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On Extending Social Informatics from a Rich Legacy of Networks and Conceptual Resources

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Abstract

Rob Kling, his research interests, and his advocacy were at the center of a movement in analytical inquiry and empirical research now known as 'social informatics'. His unexpected death in May, 2003 was a loss. Despite our loss, those of us who engage in social informatics research are finding unity by strengthening and furthering the conceptual perspective, analytical approaches, and intellectual contributions of social informatics. The vibrant and growing international community of active social informatics scholars is contributing to a social informatics resource kit that includes:

- perspective lenses through which research data can be viewed critically,
- techniques for building theory and developing models from socially rich empirical data,
- a common body of knowledge regarding the uses and effects of ICTs.

Here we identify opportunities to engage new scholars in social informatics discussions, and suggest new venues for promoting and extending the work of scholars already enrolled in the social informatics movement.

On Extending Social Informatics from a Rich Legacy of Networks and Conceptual Resources

Introduction

Rob Kling, his research interests, and his advocacy were at the center of a movement in analytical inquiry and empirical research that he called 'social informatics'. The movement he fostered has grown to encompass a widening and interdisciplinary interest in research that carefully examines the ways in which information and communications technologies (ICTs) are bound up in everyday social and organizational structures. His unexpected death in May, 2003 was, for us, both a personal and professional loss. Moving beyond the personal loss is difficult. Like others who engage in social informatics research, we can, however, find some unity in strengthening and furthering the conceptual perspective, analytical approaches, and intellectual contributions of social informatics.

Social informatics is emerging as a trans-discipline that draws researchers who focus on the inter-relationships among people, their institutional and cultural contexts, and their uses of ICTs. Social informatics research is informed by theories of social behavior, engages the situated nature of information and communications technologies' uses and builds on detailed analyses of empirical research. This is a vibrant intellectual space characterized by an active and growing community of social informatics scholars.

Here we highlight some of their current research directions. And, we outline how this growing body of work provides a basis for developing analytic techniques and conceptual tools -- a social informatics resource kit -- that includes:

- perspective lenses through which research data can be critically viewed,
- techniques for building theory and developing models from socially rich empirical data,
- common body of knowledge regarding the uses and effects of information and communications technologies.

We conclude by identifying opportunities to engage new scholars in social informatics discussions, and by suggesting new venues for promoting and extending the work of scholars already enrolled in the social informatics movement.

Social informatics as a trans-discipline

Kling (1999, p. 1) notes that: "A serviceable working conception of 'social informatics' is that it identifies a body of research that examines the social aspects of computerization. A more formal definition is the interdisciplinary study of the design, uses and consequences of information technologies that takes into account their interaction with institutional and cultural contexts."

Seen this way, social informatics is a body of rigorous empirical research that focuses on the relationships among people, information and communications technologies', and the social structures of their development and use. Social informatics studies engage a broad range of

information and communications technologies -- from large, formal, organizational information systems such as medical records systems to everyday, informal, often highly-personalized devices such as mobile phones and personal digital assistants. In these studies, information and communications technologies are seen as embedded within a larger social milieu that infuses meaning and purpose into their shaping and uses. For social informatics researchers, this embeddedness means that information and communications technologies and people can only be fully examined through socio-technical perspectives that *transition* understanding between social and technical dimensions within an overarching theoretical view. This social informatics view is still emerging from an operational approach that Rob Kling developed incrementally as he extended his personal and professional networks.

Rob's operational approach

In some ways, social informatics is the legacy of Rob's career-long quest to focus attention on the social aspects of computerization. It is also the *process* of establishing and maintaining that focus. As Rob negotiated with, cajoled, and even coerced colleagues, students and casual acquaintances to bring their insights to bear on the information-and-communications-technologies-related issues of the day, he connected a network of talented associates who helped him think about those issues in multiple ways.

As Horton et al. (this issue) point out, one of the first groups that Rob sought to engage was the European community of socio-technical studies researchers (cf. Mumford, 1995.) Their work provided a basis for cogent arguments about the critical nature of social understandings of technical enterprise, that he could incorporate into his efforts to illuminate the US computer science community, as well as the business community, about the effects of their systems development efforts. Within his local academic circle at University of California, Irvine, he quickly tapped into an interdisciplinary research team studying the adoption of computers in US city government organizations (Dutton et al., 1993; Dutton, 1999; Kraemer et al., 1987.)

These studies provided a well-spring of empirical data examples, from which he drew regularly, to ground his assertions about "better" computing and to guide the expansion of a social informatics view. Just as important, these collaborators helped him to shape his views on the social aspects of computerization, to engage in counter-arguments, and to train his attention on the basic elements of what we now call social informatics.

One elemental insight that social informatics research makes clear is that technological determinism is conceptually flawed and empirically unsupportable. Rob was continually incensed by the (perceived) failure of leaders in the computing world to take him and his research seriously – seriously enough, that is, to change their thinking and their approach to information and communications technologies' systems development and implementation. As Rob noted: "The analytical failure of technological determinism is one of the interesting and durable findings from social informatics research" (Kling, 1999.) This seemingly paradoxical persistence of technological determinism drove Rob to read widely in their disciplines (e.g. management, communication, the social sciences, history, political science) so he could better understand their ways of thinking and theorizing, and to seek to alter those approaches in ways that would make room for more nuanced and useful socio-technical understandings. When a

pundit, like Mitchell (1995) or Negroponte (1995), would come out with a new computing-rich vision of the future that glossed over the messy social aspects of its realization, that would send Rob on a tear through the literature, a "power-up" and extension of his professional networks, and the rapid compilation of an insightful article that brought a sense of socio-technical realism into the discussion (e.g. Kling and Lamb, 1998.)

Rob's works found their way into a wide array of journals, but reading widely is easier than publishing widely, and he encountered frustrations while trying to get his message out to "needy" audiences. His remedy: to reach out to colleagues in literary disciplines, like Dick Lanham, who could help him write more effectively, and to develop new areas of research that examined journal publication and library acquisition processes (Lanham, 1999; Kling and Covi, 1995). In this way he engaged a wider network of people – social informatics sympathizers – with whom he shared many of the concepts that have become central to the social informatics tradition.

A legacy network of social informaticians and sympathizers

Evidence of Rob's operational approach is best represented by the sprawling network of social informatics researchers and their connections to other researchers and policy makers in related fields who find value in social informatics approaches to computing. As Castells (1996) and others have noted, however, a network is characterized by the nodes which are omitted as well as those it includes. Rob did a lot to energize connections, but his approach could also put people off. In this way, his network and his approach constitute a legacy that can be both extended and re-shaped.

Rob was able to synthesize complex understandings of computerization contexts into cogent explanations of ICT adoption, implementation and use. However, contributions to social informatics come not primarily from Rob, but from the larger community which his synthesizing and networking have brought together. Considered altogether, the findings, perspectives and techniques of this diverse community comprise a social informatics resource kit that can equip researchers and guide intellectual explorers whose interests cross the social computing domain.

A Social Informatics Resource Kit

Thanks to the hard work of many researchers whom Rob has rounded up and harnessed to his quest over the years – some who may not even realize they have been set to this task – social informatics researchers have a set of resources which we liken to an explorer's kit for carefully examining and mapping a new domain. Metaphors and analogies have their limitations, but this one can help us see the value of multiple *perspectives* (as powerful telescopic and microscopic lenses) – each of which is better for some purposes than others. Some are multi-purpose lenses, like the socio-technical perspective; while other lenses, like critical perspectives, can bring into sharp focus parts of the landscape that may shape the trajectory of an upcoming journey.

The resource kit also contains direction finders and distance gauges (i.e. methods, *techniques* and approaches) that can help researchers plot a path through the dense underbrush of computing contexts. In addition, the kit includes a common basis of knowledge. This knowledge often

shows up as ‘rediscovered’ *findings* from prior studies -- findings that help to anchor understandings of uses, values and shaping forces surrounding uses of old and emergent information and communications technologies .

Synthesizing related research

During a workshop that Rob organized in Fall, 1997, participants began to characterize their own work and the works that they agreed were examples of "social informatics research" into three basic orientations: normative, analytical, and critical.

The *normative orientation* refers to research whose aim is to recommend alternatives for professionals who design, implement, use or make policy about information and communications technologies . This type of research has an explicit goal of influencing practice by providing empirical evidence illustrating the varied outcomes that occur as people work with information and communications technologies in a wide range of organizational and social contexts. For example, much of the participatory design research focuses on identifying the nuanced ways in which users come to understand and adapt their work with information systems. (See Horton et al., in this issue for further discussion.)

Some notable examples of normative social informatics research studies have raised awareness and provided alternative approaches to computing across a range of disciplines. Lynne Markus's work on IT power relationships (Markus, 1983; Markus and Bjorn-Anderson, 1987), as well as Kling and Covi's (1995) work on the design of electronic journals, have posed important challenges to designers and integrators. Notions of social access, developed through long-term field studies, such as the HomeNet project (Kiesler et al. 1997), have guided thoughtful approaches to social affordances in the design of human interfaces (Grudin, 1990.) Research about the internal structures of collaborative networks has led to better understandings of how to plan systems that effectively support people's work and communication (Star and Ruhleder 1996.)

The *analytical orientation* of social informatics research refers to studies that develop theories about ICTs in institutional and cultural contexts or to empirical studies that are organized to contribute to such theorizing. This type of research seeks to contribute to a deeper understanding of how the evolution of information and communications technologies' uses in a particular setting can be generalized to other systems and other settings. One example is Kling's (1980) depiction of various perspectives on ICT use in organizations. Other foundational works include early analyses of web models of ICT implementation (Kling and Scacchi, 1982), as well as more recent conceptualizations of the social actors who shape information and communications technologies in-use (Lamb and Kling, 2003.)

Normative social informatics often provide guidance for further research – particularly when contradictory evidence defies traditional rationalist explanation (Robey, 1997), or when individualistic theories must account for differences of scale, such as the critical mass effects of networked computing or communications technologies (Markus, 1990). There is a substantial body of literature that reflects this orientation (e.g., Eschenfelder (2003); Allen (2004); and Bockowski (2004). In each of these three recent articles, the authors develop a normative

analyses but study different ICT, focus on different levels of analysis, and draw on different theoretical bases.

The *critical orientation* of social informatics research refers to examining information and communications technologies from perspectives that do not automatically and "uncritically" adopt the goals and beliefs of the groups that commission, design, or implement specific ICTs. The critical orientation is possibly the most novel (Agre & Schuler, 1997). It encourages information professionals and researchers to examine information and communications technologies from multiple perspectives, such as those of the various people who use them, as well as people who design, implement or maintain them. The critical orientation also advocates examination of possible "failure modes" and service losses.

Some early critical works have greatly influenced subsequent normative, analytical and critical social informatics studies. Paul Attewell's (1987, 1991) examination of the role of computing-based systems in deskilling office work posed important questions about the motivations and agendas into which ICTs have been enrolled. Kling and Iacono's (1989) detailed descriptions of the institutional aspects of work in organizational settings, and the ways in which uses of information and communications technologies become routinized in operational environments, have showcased the value of alternative perspectives in ICT analyses. Critical approaches provide insights that go beyond normative managerial concepts of how these computing technologies can be better designed. Mansell (this issue) describes how a critical approach can challenge fundamental assumptions about how the process of technological innovation in information and communications technologies is being structured, by whom and for whom is it being negotiated, and with what consequences.

A critical perspective on information and communications technologies is not unique to social informatics. For example, medical information systems researchers in particular (e.g. Kaplan, 2001) have struggled with these issues, and have benefited from critical analyses. And, critical perspectives into ubiquitous and pervasive computing are being used to frame studies of the take up and use of these forms of ICT (Sawyer, Allen and Lee, 2003). As we note below, a social informatics is not just critical, it could be analytic or normative. For us, a critical approach to social informatics demands the work be situated (contextual), empirical, and reflect social actor principles.

Several researchers' writings combine their use of normative, analytical and critical lenses to develop an understanding that spans these basic orientations. Lynne Markus, as noted above, has taken on multiple perspectives and orientations to examine the distribution of power in information systems deployment. Rob Kling and his students (both formal and informal) have gravitated toward multi-purpose socio-technical perspectives for a comprehensive yet finely detailed understanding of information and communications technologies' contexts that can illuminate all three orientations (e.g. Sawyer and Eschenfelder, 2002).

Socio-technical perspectives

Social informaticians who adopt socio-technical perspectives generally conceptualize context in terms of interdependent and multi-level networks of socio-technical links (e.g., Castells, 1991;

MacKenzie & Wajcman, 1999). As Strum and Latour (1988) emphasize, these links are not merely social, since people use technologies such as ICTs to construct or enforce their view of reality through symbolic and material bonds. Often the literature uses different terms to describe this socio-technical arrangement. No matter the terms used, a growing number of social informatics-related studies concede that even common technical components cannot be understood apart from the social and organizational milieu in which they exist. Put simply, *context matters*: Computing cannot be considered in isolation, but must always be studied in specific contexts.

A socio-technical perspective is a powerful lens: it makes clear that people are social actors. That is, people's individual autonomy, their agency, and their behaviors are shaped by the social norms, institutional forces, and the social and physical structures that surround them (Lamb and Kling, 2003). These structures can be as straightforward as office layout. But, structures also include the uses of computer systems, the inherent organizational structure of data, procedures and interactions, and authority structures based on power and knowledge. Viewing people as complex social actors rather than simply "users" makes clear that they are often acting in very constrained, if not prescribed, ways.

Moreover, the socio-technical perspective helps make clear that information and communications technologies are ensembles of computing elements enmeshed within institutional structures (Orlikowski and Iacono, 2001). The enmeshed nature of ICT means it is difficult to abstract "best practices" or present de-contextualized findings drawn from one context and apply or extrapolate them to a second. The socio-technical, or enmeshed view, of ICT and people demands stronger conceptualizations of the independent elements and their myriad inter-relations. Technological determinism cannot provide an overarching theoretically-grounded perspective. Social informatics can.

Theoretical and empirical research techniques

A cornerstone of social informatics research is its empirical focus and theoretic grounding. Therefore, some of the most important resources in the kit are methodological techniques for building theory and developing models from socially rich empirical data, along with a few empirical "tricks of the trade" (Becker, 2000). Workplace ethnography, focus groups, and participatory design studies guide the research discovery process toward understandings that a computing or communications system's designers can use in development and implementation (Greenbaum and Kyng, 1991). By using theoretical sampling techniques (Glaser and Strauss, 1967) in conjunction with these methods, social informatics researchers have iteratively refined their research protocols with probing and insightful questions. Perhaps more often than most other research, social informatics studies mix methods –by adding qualitative research interviewing to survey studies; by doing preliminary surveys for case study site selection; or by adding field experiments to contextually oriented studies of information and communications technologies. Deciding how to mix methods, and which theoretical samples to select, is both tricky and risky; but Rob and colleagues have developed some devices to guide such choices. For example:

Substitution. Theoretical sampling requires concurrent analysis of the research data during the collection phase, and reference to related research. A first pass through the data often reveals how people gloss over difficult issues by using neutralizing language – participants do this during research interviews, and researchers do it in their summary writings and analytical publications. Substituting accurate but more "loaded" terms for euphemisms can show which literatures and theories could lend insight to a study, and how new questions could probe an unexamined issue. For example, a neutral phrase, like "the issue at hand" might be replaced everywhere it occurred in the text with something less neutral, like "the elimination of grass-roots intranets by the corporate IT team". The "X" to be replaced could be any noun phrase, verb, or adjective that is found repeatedly in the data. (For further discussion, see Kling, 1999 Section 4.0). This exercise sets up a substitution of terms that effects a "distancing" to provoke playfully serious critical analysis. For instance, when teaching with Attewell's (1987) paper about computing work in a Washington DC medical insurance office, Rob would suggest that his students replace all instances of "office worker" with "black woman" and all instances of "manager" with "white man", and then reread the piece. The inferences to racial and gender discrimination inherent in the computing arrangements then jumped out at the reader, making critical analysis unavoidable.

Active voice and subject identification. Another exercise that Rob used with his students is based on Lanham's (1999) "paramedic method" of writing. He challenged students to shift every possible sentence they wrote from passive to active voice, so as to repopulate the writing. For example, by changing "It was implemented in record time"; to "Two line workers and the quality control manager implemented it in record time", a writer starts to bring key social aspects of ICT implementation into focus. This shift in voice brings *relationships* into central consideration. It leads the reader to think about the extenuating circumstances of three people working late hours and weekends to accomplish an important and difficult series of tasks. Similarly, Rob would rarely let his students get away with a sentence that began like this: "The computer system developed a need for..." The computer system is not the proper subject here – to identify the subject (probably a number of stakeholders or organizational players) would involve identifying the different groups that the large ICT investment must serve, and also explaining how their interests were affected by the introduction or use of the new computer system.

Contextual inquiry. The two techniques just discussed repopulate and recontextualize a text in ways that generate more questions than answers. But those questions are now framed by an emergent analytical understanding of ICTs in context. Social informatics researchers are always asking: "Exactly who did that? Why? Exactly how did they do it? Under what conditions?" With partial answers in hand, they then begin to ask: "And who has thought and written about these kinds of things *in an integrated way*?"; which sends them on a mission: poring through the literature, "powering-up" and extending their professional networks, and compiling an insightful article that brings a sense of socio-technical realism into these too-often techno-centric discussions. This kind of connected contextual inquiry reinforces the central premise of social informatics research: *context matters*.

These techniques and methods help social informatics researchers juxtapose common empirical findings with the omissions, assumptions, or errors in logic that other approaches leave unchallenged.

Common Knowledge in Social Informatics

The third resource that social informatics researchers can draw upon is a core set of repeatable findings and intellectual contributions – many of which have been noted in our discussion of foundational research. This common knowledge helps to anchor understandings of new and emergent information and communications technologies by serving as a relatively stable framework for examining their uses and effects. As this stockpile of findings has grown over the years, the social informatics resource kit has become increasingly versatile; but its basic tenets are continually re-discovered in studies of new technologies, or in studies of existing technologies in new domains. For example, we frequently find that:

Uses lead to multiple and sometimes paradoxical effects. A particular information and communications technology's impacts are rarely isolated to a desired area, but rather are spread to a much larger number of people through the socio-technical links that comprise context. An examination of the larger context often reveals multiple effects, rather than one all-encompassing outcome, and unexpected as well as planned events.

Uses shape thought and action in ways that benefit some groups more than others, and these differential effects often have moral and ethical consequences. People live and work together in powered relationships. The political, economic and technical structures they construct include large-scale social structures of capital exchange, as well as the micro-structures that shape human interaction. An examination of power often shows that a system's implementations can reinforce the status quo and motivate resistance.

Design, implementation, use and context have reciprocal relationships. Constructivist concepts have been quite helpful to social informatics research, particularly when longitudinal studies of complex contexts lead to discussions of how context shapes both the computing/ communication technologies and their uses, and how these artifacts and their uses shape the emergent context.

Effects will vary by the level of analysis. Networks of influence operate at several different theoretical levels. They typically engage a number of information and communications technologies and span formal and informal work groups; departments; formal organizations; formal and informal social units like communities or professional occupation/associations; groups of organizations and/or industries; nations, cultural groups, and even whole societies. Socio-technical theoretical perspectives lend explanatory power to studies of information and communications technologies that transcend these levels.

That these findings are constantly re-discovered is both encouraging and discouraging for social informatics researchers. On the plus side, it shows that the synthesis of research methods, techniques and perspectives that Rob, his students and his colleagues has amalgamated over the past two decades is a solid body of work on which to build future research. On the minus side,

however, it reflects the persistence of technologically deterministic expectations (i.e. beliefs that the use or presence of a computing artifact can be mapped to some pre-specified and generally positive outcome), *as well as* the conceptual and institutional difficulty that ICT designers and implementers have in studying the situated and enmeshed uses of ICTs.

Moving Forward

To move forward from this rich legacy, we have several options and also some responsibilities. We certainly want to preserve the legacy that Rob has left us, and to build on it where we can – that is essentially the purpose of a *Gedenkschrift* and of this special issue. We want to extend Rob's legacy network, which was neither static nor complete by (re)enrolling, and (re)engaging, people social informatics research. And, we want to move past some of the stumbling blocks that have too-often impeded this kind of work.

As we noted above, social informatics concepts and findings need to be more accessible to designers and implementers. Detailed, complex, socially rich studies rarely make it into computer science textbooks, and so do not have much opportunity to dispel the disarmingly simple (and cognitively easy) technologically deterministic explanations that abound. Despite our own protestations, perhaps, we do have one common, simply put, strong message to engage with this audience: "Context matters!" But social informatics needs a stronger voice to get the message out.

That stronger "voice" can take shape in two ways: first, by increasing the number of social informatics researchers, and second by providing more opportunities for publishing their work in high-quality and high-profile outlets. As readers will note, the second option will lower the barriers that discourage new entrants to the social informatics network; and so extending the network, expanding publication opportunities, and extending the resource kit are all interrelated activities.

Social informatics is not an archive, something that is solely to be preserved. It is not a doxa, something that should not be changed. Social informatics is a dynamic, growing body of knowledge that is always in play. Therefore, there are now (and always will be) open issues about, for example, how to conduct or engage in doing social informatics without becoming method-bound. Just what does one need to do to do social informatics? Further concerns arise when researchers try to come to terms with the need to focus *ensemble* on the social and technical aspects of computerization phenomena. Just how does one best conceptualize the socio-technical, the socio-economic, the socio-political and all their inter-relationships in practice?

In This Issue

While there are open issues and challenges, there is also a well-connected community of social informatics researchers who are moving their lines of inquiry toward better understandings and more effective approaches. As members of that community, the authors of the five articles in this special issue have helped to shape the leading edge of social informatics.

Our *gedenkschrift* for Rob Kling begins with two invited pieces. We learn by doing social informatics, as Trevor Wood-Harper and Bob Wood describe in "Multiview as Social Informatics in Action: Past, Present and Future." These experiences are then enriched and extended as we communicate and translate our research stories within and outside the research community, as Robin Mansell discusses in "Social Informatics and the Political Economy of Communications."

Earlier, we described three prevalent types of social informatics studies: normative, analytical and critical. Normative approaches (point to IT&P pieces in this genre)

The first research article is an analytical piece that builds on the Multiview introduction of Wood-Harper and Wood's invited piece in this issue. In "Exploring Socio-technical Interaction with Rob Kling: Five 'Big' Ideas," Keith Horton, Elisabeth Davenport and Trevor Wood Harper present their view of Kling's presence in socio-technical studies of computing and work, describing how they have absorbed it into their own analyses. They examine the contexts of social informatics research itself, and put forward some provocative possibilities for future extensions of this work.

The second research article in this special issue is a critical piece about an ERP system implementation written by an author who examined similar systems while he was Rob's student. In "Value Conflicts in Enterprise Systems," Jonathan P. Allen discusses the continuing difficulty that the information and computing sciences have with questions of value conflict, and how Rob's work did, and still does, address these issues. In particular, he has tried to emphasize Rob's argument that one can either assume that a computerization claim (such as 'implement ERP') is either neutral and rational, or social and value-laden. The rational and neutral assumptions are difficult to dislodge, but Allen's skillful combination of Rob's original work, a review of the cacophony of explanations found in the ERP literature, and a case study from a world-class manufacturer, should push even staunch "ERP believers" to question those assumptions.

To conclude our editorial commentary, we would like to thank the authors whose work we have the pleasure to present in this issue, as well as those authors who submitted papers that we could not include, but would like to encourage in their ongoing social informatics research. The reviewers for these papers have done an outstanding job of grappling with difficult concepts and messy details, and then providing excellent suggestions for presenting the authors' work in its best light. We thank you, very much. Eleanor Wynn and Edgar Whitley have been patient and helpful in guiding us through the special issue process.. Last, but not least, we want to thank Rob Kling for everything he has given to us and to the entire research community: THANKS, ROB!!

Roberta Lamb and Steve Sawyer,
Special Issue Editors

References

- Allen, J.P. (2004) "Redefining the Network: Enrollment Strategies in the PDA Industry." *Information Technology & People* 17(2), 171-185.
- Attewell, Paul (1991.) "Big Brother and the Sweatshop: Computer Surveillance in the Automated Office." *Sociological Theory*, 5(Spring):87-99. Reprinted in Dunlop and Kling, 1991.
- Attewell, Paul (1987.) "The Deskillling Controversy." *Work and Occupation*, 14(3):323-346.
- Agre, Phillip E. and Douglas Schuler (eds.) (1997.) *Reinventing Technology, Rediscovering Community: Critical Studies in Computing and Social Practice*, Norwood, N.J.: Ablex.
- Becker, Howard S. (1998.) *Tricks of the Trade: How to Think about Your Research While You're Doing It*. Chicago: University of Chicago Press.
- Bockowski, P. (2004) "The Mutual Shaping of Technology and Society in Videotex Newspapers: Beyond Diffusion and Social-Shaping Perspectives." *The Information Society*, 20(4), 255-268.
- Castells, Manuel (1996.) *The Information Age: Economy, Society and Culture. Vol I: The Rise of the Network Society*. Oxford: Blackwell.
- Castells, Manuel (1991). *The Informational City: Information Technology, Economic Restructuring, and the Urban-Regional Process*, Reprint Edition, Blackwell, Oxford.
- Dutton, W. H. (1999.) "The Web of Technology and People: Challenges for Economic and Social Research," *Prometheus* (17:1), pp. 5-20.
- Dutton, W. H., J. Wyer and J. O'Connell (1993). "The Governmental Impacts of Information Technology: A Case Study of Santa Monica's Public Electronic Network." In Rajiv Banker et al. (Eds) *Strategic Information Technology Management*, Harrisburg, PA: Idea Group.
- Eschenfelder, K. (2003) "The Customer is Always Right, But Whose Customer is More Important? Conflict and Website Classification Schemes." *Information Technology & People* 16(4), 419-439.
- Glaser, Barney G. and Anselm L. Strauss (1967.) *The Discovery of Grounded Theory: strategies for qualitative research*. New York: Aldine de Gruyter.
- Greenbaum, J., and Kyng, M. (1991) *Design at Work: Cooperative Design of Computer Systems*, Lawrence Erlbaum, Hillsdale, NJ.

Grudin, Jonathan (1990.) "Interface," in *Proceedings of the Conference on Computer Supported Cooperative Work*, Los Angeles, CA, October 7-10, 1990, pp. 269-278.

Horton et al. (this issue)

Kaplan, Bonnie (2001), "Evaluating Informatics Applications—Social Interactionism and Call for Methodological Pluralism," *International Journal of Medical Informatics*, 64(1): 39-56.

Kiesler, Sara, Robert Kraut, Tridas Mukhopadhyay and William Scherlis (1997.) "Homenet Overview: Recent Results from a Field Trial of Residential Internet Use," Carnegie Mellon University, Pittsburgh, PA, Available at:
<http://homenet.andrew.cmu.edu/progress/ovrview8697.html>

Kling, Rob (1980). "Social Analyses of Computing: Theoretical Perspectives in Recent Empirical Research" *Computing Surveys*, 12(1)(March 1980):61-110.

Kling, Rob (1999.) "What is Social Informatics and Why Does it Matter?" *D-Lib Magazine*.
<http://www.dlib.org:80/dlib/january99/kling/01kling.html>

Kling, Rob and Lisa Covi (1995.) "Electronic Journals sand Legitimate Media in the Systems of Scholarly Communication." *The Information Society* 11(4):261-271.

Kling, Rob and Suzanne Iacono (1989.) "The Institutional Character of Computerized Information Systems", *Office: Technology and People* 5 1 (1989):7-28.

Kling, Rob and Roberta Lamb (1998). Morceaux de villes. Comment les visions utopiques structurent le pouvior social dans l'espace physique et dans le cyberspace, in *Utopies Urbaines*, Emmanuel Eveno (ed.), Presses Universitaires du Mirail. [See English text "Bits of Cities" at <http://www.slis.indiana.edu/CSI/WP/wp96-02B.html>]

Kling, Rob and Walt Scacchi (1982.) "The Web of Computing: Computer Technology as Social Organization" pp. 1-90 *Advances in Computers*, vol. 21. New York: Academic Press.

Kraemer, K. L., S. Dickhoven, S. F. Tierney and J. L. King (1987). *Datawars: The Politics of Modeling in Federal Policymaking*. New York, NY: Columbia University Press.

Lamb, Roberta and Rob Kling (2003). Reconceptualizing Users as Social Actors in Information Systems Resarch, *MIS Quarterly*, Vol. 27(2).

Lanham, Richard (1999.) *Revising Prose* (4th edition). Longman.

MacKenzie, D. and J. Wajcman (1999). *The Social Shaping of Technology* (2nd ed.), Philadelphia: Open University Press.

Mansell (this issue)

- Markus, M. (1990). Toward a "critical mass" theory of interactive media. In Fulk, J. and Steinfield, C.W., editors, *Organization and Communication Technology*, pages 194--218. Newbury Park, CA: Sage.
- Markus, M. Lynne (1983.) "Power, Politics and MIS Implementation," *Communications of the ACM*, 26, 1983, pp. 430-444.
- Markus, M. Lynne and Niels Bjorn-Andersen (1987.) "Power Over Users: Its Exercise by Systems Professionals," *Communications of the ACM*, June, 1987, Vol. 30, No. 6, pp. 498-504.
- Mitchell, William J. (1995.) *City of Bits: Space, Place, and the Infobahn*. Cambridge, MA: The MIT Press.
- Mumford, Enid (1995.) *Effective Systems Design & Requirements Analysis: The ETHICS Approach*, MacMillan.
- Negroponte, N. (1995) *Being digital*. New York: Alfred A.Knopf.
- Orlikowski, Wanda J. and C. Suzanne Iacono (2001.) "Research Commentary: Desperately Seeking the "IT" in IT Research—A Call to Theorizing the IT Artifact," *Information Systems Research*, Vol. 12, No. 2, pp. 121-143.
- Robey, Dan (1997.) "The Paradox of Transformation: Using Contradictory Logic to Manage the Organizational Consequences of Information Technology," in *Steps to the Future: Fresh Thinking on the Dynamics of Organizational Transformation*, Christopher Sauer and Phillip Yetton (eds.) San Francisco: Jossey-Bass, Inc.
- Sawyer, S., Allen, J. and Lee, H., (2003). "Broadband and Mobile Opportunities: A Sociotechnical Perspective," *Journal of Information Technology*, 18, 121-136.
- Sawyer, Steven and Eschenfelder, Kristin (2002). Social Informatics: Perspectives, Examples, and Trends. In B. Cronin (Ed.), *Annual Review of Information Science and Technology* (Vol. 36, pp. 427-465). Medford, NJ: Information Today Inc./ASIST.
- Star, Susan Leigh and Karen Ruhleder (1996.) "Steps towards and ecology of infrastructure: Design and access for large-scale collaborative systems," *Information Systems Research* 7:111-138.
- Strum, S. and Latour, B. (1988.) The Meanings of Social: From Baboons to Humans in Schubert, G. and Masters, R. (eds) *Primate Politics*. Carbondale: Southern Illinois University.