlow, Rheingold and Dyson, associated with the ideal of the citizen as autonomous
agent in a global village, and of cyberspace "as metaphor and tool of political self organization." In spite of the new economics of information sharing and self organization, Vedel argues that electronic democracy has yet to fulfil its promise, and that authors fail to address long established challenges of strong democracy in the new context:

- that it has a demanding conception of citizenship which potentially requires unrealistic levels of engagement;
- that actors are strategic and present biased information to support decisions, while citizens are unable to assimilate the overload of information related to diverse questions of governance;
- that democracy is reduced to discussion, while decision making and implementation is disregarded;
- and the need for intermediary bodies such as political parties to channel and contextualize information streams, and to enable collective action.

One might challenge that researchers are in fact paying significant attention to understanding these and related concerns. For example, DemoNet (2009), an online meta-community for e-participation projects and researchers funded by the European Commission, lists 70 diverse projects targeting improved citizen participation. However, what the majority of these approaches have in common, is a conception of deliberative participation driven by, or focused on traditional institutions of government - effectively mediating the engagement of citizens with a representative organisation. Not only does institutional government have limited reach in some governance contexts, it also has doubtful capacity to fairly facilitate, as well as participate in, interaction that criticizes its own practice or policy. Isin (personal communication, March 2009) refers to traditional, top down participatory processes as "strategies of containment" – a way for government institutions to give the impression of openness, while affording themselves inequitable control of the deliberative space.

The bureaucracy of government presents a further obstacle to online participatory process. The Obama presidential campaign in 2008/2009 is widely recognised for its use of social media such as YouTube, Facebook and Twitter to spread information, gather contributions and encourage bottom up participation (Lefkow, 2008). Yet Swire (2009) reports that the Obama administration are yet to use social media to the same extent as during the campaign trail - because its use in government is subject to federal laws and regulations regarding privacy, disability access, advertising, security and so on. My experience of an online participatory process driven by the Namibian government suggests a form of stalemate. Concerns that officials would make responses which could be considered formal government statements – without approval that would take weeks to obtain – resulted in a process which could not realistically support deliberation.

Online activism (Ayers & McCaughey, 2003) presents an alternative approach to governance which is not driven top down by government, and which might address some of the issues raised by Vedel (2006). Many of the popular democratic success stories of the web, for example the Zapatista movement (Garrido & Halavais, 2003), or the 2001 protests against the World Bank (Vegh, 2003) are activism related. Being significantly driven “bottom up”, by lobbying and advocating through self organised initiatives it undoubtedly has an important role to fulfil particularly where there is an unequal balance of power (Young, 2001). It has disadvantages however, in that each activist group or issue requires a critical mass of attention for which it must compete in an increasingly unequal marketplace (Hindman, 2008). Contrary to the ideals of pluralism (p.141), the online media space appears to exhibit a power law distribution of traffic where "winner takes all" – a small number of scandals dominate attention (p.131). As a result, issues are presented in isolation, propagated on the basis of their charismatic appeal to attention (Castells, 2007). Inevitably, with limited resources available to implement decisions, there are tradeoffs that have to be made in any governance situation - an optimal solution needs to integrate multiple demands. Activism does not offer a suitable framework to develop such balanced governance.
Much as it was not conceived in the online context, Cohen’s view of direct deliberative democracy (1997), as it is characterised in section 1, offers a more compelling response to the critics of online direct involvement. The notion proposes a decentralised process of local civic organisation, where government is a player, but not necessarily driving the process or implementing outcomes. In response to Vedel (2006), when direct participation (online or offline) is concerned with local governance, citizens engage where they are most qualified and empowered to provide input, where they are realistically able to challenge lack of transparency, where they can be part of decisions or act directly, and where they have most invested in potential outcomes. Unlike single-issue activism, this proposes a system of governance where issues and proposed solutions are compared to a broader governance reality and which seeks integrated, deliberated responses.

My own involvement with practical implementation suggests that this style of governance can be supported very successfully through online communities. I would argue that online social media are uniquely suited to supporting direct deliberative governance, with particular affordances to lower the co-ordination cost both of local action and the inter-local comparison of solutions proposed by Cohen. It remains to be systematically shown whether this is the case however, and to understand how the online medium particularly shapes or supports the process.

### 2.3 Social structure and action in online networks

In the previous section I considered how DDG presents a relevant basis for investigating participative engagement online. What exactly is meant by ‘online’, or ‘online social media’ as I had alternatively labelled the context, requires further qualifying. This section investigates the interplay between structure (both social and technological) and individual agency, to characterise context and clarify how the relationship between DDG and ‘online social media’ is conceptualised for the purpose of this research.

I have provisionally used the term “communities of interest” (Wenger, 1998) to characterise the social structures supporting direct deliberative governance online. With this I refer as much to the way actors are socially organised, as to the online environment that mediates their interaction. I accordingly appropriate Wenger’s definition loosely, to characterise aspects of a form of online social organisation and environment which I have practical experience of, but which may yet prove to have only limited commonality with Wenger’s characterisation. The notion relevantly describes how membership is defined by participation, that participation occurs around a shared practice, and that the resulting community spans across the boundaries of traditional forms of organisation. However, Wenger’s approach largely describes a single, relatively cohesive social structure and its evolution. The theory assumes a hierarchy extending from core to periphery, and where participation at the periphery is discussed, it is analysed in terms of the core. Members engage in “legitimate peripheral participation” (Wenger, 1998, p.100) in order to ascend in position relative to the core. Preliminary work, which I report on in section 3, suggests that this may not be an entirely accurate reflection of the case communities I base my research on.

A number of authors (Wellman, 2002; Castells, 2000; Bauman & Tester, 2001) employ a more substantial shift away from the community metaphor to a network based description of interaction and social structure. Wellman’s research contrasts traditional neighbourhood communities with internet mediated social networks (2002a, 2002b, 2005). He suggests that, as a result of the network affordances of the online space, social ties are more specialized, with different network members supplying, for example, emotional support, friendship or information. The ties are voluntary and less spatially defined, and as a result people act in multiple, overlapping networks or social circles, with potentially limited involvement in each (Wellman, 2005, Castells, 2000). In
Wellman’s “networked individualism”, the individual becomes the centre and author of their own private network, dynamically assembled from their various relations. While this networked approach is not incompatible with the notion of community, Wellman’s research does imply an increasing fluidity in its structure. In this regard, his findings echo Bauman’s (2001) more philosophical notion of “liquid modernity”. From the perspective of any particular online community, participation at the periphery becomes the norm.

Wellman recognises that online social ties potentially have reciprocal relationships with offline social groups, which may yet be more geographically bounded. He proposes a resulting hybrid structure, “glocalization”, that consists of tightly bound clusters of nodes, with a number of bridging or “weak ties” (Granovetter, 1973) linking them. This might be particularly relevant where communities are focussed on local governance, proposing a strong grounding in one or more geographic communities. Figure 1 illustrates the three forms of social organisation proposed by Wellman, with traditional neighbourhood community labelled as “little boxes” (Wellman, 2000b).

![Figure 1 - Wellman's three forms of social organisation (Wellman, 2000b)](image)

Both the community and the network metaphors capture aspects of social structure, of individual agency, and of the underlying technology. Kling et al. (2003) propose that "technology-in-use and a social world are not separate entities - they co-constitute each other." They methodologically address this duality with the notion of socio technical interaction networks (STIN), based on their research on the use of online forums in scientific communication. Specifically STIN modelling encourages thinking of networks as heterogenous – both in terms of what constitutes a node, and in the nature of the ties that connect them.

Rather than taking a view that is either socially or technologically determinist, my PhD project similarly considers the reciprocity of individual agency, social structure and technology. In the context of online social networks, the structure-agency debate takes specific forms. Castells (2000) proposes that in a social network the actors (considered nodes) do not have complete freedom, much as their networked individualism (Wellman, 2002b) collectively accounts for part of the structure. The network itself is programmed (Castells, 2007, Lessig, 2006) so that it controls flows of information (Deleuze, 1995, in...
Willcocks, 2004), or provides limited and potentially inequitable affordances (Wellman et al., 2003) for action, whether deliberately or inadvertently. The STIN methodology is well suited to investigating this domain, since STIN models foreground socio-technical concepts as control, resource dependencies, translations used to mobilize resources and governance structures (Kling et al., 2003).

The STIN methodology relies centrally on defining groups of system interactors and then modelling the relations between these “roles”. Callero (1994) proposes that social roles can be used as one way to bridge the structure-agency dichotomy, which he proposes historically formed two opposing debates in role theory itself. Structural approaches emphasise constraining and determining features of social roles (role-playing) and Interactionist approaches focus on individuals’ creative independence (role-making). He proposes that both of these none the less define roles in terms of a position in social structure. Drawing on work by Baker and Faulkner (1991, in Callero 1994), Callero frames roles as a “resource” in production of both agency and structure - a theory of the middle range that accommodates the duality, while it attempts to describe roles in a way that does not in principle depend on a position in the social structure. Baker and Faulkner consider that individuals create new positions, establishing social structures. Rather than necessarily controlling action, roles seen this way "make action possible", they contribute to agency.

As part of my first research question, I investigate roles associated with DDG online. The second research question then investigates exactly this interplay of structure and agency by considering the online space as a socio technical interaction network, to understand how communities of interest support, shape and are shaped by the roles which contribute to the deliberative process. I hope that this investigation of agency and structure in the context of DDG provides the basis to discuss design and implementation considerations for the technological aspect of the STIN, which the third proposed research question aims to investigate.
3. Preliminary work

To recap on the orienting statements given in section 1.1, the following section reports on three preliminary studies, conducted on a case that provides some proof of concept for DDG online, and which will also be used in further research. I first briefly describe this research context, where after I report on the first study, my M.Sc. dissertation, which investigated participation purely in terms of aspects of the community platform design. The shortcomings of this study - to be unable to account for the community as a socio-technical system - informs the design of the PhD research. The second study investigates the acts contributing to direct deliberative governance online, as well as the social network within which the acts occur. It serves as preliminary study of some aspects of research questions one and two, and contributes conceptually as well as methodologically to further design. The third study pilots the STIN methodology, which I plan to use in further work, and broadly informs the overall approach taken.

3.1 Research setting for the preliminary studies

The three preliminary studies draw on an initiative, launched in 2002 to promote information sharing and collective action between stakeholders in the western coastal areas of South Africa, Namibia and Angola. The project donors hoped to incubate a community of interest focussed specifically on sustainable development and environmental governance. A central project team was established, with both permanent and temporary employees to act as administrators and facilitators of the community. The team implemented a web enabled approach to participation and governance focused not only on socially inclusive interaction of citizens with government, but also, significantly, on citizen to citizen networking, capacity building and knowledge sharing. They aimed for governance to be as much driven from the bottom up, as from the top down.

The objectives of the initiative have clear parallels with key proposed attributes of direct deliberative governance in that it seeks to support pluralistic, locally relevant solutions through collective decision making, while providing opportunity for social learning through inter-local comparison of solutions. There were established environmental and development governance initiatives in the target region, but they acted in fragmented networks with little co-ordination between initiatives. This resulted in the diffusion of effort and relatively little success against large, co-ordinated opponents such as the local mining industry. The project aimed to provide a “meta network” to connect these fragmented initiatives. In the process of connecting stakeholder groups, the initiative hoped also to reconfigure local networks to particularly afford disempowered communities increased voice or agency. This steered the points of engagement it sought.

In 18 months the online community platform had served 103677 page views and recorded 2200 unique monthly visitors – of these 57% were from within the region. More significantly, there were 650 registered members who had made 1855 message posts to the discussion list. The discussions involved members of civil society and NGO’s, as well as local and regional government. They frequently focussed on practical issues of governance: legislation to protect sensitive dune environments from damage by off-road vehicles; impact assessment for a proposed nuclear power station; how to best deal with (protected) desert elephants damaging farmers’ crops. The initiative appears to have successfully provided ground where diverse stakeholders could participate in constructive dialogue and share solutions.
3.2 Study 1: M.Sc. dissertation – an economic view of the role of the online platform in participation

My Ph.D. research originates with work I did for a M.Sc. dissertation, with the OU, during 2006. Motivated by my experiences as practitioner implementing the online platform of the case community, I attempted to better understand the role of the platform in member participation.

While online participation in the developing world is most commonly discussed in terms of the “digital divide”, web based communities in both developed and developing world appear to have three well documented phenomena in common: many members abandon the community within months of joining (Beenen et al., 2004), only a small proportion of those who stay interact (Nonnecke and Preece, 2000) and of those who do interact, the bulk of content is contributed by very few (Butler, 1999; Beenen et al., 2004). I similarly found that between 2002 and 2005, out of the total user base of 320, 51 members of the DLIST community terminated membership, while a further 58 user email addresses responded with delivery failure messages. In the last six months of 2005, only 29 users posted messages, while 10 of those contributed 73% of the posts. During the entire period, 75% of users made no posts at all.

The M.Sc. project investigated possible solutions drawing on theories of social psychology (Butler, 2001; Beenen et al., 2004) and group interaction (Hoadley and Kilner, 2005; Wenger, 1998; Cosley et al., 2005). Two principles were applied – to lower the transaction cost (Cordella, 2006) associated with posting messages and to improve the apparent information value within the community (Ciffolilli, 2003). To do this the discussion forum was re-designed so that users received email alerts of all messages by default, and a hybrid mail-list/web forum was implemented that allowed users to post messages either via email, or via traditional web interface as before. I used a combination of quantitative interaction metrics and qualitative interviews to investigate user response to the changes.

I found that half of the users migrated to using email to contribute messages because it was more “at hand”, and accordingly made 37.5% more posts than those using web. Many users however continued using the web forum interface. They found the threaded display provided a better overview of the context of a conversation and was more suited to the deliberative process. Web posts were 39% longer than email as a result. As a combined result of changes, users saw more messages and many found it easier to post responses. Following the changes, overall message volumes rose by 48% relative to user numbers, the ratio of users interacting increased by 58%, and a more representative sample of users posted frequently. Users reported a perceived increase in the information value of the community.

In hindsight, the research attempted a field experiment where multiple factors of the environment were changed at once and external influence was impossible to determine while a control group could not be devised. Not only had the entire platform been redesigned, the animating initiative driving the community had substantially increased its activities. Subsequent data shows that levels of engagement had later declined somewhat when these project activities were discontinued in 2008. I was none the less able to conclude that interaction related costs and the visible information value within the community appeared to be significant factors in the levels and ratio of participation. Overall, the principles of lowering transaction cost associated with an interaction, while maximising value to users, proved to be useful tools to guide decisions about interaction design.
3.2.1 What this study contributes to the PhD project

By focusing my initial research largely on volume of interactions and relative proportions of interaction, I was unable to consider qualitative improvements in the community as a system. While subjectively I was aware that a number of important, useful interactions had occurred, I was limited to equate “better participation” with “more participation.” What mattered as much was quality of interaction and its effect on the “practice” that the community focussed on. Further, a broader interpretation of transaction cost presents the need to investigate not only usability, but also less tangible aspects of interaction (such as overcoming shyness or uncertainty) that counteract the motivation to act. These shortcomings significantly motivated the approach proposed for this more extensive study, in particular to approach the problems of participation and platform design through a less technologically determinist view of the socio-technical environment.

3.3 Study 2: Characterising acts of direct deliberative governance as they are mediated by online social media

Where my earlier research looked at participation divorced from its purpose, this produced an interpretive weakness. Why, for example, would one pattern of interaction be more desirable than another? As I have outlined in the introduction, the PhD research project frames this purpose as direct deliberative governance (DDG). While my own familiarity with the case study suggested that DDG had clearly been supported by the platform, it remained to describe these acts in a way that could support analysis of the dynamics of participation and ultimately inform the development of theory. I conducted a preliminary study, published as a conference paper, to make a first attempt at this background work.

As a first step, a typology of governance actions was developed by grouping a broad set of governance related acts on the platform into categories using an open, all-in-one card sort (Rugg & McGeorge, 1997). The degree of “agency freedom” (Sen 1988, in Barnbeck 2006) was used as grouping criterion. This produced the hierarchy of action categories in Table 1.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Related actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Animating</td>
<td>Starting the community, activating members to drive a new initiative</td>
</tr>
<tr>
<td>2. Facilitating</td>
<td>Moderating discussions on the forum, running a workshop</td>
</tr>
<tr>
<td>3. Filtering</td>
<td>Deciding which issues to cover in a newsletter</td>
</tr>
<tr>
<td>4. Creating</td>
<td>Contributing formal content, acting as topical “expert”</td>
</tr>
<tr>
<td>5. Contributing</td>
<td>Starting and commenting on discussion threads. Creating a profile.</td>
</tr>
<tr>
<td>6. Observing</td>
<td>Becoming a member, reading discussions</td>
</tr>
</tbody>
</table>

Table 1 - Typology of governance actions

Subsequently, I sought to understand how the particular online network (possibly inadvertently) impacted on the expression of these acts by investigating the network structure (topology) associated with actors in specific roles. This was done by developing network diagrams of the connections created by conversations in the community discussion forum. The view that emerged was one of a dynamic, evolving network structure, with a succession of hub and spoke arrangements as most dominant feature. It has characteristics of both Wengers’ (1998) communities of interest, and Wellman’s (2002b) networked individualism. The analysis also indicates a number of salient roles within the social network – the animator or weaver, and the community hub.
Though neither of the roles appear to have been imposed by network structure or technology, and both roles fulfilled significantly similar functions within the network, the online community platform offered very different affordances to either – in effect potentially limiting the contribution of community hubs. The community hubs were shown to be significant drivers of both dialogue within the forum, and the contingency thereof in terms of governance action. Where a trial initiative afforded community hubs increased agency freedom, the outcomes were highly successful. My review shows three important attributes of this success: support was aligned with actors’ interests, the tools provided by the community effectively reduced transaction costs and affiliation with the community provided increased contingency to actions.

The objective of the case community was clearly not to develop a system that required all the energy of its users to sustain, that would become an end in itself. Rather, where it was most successful, the online community supported individual initiatives “on the ground”, where there were already incipient action networks. This networked approach suggests that an online community such as this functions not only to support discursive action, where much research is presently directed, but also to potentially act as network broker, connecting action networks in a way that might have previously been the role of traditional governance intermediaries such as political parties.

Appendix A describes the implementation, results and analysis of this study in more detail.

3.3.1. Conclusions and contributions to the PhD project

The study usefully identifies a preliminary set of 40 actions, and the resulting typology suggests “agency freedom” as an important dimension of the interaction. The card sort methodology proved to be both useful and pragmatic, and will be employed during several stages of PhD research - much as future work will be required to establish validity by sampling a broader set of communities, and employing more than one person in the card sort.

To the extent that the study was a pilot of network analysis - as methodology to understand network structure and relations - it indicated significant limitations of the method in spite of the overall usefulness of a networked approach in this context. While the methodology and its results appear more objective than e.g. a case study, the aspects of a network that are modelled, and the definition of what constitutes a relation within the network, allows significant interpretive leeway. By constraining the analysis to the online forum, the study was unable to account for perhaps the majority of actions identified in the first stage of the pilot study. It could not account for anything but deliberative contribution to the forum and did not allow me to extend analysis to the interface between the online space and the offline world. It was also “blind” to technology itself as a shaping force in the network. As Mejias (2006) proposes of network analytic techniques – they over privilege the node and ignore the “substrate” that constitutes the environment of the network. While the first objection could be overcome by e.g. conducting interviews rather than purely relying on forum archive for data, to interview a representative sample of more than one online community would present significant logistical challenges.

3.4 Study 3: An investigation of online DDG as a socio-technical network

This study pilots the socio technical interaction network methodology (STIN; Kling et al., 2003), in the context of the DLIST community of interest. STIN presents a potential alternative to social network analytic techniques as methodological basis for investigating my second proposed research question. The STIN study was conducted in
early stages of the PhD research process and so does not fully reflect the more
developed research agenda outlined in this report. It does none the less inform on the
overall research agenda, and the practical application as well as appropriateness of the
methodology.

Kling et al. draw attention to three fundamental principles implied by their choice of the
term "socio-technical interaction networks":

1. The methodology focuses on networks, which they mean to refer to structured
relationships between diverse elements in the use of a particular system. A STIN model
might include "people (also organisations), equipment, data, resources (money, skill,
status), documents and messages, legal arrangements and enforcement mechanisms,
and resource flows." The authors suggest that relationships between elements are
similarly heterogenous, for example being social, economic or political in nature - or
potentially a complex combination of these. These attributes offer a distinct advantage,
in the context of the proposed study, over social network analysis, which typically
models homogenous relationships between human actors.

2. It is concerned with interaction. Kling et al. use the term "technology-in-use" when
discussing the social and technical interactions. STIN emphasizes the character of
interactions, an aspect which I indicated in the conclusion of study one as significant for
the proposed PhD research, but not accounted for in social network analysis.

3. The authors further specify their use of the term "socio technological" to indicate a
tightly integrated conception of people and technology. Rather than simply investigating
that technologies have social consequences, Kling et al maintain that "technology-in-use
and a social world are not separate entities - they co-constitute each other." This seems
particularly relevant in reference to the second and third proposed research questions of
my PhD project – and is strongly sympathetic with the theoretical discussion of the
agency-structure duality discussed in section 2.3. In the context of e-forums, Kling et al.
define the STIN as a "network that brings together people and equipment in ways that
are not meaningfully separable for understanding how [e-forums] work."

I accordingly broadly followed the directions of Kling et al. (2003) to analyse the case
community based on my recall of experiences as member of the project team and from
research interviews conducted during my MSc. Since I was evaluating an existing
system, I followed the approach of Letch et al. (2008) to de-emphasise the design
orientated stages of Kling's original formulation – though, in hindsight, these steps may
yet prove to be relevant to the proposed PhD project.

Appendix B reports in more detail on the process of identifying roles, developing
STIN diagrams and case descriptions, as well as subsequent analysis.

3.4.1. Evaluation of the methodology and contributions to the PhD
project

While the details reported in Appendix B contribute at conceptual level, I choose
not to repeat analysis here that has subsequently become woven into this
presentation at several levels. In stead, since the primary purpose of this
preliminary study was to pilot the methodology, I take up significant points on the
methodology itself that emerged.

Kling et al. (2003) provide little guidance, beyond their eight step heuristic, to actually
implementing a STIN analysis. They acknowledge the interpretive difficulty of developing
the model due to the absence of 'out-of-network' criteria for judging the relevance of
actors or the validity (representativeness) of a given model. My own two models
developed most successfully by choosing the perspective of a role within the network to act as filter. This has the advantage that the model could be verified against the experience of actors who act in such a role, and that it represented a "point of view", rather than generalised abstraction of many viewpoints in the system. It also resulted in analysis at more fine grained level, which appeared to be more directly useful in evaluating the interactions with the technology itself.

Related to this, the suggestion by Kling et al. to identify incentives associated with roles, preliminary to network modelling, assumes that motivations are relatively transparent or otherwise correctly reported. In practice, while there may seem to be obvious financial and political incentives, humans do not always act predictably and their own motivations may not be clear to them (Gigerenzer, 2002). This suggests the requirement for rigor especially during knowledge elicitation - for example for semi-structured questionnaires to be supplemented with a laddering process (Rugg & McGeorge, 1997). The authors do note that inevitably a theory of social action will be implicit at this stage, and should be made explicit. My own brief analysis might certainly be made more robust with such an addition. In general, STIN provides little guidance on how information is elicited - analysis may well benefit by being methodologically supplemented during this phase.

Meyer (2006) mentions the criticism that STIN models are descriptive, rather than offering explanation. On the contrary, I found the models helped explain behaviour by making potential influences more explicit. They also helped to define the social structure by showing how relevant resources might move within the network. Overall, I found the STIN models elaborated the socio-technical dynamics within the case study effectively, though the pilot implementation perhaps focussed on human and organizational relationships, rather than on the potential impact of the web platform or online medium. This deviation from the analysis I propose to do in the second PhD research question does not reflect an inherent limitation or bias of the methodology. In stead, it shows development in the focus and scope of my research project since the pilot study was conducted. It does however suggest that I will need to consider the elements and scope of STIN models carefully to be sure they provide the basis to answer my question.
4. Planned research methodology

4.1 Overall research approach

In my exploratory research, combining interpretive/qualitative methods such as card sorting and laddering (Rugg & McGeorge, 1997), with specific network-analytic tools (Borgatti, 2002), as well as statistical analysis of application logs, provided rich data for interpretation. Mingers (2001) proposes such a pluralist approach to qualitative research in information systems to account for the diversity and contingency of social situations, and to provide for richer, more reliable results. This does however present the challenge of employing such a multi-faceted approach in a demonstrably systematic, rigorous manner.

The structured-case methodological framework of Carroll and Swatman (2000) potentially provides high level support for exactly this. It features a processual model with three components:

- An evolving conceptual framework representing the current state of a researcher's/evaluator's aims, theoretical foundations and understandings. The researcher begins with an initial conceptual framework based upon prior knowledge and experience and iteratively revises it until the enquiry terminates.
- A research cycle structures data collection, analysis, interpretation and synthesis.
- Literature-based scrutiny is used to compare and contrast the evolving outcomes of the enquiry with literature.

The term ‘case’ is used to define the object of study; it may be a person, a group, a project, an organisation, a process, an IS, etc. Much like grounded theory (Heath, 2004), it encourages the researcher to produce new or revised knowledge that is demonstrably rooted in observation. Particularly relevant to the PhD research process however, it acknowledges and accommodates that an initial conceptual framework might be based on literature, that enquiry might be substantially guided by this, and that the research cycle iterates repeatedly between observation, interpretation and further reading.

At highest level then, the online enactment of direct deliberative governance represents the ‘case’ under investigation, much as the research will be based on a number of case studies at a more granular level. The research component of the PhD project is planned to comprise three stages, each focused on a high-level research question and providing input to the following stage.

1. The first stage (RQ1) aims to elicit a characterization of DDG online, in other words to generalise some aspects of the phenomenon, in order to provide a conceptual language and understanding of context that can be used in following stages of the research.
2. The second stage (RQ2) investigates instances of DDG through the lens of “socio technical interaction networks” (Kling et al., 2003), focussing on how the interaction of roles is mediated by, and in turn shapes a particular online environment.
3. The final stage (RQ3) considers aspects of the design of the online environments supporting DDG, in the light of the previous work. The notion of transaction cost is employed to consider how online social media might afford particular roles varying levels of “agency freedom” relevant to DDG.
4.2 The three research stages

In what follows I identify the approach and methodological tools that I will use during each stage, and how I propose the results will both inform the question and relate to the stage of work that follow it.

4.2.1 Research question 1: Characterizing direct deliberative governance online

RQ1. How is direct deliberative governance enacted through online social media? In particular, what acts contribute to the deliberative process online, what roles do actors come to assume, and how can the environment of interaction be characterized?

To be able to develop a characterization that is more representative than that developed during preliminary work, and that can be generalized more readily, the investigation during this stage will be based on a broader set of cases. Since preliminary work identified relatively few cases, I will need to conduct a survey to identify more online communities which support DDG in the southern African region. From these a pragmatic set will then be chosen as subjects, to give sufficient breadth and depth over each of the factors under consideration. For each one, I can then develop a short case study (Yin, 2003) to record acts, roles and features of the environment as required by each of the sub-questions below.

The communities’ online archives will serve as primary data source, supplemented with interviews, potentially with community administrators and users, to fill in gaps and verify deductions. Because I need good coverage over a relatively small sample (Price, 2005), and further need to be able to respond reactively to unexpected information forthcoming during the process, I will conduct semi-structured interviews (Rugg et al., 1997) rather than use questionnaires. In previous work I found telephone interviews particularly pragmatic for a sample that is geographically dispersed. By making calls from a computer answers can further be recorded for later reference.

In section 3.3 I report on a preliminary study that piloted this work. While the study provided a first approximation to answers, there are conceptual and methodological shortcomings that I address below.

a.) What acts contribute to the deliberative process online?

The preliminary study indicated that there are many acts, not all deliberative, and not all directly governance acts, which contribute to the overall direct deliberative governance outcome. Forty generic acts we identified – some relating to management or design of the community itself (meta-level), many relating to the business of the community (in-community), and some explicitly extending the community to the broader world (external). I had then performed a series of open (Rugg et al., 1997) card sorts to develop a typology of acts, with degree of “agency freedom” as emergent criterion.

I hope to extend this work to develop a more robust basis for further research and more representative characterization: by investigating acts in a broader set of cases, and then to follow a more extensive process of conceptual coding. As proposed by Rugg, the all-in-one card sort had been useful to explore 40 items for underlying nomothetic regularities. The typology that emerged surfaced unanticipated aspects of interaction. However, some of the validity of the method was potentially lost with only one domain
expert doing the sorting. The hierarchy of the typology did not hold for many communities it had subsequently informally compared it to, much as it provided a useful basis for discussion. For the full study, multiple participants will be used in card sort exercises so that results might be compared and validated. Since the objective at this stage is not to validate how users conceptualise their acts in the community, but to provide a grounded typology of actions, a broad sample of users need not be involved.

The methodological choices related to the card sort are discussed in more detail in section 3.3 and is not repeated here.

b.) What roles do actors come to assume?

The preliminary study in section 3.3 informally identifies a number of roles – some in relation to the typology of actions – when it refers to administrators, animators, moderators, community hubs and users. I also discuss roles such as information intermediary, project manager and donor in section 3.4 where I report on preliminary STIN analysis. In both cases, the roles formed the basis for understanding how the community may have supported DDG by empowering particular roles, or how in other cases it may have enforced the power distance between roles. While the studies had some roles in common – e.g. moderator, member and community animator – particularly the STIN analysis surfaced roles peculiar to its context. In addition to the roles indicated by preliminary work, a range of relevant roles are proposed by literature. Walker (2008) describes circuit riders, animateurs, movement entrepreneurs and techs in his review of social action settings; Nonnecke and Preece (2000) describe lurkers; Krebs et al. (2006) refers to weavers. Turner, Smith et al. (2005) analyse 1000 Usenet groups using first network analytical techniques, and then content analysis and identify “the Answer Person, the Questioner, the Troll, the Spammer, the Binary Poster, the Flame Warrior, and the Conversationalist.”

Network analytic techniques are commonly used to investigate such roles in online communities where the relationship data can be inferred directly from archives of interactions – for example the archive of a mailing list. Welser et al. (2007) for example use social network analysis to quantitatively identify the behavioural and structural ‘signatures’ of roles in a network. In their study, the “answer person” is distinguished from the “discussion person” in that they do not typically initiate conversation and make few posts per thread, and that their ego networks mostly include outward links to alters of low degree. In the preliminary study in section 3.3 I similarly report on network analysis that shows there are two types of “hub” in the network – some who spread their contribution broadly, others more inclined to in depth discussion on a small number of key topics. However, I also found that, where archived data does not exist, or where one hopes to model interactions in a broader context, for example to include offline relationships, network analysis becomes relatively ‘expensive’ as a methodology. To develop a representative model, data is required about a substantial amount of interactions, typically elicited by interview or questionnaire (Wasserman and Faust, 1994). Since my study hopes to understand the range of roles impacting the DDG process online, network analysis based e.g. on online discussion records alone will not be sufficient, while developing a more complete network model using questionnaires is unrealistic.

Turner, Smith et al. (2005) propose a mix of statistical methods and ethnography to characterise roles. They cite Smith and Fiore (2001, in Turner, Smith et al. 2005) “The diverse facets of online discussions – the messages themselves, their temporal and logical sequence, the relationships of their authors—do not integrate easily with each other. Thus, grasping the nature and extent of interaction in a complex conversation from just one kind of interface is difficult or impossible.” An integrative, case study based approach as I have outlined might then be a viable alternative to pure network analysis,
combining roles I have encountered in literature with what is suggested by the interactions in the various case communities to develop a typology of roles in the online DDG context.

In a review of role theory, Biddle (1986) describes at least five common perspectives to understanding roles: functional, symbolic interactionist, structural, organizational, and cognitive role theory. He concludes that "authors continue to differ over definitions for the role concept, over assumptions they make about roles" (p.2). The roles identified in literature reflect this diversity of understanding and therefore cannot be uncritically combined into some form of taxonomy. My preliminary work further suggests that actors assume multiple roles, and that the definitions of roles overlap and are often dependent on context. One challenge during this phase of research will then be to develop a clear conceptual basis for characterising and identifying roles in a way that facilitates analysing their contribution to DDG, in substantially different online environments.

Turner et al. (2005) investigate "the overlap between role as behavior and role as structural position." This has much in common with Callero’s (1994) approach to roles, which I referred to section 2.3 of the theoretical introduction of this report. In principle, Callero’s notion of roles as bridge between structure and agency is particularly relevant to the following stages of my PhD project, which are fundamentally concerned with the interaction between actors and the online social environment. By establishing formal definition criteria, drawing on work such as that by Callero, the roles identified in literature might be filtered and potentially integrated to develop a base typology. This might then be validated against community case study data, as well as the typology of acts developed previously. This process will contextualise roles, and potentially suggest further roles to consider.

c.) How can the environment of interaction be characterized?

The goal of this sub-question is to elicit a description the environment of interaction that allows comparison between instances, and which informs the deeper analysis of relationships in the following phase. Ultimately, I am interested to understand which aspects of the environment are most likely to be significant indicator of the prevalence, or even dominance, of specific roles and interactions.

One of the objectives of the preliminary study reported in section 3.3 was to investigate the structure of the network, as one element of the environment of interaction, using social network analysis. This proved useful, in that it indicated a network structure that was unlike that proposed by dominant theories and which suggested the significance of the “community hub” as role in the system. The evolution of the network model also gave an impression of how dynamic the structure was, changing significantly from one year to the next. However, in the previous section, I reported the limitations of the network analytic approach in my research context. As in the case of roles, I would again want to characterise aspects of the environment beyond purely what is recorded online. Further, the information thus elicited could potentially be obtained by less ‘costly’ means, allowing me to sample and compare across a broader range of communities.

Preliminary work on a second case study suggests informally that interaction grounded in a village community is very different from interaction in a more loosely connected regional community. This could mean that the closeness of participants in the real world, in terms of geography or relation, is a significant factor of the environment on interaction (Wellman, 2002b). The environment might further be characterised by dimensions such as community size (Butler, 2001), density and strength of relations (Granovetter, 1973), whether the social network has a centralised or dispersed system of governance, which geographic region the network is based in, and what range of technologies are used to support the community.
A refined set of these dimensions might be recorded as part of the case study protocol. The data on environment can then be statistically compared, across instances, to the data on roles. The results and analysis of this comparison will not only provide further insight into the nature of specific roles, but also provide the basis for selecting cases in the following phase of research. It would allow me to select cases which are either very similar across a number of dimensions, or alternatively which cover the range of a significant dimension.

4.2.2 Research question 2: Online DDG as socio-technical system

RQ2. How does the environment afforded by online communities shape the process of direct deliberative governance, and in turn, how do acts contributing to direct deliberative governance shape the evolution and effectiveness of these communities?

This question focuses on how the interaction of roles is mediated by, and in turn shapes a particular online environment - where environment refers to a socio technical system which includes aspects of social structure and online media. Underlying is the duality of agency and structure discussed in section 2.3 – that individuals practice DDG, much as any particular online network offers limited affordances for action and so doing potentially steers the process.

I have discussed the STIN approach (Kling et al., 2003) in some detail, both in relation to the theoretical basis of this project, and where I reported on a pilot study conducted using the methodology. I reported that, as a methodology, STIN surfaces relationships, intentions and motivations, in particular power and influence in networks. Relevant to this question however, networks are defined as heterogenous in terms of both elements and their relationships – in this sense, influence might equally refer to elements of technology as to human roles. The reported outcomes of the pilot study in section 3.4 and Appendix B suggest that STIN would be well suited as methodological approach to this question. Within the same domain, Letch and Carroll (2008) successfully apply an abbreviated version of STIN to evaluate e-government systems, specifically the inflexibility (to local context) introduced by integrated e-government systems.

Kling et al. acknowledge that their formulation of STIN has been significantly influenced by Latour's (1987, in Letch and Carroll, 2008) actor-network theory (ANT). However, they point out that in ANT the primary social process, which animates the network, occurs when parties try to enlist others in a central project. STIN models do not predefine a single driving social process and require the analyst to define both relationship and dynamics of social action. One could argue that ANT encourages researchers to frame a social process in terms that may not optimally describe their dynamics, by focussing on enrolment as driving force. STIN is also more conservative in attributing action to non-human agents, a departure from Latour's widely criticised "strong symmetry" between human actors and non-human agents in a system.

Considered in terms of social network analysis (SNA), another dominant approach to determining influence in networks, STIN affords more direct modelling of the role of technology in a network. As earlier discussed, Mejias (2006) criticises that in SNA the network "over privileges the node" - or put differently, by focussing on nodes and the connections between them, it "ignores the very stuff on which the network is suspended."

The outputs from phase 1 provides the basis for selecting a small number of cases for STIN modelling, as well as the background for developing the case descriptions for these. STIN modelling, as I have applied it before, requires a detailed case description
as input. From the short case studies developed in phase 1, I can then follow Letch and Carroll (2008) in using a combination of semi structured interviews, unstructured interviews to request detail on issues of interest, and existing documentation, to develop depth and detail in each case description. I already have three relevant cases that I have detailed familiarity with, which might be used if earlier analysis shows them to be most relevant.

Meyer (2006) criticises that STIN models are descriptive, rather than offering explanation. In preliminary work, I established that this depended very much on the analysis which follows case study and diagrammatic modelling, only the first steps in the STIN process. The STIN process offered an abstraction of the social network with powerful potential to produce insight into exactly the type of question I am using it to answer. I did however find that, at a high level of description, the model did not produce sufficient detail on the role of technology in interaction. I also found that different roles had very different “views” of the network. It was subsequently expedient to model the case study in terms of two different roles in turn, and then make comparisons. I will consider a similar mechanism for further work – potentially modelling a number of ‘use cases’ which might then be generalised across the communities under investigation, rather than trying to develop models of entire socio technical systems. This requirement was foreseen by Kling et al. (2003), who similarly refer to “unpacking” an element or aspect of a network.

The STIN analysis might be considered a form of “structured” case study to provide input to the third phase of my work – in particular recording the critical interactions between roles that will be important to consider in terms of design and adoption.

4.2.3 Research question 3: Designing for DDG

RQ3. How can online social platforms offer improved affordances, to be adopted by communities seeking to effect or enhance direct deliberative governance?

The third question of the research project considers how online social media might be designed, developed or implemented to afford particular roles an appropriate level of “agency freedom” relevant to DDG. The question is not intended to imply a form of technological determinism; rather it aims to approach online social platforms as I did in the previous question, as socio-technical systems. Research questions one and two aim to provide the theoretical framework, and understanding of context, with which to engage this third question. This implies an approach that attempts to define principal components (Deuze, 2006), or key architectural choice points (Kling et al., 2003) for further investigation, grounded (Carroll and Swatman, 2000) in the reality of the case communities under investigation.

In section 3.2 I reported on preliminary work that considered the impact of technological changes as a form of field experiment. The difficulty that I had to do what was essentially a “top down,” somewhat technologically determinist experiment with an online community prompted me to investigate ‘action research’ (Baskerville & Wood-Harper, 1996) as an alternative mode of investigation for this stage of work. Baskerville and Wood-Harper promote action research as a post-positivist social scientific research method “ideally suited to the study of technology in its human context.” They also cite Keen (1991, in Baskerville & Wood-Harper, 1998) that action research “merges research and praxis, thus producing exceedingly relevant research findings.” The notion that I might further involve participants in the process of design and theorising (Baskerville, 2004) was distinctly attractive considering the nature of the research question. However, after investing significant preliminary effort in a case as potential subject, only to have the project backing the community cancelled by donors, brought the potential risks of
action research in a PhD project into sharp focus. Avison (2001) highlights similar issues of control between researcher and practitioner in action research projects, specifically related to ownership, project direction and establishing action warrants. While Avis suggests several potential mechanisms to mitigate risk, the opportunities that remained for me to approach online DDG through action research were simply not realistic considering timescales and tightly defined research outputs.

As an alternative approach, the STIN research cycle, as originally developed by Kling et al (2003), converges on what they refer to as “architectural choice points” in its final stages. The methodology is ultimately orientated towards design. I might in other words extend the STIN analysis in phase two to also address question three - to consider how the output of earlier work translates to design choices in the DDG context. The intention then would not be to propose specific interventions in the cases under investigation, but rather to put forward general criteria for design, considering for example the differences in environment, the interplay of roles and the mediating influence of toolsets. This might be followed by a scrutiny in literature of cases that further inform the question, as well as in depth follow up interviews with key informants – a process that the structured case methodology introduced earlier is ideally suited to.

The notion of transaction cost, as applied by Cordella (2006) in the IS context, is potentially a useful mechanism to evaluate design choices. Cordella proposes that any interaction has an associated non-monetary cost, which plays a significant role in how each participant considers the utility of their actions within a system. While this proposes an economic view of interaction, it does not attempt to convert a complex human act into overly simplistic terms. For Cordella, transaction cost includes intangible factors such as uncertainty, fear and bounded rationality. As Cordella reports, any change in a complex system invariably reduces some aspects of transaction cost, while it adds new costs – such as information overload or technical complexity. I could in other words consider how the transaction cost of particular acts of governance, or associated with particular roles, might be mediated by changes in the socio-technical system.

4.3 Contributions and limitations

I recognise that, much as the work is made pragmatically possible by the choices above, they also limit how results might be generalised. My research will likely draw in depth on relatively small samples, focussing on a small niche in terms of governance, in terms of the online sphere, and in terms of geographic context. However, by basing work on a very tightly defined, relatively unexplored notion of online governance, and further locating case studies in southern Africa, the research project will potentially make a number of unique contributions to the existing body of knowledge on how we have come to use the internet to govern the world that we are part of. I will collate and apply knowledge from a number of fields to investigate how it applies in a particular niche – in the process perhaps extending notions of, and frameworks for understanding online governance. Further, the typologies of action, roles and spaces have not been developed in the context of online governance as far as I am aware.

While it will not be in the scope of my work to compare online DDG between southern Africa and other parts of the world, the work provides the basis to potentially do so in future. It also hopes to make a small contribution to counter the discourse of the digital divide (Gurstein, 2007), which has come to dominate much of the work related to the internet in the developing world. If southern Africa is to have a vibrant and effective online public sphere, discourse cannot remain tied purely to issues of access and infrastructure.
4.4 Ethical considerations

The ‘Human Participants and Materials Ethics Committee’ of the Open University publish a booklet containing ethical principles for research involving human participants (Open University, 2006) The booklet suggests six components to consider, which I address below in terms of the proposed work.

1. Compliance with protocol
I am aware of the Open University human research ethics approval process, and will engage the ethics committee early in the next stage of work for approval of planned research. I can do this as soon as I have sufficient detail to be able to commit to a more detailed protocol relating to data security and ethical involvement of participants.

2. Informed consent
This requires that participants “opt-in” to participate prior to being involved as research subjects, and that they are made aware of potential risks and implications of being participants. In the case of interviews, this consent can be obtained as part of the interview protocol. However, where my work studies the interaction of whole online communities, the archived interactions of potentially hundreds of people, it will clearly not be feasible to obtain consent from each individual. I will need to confer with the ethics committee to establish what level or mechanism of consent would be appropriate.

3. Openness and honesty
The nature of my research does not require me to be secretive or misleading about the work. Details can be disclosed before I engage participants, either at the individual or community level, without potentially compromising outcomes. Results may also be made available, particularly to participants of more in-depth studies.

4. Protection from harm
There is little potential that my research might directly harm any individual – other than the risk that personal data is revealed if confidentiality is breached, or data misappropriated. The guidelines propose that a risk assessment is conducted to cover potential eventualities.

5. Confidentiality
I will need to be careful to not disclose the identities of participants – and potentially also of the communities under investigation. In some cases, this will require special care, since the communities might be indirectly identified from case study material that I might present. This will be especially relevant where my analysis may show the performance or conditions of any specific community in poor light.

6. Professional codes of ethics
There are no professional codes of ethics, beyond those provided by the OU, which I am formally bound to. I am however aware that various professional organisations, e.g. the British Psychological Society, publish codes of ethics which may be relevant to my work.
5. Schedule

The following presents a brief overview of my planned schedule following probation. Note that I have set aside blocks of time to scope the amount of resource I have allocated to each step. In reality, the process will likely be more iterative.

<table>
<thead>
<tr>
<th>Date</th>
<th>Task</th>
</tr>
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<tbody>
<tr>
<td>Aug 09</td>
<td><strong>Phase 1</strong></td>
</tr>
<tr>
<td></td>
<td>Survey communities and develop interview questionnaire.</td>
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<tr>
<td>Sept – Oct</td>
<td>Conduct interviews, gather case study information</td>
</tr>
<tr>
<td>Nov - Dec 09</td>
<td>Analysis and follow up</td>
</tr>
<tr>
<td>Jan 10</td>
<td>Write up as thesis chapters*</td>
</tr>
<tr>
<td>Feb - Mar 10</td>
<td><strong>Phase 2</strong></td>
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<tr>
<td></td>
<td>In depth research and interviews covering selected case studies</td>
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<tr>
<td>Apr 10</td>
<td>STIN analysis</td>
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<td>May 10</td>
<td>Write up as thesis chapters *</td>
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<td>Aug 10</td>
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<td>Analysis of outputs from previous phases. Planning approach.</td>
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<td>Sep - Oct 10</td>
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<td>Analysis and writing up as thesis chapters *</td>
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<td>Mar – Sept 11</td>
<td>Writing final PhD thesis</td>
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Items marked with a * indicate specific deliverables. Each phase of the project leads to one or more PhD thesis chapters, ideally delivered in draft before the next phase starts. I have also planned for two refereed papers – will of course need to consider time for revisions or resubmission of these. Again, each phase of PhD work should produce the kind of output suited to a published paper.
References


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A.1 Appendix one: Characterising acts of direct deliberative governance as they are mediated by online social media

This section reports on the practical implementation, results and detailed analysis of the study reported in section 3.3 of this document. I do not repeat the introduction or conclusions contained there.

A.1.1 A typology of governance acts

As first step, a broad list was compiled of what could be considered acts of governance, acts which contributed to, or which shaped the more specific goal of DDG in the context of the DLIST platform. This was done by analysing the affordances (Wellman et al., 2003) of the community website as well as reviewing project activity reports and previous case study material. In the introduction I referred to online participative governance driven by multiple types of action. De Cindio, Di Loreto et al. (2008) similarly refer to “modes” of public participation in a socio-technical system, which proposes that participation in governance may be more diverse than purely deliberative action. If the community is analysed as a socio-technical interaction network (Kling, McKim et al. 2003), there is complex interaction between a range of actions - online and offline, from direct participation to informing others and moderating discussion, even externally orientated actions such as recruiting new members or promoting the initiative in the press. I considered the actions of various roles in the community – the agency supplying funding, the project team supporting the network, its users at different levels of engagement. The objective was to capture as much diversity as the case community offered, rather than trying to be literally complete. Each action was captured at approximately the same semantic level (Rugg & McGeorge, 1997; Upchurch & Rugg, 2001) in order to facilitate further analysis.

To subsequently develop a typology from the 40 activities compiled, I chose to first perform what Rugg et al. (1997) refer to as an open, “all in one” card sort. Rather than setting specific groups, or even criteria for the sort, only a general framing “facet” was provided: to group cards in clusters of “overall similarity” in the context of types of governance action. This implied that the sort was likely to simultaneously draw on multiple criteria and results would require subsequent refining. Rugg reports this a useful method where a large number of items (>20) are to be explored by a domain expert aiming to identify underlying factors, what he refers to as nomothetic regularities.

Reflection on the initial round of sorting suggested an implicit sorting criterion that could be characterised as “level of empowerment” (Zimmerman, 1995), or degrees of “agency freedom” Sen (1988, in Barnbeck 2006). In other words, the progression reflected “what a person might achieve with respect to their aims and values.”
Further refinement of the sorting process, using the composite criterion, produced a typology of online governance actions shown in Figure 2. 

**Observing** includes the earlier categories of presence and information seeking. Also referred to as “lurkers” (Nonnecke & Preece, 2000) in the context of online forums, people who simply observe constitute an audience for those who contribute more directly, helping provide critical mass (Butler, 2001). Their actions further constitute an implicit vote - what they pay attention to is interpreted as important, their presence considered a measure of success.

**Contributing** actions refer to e.g. communicating in the online discussion groups or setting up a personal profile – in other words giving some form of input. At this level a participant potentially takes an active role in multi directional communication.

**Creating** actions differ from contributing actions in scope and nature. In the context of our case project, these might have included developing subject briefings, writing a course module, or uploading documents to a central repository as group assets. This presents more than just a personal statement in an informal discussion. The equivalent in normal conversation would perhaps be the distinction between a comment and a formal speech. The act positions the creator as an expert, and contributes to community in more deliberate manner than through automated aggregation of informal actions.

**Filtering/editing** actions shape or interpret the information visible to others a priori. These actions typically have influence on much larger scale than the filtering implicit in the creation of a single document. It also occurs in the background – filtering is not often exposed, or even explicitly considered in terms of its impact on shaping a governance agenda. In the case community filtering would refer to, for example, deciding what stories are reported in a newsletter, how images should be categorised in the reference library, or what constitutes a body of subject knowledge in a course.

**Facilitating** refers to the process of shaping or steering the communication and actions of others. While a skilled (impartial) facilitator might e.g. attempt to ensure that everyone is given fair opportunity in discourse, this process is often strongly influenced by personal capacity and point of view, as well as a defined deliverable of the process of facilitation. The case community included discussion moderators who “seeded” conversation, posted provoking articles and were required to make judgements on inflammatory posts, or which contributions were considered “off topic”. The project management functions relevant to my typology were also considered facilitating actions.

**Animating** indicates the ability to start or animate an independent initiative. This implies...
direct involvement in, or control over each of the other steps and also constitutes the opportunity to define a new network. The donors and key members of the project team were essentially the animators of the case project. They developed the initial project design, recruited members to the community from their own networks and provided much of the initial drive.

Considering the DLIST case study as a whole in terms of the action typology suggested a number of potentially salient features. Progressing from observing to animating:

- Power and the ability to influence or exert control over others increases.
- The actors are increasingly members of the administrative core of the community.
- The required level of engagement increases.

But also

- The numbers of actors decreases.
- Diversity of several demographic factors, as well as diversity of opinions decreases.
- Physical proximity to the issues under discussion decreases.

For an online community to be effective at supporting direct deliberative governance, one would not expect the impetus of action to be hierarchically concentrated in the core, relatively distanced from the contingency of diverse local conditions. The community would need to encourage diversity, and empower as many of its members as possible to participate with a high level of agency freedom. Further analysis shows that these distributions are neither uniformly true of DLIST, nor necessarily inevitable given the online environment. The structure as network topology is an implicit factor in this discussion, and is the next dimension of the community environment that I proposed to investigate.

### A.1.2 Network structure

I previously described the case community as a form of meta-network – aiming to support networking between individual initiatives, rather than to compete with these for affiliation in a form of tightly bonded community in its own right. The practical impact of governance acts would potentially lie outside the online community, well beyond its periphery. Also, while the case community has a topical focus, in this case it did not so much imply a common “practice” as a shared governance objective. For these reasons, the communities of interest/practice approach of Wenger (1998) does not provide sufficient mechanism to understand how such a governance network might be internally structured, and how this structure might both reflect and steer its mediation with the external world.

In section 2, I presented an alternative, networked view, e.g. as proposed by Wellman (2002a) who describes a topology of network forms. I accordingly analysed the network underlying the case community to understand how its structure might relate to Wellman’s typology – whether it is dominated by a strong core, characterised by more evenly distributed participation, or potentially a hybrid with dense clusters linked by weak ties. I was also interested to understand what other structural features might be latent, particularly shaping individual expression of “agency freedom”. (Sen, 1985 in Barnbeck 2006)

The network structure was inferred from the community discussion system, which provided a record of all online communications archived by discussion thread. In the 42 months between October 2005 and March 2009 there were 145 “conversations” (threads with at least one reply), involving 163 unique users and 850 individual messages. Each participant was recorded as a “node” in the network diagram, and reciprocal links recorded between all those present in any given conversation. The number of shared conversations determined the strength of the link between any two nodes. Huberman &
Adamic (2005) successfully used a similar approach in several studies to develop a network description based on email conversations. For the purpose of this analysis, members who did not participate in at least a two way exchange of communication were not included, as I was unable to infer their relationship to any of the active nodes.

This method developed a network model in sympathy with Wellman’s dynamic characterisation of networked social organisation (2002a, 2005), with ties defined by actions rather than by a description of static relations between nodes. It does however have the limitation that it presents a composite view of the structure, which superimposes patterns of behaviour that may have been chronologically separated by a year or more. Assuming that especially stronger ties might survive for several years, such a representation is not necessarily problematic. I further acknowledge that this analysis maps relations between only 163 of 650 registered users, based on only one aspect of their interaction. It does not consider relations that may have pre-existed the community, nor relations which are expressed in ways other than through online discussion – for example by users who were very active in “offline” activities of the community. Cautions considered, relevant features could none the less be discerned from the model. By being able to identify nodes as well as the content of interactions, the features that emerged could further be grounded in a detailed case history that had been developed over several years of study.

Network diagrams were developed with Netdraw (Borgatti, 2002) employing a graph theoretic layout with spring embedding. Through iterative fitting, nodes with smallest path length to one another are placed closest in the graph. Thereafter, spring embedding spaces nodes more evenly to improve readability. This leads to diagrams that are easy to read, while retaining some features of dimensional scaling (Hanneman & Riddle, 2005) since nodes are most closely related to those placed nearest in two dimensional space. In some cases, minor manual adjustments were subsequently made to node positions to more clearly visualise significant structural features. Further adjustments to individual graphs are clarified where they are presented in the text.

Figure 3 - A network diagram of the case community, showing ties where nodes shared at least one conversation.

Figure 3 shows the resulting diagram of the network where weak ties – a single shared conversation – are mapped. The community appears to have successfully involved each
of these participants in a dense web of conversation, with most nodes in the diagram sharing ties to multiple other nodes. The mean of the ‘degree’ (the number of ties connecting a node to others) is 16, with a standard deviation of 16. **Figure 4** graphs the level of connectedness across the participants.

![Degree of connectedness](image)

**Figure 4** – Degree: Number of node ties (Y) ordinally ranked (X) for all of the 163 nodes.

As a result of the relatively high degree of connectedness, the average path length between any two nodes is fairly short, with an average “distance” between nodes of 2.2. 98% of nodes are linked to each other via 3 ties or less. This is characteristic of what Watts (199) defines as a “small world network”, typical of many social networks, including the internet. Small world networks have the potential to spread information very quickly, though the process relies disproportionately on a number of well connected nodes to supply ties between otherwise weakly connected clusters of nodes (Shirky, 2008). The slope of the curve in **Figure 4** may be a property of ties defined by the online discussion forums rather than in the community as a whole – a few prolific communicators effectively provide most of the apparent “sharedness” of conversation observed in the graph. **Figure 5**, which arranges nodes from most well connected on left, to least connected on right, shows the extent to which a small proportion of well connected nodes, further referred to as “hubs”, account for ties in the discussion network.
Figure 5 - Principal “hubs” of the case network
Having established the small world nature of the community network, I was eager to understand what structural patterns of ties and nodes were evident. In Figure 3, there are no clearly visible clusters of nodes – the community appears as a single entity with nodes of increasingly high “degree” (Freeman, 1978) towards the middle.

To more clearly account for potential underlying structure, the network was subsequently visualised showing only nodes connected by stronger ties. Figure 6 depicts the nodes in the network that are connected by at least 3 shared conversations, with stronger ties indicated for nodes who shared 5 or more conversations. To make hubs easier to point out, nodes have been scaled so that larger blocks indicate higher degree. The stronger ties do not so much create “clusters” of nodes, as two significant hub and spoke arrangements (Krebs & Holley, 2006) with node 6 and node 21 respectively representing the hubs. Almost none of the nodes representing spokes are connected directly to each other with strong ties. At weaker tie strength (the grey lines in Figure 6), a number of further hub and spoke arrangements appear, e.g. centred on nodes 92, 8 and 10. Again, there does not appear to be clear evidence of strongly tied clusters as described by Wellman’s “glocalisation”. (2002b)

Figure 6 - Nodes connected by ties with strength of >=3 (light) and >=5 (dark) relations overall

To present a view of structure aggregated over shorter time span, and so account for potential evolution in dominant elements, interaction was further disaggregated into individual diagrams for each year (Figures 7,8,9).
Figure 7 - Nodes connected by $\geq$ 3 relations during 2006

Figure 8 - Nodes connected $\geq$3 relations during 2007
The hub and spoke patterns first observed in the aggregated diagram (Figure 6) are equally present in figures 7 to 9.

A few further features are worth pointing out:

1. Node number 6 is prominently visible in each of the three yearly diagrams. This is the original animator of the community, also evident in Figure 6 as perhaps the most significant connecting force in the community.

2. The most prominent hub and spoke arrangements evolve year on year. For example, node 21 is not present in Figure 7, then very prominent in Figure 8. The next year, in Figure 9 their role is again reduced. This appears to indicate that important hubs are active for a year, sometimes two, then move to the background or disappear entirely.

3. There are a number of lesser hubs each year, some develop – others maintain a constant lower level presence through several years.

4. Note that the node ID numbers are all below 60 in Figure 7; in Figure 9, two years later, they are almost all above 60. The numbering broadly reflects the registration date of a participant. Newer members seem to be making the bulk of contribution in later years, though some longer standing members are still present.

The network structure evolves quite dramatically – at least insofar as it can be analysed by means of interaction in discussion forums. There are persistent features – particularly the community animator who keeps a constant presence - but I did not see the bonded clusters observed in “glocalisation”. This may be because the case community is not

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Note that, since there was significantly less interaction in 2008, Figure 9 uses connection strength of only two relations as minimum tie strength to achieve sufficient resolution. At tie strength of two, the diagrams for previous years become too dense to clearly visualise the hub and spoke configuration.
strongly grounded in geography or a very specific practice, but instead connects diverse people from a broader region, and covers divergent issues within “sustainable development”. It is also possible that the online forum obscures exactly the effect of geography, since only one or two members from any given local network interact and members interact as much on non-local issues as those close to home.

One pattern that consistently reappears is the hub and spoke configuration, also called a “star” (Freeman, 1978) in graph theory. Krebs and Holley (2006) describe that this pattern commonly evolves in networks that have their basis in multiple small fragments of network. In their account, a network “weaver” creates the hub and spoke arrangement when they introduce links to at least one node in each of the fragments. Initially all links between outlying fragments is through the hub, but through the efforts of the “weaver”, the structure evolves so that clusters begin to link to each other directly, forming a network with multiply connected clusters. Krebs and Holley propose the clustered configuration is more robust than a strongly centralised star network and offers a higher level of connectivity – it does not rely as strongly on the original “weaver”. In terms of my typology of actions (Figure 2), their “weaver” might be said to be engaged in “animating” actions. From a governance perspective, the evolution away from a central hub introduces multiple channels of dialogue and is more representative of the diversity the community may have been created to support. In my study, not all members of the initial fragment communities are visible – typically only one or two members of each would join, and of those, not all are active on the platform. As mentioned of geographically influenced “glocalisation”, the case study may well be shown to support a number of stronger clusters on the periphery if a more inclusive process of measurement were employed.

In addition to a main hub and spoke arrangement with the animator or “weaver” at its center, my analysis shows the emergence of multiple subsidiary hubs, similarly connected by ‘spokes’ of strong ties to up to 15 nodes. For periods, some overtake the central hub in terms of both connectivity and activity, for example node 21 in Figure 8. Closer investigation shows that prominent hubs represent not only administrators, but also diverse community members – some who are professional development practitioners or represent environmental NGO’s, others community activists who connect passionately on a few issues that relate to their location.

When a hub makes a discussion contribution, they create a reciprocal tie with each of the nodes in the discussion, improving not only their own connectivity, but that of others as well. As shown in Figure 4, this creates the impression of a high degree of overall connectivity. To better show how the effort or impetus lies with hubs, Figure 10 shows the distribution of contributions over users.
The graph approaches a power law distribution (Shirky, 2003) with thinner tail and steeper curve than that of “degree” in Figure 4. The most prolific 16 nodes (10%) contributed 419, or 49% of messages over the sampling period. As expected, hubs were all located in the head of the graph, though there was significant diversity in the relationship of contributions to degree of connectedness. Some prolific contributors spread contributions broadly across conversations, while others were more likely to engage in a sustained conversation within a smaller number of threads. It is a limitation of my network visualization that the latter are not shown as prominently in the network diagram as people who spread their contribution more broadly.

For direct deliberative governance to be successful, diverse participation is important (Cohen, 1997) – exactly the contributions from the periphery of a network need to be encouraged. At the same time, the sustained involvement of an engaged group of users, in Wenger’s terms (1998) considered the community core, is required to keep a community active and functional. The multiple hubs I have seen emerge may be one way for a social network to evolve beyond the single hub and spoke configuration that characterises its starting condition. Multiple hubs have the advantage that they present more diversity than a single core, while at the same time supplying the initiative and connective fabric required to keep a community alive. They do however represent challenges, in particular that hubs appear to emerge spontaneously and then remain active for a relatively limited period only.

### 3.3.3 Governance actions considered in terms of structure

Combining the two dimensions of online governance action – acts at different levels of empowerment, and the structure within which these acts occur – has the potential to provide a clearer understanding of the opportunities for and limitations of an online social network such as the case study to support direct deliberative governance.
Figure 11 - Network diagram for 2008 indicating community administrators in black

Figure 11 again shows the network diagram created by interactions in 2008, but further indicates the presence of different kinds of participant to emerge from my discussion. Grey squares, the regular users, represent most of the nodes in the diagram. Community administrators are coloured in black. Nodes have been scaled to show their degree – with the largest nodes representing obvious hubs.

In terms of the typology of governance actions (Figure 2), users who were engaged only as observers are entirely absent from the diagram – my method could not infer relationships for these. The majority of those represented acted as participants, the 2\textsuperscript{nd} level in the agency typology. Moderators were appointed by the project team, and were required to contribute content as well as facilitate conversation – represented by the 5\textsuperscript{th} level of the typology. They were however not sufficiently active online, in spite of their appointed role, to be visible in the diagram. Only community administrators, in this case all members of the project team, were able to fully engage in all levels of action and accordingly played a significant role as animators of the interaction.

Hubs representing community administrators (larger black squares in Figure 11) are very evident in the diagram, much as these participants were significantly visible in the community affairs. They impacted the community in very significant ways, for example:

- by steering discussion toward topics that they understood, considered sufficiently relevant and further that they were comfortable with,
- by mediating interaction with potential new hubs in terms of their own views and relationships,
- by implicitly presenting an “identity” of the community through their visible interaction – people strongly associated the online community with the main administrator.

I do not attach normative value to these acts - their impact may variously have been positive or negative in terms of the community. I do however consider that such filtering, facilitating and animating actions need to represent diverse actors and opinions for effective direct deliberative governance. It was not sufficient that only members of the project team should display this initiative.

Hubs represented by regular users (larger grey squares in Figure 11) could however also be said to have acted with a high level of agency. Their numerous network ties mediated connection, while they too steered discussion with their comments or by importing snippets from other conversations, in aggregation well beyond the influence of
the average user. These hubs were also the only users to contribute formal content by providing information to the e-library and newsletter via email. In terms of the typology, they acted as facilitators (at the 5th level), though not formally supported to do so and with limited affordance in terms of platform functionality.

This presents a more diverse picture of the impetus in the community than initially imagined, where previously the acts of hubs were simply aggregated to a “community core”. The case history indicated that many of the (non administrator) hubs acted in a way that was significantly embedded in a local community. They had strong personal interest in resolving or mediating specific local issues and so collectively presented divergent perspectives. Many of the hubs were in fact animators in their local (offline) communities, with significant ability to facilitate or initiate action and significant “social capital” (Coleman, 2000). Outside of the online community, they routinely acted with relatively high agency freedom as I have defined it.

A.1.4 Empowerment at the periphery

The analysis raises the question whether the online space should have more explicitly afforded hubs who were not part of the project team increased agency freedom? Would this have increased both their own capacity to animate sub networks within the community to diverse ends, as well as build stronger network ties for mutual benefit?

The case history reports an initiative that attempted to do exactly this, albeit not entirely enacted on the online platform. The project team had assembled what they referred to as a travelling “film festival in a box” - all the tools required for a local community hub to animate their own film festival. The animator would be given complete freedom to run the event, while the project team provided only background support. Animators would pick locally relevant films from the programme and co-ordinate screenings in their town, with proceeds and publicity targeted towards their local cause. After an initial call for participation in the online forum, news of the initiative spread rapidly and over 20 local festivals were ultimately run, many by hubs of the online discussion space. The initiative reached well beyond the expectations of the project team – it drew on substantial elements of the network that were previously unknown, and had impetus beyond anything they had previously attempted. Significantly, only one administrator hub was involved to support the festivals – the event was driven from what was previously referred to as “the periphery” of the network. The following year, several festival facilitators contacted the project team independently, interested to organize another festival. In contrast, initiatives of similar scope supported mainly by community administrators had limited success. Being part of a centralised project team, administrators were typically remote from the location of governance action, and so had limited understanding of local conditions and few ties with relevant parties outside the online community. They may also have been more strongly associated with the main community animator, a charismatic but not universally liked figure.

The architecture of the travelling film festival points to potential advantages where significant agency freedom and initiative is situated in community hubs, whether activity is offline or online. It also begs a question: How could an initiative such as the film festival have been entirely freed from the impetus of the administrative hubs of the community? The case history indicates that the festival did not run in subsequent years when it was left to the impetus of only community hubs to organize. A review of related communication seems to indicate that the sub-network driving the festival was arranged in a classic hub and spoke network, with an administrator hub at the center. I conclude that the initiative might have run independently had stronger ties been forged between the spokes, represented by community festival animators.

To return to discussion in terms of the online space - how could the platform
pragmatically afford community hubs increased agency freedom? It would almost certainly not be appropriate to simply duplicate the privileges and functionality developed for administrator users – their needs would be very different. The example of the film festival shows exactly how appropriate tools had been provided which made it possible for the festival animators to support their specific task. In economic terms, the “transaction cost” (Cordella, 2006; Shirky, 2008) of arranging a festival had been significantly lowered by the tools provided. At the same time, the event could be aligned strongly with the interests and objectives of the facilitators - people were empowered with respect to “their aims and values” (Zimmerman, 1995). It seemed also that the animators would not benefit from being entirely independent, each in their own mini-network. The community itself aided the festival events in multiple ways – by supplying initiative and creating the economies of scale required to arrange screening rights, for example. Agency freedom is furthermore not purely related to “what one can do”, but to “what one can achieve” by doing (Zimmerman, 1995). Actors are empowered only when their actions have contingency (Grimsley & Meehan, 2007). In the context of the case study, contingency was afforded by the legitimacy that association with a broader initiative conferred to actions, but also the potential audience and the links already latent in the network itself. This presents the combined challenge of affording hubs the maximum agency freedom, while none the less maintaining a relatively cohesive and supporting network.
A.2 Appendix 2: An investigation of online DDG as a socio-technical network

As a trial of the STIN approach, I broadly followed the directions of Kling et al. (2003) to analyse the case community based on my recall of experiences as member of the project team and from research interviews conducted during my MSc. Since I was evaluating an existing system, I followed the approach of Letch et al. (2008) to de-emphasise the design orientated stages of Kling's original formulation. Broadly, making iterative use of the following steps:

1. Develop a list of relevant actors.
2. Consider ways they could be grouped into "roles" and their relationships modelled, e.g. using diagrams.
3. Select a model/approach that most clearly elicits relevant interaction dynamics.
4. Write narrative descriptions, considering aspects from Klings' approach such as resource flows, undesired interactions, existing channels.
5. Consider the implications
   -What information did this elicit?
   -How else may I have modelled the network?
   -What problems did I have to implement the approach?

A.2.1 Actors in the network

The list of actors was relatively straightforward to develop - I created categories based on Kling's (2003) formulation of the elements which might be included in a STIN: people, organisations, data, equipment/tools, policies/guides. The use of these categories helped to develop a more even balance of especially non-human agents in the system. In the case of people, I began the task of role-based grouping early - there were well over 1000 potential actors to consider. People were often members of more than one group - based on their activity in a specific context. Using "roles" to abstract behaviours/interests simplified the resulting network modelling process - it also proved to be a significant interpretative step.

A.2.2 Developing network models

My initial attempts to comprehensively model the network of interactions and relationships graphically soon obfuscated more than it clarified what was occurring. Kling et al. advise to focus on resource dependency (p.54) to elicit relationships. This lead to a model of organisational politics, and the bureaucracy supporting the technology (which Kling highlights as its value), rather than necessarily eliciting relevant user interactions with or through technology.

As with models developed by Kling et al. (2003) and Letch et al.(2008) technology elements occupied relatively few nodes in the network - a model which developed human relationships relatively well, but which perhaps over simplified their interaction with technology for the purpose of a HCI related study. This may however have been a limitation of the graphical representation, or the level of analysis I chose.

Kling does suggest that "graphical representations of STINs may reveal only some of the relevant interactions... to develop or communicate an analysis rather than serve as a complete model." This step was certainly instrumental in understanding the "point of
view" or focus of a network analysis, and an early indicator of the likely relationships that would emerge from further analysis. For my purpose, I chose to develop two "points of view", develop each briefly, and then compare the results. The first, focussing on resource dependencies, was from the point of view of the project manager (Figure 12); the second attempted to model the system from user perspective, focussing on the process of making a post to the discussion forum (Figure 13).

Figure 12 - STIN analysis from project manager's perspective
A.2.3 Narrative descriptions

a.) Background to the case study

I have already described the community platform in the outline of research context in section 3.1, so do not repeat the description used in STIN analysis here. To add a few relevant details: the case project was developed by a group of practitioners and community members in 2002 as a networking and information sharing platform for coastal stakeholders along the North-West coast of South Africa. The participants used a web discussion forum as their primary means of interaction. In 2005 a significant grant from the an international funding agency (hereafter referred to as the donor) established a three year ‘project’ to support and extend the incipient community of practice. The donors were particularly interested in the online community as a pilot of web based information sharing, in the developing world context, which they might transplant as component of a number of their large environmental projects.

The project aimed to:
- expand the content and functionality of the community web portal,
- extend the reach of the project to the West coasts of South Africa, Namibia and Angola,
- implement related distance learning courses,
- run annual networking events
- and establish community "nodes" where facilitators could provide members access to the internet and assistance in using the web portal.

b.) Project point of view

The following discussion refers to diagram 12.

The first cluster of entities (Donors), elaborates on the funding agency. The donors have a number of strategic focus areas which determine the priorities for funding disbursement - in the case of this community, some of the issues concerning participants seemed to match one of the donor funding streams. This did however
introduce a potential conflict of expectation - would the funding priorities bias interaction toward marine issues, at the cost of the broader interests within the community? The funding agency were interested in aligning their support project with an existing intervention framework to be able to transfer best practice (and technology solutions) to other marine conservation projects. These requirements were captured in a “project document” that would guide implementation - a document which was developed without significant input from the case community.

The donors do not physically implement projects, and so delegated all project bureaucracy to an “implementing agency” - who would in turn contract and oversee a "project management unit (PMU)" to practically manage the project, develop technology and interact with the community. The implementing agency in this case had their own internal development priorities and perspectives on the project. Their primary concern however would be that the project runs smoothly - according to activities, targets, budget and schedules set up in the project document.

In the case community, the original “network animator” (a role appropriated from Walker, 2008) was in charge of the PMU, and also director of the organisation that employed the team who were to practically implement the project. The PMU received quarterly funding disbursements from the project grant to implement activities set out by the project document - against which they reported back to the implementing agency. While this arrangement ensured that the project accounted to “donors”, there was no formal process for the online community members to provide input on project priorities. In effect, the PMU were positioned between the wishes of the funding agency, and the interests of an already established ‘community of practice.’ From the perspective of the donors, the pre-existing relationship of the PMU with the online community (as network animators) established legitimacy - they had no interface with the community other than annual reports from the project steering committee, and being able to "lurk" (Nonnecke & Preece, 2002) on the web forum.

This had the direct effect that discussion on the forum served a secondary, unintended purpose - the most accessible first hand evidence that donors had that the developing project was successful. As a result, the moderation of forum messages - which had previously been a mechanism purely to avoid spam and blatant abuse - became a sensitive matter. Users were strongly encouraged to only post “on topic”, and moderators were cautious of emotional language - unless it supported the ethic of the various overseers of the system.

Indirectly the disconnect between the online community and donors meant that both parties had unrealistic expectations - their worlds did not meet. Where there was a topical overlap in agenda, the level of understanding was entirely different - with donors interested in issues at national and policy level, which seemed irrelevant to coastal community members.

A further point to highlight in terms of the diagram - from a project point of view, the interface of participants with project facilities (in particular technology) is relatively poorly developed. Facilities were in large influenced by needs expressed in early stakeholder meetings - and subsequently embedded by the project document and expected as outcomes. A more detailed model of this area may show strong tension between the requirements of the 'project' and the evolving needs of a community.

Finally, the model highlights the role of ‘information intermediary’ - members of the online community who actively spread information and opinions from the DLIST web platform to their community. In some cases this was a formal arrangement - e.g. printed discussions on a message board - while in others a more informal spreading of news. A role which was perhaps underestimated in original project design - without which the discussions on the platform would remain amongst a few hundred registered members.
c.) User point of view

The following discussion refers to diagram 13.

This model focuses on the network of effect on a user contributing to the discussion forum (what Kling et al. (2003) referred to as "technology-in-use"), viewed from their own perspective ("me"). Their message would normally be submitted to the online community, via their web forum. Users are aware that messages are moderated by a project team who they strongly associate with a key network animator. This undoubtedly has an effect on the content and style of contribution - the network animator is a charismatic figure with perceived access to significant resources (influence, knowledge, contacts, funds). Most of the regular participants in the community will have had personal interaction with the network animator - frequently in a context where such resources came into play to their benefit. There is some expectation of reciprocation (indicated by dark arrow) by network animator when a message contribution is made.

From a participant's perspective, the donor world is remote - they may simply know that a significant donation was made to the network animator's organisation to develop the community, without understanding the nature or terms of the relationship. In some cases this lead to a misunderstanding about the availability of funds from the project to support participant's own environmental or community work.

Contributors are aware that their messages are broadcast via email to other members of the community, many of whom they know. They expect some level of reciprocation from fellow community members (again indicated by dark arrow.) However, they cannot know where their message will be forwarded beyond this - or indeed who may read the message months later on the web forum (which is open to visitors). In a number of cases participants expressed fear that their employer (e.g. in the case of government - or mines) would misinterpret, or simply disapprove of something they wrote. Others expressed anxiety at the "unknown" audience - that their opinion would be derided by perceived experts in the network.

A.2.4 Analysis

a.) What new information did each of the two models elicit

The process of modelling STIN networks served as productive lens through which to view interactions - it provided the mechanism to make sense of (and subsequently present) some aspects of human behavior in the system.

Most obviously, the models highlight the difference in "incentives" (Kling, 2003) between donors, implementers and participants - and the central role of the network animator to attempt to find a reasonable compromise. It appears however that developing this compromise did not involve an explicit process - something that may have strongly impacted the development of the community in general, including the agenda for technology development. The diagrams also suggest a mismatch in how the online community is conceptually perceived: For the donors, it is a toolset, a pilot set of protocols and technologies which they might transplant to other projects. From the perspective of the participants, it is a community of practice - people who rally around issues which concern them - albeit facilitated by a web based platform. There is a strong suggestion in this view that the social and technological aspects are not separable - more than simply facilitating dialogue, the web platform represents and coheres the community, it provides a focal point without which the community would dissolve.

As noted by Walker (2008), the process of defining roles highlights functions within the network - e.g. the key role of "information intermediaries" in the case context - and
serves as useful reference for further investigation. Unanticipated relationships may also be made explicit - for example participant expectation of reciprocity from the network animator, in particular in view of their perceived access to resources. This questions to what extent this relationship (or at least expectation) may have motivated interaction within the community. Certainly the technology provided participants with unusual (if indirect) access to a number of influential people.

Subsequent system analysis might have focussed on the interface of the community with the world at large, the relative role of information intermediaries and the extent to which their interactions are technology mediated.

b.) What emerges when we compare the two models

It was instructive to see how significantly different perspectives on the same system developed based on my choice of "filter" - in this case the network view of different role players in the system. This level of interpretive flexibility has both been criticised and applauded (Meyer, 2006). In this instance, models do not claim to represent any "objective" or absolute model of the socio-technical network. Certainly, the two points of view are not contradictory, they simply highlight different aspects/dimensions. I found in particular that the entity "roles" I chose changed as each network diagram/model developed - though some key entities were mutual to the two models. This was perhaps not as much a reflection of fundamental roles of users in the system, as of the kinds of action or relationship that a particular network view elicited. Roles appear to be overlapping, tricky to define absolutely and potentially risky to generalise because they are contextually sensitive.