

Conversations with Non-Human Actors in E-Democracy Evaluation

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Abstract

Software systems that structure conversation (and vice versa), formalise the roles of interactors, process their interactions, and provide other forms of 'support' are the object and subject of design and evaluation in CSCW, and its related fields of research and practice. E-democracy is a relatively recent addition to them, and can be characterised as the use of network technologies to promote collaboration between actors for policy-making purposes, whether acting as citizens, their elected representatives, or on behalf of administrations, parliaments or opposition groups. This paper explores the applicability to e-democracy evaluation of sociological approaches to conversation that have been widely used in CSCW studies to demonstrate how relations between human and non-human actors are constructed in online and offline settings. Two brief examples are given from the evaluation of software in the projects EDEN and AVANTI, under the European Commission's programme of research and development of Information Society Technologies. In both projects ethnographic analysis has had a role in evaluating the risks and benefits of software that mediates conversation between citizens and administrations. These examples are used to argue for the value of 'pragmatist/culturalist' approaches in e-democracy evaluations, which may otherwise lack the richness of CSCW studies of technology usage. Such approaches demonstrate how e-democracy development entails 'politics' in the re-allocation of representational roles from human actors to software ones. Attending to the detail of conversation between actors, human or otherwise, can help to make design and deployment choices more transparent than they would otherwise be.

Introduction: Framing E-democracy as Conversation

CSCW research has for several decades dwelled in the 'great divide' between social and technical perspectives, which the more recent development of e-democracy research sits astride. Many governments are actively experimenting with web applications that are intended to enhance public participation in policy-making. These are often 'vertical' applications of generic tools. For example discussion fora are being widely deployed by local, national and international institutions to consult their constituencies on issues and policy drafts, and by non-governmental organisations to articulate positions and influence agendas (see e.g. OECD, 2003). Yet the impact of these fora on policy-making is far from obvious. The claimed benefits of enhanced deliberation, more transparent policy-making, and wider participation by citizens are difficult to ascertain since e-democracy experiments are frequently marginal and ineffectively linked to existing decision-making practice (Coleman and Goetze, 2001). The 'fit' between e-democracy systems and policy-making practice is thus a critical issue for ensuring the adaptability of e-democracy systems (Westholm, 2003), an issue long addressed in CSCW studies that investigate the fit between working practices and collaborative technologies.

E-democracy framed as 'conversation' thus has a wider scope than the usability or acceptability of discussion fora, embracing other online and offline communications between citizens, their elected representatives, and public administration officers. Many writers on politics and technology are interested in the mediation of that communication by civic (and other) organisations, and by concepts of citizenship, and in characterising their relationships vis-à-vis the state as alliances, partnerships, lobbies, oppositions and so forth. E-democracy research thus cuts across the entire range of concepts and methods used to such ends in organisation science (see e.g. Morgan.). Relatively fewer writers have attended to the messy detail of conversations in and around e-democracy systems, although such studies continue to demonstrate their value in CSCW (Martin et al, 2001).

The lack of such studies in e-democracy is despite the parallels between the development of e-democracy systems and inter/intra-organisational internet/intranet developments. CSCW has tended to focus on the latter, and on the application of social science methods to studies of working practice and system usage that are meant to inform systems design, often for the purposes of requirements analysis or evaluation (e.g. Hughes et al, Crabtree, 2000). The methodological developments have tended to be cast in terms of a distinction between (on the one hand) managerial notions and models of organisational structures, cognitive and business processes, mainstream sociological concerns with developing or applying theoretical concepts of social structure, and (on the other) ethnographic approaches informed by ethnomethodology (e.g. Suchman 1987), interactionist sociology (e.g. Wenger, 1997) and actor-network theory (e.g. Suchman, 2001).

It is mainly the latter, 'pragmatic/culturalist' approaches (Kaghan and Bowker, 2001) that this paper is concerned with, since they attend to the detail of conversation *as* working practice, in order to subject design concepts and prototypes to a 'reality check' that can demonstrate their fit with practice, or otherwise. The paper is based on the premise that this is necessary in e-democracy systems, and moreover that CSCW offers the latter perspectives and technologies of *accountability* (Suchman, 1994), that can both enrich e-democracy systems development and address its frequently expressed aim of enhancing transparency (Whyte and Macintosh, 2001). In the rest of the paper I will briefly outline two examples of 'ethnographically-informed' analysis of conversations in and around e-democracy systems, and implications for their evaluation.

Conversation and technology in EDEN and AVANTI

EDEN (Electronic Democracy European Network) and AVANTI (Added Value Access to New Technologies and services on the Internet) both involve public administrations and technology developers in project consortia¹, funded under the European Union's Information Society Technologies programme. In both projects, which can only be briefly outlined in this short paper, the software products are intended to support and enhance communication between citizens and public administrations. The author is involved in both, in coordinating work on evaluation of the software.

The development and evaluation of prototypes has been informed by participatory design (PD) methods, using scenarios and early prototypes to establish and test requirements with groups of 'target users'. To an extent the projects' aims overlap with PD, being concerned with 'enhancing participation' in decision-making (EDEN) and as citizens in an information society (AVANTI). EDEN is explicitly intended as an e-democracy application, meant to enhance the citizens' voice in deliberations of elected representatives, and officers of the administration and planning professionals who act as its agents. AVANTI on the other hand is conceived as e-government, meant to enhance citizens' capability to use the Internet for online transactions regarding services they would otherwise use in person, through interaction with an officer or intermediary (e.g. a librarian at a public enquiry desk).

Both projects envisage more 'natural' interaction with systems, thus reducing barriers to citizens' participation and addressing administrative concerns. The latter are largely framed in terms of process efficiency and service quality, with citizens as customers of e-government services. In EDEN enhanced access to, navigation, and comprehension of information on urban planning is meant to provide a basis for better-informed (more 'deliberative') contributions by the citizenry to public consultations on city planning.

¹ EDEN involves city administrations in Antwerp, Bologna, Bremen, Vienna and Nisko (Poland), together with software providers Yana Research, Omega Generation, and Public Voice Lab; with support from the University of Bremen's TZI, Bologna's Osvaldo Piacentini Archive. AVANTI comprises city administrations in Edinburgh, Lewisham (UK), Ventspils (Latvia) and Kista (Sweden), with software providers Microsoft and Fujitsu Consulting. Both also include Napier University's International Teledemocracy Centre as partners.

An important expectation in administrative (managerial) thinking is that 'performance measures' should be applied to e-democracy and e-government initiatives². So a focus of the evaluation approach has been to collaborate with the city administrations to develop evaluation criteria and indicators, to assess the prototypes against qualitative data and quantitative 'satisfaction' ratings on agreed usability and acceptability factors.

Both projects have produced software toolkits to structure citizen-administration communications, giving roles to non-human actors that employ NLP (Natural Language Processing) capabilities:-

- In EDEN the non-human actors (software modules) are used *inter-alia* to take messages that citizen-users enter on a web-based mail interface, and 'guess' on the basis of their content which office mailbox they should go to in the city administration.
- In AVANTI on the other hand, NLP is used to automatically produce responses delivered as text and voice by cartoon-like characters or 'avatars'.

A further point in common is that in both projects software systems have been conceived and designed from the perspective that computational linguistics, applied in NLP software, can meaningfully process human texts on the basis of the syntactic and semantic structures their analysis yields. In EDEN's case the texts are enquiries that citizens would ordinarily make by email to public administration officers who handle enquiries, or enter into city website search facilities. AVANTI adds to this the notion that cartoon-like conversational agents can usefully mimic the part (again) played ordinarily by public administration officers who handle enquiries, by producing a response they might ordinarily give. How the projects frame those interactions and how they constitute 'conversation' (or not) is an interesting research question and, as shown in the rest of the paper, an evaluation concern.

The limited ethnographic studies outlined here have informed both the evaluation criteria and the assessment of prototypes against them. Limited by time/resources and the still somewhat marginal role of ethnography in e-democracy development, ethnographic description has been 'quick and dirty'. In EDEN it has been focused on translated interview notes and samples of email exchanges between citizen/users and city council officers. AVANTI has involved analysing video recordings of exchanges between citizen/users and 'avatar' characters, during 'feedback sessions'. Participants are also asked to complete a questionnaire and offer their opinions on the software's suitability for its purpose and use at public access points (in libraries for example).

EDEN's route from citizen to council office

One of the EDEN tools is *Address Guesser*³, one of 7 that when deployed in various combinations are meant to extend the resources and opportunities available to citizens, to make better-informed decisions on whether or not to give their views on city planning decisions to council officials. If that is what they decide, they may do so online in discussion fora that are structured around links to planning proposals and supporting information, *or* via direct contact to the office responsible for the issue they want to raise. The project assumes that having made that choice the resulting communication between citizen and public official can be done *with less effort per citizen* online. The (imminent) evaluation of these tools therefore needs to consider the difference they make to the effort required on the part of citizens and officials. As well as asking them, samples will be taken of online exchanges made using *Address Guesser* web-based mail interface. The evaluation criteria and indicators for this were partly informed by analysis of earlier samples of online email exchanges between citizens and local government officers.

² See for example the Council of Europe's current draft recommendations on *the measurement of impact and cost-effectiveness of e-governance* at http://www.coe.int/t/e/integrated_projects/democracy/02_Activities/01_e-governance/01_e-governance_draft_recs_v2.asp (August 2003)

³ This and other aspects of the EDEN project are discussed in more detail in Whyte and Macintosh (2003), and Westholm (2003).

That analysis is influenced by Conversation Analysis (CA) studies of human-human conversation and its application to exchanges mediated by e-mail, newsgroups and other genres of computer-mediated communication. (e.g. Herring, 1999, Reed and Ashmore, 2000). These are of interest since computational linguists acknowledge that indexical or 'deictic' terms in language presents serious obstacles to Natural Language Processing (NLP) based on semantic or syntactic analysis (e.g. to determine where 'this street' refers to).

In contrast to AVANTI, and although predicated on NLP technology, the EDEN project objectives frame communication between citizens and officers as workflow rather than as conversation. The connotations of the workflow metaphor are that a message begins with 'the citizen' then enters the administration *already as* a question, complaint, request, comment and so on. Currently any citizen unfamiliar with which-office-does-what can use a generic email address, or phone the city councils' call centre to have their call routed 'manually' to an office that may answer their enquiry. As in many large organisations however, messages and voice calls are often forwarded to the 'wrong' office, requiring effort to re-route them appropriately.

Following the project's logic, effort can be minimised by using the electronic flows associated with the *Address Guesser* tool. This will perform a match between the naturally expressed language of an enquirer's message text, and a (manually compiled) corpora of previously received messages that each office has answered, then forward the message to the office(s) that are 'closest' in terms of a syntactic and semantic analysis of both. The *Address Guesser* tool is just entering its pilot phase, and we can infer that certain issues will arise for our evaluation from our participants' comments. However these comments provided little direct evidence of the likely impact of NLP. A general rationale for using ethnography to complementing users' direct involvement in design is that the latter does not illuminate relevant but taken-for-granted aspects of practice (Luff et al, 2000). That is an important consideration here since it is precisely those aspects that NLP can be expected to impact.

The legitimacy of participation in planning consultations is judged partly on residence and partly on identification with interest groups or, rather, on the ability of officers to identify these attributes from the information that is routinely made available at public meetings, in letters or in telephone calls. Also since city councils may have de-centralised responsibilities for enquiry handling to district or neighbourhood offices, the 'competent' office to deal with a particular enquiry may depend on where the enquiry refers to (as well as where the enquirer is). It is relevant therefore to look at how citizens formulate their place and identity in relation to the topic of their email enquiries.

The example below will illustrate what we mean by this:-

Dear Mr. Black,

According to the site of [Cityname Transport] you're the contact person for the city development area in the north of [Cityname]. As future inhabitants of that neighbourhood, we're very interested in the future developments of this area. On the internet page I found some information on the architecture competition for the new destination of the railway site. Could I get some more information on the conditions for participation?

Yours sincerely, Peter White

Dear Mr. White,

The information on the website is out of date. The City Council has decided that an autonomous public organisation [New North Cityname] will organise that project. Up to date information can be received through K. Smith of [Cityname Transport].

Yours sincerely, Paul Black

Dear Ms Smith,

I'm looking for more information on the future destination of the railway site in the north of [Cityname] ([name of neighbourhood]). Could you help me?

Yours sincerely, Peter White

The exchanges above are 3 consecutive e-mail messages, with the addresses removed and anonymised for privacy reasons. On closer examination though we can see that the original question, stated as the final sentence of Citizen White's first message, is not answered by Officer Black's response and is then *reformulated* in White's second message. Black's response is *not* to forward the message on, but to respond directly to White. The response first offers some background information as the grounds for forwarding *the enquirer*, and not to the office that is apparently most closely concerned, since that is an 'autonomous' organisation, but to a person of another organisation that is implicitly more closely associated with the city administration.

The topic of the enquiry is *re-negotiated* in the course of the interaction and at various points is referred to 'indexically', i.e. by reference to a mutually understood context – for example White's "...will organise *that* project". Indexicality is also noticeable in relation to place names (e.g. "As future inhabitants of *that neighbourhood*, we're very interested in the future developments of *this area*"). However place references present our modules with other problems. Place names are frequently used in conversation to do other things than to formulate a location, for example they may formulate an occupation, the name of an organisation (as in the 'City Transport' example above), an activity, or a stage of life (as in 'when I was in High School') (Schegloff, 1973). In our example above the statement "As future inhabitants of that neighbourhood" serves as a partial formulation of the sender's identity, an opening move that we have also found in other examples. In this case it serves to legitimise the enquiry as coming from someone who may properly demand the time of an employee of this City Administration, and specifically one responsible for developments affecting its future inhabitants.

The interaction we have used here is of course only one very brief example, although it was considered 'typical' by members of the administration concerned. Nevertheless it shows that what lends enquiries their continuing status *as* enquiries is a negotiated mutual understanding among collaborating actors and actants about what the message is (a question, a complaint, a comment), what substantive topic from all those that may be identified 'in the text' is the one that needs a response; and which locations the parties to the interaction can legitimately and knowledgeably comment on. A key point stressed by conversation analysts over the last three decades is that the places and topics of mutual concern to interactants are not necessarily formulated 'correctly' in a single opening statement, i.e. to both parties mutual intelligibility given the task at hand. They become relevantly formulated in successive moves through which misunderstandings can be 'repaired'. That is, certain shared-in-common assumptions are used to formulate (for example) location references but, since there are many ways of formulating the 'same' location, the relevant one may require a succession of questions and responses to be seen as mutually recognisable. Crucially, the 'conversational repair' of place references also depends on the mutual recognition of each party's membership of a territorially-based environment of places (streets, neighbourhoods, landmarks). It is this membership that is the basis of the shared-in-common knowledge that in turn allows a relevant formulation to be worked out and then acted upon (Schegloff, *ibid.*)

The practical implications are firstly for the capabilities of the 'Address Guesser' module. Re-focusing on the *flow* of enquiries along their route leads us to the concern that, in the case of wrongly 'guessed' addresses and even in the case of correctly guessed ones, the *reason* for any particular office being provided as the 'correct' place to send an enquiry and have it dealt with competently is not available to either party as a resource for the repair of either place or topic formulations. In other words, the preferred reason for using the 'Address Guesser' is that the sender does not know which particular office to contact. So the basis for initiating a conversation with that particular office may not be stated in such a way that the participants can use it to formulate place references *relevantly*. That is, without putting *more effort* (i.e. further turns) into conversational repair than would be required if the message were routed via a human actor, or the conversation carried out by telephone. This suggests a risk that, rather than decrease the effort associated with repeated forwarding of telephone messages between offices, automatic routing of e-mails may perversely increase it. Two consequent changes to the *Address Guesser* design were to include an address field for enquirers, and to allow citizens to manually select from

'guessed' addresses, before routing their message. To evaluate the effort needed to use the tool, we will seek user views on the difficulty of working out what to say in, and do with, the messages composed using 'guessed' addresses compared with known office addresses, and analysis of the number of turns needed to complete an exchange between citizen and officer.

Conversations with AVANTI as subject and object

AVANTI is also concerned with enquiry-handling, except as previously mentioned the enquiries in this case are 'handled' not by human actors but an avatar or agent meant to provide the citizen/user with information on council services. The point of video-recording exchanges with avatars is that those exchanges are supposed to replicate features of interaction with 'the service', whether that is the city libraries, benefits advice, or a general enquiry handling service. Key questions are 'which features?' and 'how acceptably?', whether in comparison with current web sites that use the more conventional page metaphor, or with human-human conversation. These were open questions for the evaluation, although responses to them can be found in the project's rhetoric and in the literature on 'conversational agents'. In the former, the 'flow' of conversation with an avatar, and the points when it can be interrupted, are *pre-specified* using a 'conversation builder toolkit'. The conversations are one-to-one (rather than multi-party), and controlled by the avatar so that the user follows a sequence of decision-points, in response to which the character displays a range of pre-specified gestures and text 'bubbles' that are also synthesised as robotic speech.

In the above respects AVANTI agents/avatars invoke characteristics described in the 'embodied conversational agent' (ECA) literature. A fundamental claim to the conversational nature of ECAs lies in their modelling of attributes of human-human conversation, and in particular *turn-taking* (Cassell et al, 1999). From the quite different, ethnomethodological perspective of Conversation Analysis (CA) turn-taking is also fundamental to the unfolding organisation of talk. As Reed and Ashmore put it "ordinary talk is not considered by its practitioners to be particularly skilled (presumably because it is so basic, so pervasive, so ordinary); yet CA shows it to be a precision instrument, wielded by maestros. Subtle, nuanced and highly sensitive; yet structured, normative and accountable; it displays 'order at all points', yet is entirely improvised. (Reed and Ashmore, 2000). From ethnomethodological/ CA perspectives, computers may be able to reproduce a simulacrum of conversation, but claims that they can be endowed with human turn-taking capabilities are on a par with similar claims to 'intelligence', attributable to erroneous assumptions about rule-following in human conversation (Button, 1990). Proponents of ECAs attribute to them an ever growing list of human capabilities, including "empathy, personality and a capacity for social relations" (Isbister and Doyle, 2002, p.2) But however believable the mimicry, the use of anthropomorphic animated characters to 'do the talking' has trenchant critics in the HCI community. Schneiderman (1997) for example argues the approach has already proven inferior to direct manipulation interfaces that use environmental metaphors such as desktops and pages.

There are grounds, then, for treating the claims made for ECAs with sufficient caution to doubt that they might replicate the role of a librarian or other council officer whose job is to handle enquiries from the public. While it is not the *aim* of AVANTI to replace them, possible cost-benefits expected from deployment include shifts to 'self-service channels' for citizens to make enquiries. So although AVANTI claims only the sub-set of ECA capabilities identified at the beginning of this section, it is important to subject those claims to scrutiny by observing the flow of 'conversation' between users and avatars in the feedback sessions carried out to evaluate.

A critical criterion for the evaluation, then, is whether or not the target citizen/users were sufficiently able to work out what to do next when using AVANTI, and whether or not they were helped enough when things went wrong. There is little space here to include transcripts of the demonstration sessions. Suffice to say that the criterion was not fully met and, to the contrary, the transcripts showed that the avatar was not 'in control' of the interaction, could not repair breakdowns in users' understanding of

what to do next, and (partly as a consequence), the conversations were multi-party ones involving other citizen/users in the vicinity, and demonstration facilitators who they asked for help. These 'findings' are predictable from a CA perspective. The value of transcribing the interaction was firstly that (in contrast with the facilitators discussion notes) the source of citizen/users troubles could be correctly attributed to the 'conversation' model, and used to improve it.

A (perhaps) surprising result of the evaluation was that, despite the many instances of the avatar failing to respond competently to their requests, those test users who were inexperienced with web site navigation found the tasks set for them less daunting and the error messages less annoying, preferring the avatar to the council web sites that currently provide information to support the same tasks. We could not attribute this specifically to the avatar character – an animated cartoon-like parrot – its synthesized voice, or the linear presentation and suspect each of these contributed.

Moreover it was evident from participant observation and video analysis of the sessions that the council officers facilitating them found system errors easier to manage, in that they could be attributed to the system without further 'technical' explanation. They simply blamed the avatar, jokingly referring to the parrot being dead, going on strike, being stubborn (and so on) rather than offering a more technical explanation. System failures are not desirable, and in most cases the precise cause was not something the facilitators could readily diagnose or explain in terms that could easily be understood by someone unfamiliar with Internet software. However such failures are not unusual for even off-the-shelf software, especially when operating against the unpredictable responsiveness of the Internet. Council staff who provide 'citizen-facing' intermediary roles with computers have to manage and 'repair' situations where a service user needs help with their online task. This appeared to be a more manageable task when helping users with the demonstrator than with the current online service.

An improved ability for human agents to provide a mediated service and/or support at Public Internet Access Points (or remotely) may address one of the major criticisms of conversational agents:-

“A critical issue for designers is the clear placement of responsibility for failures. Agent advocates usually avoid discussing responsibility. Their designs rarely allow for monitoring the agent's performance, and feedback to users about the current user model is often given little attention. However, most human operators recognize and accept their responsibility for the operation of the computer, and therefore designers of financial, medical, or military [systems] ensure that detailed feedback is provided.” (Schneiderman, 1997, pp.6)

I am not suggesting that the AVANTI software or ECA's are inherently more or less able to provide detailed feedback than other interaction modes. On the contrary I am arguing that by setting aside such 'in principle' arguments and examining the detail of what happens in interaction, we can better appreciate how system users (as well as designers) themselves endow avatars with human-like characteristics. It is not news to ECA proponents that users do so- and that they do so routinely with conventional media and technologies (e.g. Nass *et al* 1994). Nor is it news for those who critique ECAs from an actor/network perspective (Suchman, 2001). In the example discussed here, the characteristics are those that ECA proponents would probably not want to model (being stubborn, asleep, going on strike) even though they are human ones. The implication is not that the AVANTI avatar-interface should be rejected as a result of its limited conversational competence (it was not), but that it appeared to complement the conversational work of intermediaries precisely because 'novice' users felt more comfortable apportioning the blame to the computer when things went wrong, and intermediaries better able to cope with the consequences.

Conclusions

The attribution of responsibility is a *political* matter in the sense that artefacts 'have politics', because they "depend upon specific social relations being in place before they can be used, constructed or even thought of" (Bowers, 1992 p.233). It is these politics that come to light through ethnographic description of systems in use. E-democracy design 'has politics' in large measure because it re-allocates *representational* roles from human actors to software ones. In EDEN, Address Guesser re-shapes citizens' choices of how to represent themselves and to what office. If they choose to use it, their representations are acted upon and re-addressed by the non-human actor, with as yet uncertain effects on the ability of human recipients to respond, since it is not clear whether they (the senders') will successfully anticipate what they should relevantly say. In AVANTI a non-human actor responds, again provided the citizen/user can work out what to say in order to produce a relevant response. In contrast to *Address Guesser* the non-human actor's relative lack of conversational ability is made incarnate, visible for its user to account for, and potentially for an intermediary to assist in getting the conversation back on track and/or picking up where it left off. By looking at the detail of that, it appears that our test users and intermediaries found their exchanges more manageable despite the apparent conversational incompetence of the avatar. AVANTI may therefore reconfigure the citizen-to-intermediary relationship rather than acting as an agent for the citizen or the council.

Despite aiming to help citizens who need to find out and impart information about council services both EDEN and AVANTI are premised on the assumption that citizen/users conversations with city council staff are structured prior to their interaction – as knowledge of what they should do through what they say. Ethnographic analysis of exchanges between humans and non-human actants can demonstrate how (as well as that) human actors mutual knowledge of what they are doing is constructed in the act of conversation, and vice versa. This paper has claimed that such analysis can usefully inform the evaluation of e-democracy systems to put the benefits claimed for them to the test, and question the consequences of problems being framed as they are.

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