# From Habermas's communicative theory to practice on the internet

Michael S. H. Heng* & Aldo de Moor[†]

*School of Accounting and Information Systems, University of South Australia, Adelaide, Australia, email: michael.heng@unisa.edu.au, and [†]Department of Information Systems and Management, University of Tilburg, Tilburg, the Netherlands, email: ademoor@kub.nl

**Abstract.** *Communication plays a crucial role in influencing our social life. However, communication has often been distorted by unequal opportunities to initiate and participate in it. Such conditions have been criticized by Habermas who argues for an ideal speech situation, i.e. a situation of democratic communication with equal opportunities for social actors to communicate in an undistorted manner. This ideal situation is partially being realized by the advent of the internet. The paper describes how an internet-based tool for collaborative authoring was conceptualized, developed and then deployed with Habermas's Critical Social Theory as a guiding principle. The internet-based electronic forum, known by its acronym GRASS (Group Report Authoring Support System), is a web tool supporting the production of concise group reports that give their readers an up-to-date and credible overview of the positions of various stakeholders on a particular issue. Together with people and procedures, it is a comprehensive socio-technical information system that can play a role in resolving societal conflicts. A prototype of GRASS has been used by an environmental group as a new way in which to create a more equal exchange and comparison of ideas among various stakeholders in the debate on genetically modified food. With the widespread use of the internet, such a forum has the potential to become an emergent form of communication for widely dispersed social actors to conduct constructive debate and discussion. The barriers to such a mode of communication still remain – in the form of entrenched power structures, and limitations to human rationality and responsibility. However, we believe that the support provided by the comprehensive system of technological functionality as well as procedural checks and balances provided by GRASS may considerably reduce the impact of these obstacles. In this way, the ideal speech situation may be approximated more closely in reality.*

*Keywords:* communication, software tools, authoring, Habermas, the internet, transparency, legitimization, accountability, democratic forum

## INTRODUCTION

The aim of this paper is to explore how the internet may be used as a technological platform to support a kind of 'undistorted' communication as suggested in the theory of communicative action of Habermas. We will illustrate our discussion with the case of an internet-based system known as GRASS (Group Report Authoring Support System), of which the main component consists of a web tool for collaborative report authoring with different stakeholders in a societal debate. Using this tool, positions and arguments on selected research questions can be developed and consensus of participants on issues easily assessed.

We are interested to move beyond a high-level discussion of the value of Habermas's ideas to the information systems discipline to the actual implementation of his ideas of communicative action in a functioning system. The domain chosen is one well suited to open, reflective and discursive conversation (Habermas, 1996), namely the issue of genetically modified food. In the process, we wish to discover the extent to which we can build a Habermasian information system on the internet, and we also hope to study the nature of governance of an internet-based authoring forum.

Our work continues the efforts of a number of information systems scholars in applying the theory of Habermas. A very influential paper by Hirschheim & Klein (1989) draws on Habermas and sociological insights from others to map out four paradigms of information systems development. Similar high-level theoretical contributions come from Lyytinen & Klein (1985) and Lyytinen & Hirschheim (1988) who value Habermas's theory as a solid conceptual foundation of information systems. At a more practical level, Ngwenyama & Lee (1997) use the theory to study the notion of communication richness of software by analysing emails in their actual context of use.

This paper draws heavily on Habermasian thought to design and implement internet-based information systems that support improved societal communication. Thus, this can be seen as an information systems exercise that contributes to the validation of Habermasian theory. Previous works relating various communicative acts to information systems design and use are: Winograd & Flores's (1986) research in combining phenomenology and speech acts theory in computer systems design, Winograd's (1987) work on mapping Austin's and Searle's speech acts theoretically and with the communicator email tool, and Blair's (1984; 1990) work on semiotic text analysis. Looking at the needs of end users from a communication perspective, Winograd (1995) argues for providing robust support for communication between developers and end users, and suggests a shift from programming environments to design environments. Our work is different from theirs in that we are using a communicative theory to construct an electronic forum on the web with a particular context of use, societal conflict mediation, a social and technological environment that is as near as possible to what Habermas perhaps could hope for. In a sense, it is a more democratic, modern-day implementation of the Science Court model developed in the 1970s, which was aimed at the resolution of policy controversies involving expert disagreements (Aakhus, 1999).

GRASS is basically a system which supports the broad notion of argumentation or discourse in a social context. The basic model of argumentation systems is issue-based infor-

mation systems (IBIS). IBIS helps its users to identify questions and develop the scope of positions in response to them, and assists in creating discussions (Kunz & Rittel, 1970). IBIS support stakeholders in their conversations about complex or 'wicked' problems, by structuring the creation and handling of 'issue nets' (Conklin & Begeman, 1988). Issue nets have three main types of nodes: issues, positions and arguments. Many refinements of nodes and the types of links between them are conceivable. A good example of a web-based tool that closely follows the IBIS paradigm is HyperNews (http://www.hypernews.org/HyperNews/get/hypernews.html).

There are two main problems with many IBIS tools, including HyperNews. First, they allow discussions to diverge, but have no support for discussion convergence. There are no stopping rules, or ways to wrap up discussions and have them feed back into a higher-level document structure. Second, these tools generally do not incorporate workflow models tailored to the specific social context of use, which makes it hard to produce useful results. One example of a tool that aims to do this, in its case for the objective of scientific collaboration, is the Scientific Collaboration System (Kim *et al*., 1993). Other, more generic systems focused on providing facilities for mediating planning conflicts and authoring structured documents are Zeno and the Digital Document Discourse Environment, D3E respectively (Gordon *et al*., 1996; Shum & Selvin, 2000).

GRASS, however, is unique in the sense that its document structure and focused discussions are seen as situated in a social context, and are implementing a particular set of discourse norms, which are similar to Habermas's. Building these communication norms into the design is essential for such complex discourse systems to work (Aakhus, 1999). In other context models of argumentation, the parties involved submit their positions, interests, assumptions and value orientations to some kind of test, e.g. within the legal framework of rights as it has been constitutionally enacted, elaborated and interpreted. Archetypical context models of argumentation are parliamentary debates and lawyer arguments in court. A main feature is to win the debate or to score a point. The main characteristic of GRASS, however, is the facilitation of communicative action. Its facilities, including role division and organizational procedures, are tailored to its particular context of use, as defined by its main objective of facilitating structured societal discourse mediation.

In the next section of this paper, we give a brief account of Habermas's idea of knowledge and human interests, and of communicative action. In the rest of the paper, we discuss some implications of these ideas for the design of information systems that can initiate and support such communication. We examine how the internet possesses features that render some central aspects of a Habermasian communication not so utopian, while acknowledging that realistic systems design must take into account some practical challenges. The potential of the internet is being moderated by the existing structure of power and ownership of the data-communication infrastructure, as well as our limited capacity to live up to the Habermasian model. However, is there a way of maximizing the potential while coping with the difficulties? One domain in which this question can be examined is online societal discourse mediation. The extent to which these ideas can be realized in an internet-based information system (as, for instance, embodied in GRASS) is

explored. We outline the system's structure and functionality and present some initial user experiences. In the last two sections, we discuss the GRASS system from a Habermasian point of view and discuss some limitations of internet-based authoring forums. We also examine what we have learned from the exercise and give a tentative view of how to continue in the future.

## HABERMAS'S THEORY OF COMMUNICATIVE ACTION

Open communication is a cornerstone of the democratic ideal. Two assumptions are often made. The first holds that, if a variety of ideas are given equal opportunity to compete continuously and publicly, the ideas best suited for society will win out in the long run. This presupposes that dependable and relevant information will be inexpensively made available to all those interested. The second assumption is that a successful outcome of the debate requires that a majority of the general public be reasonably public spirited and patient, and is not unduly confused and alienated by an excess of information and communication.

Habermas (1984) even goes one step further by framing the importance of communication in the context of human survival as a species. 'If we assume that the human species maintains itself through the socially coordinated activities of its members and that this coordination has to be established through communication – and in certain spheres through communication aimed at reaching agreement – then the reproduction of the species also requires satisfying the conditions of a rationality that is inherent in communication action' (Habermas, 1984, p. 397). Habermas argues for a set of rationalities to support a kind of undistorted communication which is essentially a democratic system of exchange. Such a mode of communication provides a flat playing field for the social actors to apply speech acts in an undistorted manner. In other words, all participants in the social discourse enjoy an equal opportunity to initiate and sustain communication. The whole communicative exercise is transparent. Here the desirable features centre on the strength of good, well-grounded argument provided in an open forum, rather than authority, tradition, ideology, power or prejudices.

Habermas's view certainly appears idealistic if we are reminded by the reality of social life. Social experiences provide us with ample examples where the rich and powerful enjoy more than their fair share of control over information resources and communication channels, and that public debate is not always steered by reasons (see, e.g. Herman & Chomsky, 1988). However, the advent of the internet provides its users with a platform to conduct potentially open discussion, debate and exchange of information, which gives equal opportunity to the participants, and is free from constraints of power relations. It is a kind of communication infrastructure that approaches the requirements of a Habermasian communication, at least potentially. Still, we must be conscious of the unpleasant fact-of-life that some may abuse the internet to incite hatred, to disrupt smooth discussion or to sabotage it. Events in cyberspace often reflect features of the off-line world. In designing internet-based communication systems, we should take those practices into account when facilitating a group discussion committed to uncover the facts, to reach consensus and to attain understanding.

There are many well-known, comprehensive accounts of Habermas's ideas of communicative action which are directly relevant for this study, e.g. McCarthy (1978), Lyytinen & Hirschheim (1988), Alvesson & Willmott (1992) and Ngwenyama & Lee (1997). We will therefore restrict ourselves to only the essential points that we need to present our story. In his *Theory of Communicative Action*, Habermas (1984, 1987) describes two archetypes of social action, namely purposive-rational action and communicative action. Purposive-rational action in the narrow sense is often known as instrumental action. It refers to action or systems of action that are governed mainly by rational decision-making and instrumentally efficient implementation of technical knowledge. Its orientation is towards decisive control over rational and social processes. An example of this is the rationalization of administration through the use of empirical knowledge based on research in the behavioural sciences. Purposive-rational action in the broad sense includes what is known as strategic action in Habermasian literature. It refers to action that takes account of the behaviour of others and is thereby determined by expectations as to the behaviour of external objects and of other persons; it makes use of these expectations as conditions or means for the rational, successful oriented pursuit of the agent's own rationally considered ends.

In contrast to purposive-rational actions, communicative action is motivated by the wish to understand the other side in a communication. Interaction takes place on the basis of an already achieved common notion of the situation. It assumes a sort of background consensus consisting of four validity claims raised by the communication partners: that the speaker's utterances are *comprehensible*, that the contents of their proposition are *true*, and the claims that the speaker is *truthful* or sincere in uttering them, and that it is *appropriate* for him to be doing so. Where agreement between actors about a shared background can no longer be taken for granted, the actors undertake to examine and clarify various assumptions concerning the communication background, and to test their validity. Such action is oriented towards the co-operative search for truth, the clarification of unclear message content, the analysis of the intended use of the messages, etc. It is initiated to establish the validity claims as well as to discover and weigh up the arguments proposed for or against a message, in terms of its validity claims. By means of systemic self-reflection, Habermas hopes to lower the barrier to meaningful and genuine social relations. This is consistent with a belief expressed by him earlier that the ideal of a speech conversation is not closure but an infinite horizon of possibilities to seek truth and achieve understanding (Habermas, 1979).

Communicative action requires that all actors abide by certain ground rules which allow the actors a chance to express their opinions, and honour only the force of the better and more rational arguments. For all interested participants, there is a symmetrical distribution of chances to choose and apply speech acts. Such a situation is considered as an ideal speech situation, which enables communicative rationality and is in turn pervaded by it (Alvesson & Deetz, 1996). Here the desirable features centre on the strength of good, well-grounded argument provided in an open forum, rather than authority, tradition, ideology, exclusion of participants, power, rules of experts, fear, insecurity, misunderstanding or prejudices.

Abiding by certain ground rules implies that communicative freedom is *not* absolute. Communicative action involves obligation, and communicative freedom is not a license to sow dis-

cord or to incite communal hatred. Referring to Gunther (1992), Habermas (1996) understands communicative freedom as the possibility of responding to the utterances of one's counterpart and to the concomitantly raised validity claims. 'Communicative freedom exists only between actors, who, adopting a performative attitude, want to reach an understanding with one another about something and expects one another to take positions on reciprocally raised validity claims. The fact that communicative freedom depends on an intersubjective relationship explains why this freedom is coupled with illocutionary obligations' (Habermas, 1996, p. 119). In the next section, we show how the internet can be used as an instrument of communicative action, while simultaneously recognizing that there are many hurdles to be overcome in practical information systems design.

## USING THE INTERNET TO SUPPORT HABERMASIAN COMMUNICATION: PROMISES AND PITFALLS

The internet has considerable potential as a facilitator of communicative action. However, great care must be taken that the design of actual applications is realistic. In next subsection, we show how it can provide a technological infrastructure for communicative empowerment of social actors, an important focus in Habermas's work. We then qualify this empowerment by listing some limitations of the real world in achieving this ideal. We go on to outline one important communications domain of implementation and analysis: societal discourse mediation. We list some key design principles for communication in this domain. In the final subsection, we introduce the GRASS project.

### Communicative action: the potential of the internet

The internet is a unique blending of military strategy, big science corporation and counter-cultural innovation (Hafner & Markoff, 1991). The roles of the American Defense Department and National Science Foundation in initiating and subsidizing the ARPANET, and later the ARPA-INTERNET, are pretty well known and they need no repeating here. The second aspect of the story, that of counter-culture, is less well known. Parallel to the efforts of the Pentagon and the Big Science, 'a sprawling computer counterculture emerged in the United States, often mentally associated with the after shocks of the 1960s movements, in their most libertarian/utopian version' (Castells, 1996, p. 351). In such culture, major technological breakthroughs emerged, e.g. email, the modem and the Bulletin Board Systems, and, much later, the World Wide Web. The acceptance of standard in the internet is essentially a bottom-up process, through trial-and-error and popular acceptance (Kahn, 1994). This grassroots culture is a key feature of the evolution and use of the Net. The counter-culture may be forgotten with the passage of time and the increasing commercialization of the Net, but the social codes have continued to frame its development and utilization. This is illustrated by the increasing popularity of open source code software, which blends the traditional internet values of sharing and bottom-up development with restricted forms of commercial interests (Berkman Center for Internet & Society, 1999).

As a technology, the internet has opened new pastures of opportunity for those who are not in the seats of established power and wealth to reach out to a global public. It helps resolve the problems arising from hierarchical and spatially separated positions, thereby promoting a new form of information storage, dissemination and active exchange. It can contribute to discourses which would otherwise be difficult, if not impossible, because of communication costs, time–space separation, emotional inhibition, etc. In other words, it lowers the financial and technical barriers for social activists with a personal computer with communications accessories to reach out to a bigger public. The cyberspace of the internet is cosmopolitan in scale and in a very real sense it transcends the direct regulative control of any particular state. It is a technology made for a world where fragmentation creates a space for weaker voices marginalized by institutionalization, centralization and concentration (Clegg & Hardy, 1996, p. 8). The PCs, the laptops, the internet and the fax machines have created a once unthinkable network for them to co-ordinate strategies, to share resources and experiences. This possibility has been noticed by the research literature and media indicating that the internet offers an opportunity to strengthen political participation and horizontal communication among individual citizens. But not only individuals benefit. We also find a process of empowerment for grassroots groups, who can operate and collaborate more efficiently using the internet as an instrument of information retrieval, communication and organization (Castells, 1997). 'It appears that it is in the realm of symbolic politics, and in the development of issue-oriented mobilization by groups and individuals outside the mainstream political system that the new electronic communication may have the most dramatic effects' (Castells, 1997, p. 352). Thus, the internet has become a medium for international, established organizations, such as Greenpeace and Amnesty International. However, it has also become a medium within which the more loosely organized diaspora of exiles and political activists can find a community and a voice. A rather vivid illustration of how the internet can be used as channel to voice the protest of many is provided by the Free Burma Coalition (see quote below). In fact, since the 1990s, a number of non-governmental organizations have begun to make effective use of information technology (IT) networks to co-ordinate their strategies and campaigns, linking developing countries and the industrialized world for voicing their concerns on issues of human rights, the environment, etc. The Association for Progressive Communication was founded to co-ordinate global networks working for protection and preservation of the environment; it already had member networks in 16 countries a few years ago and provides access to over 20 000 activists and organizations in 133 countries (Madon, 1997). It is partly because of this possibility of reaching out to a world public by anyone – individual, organization or large network – with access to the internet that is causing concerns to authoritarian governments.

When spiders unite, they can tie down a lion. (*The Economist*, 10 August 1996)

The line that you just read is the motto used by the Free Burma Coalition to adorn their fax messages. The group is a movement dedicated to the downfall of the military junta. It has effectively exploited the potential of the World Wide Web and the internet for its campaign, and its aphorism of the strength of the spider web is beautifully appropriate. It offers the movement a cheap and immediate way of communication and, partly as a result of that, a sense of solidarity.

The movement has an electronic news service named BurmaNet, providing up-to-date news to its 700 subscribers. Campaign information is also easily accessible at its web site. Partly with the help of the internet, it has successfully persuaded several transnational corporations to stop doing business in Burma.

## Communicative action: the constraints of the real world

Although recognizing that the internet provides new avenues of opportunity for those not in power or wealth to voice protest, we must not lose sight of the fact that real powers are still strongly entrenched. This view is necessary to balance the tendency towards a rather euphoric view about the possibility of the micropolitics of power with the advent of the internet. This is illustrated by the reliance of the internet on the telecommunications infrastructure still in the control of giant telecommunications concerns. The established powers that be still can legislate laws to deny access to certain sites, which is a very real issue in countries run by authoritarian governments. Moreover, the opportunity to directly participate in an internet-based forum would be denied to those who have no access to a computer linked to the internet. Also, increasingly strong governmental and commercial pressures lead to communication restrictions built into the internet software itself (Lessig, 1999). All these represent a serious barrier to fully realize the potential of the internet to support an electronic form of Habermasian communication.

Another serious problem is related to human weaknesses – our inability to act responsibly, ethically and rationally. It is reflected in the use of the internet in the service of pornography, racism, sectarianism and violence (Castells, 1996; 1997). Habermas's theory of communicative action, like his other contribution to social critical theory, has been criticized for its over-emphasis on the possibility of rationality and value of consensus, and for putting too much weight on the clarity and rationality potential of language and human interaction (Thompson & Held, 1982; Burrell, 1994; Alvesson & Deetz, 1996). To some extent it relies on a model of the individual as potentially autonomous and clear-headed, and who is interested and committed enough in community affairs as to participate actively in communicative action. Vattimo (1992) criticizes his theory for its benign and benevolent view of the humankind which counts on knowledge and argumentation to change thought and action.

The third point is related to the nature of interactive and instantaneous communication in political discourse. Internet conferences have been often referred to as electronic town-hall meetings. Such term borrows the use of town-hall meetings in American past political practice. It has the merits of direct, two-way communication as opposed to the one-way communication associated with newspapers, radio and TV. However, not all political commentators are persuaded by such merits. For example, Schlesinger (1997) says that interactivity encourages instant responses, discourages second thoughts, and offers outlets for demagoguery, egomania, insult and hate. In too interactive a polity, a common passion could sweep through a people and lead to emotional and ill-judged actions. The internet has done little thus far to foster the reasoned exchanges that refine and enlarge the public views (Schlesinger, 1997, p. 7). This is a strong statement which needs to be qualified. For example, many internet news-

groups, mailing lists, etc. carry numerous spirited debates that do lead to new insights and productive collaboration instead of just generating (much publicized) flame wars (Rheingold, 1993).

To summarize, in the Habermasian scheme of social life, there should be no obstruction to an equal communicative exchange between social actors. In the technological sense, the infrastructure provided by the internet and related networks helps to meet this requirement. However, to create truly effective electronic fora for societal discourse, it is not sufficient to merely provide access to information tools. Well-balanced systems of appropriate technologies, combined with organizational rules and procedures, are needed. The systems need to satisfy the social norms of the network of users, and must be embedded in a wider societal context for communication to be successful (De Moor & Kleef, 2001). To compare theory and practice, it is not sufficient to talk about communication processes in general. Different communication domains, resulting in specific design requirements and implementations, must be analysed. One such domain is that of societal discourse mediation. We outline some key design principles that can be used in the construction of communications fora in this domain.

## Key design principles

Complex societal problems, such as those related to sustainable development, involve many issues and stakeholders. Sometimes, serious conflicts occur, requiring sophisticated conflict resolution processes. In some of these cases, democratic governments have launched initiatives, such as expert panels and regional consultation processes, to achieve consensus on what should be done (e.g. Scientific Panel for Sustainable Forest Practices in Clayoquot Sound, 1994–95). However, these efforts are often expensive, slow, and involve only a small number of stakeholders. Mediators of societal discourse, such as the traditional printed press and other mass media, have the advantage that they are fast and reach a wide audience, but on the other hand are also often selective and biased in their reporting (Herman & Chomsky, 1988; Keane, 1991).

A serious drawback of these traditional kinds of societal discourse mediation is that they are neither neutral nor transparent (De Moor & Weigand, 1996). *Neutrality* does not mean that individual opinions are to be free of bias, they cannot be. Instead, the discourse procedures, and thus the supporting technologies, should ensure that equal weight is given to all opinions, while not forcing participants into accepting false consensus. *Transparency* of the discourse process allows participants and third parties to see not only the end results of discussions, but also how these outcomes came to be. It has been said that public discourse, instead of conflicting parties *having* an argument, should be turned into stakeholders *making* an argument (Tannen, 1998). Here we go beyond the notion of winning an argument by certain individuals or groups to the notion of a collaborative effort to advance understanding by a community who share the same interest in a given issue. In other words, it is a kind of discourse that goes beyond 'contested interests and values to engage the participants in a process of self-understanding by which they become reflectively aware of the deeper consonances in a common form of life' (Habermas, 1996, p. 165).

Habermas's theory of discourse ethics contains general rules for practical discourse leading to an ideal speech situation. These rules guarantee discursive equality, freedom and fair play by not excluding anybody from participating, and by allowing them to challenge anything they deem important, while ensuring that nobody is prevented from exercising these rights.

However, an important question is how to translate these ideals into actual conversation support for the real world (Chambers, 1996). Two points may be noted here; the first refers to the technology itself, the second to the socio-technical design principles with which the technology is put to effective use.

We readily admit here an observation made many times elsewhere, that a majority of people in poor countries still have no access to telephones, let alone the internet. Accepting this unpleasant fact, the internet still provides the most democratic IT infrastructure we currently have for a near-Habermasian sort of discourse with a worldwide reach. Many developments are on the way to provide widespread access to the internet also to the economically less advantaged, tailored to their technical limitations (Madon, 1997; COMMSPHERE, 2000). The internet and its associated technology thus provide us with the developmental tools for building an even playing field for an open forum. As we have seen, the internet offers considerable *potential* to actively involve widely dispersed stakeholders in prolonged discourse processes. This offers the best chance of approximating the ideal speech situation.

However, instead of a flat structure or free for all chat room type of construction, we propose some form of structure to organize the discussion. One way to organize societal conflict mediation discourse is by producing group reports to assess consensus on sensitive issues, such as environmental problems (De Moor & Weigand, 1996).

As alluded to earlier, there are some social realities, which influence our design. A certain abuse of the internet to spread hatred, etc. is a fact. Furthermore, there is a danger of online communities being commercialized, thereby preventing the spaces for community formation from being truly open, diverse, participatory and democratic (Werry, 1999). Therefore, adequate organizational and technological safeguards need to be established to ensure that the group reports produced by these virtual communities are dialogic texts, which, contrary to more traditional collaborative texts, reflect the involvement of multiple authorial voices (Harrison & Stephen, 1992). Participants of the discussion will have not only rights, but also *responsibilities*, a point that even classics champions of libertarianism, such as John S. Mill (Mill 1859) and Isaiah Berlin (Berlin 1997), would not disagree with. This dualistic relationship of freedom and responsibility is reflected throughout our design. A key example is given by our treatment of the difficult chairperson role of discourse being assumed by an editor. At first sight, the editor may act like 'some are more equal' of George Orwell's *Animal Farm.* However, having a chairperson to facilitate a discussion does not in itself render the discussion undemocratic, restrictive and non-Habermasian. Power exercised in a proper manner does not conflict in any way with open and rational discussion aimed at seeking the truth. 'Civil society is expected to absorb and neutralize the unequal distribution of social positions and the power differentials resulting from them, so that social power comes into play only insofar as it facilitates the exer-

cise of civic autonomy and does not restrict it' (Habermas, 1996, p. 175). In more concrete terms, we formulate the following as our guiding key design principles for communications for group report authoring:

**1** to provide an open forum to all interested persons and groups who have access to the internet;

**2** to facilitate the discourse. This duty is assumed by the editor(s) who can be any combination of the authors;

**3** to discourage the editor(s) from developing the position into a power base or structure, the role of the facilitator should not be monopolized nor permanent;

**4** to produce a neutral and transparent document to report all the undistorted views of all the participants of the discussion;

**5** to provide some mechanism of ensuring and for the participants to take on responsibility; and

**6** to seek understanding and where possible true consensus rather than contrived conclusions.

These principles are worked out in more detail in the following sections. Note that we do not claim that this is the ultimate list of Habermas-inspired design principles. Grounded in his theory, it should be refined in future work. The importance, however, of this checklist is that it links communicative theory and practice.

## Background and objectives of the GRASS project

In 1993, the Global Research Network on Sustainable Development (GRNSD) was formed (please see http://infolab.kub.nl/grnsd). One of its goals, as laid down in its Charter, was 'to develop new and creative approaches to increase the quality of research and communication processes related to sustainable development'. Although the network is no longer operational, it spawned a number of groups which have been quite active until recently.

One of these groups is the British Columbia Forests and Forestry Group (BCFOR). In this group, Canadian and international members, representing a wide spectrum from timber industry consultants to environmentalists, discussed issues related to forests and forestry in the Canadian Pacific province of British Columbia. Initially, only a mailing list discussion was conducted. However, it was decided after an intense email discussion that the group should produce more tangible outputs: *group reports* in which forestry policies could be critically analysed in a systematic way. After some relatively unsuccessful attempts, it turned out that mailing list functionality was not sufficient, and that, besides technological aspects, complex social factors (related to the authoring process) also needed to be taken into account. To deal with these issues, the GRASS project was conceived.

The purpose of the GRASS project is to develop an arena for credible societal discourse. Its aim is to produce concise group reports that give their readers an up-to-date and credible overview of the positions of various stakeholders on a particular issue. As such, these reports may play an important role in catalysing societal conflict resolution.

GRASS is to provide a comprehensive socio-technical system, consisting of a balanced mix of people, tools and procedures. Admittedly, this feature does not qualify it to be called Habermasian. A central point here is that the system design follows closely the principles and spirit of a Habermasian discourse for people interested in seeking understanding, although compliance can of course never be completely guaranteed. Still, one should strive to incorporate the principles and spirit within the constraints of social reality. Aspects of such social reality are that some people may abuse the system while some others may intend on sabotaging a meaningful discussion. These are features quite obvious in the cyberspace and off-line world. In Habermas's view, people are expected to communicate in a rational way, i.e. defend validity claims in discourse, etc. One problem with public web tools is that users can be anonymous and do not need to make a commitment to participate in conversations in a serious way. Therefore, the *technical 'barrier' of* disallowing anonymity and requiring effort of logging in, as GRASS does, results in *removing* rather *introducing* barriers of rational communication. Furthermore, the roles of the editor, like the role of a chairperson of meeting, are just to *facilitate* the discussion, not to *dominate* it. For example, one editorial responsibility is to activate authors to formulate their positions, etc. Another function is to summarize introductions and conclusions and continue revising these draft report elements until *all authors* agree on the formulation. Other checks and balances to promote autonomy and emancipation are that every author can become an editor and one editor role can be played by more than one (opposing) stakeholder.

A group report should be a neutral document in the sense of showing all the, undistorted, views of its authors and its creation processes should be transparent to the reader, so that the way in which claims came to be can be easily analysed. Such a report represents the various opinions of all participating stakeholders on a specific issue in a structured way. The report consists of parts about which true consensus has been reached, and parts containing opinions about issues of conflict, on which the authors have not yet reached agreement. Key to establishing what Habermas calls true consensus, instead of settling for forced compromise, is that all authors should see their views reflected in the final report, which is the objective of GRASS.

In the next section, we outline the group report authoring process supported by the GRASS system, its functionality and some initial user experiences.

## THE GRASS SYSTEM: CONSENSUS WITHOUT COMPROMISE

In this section, we present the ideas behind and functionality of GRASS in more detail; we outline our view on the group report authoring process, present the structure of the GRASS group reports and describe the functionality of the system. The last subsection lists some initial user experiences with the system in action.

### The group report authoring process

In the first, pre-GRASS, email only mediated BCFOR group report authoring project, a topic was indeed successfully selected by the group as a whole. After this, the authoring process

was to take place. This we call the *isolated group report authoring process* (Figure 1), as the focus was on the authoring process itself, not on the social context in which it was embedded.

However, the actual authoring process never got started. One of the reasons for the writing process to fail might have been that it was unclear exactly what role the group report was to play in *overall societal discourse*. Furthermore, there was no key beneficiary who could *motivate* others to participate. Thus, what we call both *external* and *internal motivators* for actively participating in the authoring process were lacking.

An alternative authoring process model, taking into account these issues, is the following. A *proponent* is interested in having a question answered and proposes that a report be written to investigate it. An example of such a proponent is an environmental group that claims that current forestry policies are unsustainable, or a timber company that wants to argue that its logging practices have become sustainable. The proponent selects the topic and provides the background material for the report. The group of report authors, including the important category of *opponents* who have an interest in refuting the claims of the proponent, criticizes and extends the material in line with the community neutrality/transparency guidelines. Only after the group has approved the final version of the report can it be disseminated and used externally, e.g. in public media discourse. This in turn may create an incentive for societal stakeholders to initiate and participate in new report authoring processes (see Figure 2).

This is what we call the *situated group report authoring process* model, as adopted in GRASS. By better defining and embedding the primary authoring process in a social context of other stakeholders and links to other fora and media of public discourse, both the credibility
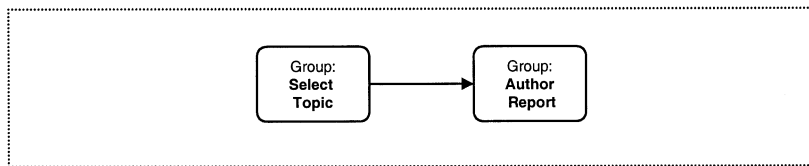


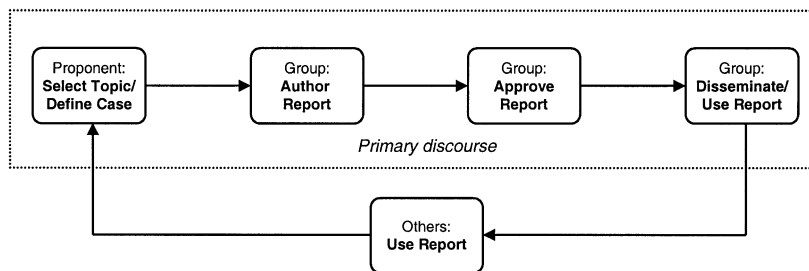**Figure 1.** The isolated group report authoring process.



**Figure 2.** The situated group report authoring process.

of the results, and the motivation for different categories of participants is likely to increase (De Moor & Kleef, 2001). In the GRASS project, for each of these four stages a combination of human roles, organizational procedures and technical features has been defined. Space is lacking to describe these combinations for all subprocesses here. We therefore focus on illustrating our approach to stage 2, the actual report authoring process.

## The structure of the group report

Each GRASS group report is subdivided into three main parts: (1) the problem description; (2) the sections; and (3) the report conclusion.

The *problem description* part contains an *introduction* of the problem domain, the *central issue* that is the focus of the report, and a list of one or more *key questions* that are to be answered in the respective *sections* (one section per question).

The *sections* thus form the body of the report, in which the actual discussion takes place. Each *section* comprises an *section introduction*, the *key question* to be examined as well as a number of *positions* that authors can take. For each position, *arguments* pro and contra can be entered. An argument can also be linked to other arguments, thus forming an *argument tree*. A section is ended by the *section conclusion*, in which the various positions to the key question are summarized.

Each report is ended by a *report conclusion*, which summarizes the answers to the various key questions, and indicates areas for future research.

## GRASS functionality

Given that the group report authoring process is sufficiently embedded in a wider social context, the problem of co-ordination and performance of authoring tasks remains. In the BCFOR case, these were very hard to support with just the primitive mailing list functionality then available. For GRASS, a prototype web server was therefore developed, accessible through any standard web browser (please see http://infolab.kub.nl/grnsd/grass/). Through this tool, users can either read current reports or participate in the authoring process themselves.

In order to coauthor a report, a user has to register. Several editor roles have been defined. Each editor role can be filled by one or more authors, thus preventing undesired power structures from developing. An overall *report editor* is responsible for editing the *problem description* and *report conclusion* parts, as well as for adding new sections. A *section editor* is responsible for editing the *section introduction* and *conclusion*. *Authors* can add new *positions* and also indicate the degree to which they support or reject each of these positions and add *arguments* pro or contra positions and other arguments. Positions taken can be modified continuously, reflecting the change of opinions held (Figure 3). Arguments, once made, cannot be changed, to prevent loss of discussion structure. An important feature of the GRASS tool is that it stores all report elements in a database, which can be used to generate group reports in different formats. For example, a list of the issues everybody agrees on (i.e. the positions are not rejected by any author) or issues of dissent (i.e. at least one author rejects it) can be produced simply.
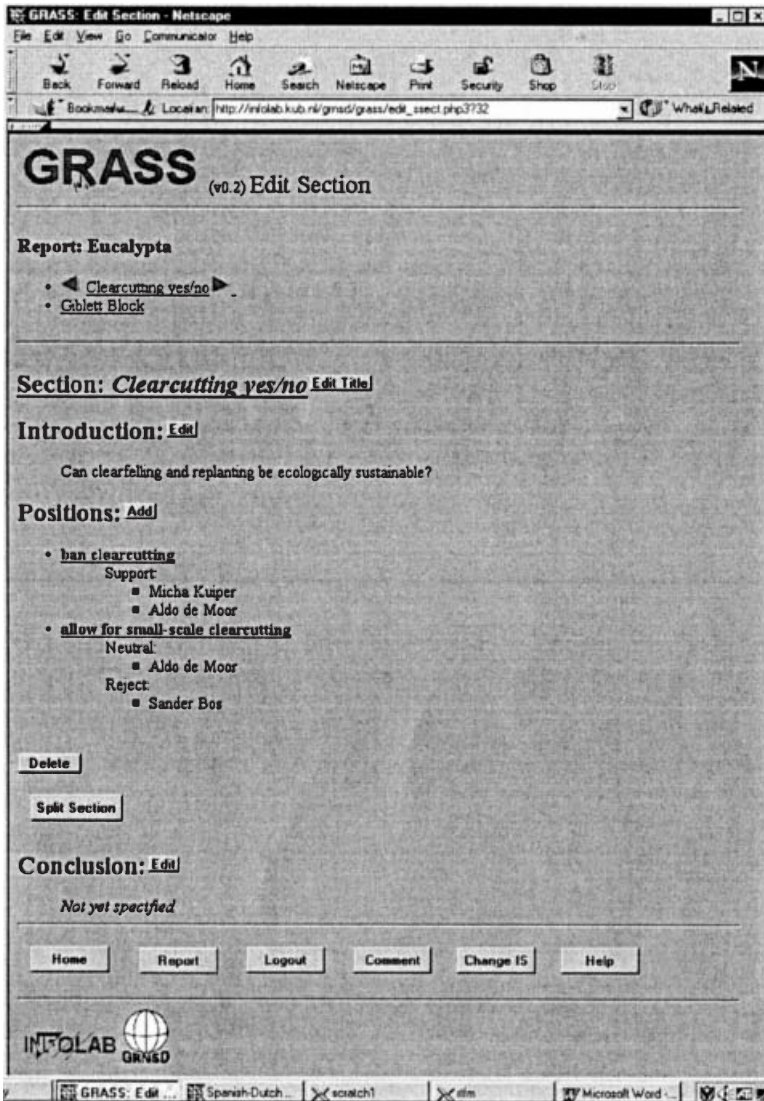
**Figure 3.** Editing sections with GRASS.

Another option would be to make a summary of all positions adopted and arguments made by different stakeholders (e.g. the positions taken by the representatives of environmental organizations vs. those of corporations).

The tool facilitates participation in the process by notifying authors of changes in the report at intervals of their choosing (i.e. every change, daily, weekly). Furthermore, those authors or

readers who do not have access to web technology, but, for instance, only have an email account, can be sent report parts and changes in text format.

### Some initial experiences in using the system

A prototype version of the GRASS web server has been completed, and part of its functionality implemented. It is possible now to read reports and register as an author and as a report or section editor. As far as writing reports is concerned, one can add and edit (sub)sections, add, edit and select positions, and add argumentation to a certain position. Still to be implemented is the role enforcement functionality, which ensures that one can only access the functionality permitted by the roles one plays. The report generation facilities are still primitive in that only one report summary format can be generated. However, in the near future, reports in different formats tailored to the specific needs of report authors or readers should be implemented.

This initial version of the tool has been tested by a small group of non-technical users, and a number of test reports on environmental issues have been created. Entering the various report elements turns out to be feasible, but not trivial. One reported problem is in the lack of awareness as to exactly where an author is located in the report. To resolve this problem, an overview of the complete report structure was added on top of each section editing page, with the current (sub)section highlighted. Once descended into the position and argumentation editing page, a similar overview of the argumentation tree belonging to that position is given. Another reported difficulty is the lack of procedural knowledge. Because report authoring is a complex process, comprising many subprocesses and participants in various roles, users often do not exactly know what kind of input is expected at what moment. Therefore, a set of tutorials is being written that should make the expected actions more easy to understand. In a future version of the tool, users can see the possible actions permitted by the specific authoring roles they play in a separate window. In this way, lost users can be guided in their writing process, making it more effective and efficient.

JMA, a Dutch environmental organization, used GRASS to write a series of reports with various stakeholders, in which the societal implications of the adoption of genetically modified foods were assessed. This 'Talk2000' project particularly focused on high school students. Because the prototype web server was not fully operational yet, and considered to be relatively complex to use for the intended user group, part of the GRASS functionality was implemented in a generic text authoring and annotation tool, FreeText, while the editing functionality was performed manually by the facilitators. However, report structure and procedures were exactly the same as in the web server version.

User surveys were held during and at the end of the project. In general, the usage experiences were relatively positive. A set of reports was indeed written in which the theme of genetically modified foods was explored. Strong points were that the process was considered to be fair and constructive, and that discussions were more focused on answering the questions, instead of diverging like, for instance, many newsgroup discussions. Problematic issues were still considered to be that the authoring process is labour intensive, the interface was still rather primitive, and that conceptually it is sometimes difficult to see to where report elements belong

in the report (e.g. to which position an argument applies, whether something is an argument node or itself a position, etc.). Also, it is not always clear what one is supposed to do at a particular moment in time.

Overall, the message is that report authoring is viable, but needs considerably more development of the information technology used, and the procedures that define authoring responsibilities. Especially helpful would be to have more workflow support built into the tool, for instance, by automatic role enforcement and more advanced use of notifications ('you are now asked to indicate your support for position #23').

## DISCUSSION

To discuss the relevance of GRASS as an operationalization of communicative theory, we first discuss its Habermasian qualities. We then dwell on some limitations of GRASS.

### GRASS and Habermas

GRASS endorses the ideals of Habermasian communication and its design is strongly guided by them. Neutrality and transparency are important Habermas-inspired design principles in the tool, aimed at getting closer towards the ideal speech situation (De Moor & Weigand, 1996). The *neutrality* of the authoring process is supported first of all by allowing each interested user to register as an author. A problematic issue is the authoring roles, such as report editor and section editors. Such roles are needed, because responsibilities need to be clearly assigned for essential writing tasks. On the other hand, there may be the worry that the neutral nature of, for instance, report conclusion is violated if only one person (playing the report editor role) is able to manipulate this text. Therefore, three rules have been defined. First, any author is permitted to play the various editing roles. If more than one person plays a particular role, they have to agree on any change made in the report element they are responsible for. This means, for instance, that the editors of a particular section conclusion must indicate whether the conclusion was accepted unanimously by all authors or to what extent there were dissenting opinions. Second, any problem related to the report authoring process can always be discussed in a public electronic forum, to which every author has access. In GRASS, this forum consists of an electronic mailing list, to which every author is subscribed and has – unmoderated – access. Third, common report elements, such as report and section introduction and conclusions, after having been drafted by their responsible editors, need to be agreed upon by every author.

The *transparency* of the authoring process is guaranteed by offering simple web functionality, accessible to all authors and readers. Via email notifications of report element changes, and by technologically ensuring that no unauthorized changes can be made in the report elements, the authoring process can be easily monitored.

Habermas stresses the importance of multiple, overlapping conversations. Consensual will formation is not the product of a single conversation, but an accumulation of effects of many, interrelated conversations over time (Chambers, 1996). GRASS supports this process of cre-

ating expanding yet focused webs of conversations, by lowering the barriers for people to initiate and participate in report authoring projects dealing with contemporary societal issues, while at the same time increasing the credibility and value of these discussions by conducting them in a more systematic way. Multiple reports can be initiated and linked on related topics.

Respectful conversations with a commitment to seek understanding and truth present the participants with the opportunity to appreciate the strength and weaknesses of various positions. In the spirit of Mill (1859), a participant 'must be able to hear [opposite arguments] from persons who actually believe them, who defend them in earnest and do their utmost for them. He must know them in their most plausible and persuasive form; he must feel the full force of the difficulty which the true view of the subject has to encounter and dispose, else he will never really possess himself of the portion of truth which meets and removes that difficulty' (p. 36). Such an exchange of views challenges beliefs which may draw on habits or powerful institutions, or more subtle forms, such as prejudices, superstitions, envy and self-interest. The goal of such dialogue is thus to reach for a deeper level of understanding and to build consensus which has a better guarantee of commitment. By forcing authors as coeditors to jointly write section and report introductions and conclusions that must be acceptable to all, and by allowing positions of dissent not to be suppressed but to be an integral part of the report, such understanding and commitment is promoted.

## Some limitations of GRASS

We expect to learn more about the limitations of GRASS in the course of its operation. At this stage, there are the following limitations.

It was pointed out to us that the GRASS system seems to be more appropriate for an intranet environment rather than the internet. If it was to be deployed in the internet and supposedly attracted a large number of participants, then a potential problem that is likely to arise is the overloading of information. Agreed, it would generally be easier to use the system in a controlled intranet environment. For example, when demonstrating the method to several Dutch members of parliament, one indicated that it could be useful in preparing his party's position before plenary parliamentary debate. In defence of its internet use, however, we wish to say that the main *raison d'etre* of GRASS is to attract a large number of participants, and to connect to other, more traditional forms of media discourse. First, the GRASS discourse (primary discourse) is to be a catalyst of societal discourse (secondary discourse), e.g. in the media, by civic groups, concerned citizens, etc. 'Lurking' is an important feature, recognized in the 'reader' role. By having many people who represent different stakeholders monitor the discussion, several functions are realized: (1) the authors have an audience and will be more motivated to be actively involved; and (2) readers can monitor the quality of the claims and arguments made and interfere by informing authors of incorrect statements or by notifying parties involved in the secondary discourse, such as the press. The number of readers is in principle unlimited. Second, GRASS is supposed not to be used only once, but to be a continuous forum. Multiple reports can be written on focused but related issues. Third, the structure of the reports is focused much more on opinion assessment than definition. Thus, an author can

already contribute by just taking a position, possibly defined by another author. Also, report elements, such as introductions and conclusions, need to be concise. Reports are organized top-down, so that potentially large argument threads are at the leaves of the report structure tree, and can be viewed optionally. This leaves the concise upper branches (introductions, questions, positions, conclusions) intact. Thus, a large number of authors does not necessarily lead to overload, provided that the socio-technical system is well designed.

Another, more important limitation is essentially human and may be the most serious obstacle to implementing GRASS type systems on a broader scale: incentives and motivation. One of the three anonymous reviewers of two earlier versions of this paper put it so well that perhaps we can be forgiven for quoting the remark in full.

> Authoring is time consuming – as this review process shows. Most competent people are busy with their careers, families, and social life. So, what are the chances that a representative sample of *rhetorically competent and subject knowledgeable* stakeholder spokespersons will make the effort to actively participate in or just keep up as lurkers with the GRASS process? This is not fun, but serious work that requires professionals. Experts are paid for their reports. It is expert opinions in a broad sense, i.e. people with real experience or theoretical knowledge plus good rhetorical writing skills that are needed to contribute. In the case of ecology, one can maybe count on sufficient numbers of competent idealists – but who will be willing to author on health or tax legislation, when those people whose stakes are most affected can get their points heard more effectively through legislative lobbying? Maybe I am missing something, but I suspect if authoring is left to self-selection, the discussion on GRASS will degenerate into uninformed tirades and boring chats. Therefore, the issue is how to motivate the most competent people to participate in the GRASS process and screen out low quality contributions.

The problem is inherently human in character and there is a limit to what technical solutions can do. However, it need not be used by overworked idealists only. First, within limited, intranet contexts, people could be motivated professionally to participate. Used on the internet, it could also be another medium for professional organizations to promote their goals. An oil company, for instance, could publicly defend in this neutral and transparent forum that its measures to deal with the effects of an oil spill had been really effective.

One more limitation is that we are not able to provide an environment where the participants can systematically experience the four validity claims of a Habermasian discourse. Knowing more explicitly what kinds of claims are being contested may help in more efficient dispute resolution. This point provides a useful pointer for the subsequent version. Future work can also learn from the theory of argumentation of Toulmin (1958), whose model is based on three principal elements: claims, evidence and warrants. The usefulness of Toulmin's idea in providing a logical structure of arguments in information systems design has been pointed out by Klein & Hirschheim (2001). Using more sophisticated evidence-centred argumentation models, such as Toulmin's, may also help in clarifying and structuring arguments, helping to let them more quickly converge on the problems at hand. The primary focus of GRASS development so far has been on integrating argumentation in a pragmatic, social context. Still, integrating

improved argumentation models may contribute to more successful report collaboration in the future.

## CONCLUDING REMARKS

Information systems researchers have used the theory of communicative action of Habermas to do theoretical studies of information systems development (e.g. Lyytinen & Hirschheim, 1988) and to conduct hermeneutic studies of email exchanges (e.g. Ngwenyama & Lee, 1997). Here we are using Habermas's ideas as inspiration to design and build an internet-based electronic forum supporting a form of public discourse aimed at societal conflict mediation. The internet provides a technological environment to build a cyberspace venue with a very low financial and technical threshold for people to potentially conduct undistorted conversation.

The GRASS system is a software tool plus procedures supporting the production of group reports that give their participants an up-to-date and structured overview of the positions of various stakeholders on a particular issue, helping them to establish true consensus. The only requirement to participate in it is the observance of a set of rules intended to serve the Habermasian form of discourse. To ensure that these rules are actually observed, a number of organizational, procedural and technological checks and balances have been built in. The prototype version of the system has been tested by a small group of users, and a number of test reports on environmental issues have been created (an environmental organization used it to discuss the impacts of genetic technology). These are exactly the category of participants engaged in a process of self-understanding (Habermas, 1996). Initial user experiences were quite positive in principle, the main hurdles reported being technological and procedural, rather than social. In future work, we would like to improve functionality, layout and documentation. More fundamentally, issues of more effective discourse models and incentives for participants need to be addressed. Checking validity claims, more extensive authoring role definition, and sophisticated argumentation models need to be integrated in the system for it to become more effective. To this purpose, the social context of the system in use also needs to be carefully examined, requiring more systematic empirical validation of collaborative performance.

By further developing the system, we hope to gradually increase its usefulness and impact. Such an incremental way of developing is essential for complex discourse systems to become successful (Shum & Selvin, 2000). We intend to follow closely the activities and projects supported by the system to gain more insights into the extent we can achieve Habermasian communications with the help of the internet, and in what ways such activities can contribute to theory building in undistorted communication. By operationalizing and testing Habermas's ideas in this way, his ideals may be turned into reality.

## ACKNOWLEDGEMENTS

## REFERENCES

Aakhus, M. (1999) A case study in designing discourse to manage policy controversy, knowledge, technology & policy. *Science Court*, **12**, 20–37.

Alvesson, M. & Deetz, S. (1996) Critical theory and post-modernism approaches to organizational studies. In: *Handbook of Organization Studies*, Clegg, S. *et al.* (eds), pp. 191–217. Sage, London.

Alvesson, M. & Willmott, H. (1992) *Critical Management Studies*. Sage, London.

Berkman Center for Internet & Society (1999) The power of openness – why citizens, education, government and business should care about the coming revolution in open source code software. Technical report, http://www.opencode.org/H20

Berlin, I. (1997) *The Proper Study of Mankind – An Anthology of Essays*, Hardy, H. & Hausheer, R. (eds). Chatto and Windus, London.

Blair, D.C. (1984) The data-document distinction in information retrieval. *Computer Practices*, **27**, 369–374.

Blair, D. (1990) *Language and Representation in Information Retrieval*. Elsevier Science Publishers, Amsterdam.

Burrell, G. (1994) Modernism, postmodernism and organizational analysis 4: the contribution of Jurgens Habermas. *Organization Studies*, **15**, 1–19.

Castells, M. (1996) *The Rise of the Network Society*. Blackwell, Oxford.

Castells, M. (1997) *The Power of Identity*. Blackwell, Oxford.

Chambers, S. (1996) *Reasonable Democracy – Jurgen Habermas and the Politics of Discourse*. Cornell University Press, Ithaca, NY.

Clegg, S.R. & Hardy, C. (1996) Organizations: organization and organizing. In: *Handbook of Organization Studies*, Clegg, S. *et al.* (eds), pp. 1–28. Sage, London.

COMMSPHERE (2000) International Millennium Conference on Affordable Telecom and IT Solutions for Developing Countries, Madras, India, 28 February–2 March 2000, http://www.tenet.res.in/commsphere/

Conklin, J. & Begeman, M. (1988) IBIS: a hypertext tool for exploratory policy discussion. *ACM Transaction on Office Information Systems*, **6**, 303–331.

Gordon, T.F., Karacapilidis, N. & Voss, H. (1996) Zeno, a mediation system for spatial planning. *Proceedings of the of the ERCIM Workshop on CSCW and the Web, Sankt Augustin, Germany, February 7–9, 1996.*

Gunther, K. (1992) Die Freiheit der Stellungnahme als politisches Grundrecht. In: *Ptheoretische Grundlagen der Rechtspolitik, Archiv Fur Rechts-und Sozialphilosophie, Beiheft 54*, Koller, J. et al. (eds).

Habermas, J. (1979) *Communication and the Evolution of Society*. Heinemann, London.

Habermas, J. (1984) *Theory of Communicative Action 1*. Beacon Press, Boston, MA.

Habermas, J. (1987) *Theory of Communicative Action 2*. Beacon Press, Boston, MA.

Habermas, J. (1996) *Between Facts and Norms*. Polity Press, Oxford.

Hafner, K. & Markoff, J. (1991) *Cyberpunk, Outlaws and Hackers in the Computer Frontier*. Touchstone, New York.

Harrison, T. & Stephen, T. (1992) On-line disciplines: computer-mediated scholarship in the Humanities and the social sciences. *Computers and the Humanities*, **26**, 181–193.

Herman, E. & Chomsky, N. (1988) *Manufacturing Consent – The Political Economy of the Mass Media*. Pantheon Books, New York.

Hirschheim, R. & Klein, H.K. (1989) Four paradigms of information systems development. *Communications of the ACM*, **32**, 1199–1216.

Kahn, R.E. (1994) The role of government in the evolution of the Internet. *Communications of the ACM*, **37**, 15–19.

Keane, J. (1991) *The Media and Democracy*. Polity Press, Cambridge, UK.

Kim, W., Suh, Y. & Whinston, A. (1993) An IBIS and object-oriented approach to scientific research data management. *Systems Software*, **23**, 183–197.

Kleine, H.K. & Hirschheim, R. (2001) Choosing between competing design ideals in information systems development. *Information Systems Frontier*, **3**, 75–90.

Kunz, W. & Rittel, H. (1970) *Issues as Elements of Information Systems*. Technical Report 131, Institute of Urban and Regional Development, University of California.

Lessig, L. (1999) *Code and Other Laws of Cyberspace*. Basic Books, New York.

Lyytinen, K. & Hirschheim, R. (1988) Information systems as rational discourse: an application of Habermas' theory of communicative action. *Scandinavian Journal of Management*, **4**, 19–30.

Lyytinen, K. & Klein, H.K. (1985) The critical theory of Jurgen Habermas as a basis for a theory of information systems. In: *Research Methods in Information Systems*, Mumford, E., Hirschheim, R., Fitzgerald, G. & Wood-Harper, T. (eds), pp. 219–236. North Holland, New York.

Madon, S. (1997) The Internet: an opportunity for developing countries? *Information Technology in Developing Countries*, IFIP 9.4 Newsletter 7.

McCarthy, T. (1978) *The Critical Theory of Jurgen Habermas*. MIT Press, Boston, MA.

Mill, J.S. (1859) *On Liberty*. (Reprinted 1947.) Appleton-Century-Crofts, New York.

de Moor, A. & Kleef, R. (2001) Authoring tools for effective societal discourse. *Proceedings of the of the 15th International Informatics for Environmental Protection Symposium. Sustainability in the Information Society, October 10–12 2001, Zurich*, pp. 751–756.

de Moor, A. & Weigand, H. (1996) The role of social constraints in the design of research network information systems. *Proceedings of the Eco-Informa Conference, 4–7 November 1996, Lake Buena Vista, Florida*.

Ngwenyama, O.K. & Lee, A.S. (1997) Communication richness in electronic mail: critical social theory and the contextuality of meaning. *MIS Quarterly*, **21**, 145–167.

Rheingold, H. (1993) *The Virtual Community. Homesteading on the Electronic Frontier*. HarperPerennial, New York.

Schlesinger, A. Jr (1997) Has democracy a future? *Foreign Affairs*, **September/December**, 2–12.

Scientific Panel for Sustainable Forest Practices in Clayoquot Sound (1994–95) *1994–5 Report Series*. Cortex Consultants Inc, Victoria, Canada.

Shum, S.B. & Selvin, A.M. (2000) Structuring discourse for collective interpretation. *Proceedings of the Collective Practices 2000 Conference on Collective Cognition and Memory Practices, Paris*. 19–20 September 2000.

Tannen, D. (1998) *The Argument Culture: Changing the Way We Argue and Debate*. Virago Press, London.

Thompson, J.B. & Held, D. (eds) (1982) *Habermas: Critical Debates*. MacMillan, London.

Toulmin, S. (1958) *The Uses of Argument.* Cambridge University Press, Cambridge.

Vattimo, G. (1992) *The Transparent Society*. John Hopkins University Press, Baltimore, MD.

Werry, C. (1999) Imagined electronic community – representations of virtual community in contemporary business discourse. First Monday 4, 1–20 (http://www.firstmonday.dk/issues/issue4-9/werry/index.html/).

Winograd, T. (1987) A language/action perspective on the design of cooperative work human. *Computer Interaction*, **3**, 3–30.

Winograd, T. (1995) From programming environment to environments for design. *Communication of the ACM*, **38**, 6.

Winograd, T. & Flores, F. (1986) *Understanding Computers and Cognition.* Ablex Publishing, Norwood, NJ.

## Biographies

**Michael S. H. Heng** is an Associate Professor of Information Systems and Assistant Director of the IS Doctoral School at the University of South Australia. His current research interests include globalization, information systems strategy, e-business, information systems development and open source software. He is an Associate Editor of the *Journal of Electronic Commerce Research*, and Co-program Chair of Pacific Asia Conference on Information Systems 2003.

**Aldo de Moor** is an Assistant Professor at the Department of Information Systems and Management at Tilburg University. He holds a PhD in Information Management from this university and has been a Visiting Researcher at, among other institutions, the University of Guelph, Canada, and the University of Technology, Sydney. His research interests include the evolution of virtual communities, communicative action theories, user participation in systems development, normative system specification methods, and the impact of information and communication technologies on society. Projects in which he has participated include the development of an electronic journal, a business negotiation support system, and various virtual community and network development projects.