Kling and the "Critical": Social Informatics and Critical Informatics

Ronald E. Day

*School of Library and Information Science, Indiana University, 1320 E. 10th Street, Bloomington, IN 47405.
E-mail: roday@indiana.edu*

The article discusses Rob Kling's notion of the *critical* and how this term is embodied in Kling's social informatics and in works of other authors, which we identify as belonging to *critical informatics*. Issues of method and the notion of the empirical are discussed. The importance of such analyses in regard to social life and professional education is discussed.

Introduction

This article identifies the presence and the importance of a notion of the "critical" in some of the later works of Rob Kling, arguably the foremost proponent of social informatics during his lifetime. As Kling emphasized in his work, the importance of the *critical* as a concept lies in social and professional contexts that tend to repeat normative assumptions regarding the social value of information and communication technologies, despite empirical evidence to the contrary. The importance of a *critical* analysis is to bring into question established social assumptions and values regarding information and communication technologies (ICTs) and established understandings of "information," particularly as they play themselves out and are institutionalized in social and professional discourses and professional training. This article discusses several of Kling's later works within the context of research and pedagogy in library and information science, information science, and informatics, aiming not toward a comprehensive review of Kling's work (Robbin, 2005), but rather toward an understanding of the concepts of *critical* and *empirical* in his work. The article suggests that social informatics was founded upon the notion of the *critical*, as the analysis of disjunctions between popular and professional claims about the social values and uses of information and communication technologies and the empirical reality of such. The article then identifies other authors writing in an area of critical informatics that has sometimes been termed *critical information theory* or *critical information studies*, where this disjunction is explored through conceptual and discursive analyses (inclusive of historical and cultural concerns). I argue that Kling's notions of method and the empirical in social informatics may be broader than is sometimes assumed and that works by others, largely not seen as belonging to the social informatics camp, develop methods and themes that are important and foundational, but are also underrecognized elements in Kling's own oeuvre in social informatics. I am not suggesting that Kling's work fell short in regard to the importance he placed upon the critical, but rather that further development of this theme in conceptual and discursive analyses was both promised in Kling's work and pursued outside what is commonly considered social informatics. One may suggest that the relationship between social informatics and critical informatics is one of both complementary and metonymic development, the latter fostered through the generality of the notion of the empirical in Kling's work and by nascent conceptual and discursive methods of analysis in that work.

Social Informatics

Definitions

Kling's work on social informatics arose out of a culture of concern by computer professionals with the social values and uses of computers. Most of all, it arose out of disjunctions between popular and professional claims about the social values and uses of information and communication technologies and the empirical reality of such during the last two decades of the 20th and the beginning of the 21st centuries. Historically, Kling's concerns arise from a lineage of critique and concern that includes the writings of Phil Agre and the concerns of

such organizations as Computer Professionals for Social Responsibility (CPSR).[1]

Over the course of Kling's oeuvre one can witness the morphing of the material objects of his concern from that of computers, per se, to information technologies, and then to information and computer technologies (ICTs). The inexactness of the technical object of what would become the central concern for social informatics not only reflects the morphing of social-technological roles for digital computers during this period, but also suggests two points that Kling's work does not: first, that the empirical objects of social informatics can be as much conceptual constructs as empirical entities, and second, that social informatics's central concern is the examination of the notion of information as a culturally and historically specific conception of knowledge. The second half of this article suggests some works other than Kling's that have investigated information and information technologies through conceptual and rhetorical modes of inquiry.

Parallel to and since the last years of Kling's work, other authors' definitions of social informatics have largely condensed and repeated Kling's own definitions of social informatics. For example, Sawyer and Eschenfelder's definition of *social informatics* in the *Annual Review of Information Science and Technology* of 2002 is a faithful amalgamation of various definitions that Kling offered over the years:

> Social informatics is the term we use to represent a field of research focusing on the relationships between information and communications technologies and the larger social context in which these ICTs exist. Contemporary social informatics work spans issues of design, implementation, and use of ICTs in a wide range of social and organizational settings. This body of research includes analyses of the impacts of the social and organizational settings on the design, implementation, and uses of ICT, including the intended and unintended social and organizational consequences of ICT-enabled change and change efforts. Thus, social informatics research

focuses on exploring, explaining, and theorizing about sociotechnical contexts of ICTs. (Sawyer & Eschenfelder, 2002, p. 428)

Earlier, Sawyer and Rosenbaum (2000) offered the following elaboration of a definition of social informatics as given in Kling (1999). They write, citing Kling:

> Then what is social informatics? According to Kling (1999), "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.'" Social informatics is a problem-driven research domain that begins with an assumption that ICTs and the social and organizational settings in which they are embedded are in a relationship of mutual shaping. (Sawyer & Rosenbaum, 2000, p. 90)

Kling offered various, though very similar, definitions of social informatics during his career. Here is a later one from the *Encyclopedia of Library and Information Science*:

> Social informatics (SI) is the systematic, interdisciplinary study of the design, uses and consequences of information technologies (IT) that takes into account their interaction with institutional and cultural contexts. Thus, it is the study of the social aspects of computers, telecommunications, and related technologies, and examines issues such as the ways that IT shape organizational and social relations, or the ways in which social forces influence the use and design of IT. For example, SI researchers are interested in questions about the future consequences of IT developments. However, unlike common lay speculations, SI research strategies are usually based on empirical data. SI researchers use data to analyze the present and recent past to better understand which social changes are possible, which are plausible, and which are more likely in the future.
> One of the key concepts of SI is that IT is not designed or used in social or technological isolation. From this standpoint, the social context of IT influences their development, uses, and consequences. (Kling, 2003, p. 2656)

Despite some differences, several central characteristics attributed to social informatics in the preceding definitions should be mentioned. The definitions are relatively homogeneous in terms of what they offer and they are rather typical of definitions of social informatics in information science. First, common to all the definitions is an emphasis upon a determinative, causal model between social forces and computers (or information technologies or information and communication technologies), on the one hand, and ICTs and social forces, on the other hand. Other "contexts" for computer or IT or ICT "use" and "consequences" are mentioned, such as Kling's (2003) "institutional and cultural" contexts, but how these should differ from social contexts is not explained. I have included the second half of Kling's 2003 quote because it seems to suggest the historical context against which social informatics arose: an understanding of

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[1]The Kling articles that I refer to in this article are from the end of the second and the last decades of Kling's publication history. This is the period when, in Cronin and Shaw's words, "in pursuit of his [Kling's] goals he not only switched disciplines (in effect abandoning computer science for large-scale social theorizing) and academic homes (leaving UC Irvine's School of Information and Computer Sciences for Indiana University's School of Library and Information Science) but also absorbed theories and methods from a variety of scholarly literatures to inform his own investigations, which, of course, were duly published in a wide range of journals in a wide range of fields" (Cronin & Shaw, 2005). Table 4 of Cronin and Shaw's (2005) article also demonstrates, through the analysis of acknowledgments in Kling's articles, these shifts in interests and methods in his work, showing that the two most heavily acknowledged authors in Kling's works for the last decade of his published works, 1995–2005 (including, of course, posthumous publication), were the computer scientist and critical and social theorist Phil Agre and the cultural historian and critical theorist Mark Poster. Interestingly, as well, Cronin and Shaw's (2005) paper suggests that foundational influences upon an author are not necessarily reflected in Kling's (or any other author's) bibliographical citations, but rather, that they are shown in acknowledgments. This should not surprise us because influences—particularly influences from "alien" disciplines—often show up in texts as methods and approaches and not as citation evidence.

computer or information and communication technologies as having their values and uses independently of social causes and even their effects. A critique of this type of understanding was at the heart of Kling's social informatics.

The second aspect of the definitions that I would like to point out is the emphasis that is placed on social informatics as empirical and "problem-driven." From the reference to the "empirical" we may expect that problems in social informatics are defined by those empirical methods that are so common in the quantitative social sciences, and by the reference to the "problem-driven" we may expect that social informatics analyzes particular problems toward arriving at solutions that resolve those problems. This wording suggests that social informatics is "practical," as opposed to being "just theoretical." These definitions unequivocally place social informatics in what many would consider to be the social sciences and in professional practices and their studies, insofar as social informatics is said to use empirical methods of analysis and is problem-driven toward what are sometimes termed *solution-centered* answers.

Given these definitions of social informatics, it is with some perplexity that we encounter some of Kling's articles that seem to take a broader, more conceptual view of social informatics and its critique. In particular, I would like to point to his work on genres of "computerization" discourse (Kling, 1994) and his Indiana University Center for Social Informatics (CSI) Working Paper "Critical Professional Education About Information and Communication Technologies and Social Life" (Kling, 2002). These studies are largely discursive and conceptual, not only in their objects of analysis, but in their methods of analysis. They also relate to works throughout Kling's oeuvre on "computerization movements" and their discourses and what Kling calls their "ideologies." Furthermore, they seem to issue from Kling's original desire that social informatics explore the disjunctions between popular and professional claims about the social values and uses of information and communication technologies and the empirical reality of such, and they seem to play a fundamental role in exploring these disjunctions.

Social Informatics, the "Critical," and Affordances

The reasons that we may be surprised by Kling's work on genre analysis and on issues of social critique in professional practice and elsewhere are that genre analysis and critical studies are neither defined nor exhausted by empirical techniques as defined by the quantitative social sciences, nor do genre analyses and social critique necessarily lead to solvable problems. Instead, these approaches point to contextually sensitive problems of cultural affordances[2] contained

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[2]Affordances are causes that "afford" actions, leading to certain expressive meanings and sense rather than to others. In this sense they are "formal causes." The term *cultural affordances* includes all manners of semiotic signs, including language, and most generally, the term covers materials understood as tools that allow expressions to occur. Affordances allow expressions to occur as certain expressions, rather than as others—"this" expression rather than "that" expression or no expression at all. These expressions then act recursively in shaping agency and in modifying and producing new affordances.

within rhetoric and discourse, and they point to conceptual *problematics* (which are not necessarily solvable), rather than structured empirical *problems* (for which one may seek "solutions"). Conceptual problematics may be *resolved* by analysis, but they are not *solved* because they are neither rationally nor empirically structured so as to yield such certainty through analysis. Conceptual problematics involve hermeneutic circles (i.e., their objects of analysis are bound up with their conditions and tools of analysis and judgments). Furthermore, cultural materials (such as rhetoric and discourse) are not causal in the manner offered by social informatics's understanding of the relation between "social" factors and technological agents. The type of efficient causality (to use the Aristotelian category) assumed in social informatics understood as a *social science* is not possible with cultural analyses, because cultural categories and their conceptual terms are affordances of expressions. *That is, the types of causation that can be attributed to culture and its concepts are "formal" rather than "efficient" (to use the Aristotelian categories).*

So, if we are to include these two papers (Kling, 1994, 2002), along with Kling's work on "computer movements" (Kling & Iacono, 1995), within the domain of social informatics, we must engage in rethinking the types of definitions of social informatics that would exclude or include them. In this way, it may be that Kling's work takes us beyond what is thought to be an exclusive definition of *social informatics* relying on simple or traditional notions of empirical and problem-centered work, not only as offered by other authors, but by Kling himself in other of his writings.

In order to account for Kling's writings on genres of computer discourse, for his writing on "critical professional education," and for his discourse analyses of computer "ideologies," it is necessary to recognize the importance of these issues and the critically reflective, conceptual, and discursive approaches that he employed to address them. In regard to popular and professional claims regarding the social values and uses of information and communication technologies, Kling often used the terms *beliefs* and *ideologies* to indicate the social power and the intrinsic hegemony of such claims. Kling's work was based on the argument that these claims were "uncritical" statements and narratives divorced from "empirical" reality. With this concern, the education of computer, and then information, professionals was important as well, because professional education is often taken as a matter of technical training (and hence, problem solving) rather than critical education (i.e., reflective questioning of the value and meaning of discourse and other activities in an interventional manner that is guided by informed judgment and reference to the empirical in various, not strictly structured, manners).[3]

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[3]Phil Agre's (1997) discussion about the differences between prescriptive activities and "critical" activities is very useful here, particularly as these differences are illustrated by an autobiographical narrative on his education as a computer scientist turned critical theorist.

The purpose of Kling's 2002 article "Critical Professional Education About Information and Communications Technologies and Social Life" (Kling, 2002) was to suggest that professional computer-related education would benefit from the infusion of social informatics in professional programs of study because many of the "troubles" of computer-related ventures had been caused by uncritical analyses of the possibilities and limits of computer technologies in institutional and other social settings.[4] Kling's 1994 work on genre pointed to different conventions or genres of narrative and method through which computers and computerization are understood. According to Kling (1994), computer professionals are inclined to believe the most utopian (or equally, dystopian) narratives about the social values and uses of computers. These narratives both instill and reflect these professionals' "beliefs" about the social values and uses of computers, and thus, they constitute "ideologies" on computer value and use in society. The project of social informatics, as suggested in both articles (Kling, 1994, 2002), is to assess, judge, and intervene in the social and educational construction of the meaning, value, use, and even design of technologies. Critical analysis in social informatics is, therefore, ultimately, a discursive and cultural examination of the construction of meaning and concepts related to ICTs, and as such, it constitutes a potential intervention into the formation and repetition of regimes of statements and stories and the accepted actions, intentions, and expectations attached to ICTs. Narrative form, particularly, gives rise to what Kling called, "computer movements" (CM) (Kling & Iacono, 1995). These "movements" attempt to distribute belief structures ("ideologies") vis-a-vis the social privileges of various producers at various points of social and institutional production (Kling & Iacono, 1995). Hence, genre and discourse analyses are central means toward intervening in the production and reproduction of unwarranted beliefs in the social value and use of certain technologies. Insofar as certain educational bodies have the role of producing future users and designers of ICTs, they also have the need to critique such unwarranted beliefs and ideologies. Hence, critical education in regard to ICTs should be a high priority for such institutional bodies, and insofar as social informatics prioritizes such an undertaking, social informatics should be a cornerstone activity within information disciplines.

In his 2002 article, Kling quotes, and then expands upon, his earlier (Kling, 2000) definition of social informatics, by emphasizing the concept of the "critical":

> "Social informatics refers to the interdisciplinary study of the design, uses, and consequences of IT that takes into account their interaction with institutional and cultural contexts. Social informatics research comprises normative, analytical, and critical orientations, although these approaches may be combined in any specific study."
> The critical orientation refers to examining ITs from perspectives that do not automatically and uncritically accept the goals and beliefs of the group that commission, design, or implement specific IT applications. (Kling, 2002)

The term *critical* in Kling's 2002 title thus bears several meanings: (1) that the project of social informatics is "critical" of the "uncritical" discourses about the social values and uses of computers/IT/ICTs (here, *uncritical* means unreflective upon the disjunctions between popular and professional claims about the social values and uses of information and communication technologies and the empirical reality of such); (2) that such thought is critical (that is, necessary, in a site-specific and time-valued manner) to professional education, which is often conducted as problem-driven and technically oriented training (and this latter type of training may contribute to the sense of *uncritical*, as in 1); (3) that such a project is not only critical to "professional education," but as the full title suggests, to "social life," today, as well. I might suggest that the use of the term *education* in the title of Kling's (2002) article is important here, as the article explores a notion of critical *education* that is different from that type of education that is often taken as synonymous with professional training. *Professional education* in Kling's (2002) work is highlighted by critical activities that are not problem-centered, but without which one socially and educationally risks entering into many "troubles" by engaging in technical designs and implementations without adequate consideration of the social (and historical and cultural) factors influencing these designs and implementations and alternatives that may be available. Professional *training*, in contrast to such professional *education*, may be seen as not requiring reflective judgment of this type, but rather, as promoting education as a prescriptive and problem-centered type of learning. The contrast between education and training involves, as well, issues and activities of experientially informed judgments; what could be, what could have been, what ought to be, rather than what must and must not be in the sense of solving structured problems.

Kling (2002) suggested that the new "information schools" at the time of his writing would engage critical issues that were of no interest to computer science; the latter, according to Kling, had instituted a "critical chill" by means of "identifying mathematics as the only legitimate kind of theoretical orientation in computer science" (Kling, 2002). Kling's

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[4]The abstract for Kling (2002) reads, in part: "Looking back over the 1990s, it is easy to see the widespread troubles of many ventures that depended upon advanced IT applications, including business process reengineering projects, enterprise systems, knowledge management projects, online distance education courses, and famously—some of the dot-com businesses of the 1990s. These 'troubles' vary from substantial underperformance (i.e., projects that were much more costly and/or produced much less social or business value than most of the participating IT professionals anticipated) and many outright failures. Many of these 'troubles' could have been avoided (or at least ameliorated) if the participating IT professionals had much more reliable and critical understanding of the relationships between IT configurations, socio-technical interventions, social behavior of other participants in different roles, and the dynamics of organizational and social change. Social Informatics is the name for the field that studies and theorizes this topic, and I discuss it in more detail below. The key issue addressed in this article is who will produce social informatics research for IT professionals, and where will they learn about important findings, theories, design approaches, etc.?"

critique, here, not only opens the way to loosely structured and non-solution-centered modes of analyses, but, in fact, places them as the cornerstone of professional education and research. By this alone, Kling's work remains a radical challenge to information education and research, even today.

The "Empirical"

Kling's emphasis upon social informatics's criticality in research and professional education was an articulation of social informatics's origin in critical readings of computer and information technology development and deployment. The themes of belief and ideologies, and the discourses of computerization movements, show that central to this analysis is the analysis of discourses and concepts.

There is a methodological tension that is present in Kling's work that can easily be missed, though one sometimes finds it in terms of apologies for having taken a conceptual or discursive approach in the writing rather than an empirical one (for example, the 1995 "epilogue" to the original 1988 paper that became "Computerization Movements and the Mobilization of Support for Computerization" [Kling & Iacono, 1995]). This tension may be said to stem from Kling's desire to engage in conceptual analyses and to do so from empirical bases. The notion and practice of "evidence-based" research in Kling's work, however, stretch between two quite different conceptions of the empirical: on the one hand, traditional quantitative, empirical work done in the quantitative social sciences and, on the other, non-quantitative, interpretative analyses of discursive structures, literary genre categories (Kling, 1994), and normative conceptual or ideological (Kling & Iacono, 1995) beliefs, the latter whose methods are usually seen in the humanities and in the qualitative social sciences. From one perspective, discourse analyses of texts might be said to be an empirical activity, whether anchored in further quantitative empirical methods or not, because such analyses begin with the close reading of texts. And though Kling seems to advocate empirically anchored investigations in the traditional quantitative social science sense of empirical method, his very work itself—as is the case in his examination of genres of computer discourse, his analysis of computerization movements, and his analysis of critical professional education—often occurs as critically reflective conceptual, interpretative, and historical analyses. Further, as cited previously, Kling had criticized computer science for instating a "critical chill" by means of reducing theoretical work to those methods using mathematical means. Such a "chill" can also be instituted when the notion of empirical research becomes synonymous with research whose central modes of argumentation and proof rely upon mathematical or statistical data gathering and modeling. Such a synonymous reduction of the empirical and the mathematical is not an uncommon prejudice in the social sciences and in information science, despite the difficulties in specifying exactly what is meant by both the empirical and the mathematical in such an equation.

At a quick glance it *seems* that Kling was advocating "theoretical explorations"[5] of "empirically anchored" (Kling, 1994) issues. On the other hand, however, the problem remains of what constitutes an empirically anchored issue, and Kling's examples of theoretical explorations do not help clear up this difficulty.[6] Certainly, "ideology" is an issue that can be suggested empirically, but in itself it is not an empirical object nor a structured problem that can be solved. Ideology is a concept. That ideology is said to exist means that claims are made that there exist states of relative hegemony in statements or actions. The existence of ideology may be supported by descriptions and by data or by descriptions alone, and in that way, it may be said to be empirical, as well. Ideology, however, does not exist independently of such descriptions. Furthermore, if we examine the theoretical explorations that Kling advocated, some of them are not known for making use of traditional empirical data—their critical work involves conceptual interventions into the categories and assumptions that empirical work must take for granted in its data-driven studies. For example, after stating, "I believe that there is a shortage of good empirically anchored theoretical explorations of the social aspects of computerization," Kling lists, among other "theoretical explorations," "reinforcement politics," his own "web models," "structuration theory," and "post-structuralist theories" (Kling, 1994).

Now, as to this last, it is difficult to imagine data-driven, method controlled, empirical evidence as the origin for most poststructuralist theories or studies, which, themselves, are sometimes critical of such type of empiricism in the social sciences. While Kling did engage in genre analysis (Kling, 1994) of discourses on computers, it was a conceptual and interpretative analysis, and not at all involved with vocabulary counting and other methods of empirical textual analysis. In brief, if we are to take all of Kling's writing into account, and to take seriously his—and others' claim—that social informatics is empirically based, we would have to include those nonquantitative, non-problem-driven and non-data-driven, conceptual, interpretative, and historical approaches more commonly found in the humanities and the qualitative social sciences. Such approaches are based on cultural materials (foremost, language), and they involve conceptual, interpretative analyses.

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[5]Conceptual and discursive methods are sometimes discussed in terms of being "theory." This is not the place to discuss this issue in more detail. However, Alice Robbin's (2005) very exhaustive review of Kling's work makes the following observation: "[Kling's] work is 'theory-laden.' He always insisted on 'theorizing'; it was a word dear to his heart and he employed it often, both informally with colleagues and students and in formal settings. He was an eclectic reader and critic of theory in several disciplines, although his affinity lay with varieties of modern social and political theory as conceptual tools that best addressed the problematics of information and computer technologies (ICTs) in organizations and the polity."

[6]One of the anonymous reviewers of this article pointed to the importance of Kling's "preference for evidence from practice" as a reason for what otherwise might seem Kling's *eclectic* use of different theoretical paradigms. This seems to me to be a very rich insight whose importance I would like to note, though because of its complexity it cannot be pursued in the present article.

I might suggest that if such work were more fully incorporated into professional "information" programs, even today, it would constitute a challenge to the scientism that dominates education and research in information science and library science, and it would also challenge those who argue that social informatics should be advanced as a discourse in these fields because it would "help us do things better," for, while this last was a *possibility* of Kling's critiques, his critiques bring into question illusions, reveal paradoxes, and expose aporias that are embedded in prescriptive education, research, and the ideologies of ICT use in social life. Putting in question illusions does not *necessarily* help us to "do things better," but rather, challenges what we are doing and why. These challenges are interventions into the future by means of critiques of the present. Interventionalist critiques promise nothing but the possibilities that arise from their putting things and events in question, but in doing so they seek to open up the present so as to create the possibility of different futures than those that are often promoted and believed as inevitable and necessary.

Conceptual and Discursive Critical Analyses of ICTs and Information

If the notion of the critical is taken as central to the origin of Kling's understanding of social informatics in the context of the rise of personal computer technologies and of their professional and social discourses of the 1980s, 1990s, until today (particularly in their Californian flavors, the original site of Kling's critical work, Agre's critical work, and that of others [for example, Nunberg, 1996; Day, 2001]), then social informatics—at least as Kling saw it—shares a project with other critical works on information technology value and use both inside and outside information science. Works, for example, such as that of Frohmann's on the concept of information and knowledge (1990, 1992, 2004), Nunberg's (1996) on the rhetorical-material forms for "information," and Day's (2001) on the historical development of the modern understanding of information during the 20th century as a rhetorical trope and as a concept, share Kling's concern with analyzing information, knowledge, and ICTs critically. All these works not only share Kling's concerns about the social discourse of information and communication technologies, but also expand Kling's concerns to that of questioning the modern senses of information and communication, as well.

Highlighting these neighbors of social informatics, which share the same or similar critical concerns, the same historical specificity, and often the same geographical origins with respect to Kling's social informatics, suggests the roads not taken by Kling's social informatics, even though, as we have seen, social informatics could well, and may well be able to, develop in such directions other than those defined by empirical methods and problem-driven issues. As I have argued, though Kling's work is constituted by multiple and even eclectic sets of methods and approaches to analyzing computers/IT/ICTs and society, the stress placed upon empirical methods and problem-driven analyses in social informatics

dominates its legacy today. Certainly, some of that latter emphasis may be attributed to Kling's own discourse and practice, to Kling's own training in computer science, and to his institutional inscriptions in computer science and later in information science, as well as the institutional location of social informatics today, largely in information science, computer science, and "informatics" departments. Kling's work, however, suggests that social informatics could and should engage other approaches and departments, particularly those of the humanities and the qualitative social sciences.

Asking the question, What elements of Kling's work and social informatics remain relatively undeveloped? within the problematic of Kling's work means posing the possibility of developing social informatics according to lines that are not just hagiographical reflections of the dominants of Kling's work in social informatics, but extensions of the mentioned, but undeveloped, elements of Kling's work and of social informatics writings as a whole up to the present time. Such a direction points to a critical informatics project that is both besides and, and in a sense, inherent, but undeveloped, in current social informatics. And by asking this question alongside other, akin works to his call for a critical social informatics, we point to the relation of Kling's work to other works that attempted and attempt to address the theoretical and practical discords to which Kling pointed.

So, what remains present, but undeveloped, in Kling's understanding of social informatics as a fundamentally critical activity that these other studies we have mentioned address?

First, we may point to a larger view of the problem of information and communication than that centered upon computers or information and communication technologies, per se. By suggesting that the causal relation of society and computers/IT/ICTs constitutes the central issue for social informatics, Kling reified the notion of the social as a causal agent and did the same for a general, and fuzzy, category of technological objects ("computers," "ITs," "ICTs"). While the issue of the reification of social elements, *qua* "society," remain thorny in other fields and discourses than social informatics, we can deal with the reification of the technologies of Kling's analyses by asking what technologies are said to be productive of information.

Nunberg's analysis (1996) is insightful in this regard, for it points to technologies and techniques of documentary production in modernity that became understood, and used, as producers of our modern sense of *information*: what Nunberg terms the "abstract sense" of the term *information*, and what Frohmann (2004) has termed *epistemic content*—namely, a concept of a disembodied, atomic, readily understood, and recombinable form of knowledge—which in poststructuralism was discussed as knowledge understood as "presence." Nunberg's (1996) work usefully points to the historical and material construction of this sense of information in modernity, through mass communication devices and atomic documentary forms for meaning production. These are material agents for the production and reproduction of

information. While such material forms do not produce information in any causal manner, Nunberg (1996) usefully points to the rhetorical and material specificity of such forms in creating a modern sense of information. Material, here, is seen as formally constructive of expressions (here, of information) within cultural and social contexts. How determinative a given material is of such expressions and how tightly such expressions produce a determinate sense (e.g., as information) is an interesting, but highly complex question, which we may be able to address, perhaps, only through descriptions of given instances and events.

Day's (2001) contribution in this area was to argue that our current dominant way of understanding the term *information* was historically formed during the 20th century and that it has become a dominant trope for knowledge and communication in our own day. Day (2001) analyzes texts from 20th-century documentation, early cybernetics, and a discourse on "the virtual" in the 1990s, as well as counterdiscourses in the social theorist Walter Benjamin's and the philosopher Martin Heidegger's works, in order to demonstrate that the modern concept of information is historically specific and culturally rich. Although Kling's work analyzed lacunas in the value of information in terms of the difference between the social claims and the actual social uses and productions of ICTs, his analysis was largely synchronic, and he did not look very closely into the cultural construction of ICTs and terms such as *information*. In contrast, Frohmann, Nunberg, and Day's works, for example, argue that the term is a product of material processes, rhetorical and discursive forms, historical powers, and cultural and conceptual categories. Here, for example, *information* (as well as *communication*) is seen as the term and concept that codetermines the social and historical emergence of both information users and information and communication technologies. From, for example, a Foucauldian perspective, in order to understand these informational expressions it is necessary to examine the historical and cultural emergence and power of information as a conceptual affordance, particularly as a conceptual affordance that rhetorically and politically has been positioned by authors so as to reproduce its own power as a dominating concept for knowledge (see Day, 2001). Such an emphasis points back to the importance of discourse analysis, in the mode of Michel Foucault's works—that is, as historical accounts of the emergence, dominance, and fall of concepts and the material forms and technologies that support such concepts though particular productions and affects. Concepts or ideas are repeated language acts that have established, by their repeated associations with objects and actions, certain normative meanings and senses. To understand an idea is to understand along with others how to do things with words and other tools and objects. Thus, concepts such as the modern understanding of information must be accounted for in terms of assemblages of expressions and actions, recognizing that concepts are not strictly defined but are temporally and culturally produced by such expressions and actions. From a social perspective, we must examine techniques and technologies in their production of those expressions and products that we call information, remaining aware that such production both is an expression of, and develops and/or reinforces, cultural understandings of information as a concept, as well.

In Frohmann's work (particularly 1992, 2004), the critique of information is, in one instance, developed toward analyzing how a reified notion of "epistemic content" (Frohmann, 2004) has colonized the study of documentary processes—for example, in the construction of "information seeking behavior" as a unified field of study, and, in the historical appearance of information science as the successor to the practice and study of documentation. Frohmann (2004) has pointed to the social, epistemological, and disciplinary power of our modern conception of information as epistemic content in its determination of a certain "cognitive" approach to documentation, which has changed the focus of the information science field from that of studying documentation to studying an overly generalized and reified concept of information.

Besides the preceding works, which are focused on the concept of information and its historical and social evolution, I would like to mention a few other works that are akin to Kling's call for a "critical informatics." Such mention is not meant to be exhaustive by any means; rather, I am raising these examples as ones that particularly take into account cultural phenomena, an area that is little explored in Kling's work. Belton (2003) has argued, seemingly drawing on Latour's (1987) concept of "centers of calculation" (*centres de calcul*), that the concept of information had an earlier historical embodiment and function, namely, in the assemblage and management of data for colonial control during the 16th century. As Belton (2003) tells it, complex social relationships in the newly discovered lands of the Orinoco region of South America were represented by the colonizers in simple and sometimes allegorical narratives, pictures, charts, and maps, so as to comprehend and manage cultural differences and physical spaces in ways that best served colonial decisions made in distant Europe. Yates (1989) has suggested that new, stark forms of rhetorical and documentary representation were important in the colonization of the American West and the westward expansion of industry in the 19th-century United States. In the second chapter of her book, *What Is Documentation?* (Briet, 2006), the European documentalist Suzanne Briet wonders about the social implications of "a massive extension of 'substitutes for lived experiences' (photos, films, television, audio records, radio broadcasts)," suggesting a link between the development of such "substitutes" and documentary techniques and technologies. Briet's concerns echoed those of the earlier critical theorist Walter Benjamin, as well as others of the 1920s and 1930s, about the substitution of mass media created experiences for experiences that are arrived at within a context for understanding, an event that Benjamin directly linked to the development of newspapers in modernity and under capitalism in particular (Benjamin, 1968a, 1968b, 1968c; Nunberg, 1996; Day, 2001).

The preceding examples are meant only to suggest some of the paths that are implicit in understanding social informatics as critical conceptual research, particularly following deeper historical and cultural engagements than Kling's works generally demonstrated. However, as I have suggested, not only are these accounts akin to Kling's work and do they develop in regard to the same and similar concerns that Kling had in regard to disjunctions between popular and professional claims about the social values and uses of information and communication technologies and their empirical reality in professional and "social" life (Kling, 2002), but their methods of analysis are suggested in Kling's work in genre and discourse analyses and in his analysis of the role of education in developing professional and social understandings of information and communication technologies.

Where these examples of critical studies of "technology and society" differ from Kling's work is in their greater historical and cultural engagements, their richer conceptual analyses, their increased attention to close textual readings of documentary evidence, and their less ambiguous commitments to conceptual, historical, and in general, discursive methods of analysis. Although these differences may, for some, disqualify them from the proper domain of social informatics or information science or "professional studies," Kling's notion of the critical as the foundation for social informatics and his critically reflective conceptual, historical, and interpretative analyses in this area suggest that, at least for Kling, social informatics was not so exclusive and, for the good of professional education and "social life," such approaches and their concerns were not only necessary, but foundational.

In conclusion, it may be said that the heart of Kling's conception of social informatics was a critical informatics, and that the cornerstone for critical informatics were approaches that remained a minority in Kling's overall work. I have suggested that alongside Kling's work, however, ran and runs a further development of this critical informatics, one that works in the very language and methods that Kling sought as the frontier for social informatics and information studies.

Acknowledgments

References

Agre, P. (1997). Toward a critical technical practice: Lessons learned in trying to reform AI. In G. Bowker, S.L. Star, & W. Turner (Eds.), Social science, technical systems, and cooperative work: Beyond the Great Divide (pp. 131–157). Mahwah, NJ: Lawrence Erlbaum Associates.

Belton, B.K. (2003). Orinoco flow: Culture, narrative, and the political economy of information. Lanham, MD: Scarecrow Press.

Benjamin, W. (1968a). On some motifs in Baudelaire: In Illuminations: Essays and reflections (pp. 155–200). New York: Harcourt, Brace, & World.

Benjamin, W. (1968b). The storyteller: Reflections on the works of Nikolai Leskov. In Illuminations: Essays and reflections (pp. 83–110). New York: Harcourt, Brace, & World.

Benjamin, W. (1968c). The work of art in the age of mechanical reproduction. In Illuminations: Essays and reflections (pp. 217–252). New York: Harcourt, Brace, & World.

Briet, S. (2006). What is documentation? R.E. Day & L. Martinet (Eds.). Lanham, MD: Scarecrow Press. (Original work published in 1951 as Qu'est-ce que la documentation?)

Cronin, B., & Shaw, D. (2005, March 11–12). Peers and spheres of influence: Situating Rob Kling. Paper presented at the Social Informatics Workshop, hosted by the Center for Research on Information Technology and Organizations (CRITO), University of California, Irvine.

Day, R.E. (2001). The modern invention of information: Discourse, history, and power. Carbondale: Southern Illinois University Press.

Frohmann, B. (1990). Roles of indexing: A critique of mentalism in information retrieval theory. Journal of Documentation, 46 (2), 81–101.

Frohmann, B. (1992). The power of images: A discourse analysis of the cognitive viewpoint. Journal of Documentation, 48(4), 365–386.

Frohmann, B. (2004). Deflating information: From science studies to documentation. Toronto: University of Toronto Press.

Kling, R. (1994). Reading "all about" computerization: How genre conventions shape non-fiction social analysis. The Information Society, 10(3). 147–172. Retrieved January 11, 2005, from http://www.slis.indiana.edu/faculty/kling/read94a.html

Kling, R. (1999). What is social informatics and why does it matter? D-Lib Magazine, 5(1). Retrieved December 12, 2005, from http://www.dlib.org/dlib/january99/kling/01kling.html

Kling, R. (2000). Learning about information technologies and social change: The contribution of social informatics. The Information Society, 16(3), 217–232.

Kling, R. (2002). Critical professional education about information and communications technologies and social life (revised version, December 3, 2002). CSI Working Paper no. WP-02–06. Retrieved October 19, 2004, from http://www.slis.indiana.edu/CSI/WP/WP02–06B.html

Kling, R. (2003). Social informatics: Encyclopedia of library and information science. New York: Marcel Dekker.

Kling, R., & Iacono, S. (1995). Computerization movements and the mobilization of support for computerization. In S.L. Star (Ed.), Ecologies of knowledge: Work and politics in science and technology (pp. 119–153). Albany, NY: State University of New York Press. Retrieved October 19, 2004, from http://www.slis.indiana.edu/faculty/kling/pubs/MOBIL94C.htm

Latour, B. (1987). Science in action. Cambridge, MA: Harvard University Press.

Nunberg, G. (1996). Farewell to the information age. In G. Nunberg. (Ed.), The future of the book (pp. 103–138). Berkeley: University of California Press.

Robbin, A. (2005, March 11–12). Rob Kling in search of one good theory: The origins of computerization movements. Paper presented at the Social Informatics Workshop, hosted by the Center for Research on Information Technology and Organizations (CRITO), University of California, Irvine. Retrieved December 12, 2005, from http://www.crito.uci.edu/si/resources/robbin.pdf

Sawyer, S., & Eschenfelder, K. (2002). Social informatics: Perspectives, examples, and trends. In Cronin, B. (Ed.), Annual Review of Information Science and Technology, 36, 427–465.

Sawyer, S., & Rosenbaum, H. (2000). Social informatics in the information sciences: Current activities and emerging directions. Informing Science, 3(2), 89–95. Retrieved December 2, 2005, from http://www.inform.nu/Articles/Vol3/v3n2p89–96r.pdf

Yates, J. (1989). Control through communication: The rise of system in American management. Baltimore: Johns Hopkins University Press.