SOCIAL INFORMATICS
OVERVIEW, PRINCIPLES AND OPPORTUNITIES (Steve Sawyer)

Social informatics is the term that I and others use to represent the trans-disciplinary study of the design, deployment and uses of information and communication technologies (ICT) that account for their interaction with institutional and cultural contexts, including organizations and society. This research is done by scholars in fields such as library and information science, information technology, education, communications, organizational studies, sociology, information systems and computer science. Those pursuing social informatics engage a diverse set of topics and employ a variety of approaches.

Social informatics has been characterized by many names including *the social analysis of computing, human-centered computing, social studies of information technology* and *the sociology of computing*. No matter the label, social informatics provides insights on computing that alternative approaches do not. For example, the rapid growth of *socialware* networking applications such as Friendster and Linkedin cannot be understood solely as computational artifacts, mediated communication tools, useful and useable interfaces or as electronic exchange markets. Rather, the variations in engaging and using these socialware networking applications reflect a complex interaction of technological and social factors, including social communication norms, group communication expectations, perceived cost and value of communication and the presence or absence of other communication tools. This more complex, situated, multi-level, multi-effect and socio-technical perspective is the added value of social informatics.

Here I articulate the principles that help to define social informatics, highlight some of the common findings from this work and identify two debates about engaging this form of research that serve as opportunities for you to get involved. My premise is that social informatics will become even more important as computerization continues to engage our society. Computerization, to paraphrase sociologist Beverly Burriss, is the implementation of computerized technology and advanced information systems, in conjunction with related socioeconomic changes, leading to a fundamental restructuring of many social organizations and institutions.

Computerization is quintessentially socio-technical: it is complex, large scale and situated in particular activities. For example, we can see Google's intent to digitize holdings of five research libraries as an example of computerization. By providing digital access to materials previously (and only partially) available through the physical movement of these items through a complex interlibrary loan system changes both the patrons' experiences (for example, ease of access) and alters the ways in which these libraries will develop and share their collections. Further, I would argue the Google project is likely to have larger scale effects – perhaps increasing pressure on libraries with fewer resources to mimic these efforts. In the five libraries that have agreed to work with Google, social informaticians will see social and computing issues regarding changes to access, possible changes in use (for both physical and online patrons) and variations in (and varieties of) policy and legal implications, systems design and systems deployment. Some social informaticians will see Google's efforts in relation to other digital library activities and information management themes. Still others will focus on the roles of informational objects and the uses of digital representations as a changing form of social discourse.

Principles of Social Informatics

Unpacking Google's plan to digitize five research libraries' holdings helps illustrate several principles that together define social informatics work. First, the various issues I raised above underscore that social informatics is *problem-oriented*. This work is defined by its interest in particular issues and problems with computerization and not by its adherence to certain theories or particular methods (as is operations research). The range of issues raised illustrates that *social informaticians see computing as a web-like arrangement of material artifacts such as computers and software, and the rules, norms and practices of people*. These webs of computing are *configurational* in that their specific forms change over time and are intimately shaped by the social milieu in which they exist.

Webs of computing are, however, path dependent in that previous actions and events guide, but do not predict, the forms and shape of future actions and events. This characteristic is why social informaticians frame Google's digitization plan in terms of changing social norms, issues of copyright, access and fair use. Digitization is more than just a media decision. From this perspective Google's intentions raise important and unresolved issues of use, access, design and policy. It is clear that the technical act of

digitization is possible (if laborious and based on many, as yet unmade, micro-design decisions). At the crux of Google's ambitious efforts, however, are the tricky issues that deal with the social activities around these technical activities and ways in which what is social and what is technical interact. If Google's digitization project is seen primarily as a technical act, or if they mistake the deeply and broadly socio-technical nature of this effort by seeing it as some sort of high-quality interface design, they do little to increase the likelihood of the effort's long-term success. And, we know much about this topic: Ann Bishop and Nancy Van House have already highlighted the social informatics perspective of digital libraries. Google is a smartly run organization, so they are likely familiar with this insightful work.

By selecting five highly visible, and international, libraries, Google's leaders made clear they understand that context matters. *Context-dependency is a core principle of social informatics scholarship*. The situated nature and uses of computing mean that context and use are bound up through practice: to report on use is to report on the situations of that use. *In social informatics research, people are depicted as "social actors."* That is, people are depicted as having individual agency, acting in ways that reflect both informal social norms and formal rules of action, and perhaps most importantly not primarily users of ICTs. It is the social actor principle in play when social informatics scholars focus on the notion that many users of newly digitized library material are likely to follow some of our currently recognized information-seeking behaviors in relatively predictable ways even as others explore new (and possibly controversial or innovative) behaviors.

Social informatics work is often critical, as I've made clear through my quick analyses of socialware and Google's digitization project. *Social informatics scholars challenge taken-for-granted assumptions about the material value of an ICT, people's actions toward both computing and the social worlds in which they live, and the nature of the arrangements among these elements*. While critical perspectives are sometimes seen naively as being negative towards computerization or a particular ICT, a critical approach is more about exploring embedded and implicit assumptions. Social informaticians eschew deterministic statements such as "digitization is good for all of us" or "being on the Web means unproblematic access for all."

This critical orientation demands that social informatics research be based on rigorous empirical work. The strong empirical basis of social informatics work, however,

is combined with both methodological and theoretical plurality. Social informatics work typically includes an array of data collection approaches, sophisticated large-scale analyses and complex conceptualizations. The rigor, empirical depth and the plurality of theories and methods help to define social informatics work. This also helps make clear that social informaticians often are integrating theories and methods. In this explicit focus on integrative scholarship, social informatics research provides insights that other contemporary approaches to the study of computerization do not.

The Common Findings of Social informatics

More than 30 years of careful empirical research exists in the social informatics tradition. As noted, this work is found in a range of academic disciplines, reflects a mix of theories and methods, and focuses on different issues and problems with computerization. Here I highlight five observations that are so often (re)discovered that they take on the notion of common findings relative to computerization.

1. **Uses of ICT lead to multiple and sometimes paradoxical effects**. Any one ICT effect is rarely isolatable to a desired task. Instead, effects of using an ICT spread out to a much larger number of people through the socio-technical links that comprise context. An examination of this larger context often reveals multiple effects, rather than one all-encompassing outcome, and unexpected as well as planned events. For example, peer-to-peer file sharing may help some musicians and hurt others.

2. **Uses of ICT shape thought and action in ways that benefit some groups more than others**. People live and work together in powered relationships. Thus, the political, economic and technical structures they construct include large-scale social structures of capital exchange, as well as the microstructures that shape human interaction. An examination of power often shows that a system's implementations can both reinforce the status quo and motivate resistance. That is, the design, development and uses of ICTs help reshape access in unequal and often ill-considered ways. Thus, course management systems may provide added benefits to some students, put added pressure on some faculty and allow some administrators to use the system to collect additional evidence regarding the performances of both students and faculty.

3. **The differential effects of the design, implementation and uses of ICTs often have moral and ethical consequences**. This finding is so often (re)discovered in studies across the entire spectrum of ICTs and across various levels of analysis that ignorance of this point borders on professional naiveté. Social informatics research, in its orientation towards critical scholarship, helps to raise the visibility of all participants and a wider range of effects than do other approaches to studying computerization. For example, characterizing errors in diagnosing illnesses as a human limitation may lead to the belief that implementing sophisticated computer-based diagnostic systems is a better path. When these systems err, the tendency may be to refocus efforts to improve the computerized system rather than on better understanding the processes of triage and diagnosis.

4. **The design, implementation and uses of ICTs have reciprocal relationships with the larger social context.** The larger context shapes both the ICTs and their uses. Moreover, these artifacts and their uses shape the emergent contexts. This can be seen in the micro-scale adaptations that characterize how people use their personal computers and in the macro-scale adaptations evident in both the evolving set of norms and the changing designs of library automation systems. Library automation is not simply about recent developments of applications with sophisticated librarianship functionality; it is also about patrons' differential abilities to use computers, library budget pressures, Internet access to libraries and the increasing visibility of the Internet and searching.

5. **The phenomenon of interest will vary by the level of analysis.** Because networks of influence operate across many different levels of analysis, relevant data on computerization typically span formal and informal work groups; formal organizations; formal and informal social units like communities or professional occupation/associations; groups of organizations and/or industries; nations, cultural groups and whole societies. This common finding is exemplified by the tremendous positive response by younger users to peer-to-peer file sharing, the absolute opposite response by music industry leaders and the many approaches taken by organizational and civic leaders regarding the legalities and responses to use.

Debates

The number of scholars pursuing social informatics research continues to grow because social informatics work provides insights that other approaches to studying

computerization do not. In closing, I present two areas of debate currently engaging social informatics scholars. These debates help to make clear some of the opportunities for you to contribute both to our understanding of computerization and to improving the approaches to doing this research.

The first area of debate regards showcasing the value of social informatics scholarship relative to older forms of research on computerization. The added insights derived from the rigorous and empirically grounded research that characterizes social informatics is often best understood when presented in comparison with another approach. An example of this is the research my colleagues and I have done investigating the impact of computerization on the work of residential real estate agents in the United States . In contrast to economists who predicted that the presence of the Internet would make information free and that these real estate agents would, thus, go away, we found that they rapidly became sophisticated users of the Internet, mobile phones and digital forms. Instead of disappearing, real estate agents have been adapting and thriving (over the past 10 years, there is a 10% growth in the number of real estate agents in the United States). Contrasting social informatics research with less well-grounded work provides other scholars with evidence of the limitations of these approaches to studying computerization and helps to delineate the form and value of social informatics contributions. In our case, the empirical work on U.S. residential real estate agents' uses of computers helped make clear that simplified views of computerization provide little, and perhaps false, insight.

The second debate concerns the analytic demands of social informatics. Combining the need for extensive data collection with the complex conceptualizing of socio-technical phenomena means it is a difficult methodological toolkit for many scholars. There are at least two opportunities. First, there is a need for continued methodological innovations regarding both the collection and synthesis of multiple forms of data regarding computerization activities. Second, there is a need to continue developing theories that help to explain computerization. One example of this is Bill Dutton's theorizing that the access to and uses of computing (and particularly Internet computing) are more complex than just greater availability. Changes in one's access to computing help redefine one's relationship with information and interaction. More work like this is needed.

To help you better understand, draw from or engage in social informatics scholarship, I have highlighted its underlying principles and outlined several more opportunities for engaging social informatics. For contemporary library and information science scholars, there are significant computerization issues in at least four areas of active interest. For scholars of user behavior, information management, organization of information and information seeking in context, the ongoing changes in the ways in which people characterize and pursue their information needs and wants; the expanding choices of media, devices and search tools; the increased expectations by (and of) people using search and search technologies; and the issues with privacy, security and trust in online environment suggest to me that the added insights provided by a social informatics approach will be highly valued.

Acknowledgements

For Further Reading

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