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ATTACHMENT A - NOTES

(1) The utopian potentials of the "new" electronic communication technologies have been argued pro and con by numerous authors, focusing both on specific technologies (e.g. the relative technological newcomer -- the e-book) and on more general features such as hypertext and massive interconnectivity. Those informing this proposal in particular include: Albanese (2000); Anderson, B. (2000); Angell (2000); Churbuck (1993); Compaine, 2001; Cronin & Davenport (1998); Cairncross (1997); Center for Democracy and Technology (2000); Dervin (1999a, 1999b); Kling (2001); Landow (1992); Lanham (1993); Larson (2000); Lewis (2001); Lunenfield (2000); McClure & Bertot (1997); Mitchell (2000); Murray (1997); O'Donnell (1998); Scott (2002); Sheppard (2001); Somerset-Ward (2000); Tenner (1996).

Historical analyses show that utopian expectations were charted for each communication technology (e.g., telephone, film, radio, television) during development stages. What has changed with recent advances is potentials for flexibilities of use far beyond those previously offered. Even with less flexible technologies, however, ample evidence exists on how users have grabbed whatever freedoms they could find and bent technologies to their wills. It is well documented that the inventors of technologies more often than not have made very bad guesses about user behaviors (even when informed by research). It is also well documented how users actively circumvent restrictions placed on technology usage whenever they can. The most famous example is the telephone, originally invented as a tool for commerce and not for useless activities such as "gossip" but which women quickly claimed as useful for family maintenance and nurturing. Discussions which have informed our attentions here include: Brooks (1976); Marvin (1988); Rakow (1988, 1993).

(2) A number of observers have documented the astonishing spread of internet use, some terming it the fastest technological diffusion rate in human history. (Connaway, 2001a; Rogers, 2000; United Nations, 2000.) Data show over 60% of Americans -- some 172 million people -- were "wired" in December 2002, up some 25% from diffusion three years earlier (Horrigan and Rainie, 2002b; NUA Internet Surveys, 2002). In a March 2002 report, Horrigan and Rainie (2002a) described the internet as "shifting from being the dazzling new thing to being a purposeful tool that Americans use to help them with some of life's important tasks." (p. 2). In their observational study of student internet use, Cmor & Lippold (2001) concluded that "students use the web for everything."

A series of studies from the Pew Internet & American Life project have documented the increased reliance on the internet for all manner of information, help, resource finding, and human contact. A few statistical findings illustrate the point: Fox & Rainie (2002) found that 62% of internet users had gone online in search of health information. Kommers & Rainie (2002) found that 39% of internet users reported the health information they obtained online played an important role in their aid to another person facing a major health problem. Horrigan & Rainie (2002b) found that 81% of internet users expected to find reliable health information online. Allen & Rainie (2002) found 70% of U.S. parents with children 18 years of age or younger used the internet, with 58% reporting using it for research relating to school and training. Lenhart, Simon & Graziano (2001) found 73% of teenagers (youths aged 12-17) had online access. Minkle (2002) found 78% of online teens preferred the internet as their primary source for school work.

(3) In actuality, the data on the impact of electronic access on library use is contradictory although the overall portrait is one of a complementarity between library use and electronic access. A recent American Library Association study (2002) found that 91% of US adults believe libraries will play an important role in the future despite the massive amount of information available on the internet. Connaway (2001a) suggested that as "...more people participate in distance and distributed learning programs, they will become more dependent on full-text electronic resources from libraries." (p. 347). Several studies have

shown increases in library use. The ALA (2002) study, for example, documented that 72% of 25 large public libraries serving populations of more than one million experienced significant circulation increases since March 2001. This was described as documenting the long hypothesized impact of economic downturns on library use. The Gordon, Gordon, & Moore (2001) Gates Foundation sponsored program study found that 91% of public libraries had experienced increases in library traffic with the increase being mainly for internet access. Several academic library use studies have suggested that students tend to access academic library catalogues remotely while using the library primarily to study or do email and web-surfing. (Jones, 2002; Outsell, 2000; Whitmire, 2001). D'Elia, Jorgensen, Woelfel, & Rodger (2002) projected that decreasing use of the library is a possible scenario although their opinion data showed that 10.4% of their survey respondents estimated they would increase their use of the library in the future while 2.5% said they would stop using the library. While some authors (cited in Note 1) have projected that the unmediated access to information that the internet allows will depress library use or, at an extreme, make libraries unnecessary, others project a more important role for libraries as metamediaries (Jones, 2000) stepping into the chaos cyberspace leaves in its wake. This issue is discussed in Notes below.

(4) A major impact of the spread of new technologies of particular relevance to libraries is the renewed and revitalized interest in reading and the book. The International Conference on the Future of the Book planned for April 2003 in Cairns, Australia is but one example (Dare, 2002). Concerns about reading literacy and the study of reading itself are both on the increase and facing a variety of reconceptualizations. The reconceptualizations pursue several lines of argument. One is that reading and, indeed, the very book itself, is facing extinction in the midst of the emphasis on images and disconnected texts brought on by the electronic age. The second is that the cyberspace age will require a new kind of reading and a new kind of literacy. The third calls for a radical change in the emphasis in reading research, up to now studied in terms of barriers to reading acquisition, comprehension, and speed. The call is for a more user-oriented, culturally informed, and socially anchored approach to understanding reading than has been traditionally allowed within the stereotype of reading as a solitary and individualist activity. See, in particular: Adoni, 1995; Alvermann, Hinchman, Moore, Phelps, & Waff, 1998; Birkerts, 1994; Boyarin (1992); Darnton (1982); Healy (1990); Landow (1992); Lanham (1993); Long (1992); Nunberg (1993); O'Donnell (1998).

(5) Wurman (2001) has called the information age the "age of also" (p. 6) with different information forms and channels each finding their niche while sometimes displacing but more often synergistically enlarging the others' potentials. This portrait has been previously well established in mass media research. (See, for example: Carroll, Silbergeid, Beachum, Perry, Pluscht, & Pescatore (1993); Dimmick (1997); Dimmick, Patterson, & Albarran, (1992); Maynard (1995). The growing number of studies on electronic source use begins to confirm this portrait See further discussions of these below. The difficulty, however, with e-source studies is that incomplete diffusion, and underdeveloped user skills and system interfaces confound findings.

(6), The calls to libraries to be more things to more people come in a variety of ways from numerous authors. We provide a sampling organized around four themes suggesting that libraries need to:

a) Take diverse users into account in all aspects of digital library service and design. See, for example: Connaway & Wallace (1998); Connaway (1999); and Theng, Duncker, Mohd-Nasir, Buchanan, & Thimbleby (1999). Connaway (1999), for example, calls for cataloguers to consider end-users. Theng et al. charge that there is "little provision for end-user browsing and inter-cultural needs". They call for user participation in system design processes. ;

b) Be particularly mindful of how the disenfranchised face both a hardware and increasingly a conceptual "digital divide". See, for example: Allen & Dillman (1994) Hindman (2000); Wilhelm (2001). The hardware divide refers to lack of access to computers and other electronic access devices. A conceptual divide refers to those users, particularly those who are marginalized socio-economically, who do not approach system interfaces with skills for using the conceptual frameworks and procedures that typify system designs.

c) Be mindful as well as how many users, now freed from the constraints of library catalogues, do not use or want, and sometimes actively resist, the traditional controlled access tools developed so painstakingly by library and information science expertise. Likewise, many users do not use such traditionally accepted criteria as accuracy for judging search outcome qualities. A growing number of studies document this "divide" between a large number of users and library/information system experts. See, for example: Cmor & Lippold (2001); Cunningham & Connaway (2002); Griffiths & Brophy (2002); Jansen, Spink, & Saracevic (2000); Rieh (2002); Rieh & Belkin (1998, 2000). Dervin (1980, 1999a) has long addressed the expert-user divide, suggesting that it is at least in part an artifact of how research and system design constrain our understanding of users to system maps and thus arrive at distorted views of what complexities users actually address when seen from the vantage point of their own maps. This issue is discussed in more detail below.

d) Address the bottom-line of accountability by documenting how library services contribute to user growth, change, and learning as individuals, family and community members, workers, and national as well as global citizens. See, for example: Rudd (2002); Sheppard (2001).

(7) There are many commentaries on exactly what is happening informationally in cyberspace and what role libraries and other information/communication institutions ought to play. (See Note 1 references). Referring to the chaos of cyberspace, Bruce (2000), writing in the field of educational philosophy, said that while cyberspace appears "lawless", in fact two laws are operating. One is that the computing capacity of the microchip doubles about every 18 months and it appears as if the limit of this evolution will not be reached until around 2017. The second is that the value of the web increases proportionately with increased numbers of resources and users but this, too is expected to have a limit. Before these limits are reached, we can expect the digital world to be a constantly changing one. It is this constant change that drives the directive that has become a mantra of our times -- the call to flexibility. Toffler (1970) predicted the call when he suggested that in the year 2000 being an educated person would require learning, unlearning, and relearning in endless cycles. The call to flexibility is present in all professional discourses, calling practitioners to value and nurture flexibilities in practice. In library science, for example, Connaway (1999, 2000a, 2000b, 2001b) has echoed this call.

Beyond this call for flexibility is a deeper reckoning with the chaos of the cyberspaced information environment, a chaos that users as well as professionals recognize (as shown in the Pew studies cited above). Amid this chaos, libraries and information centers are called to a number of missions that on the surface seem to run counter to those enumerated above. The tension between these two calls is one of the concerns that serve as impetus for this proposal. Note 6 proposes attention to diversities. In contrast, others challenge libraries and information science to return to traditional roots to focus on mapping knowledge landscapes and providing standards for assessing information quality. The writers who have particularly informed our address of these issues include, as examples: Albrechtsen & Jacob (1998); Arant & Payne (2001); Andersen (2002); Hjorland (1996); Jones (2000); Lynch (2001a); Lombardi (2000); Olaisen (1996a, 1996b); Wilhelm (2001); Wilson, P. (1993a, 1996a, 1996b, 1996c). Themes that emerge from these writings suggest that libraries and information services should:

a) Fill roles as metamediaries (Jones, 2000) or mega-gateways (Lombardi, 2000) or intelligent intermediaries (Albrechtsen & Jacob, 1998) in a cyberspaced world where users increasingly have unmediated access to massive amounts of information.

b) Attend, in particular, to criteria for evaluating information quality. As Lynch (2001a) put it: "The integration of trust and provenance into information retrieval systems is clearly going to be necessary and....inevitable." (p. 17). Others making similar calls include, for example, Hjorland (1996); Olaisen (1996); Rieh (2002); Wilhelm (2001); Wilson, P. (1993a).

c) Be pro-active in intervening in the information environment in order to impact not only information system design and user education efforts, but, in fact, the very structures with which information is generated and disseminated. Arant & Payne (2001), for example, say: "At this time, librarians tend to act as the interface between a plethora of data and those who are seeking answers... But...librarians not only should, but must, prove their worth by taking a prominent role in the organization, evaluation, and instruction of electronic resources." (p. 65). Some argue even more strongly that library and information science practitioners must impact the very way in which knowledge-making is pursued. Wilson, P. (1993a), for example, calls for librarians to be the authorities on the authority of information. Albrechtsen & Jacob (1998) call for the library to be a "...participant in the production of knowledge...." (p. 293). Hjorland (1996) and others agree that this will take an altered approach to research supporting practice because what is needed is a new kind of knowledge-mapping -- one that still focuses on domains, disciplines and specialities but does so informed by a social epistemology. What is being suggested, in essence, is an approach to knowledge mapping based not on essential categories but rather on empirical categories of knowledge production and use within work and use communities. Hjorland (1996), for example, sees this as the kind of required conceptual change which will allow librarians to intervene in the "overproduction of unrelated facts" (p. 52) which plague information systems designed for expert use and, hence, confound address of those systems by non-experts.

One aspect of the call for attending to the chaos of cyberspace in professional roles is an emphasis by some authors that, in actuality, chaos in the informational environment is not a new condition Rather it is a condition that cyberspace communication has made painfully apparent but which has been a major impetus behind the call for user studies in LIS since the 1970s. The essential idea is that for most users the expertise of both the knowledge system and the structures that allow access to it are impediments written in foreign languages -- i.e. the languages of narrowly-focused experts rather than the languages of everyday life. Further, users of information in the concrete conditions of lived experience are all too aware of conflicting information inputs and the ways in which experts intentionally or unintentionally hide or avoid addressing such conflicts. For discussions of these and related issues, see, as examples: Agosta (2002a, 2002b); Cronin and Davenport (1998); Gross (1999); Introna (1999); Rakow (1989); Rauterberg, Strohm, & Kirsch (1995). This issue has been a major emphasis in Dervin's work (1980, 1984, 1989b, 1999a).

(8) A number of authors discuss the problem of the astonishing mass of contradictory research focusing on information seeking and use. As Hjorland (1996) puts it: "We must cease the overproduction of unrelated facts." Most deep commentaries focus not just on contradictions in findings but also on the differing and sometimes competing paradigms brought to bear on research. The contradictions thus arise not only from what is found but also from how researchers go looking and how they talk. This lack of integration across research traditions has impacted, in particular, user studies. As Vakkari (1999, p. 36) put it, the integration is at best "fragmentary." This chaos in research findings and traditions is not unique to LIS but can be found in all the social sciences and the fields to which they are applied. (See, for example, Brittain, 1989; Dervin, 1993. 1994; Hjorland, 1998a, 1996; Loftus, 1991, Olaisen, 1996b). Further, many suggest that the chaos results in good part because disciplinary boundaries are collapsing while at the same time reward systems and publishing procedures rigidify along old disciplinary divides. (See, for example, Fisher, 1990; Palmer, 1996; Pinch, 1990). Authors who discuss possible resolutions to these dilemmas are discussed in later notes. Those who have been most useful for purposes of this proposal in attending to issues of the overload of unrelated facts and research approaches include, as examples: Anderson (2000); Dervin (1999a); Doty (2001); Froehlich (1994); Hjorland (2000); Ingwersen (1996a, 1996b); Limberg (1999); Olaisen (1996a); Spink (1999); Vakkari (1996, 1997), Wilson, P. (1996b, 1996c.). Between them, these authors offer different, sometimes seemingly incommensurate critiques and resolutions. While disparate, each offers something of value for thinking about these struggles.

(9) Study after study confirms that one of the important characteristics of interpersonally delivered expertise is its responsiveness to situational conditions. Pettigrew (1999), for example, found that the information providers she studied intuitively focused on situational aspects of their users' needs and not on personality or demography. Dervin (1999b) has discussed the need for redesigning systems so that they can support the demands users place on information providers to take account of their situations and material conditions. She suggests that professional burnout comes at least in part from the disparity between the help people need and systems as designed. Human intermediaries absorb this gap. Dervin and others argue that this gap can be bridged with design principles. For other discussions of burnout, see, as examples: Demerouti, Bakker, deJonge, Janssen, & Schaufeli (2001); Densten (2001); Kalimo (1999); Miller, Birkholt, Scott, & Stage (1995); and Weber & Jaekel-Reinhard (2000).

(10) The charge that there is a research-practice divide in applied fields is an old and continuing one. It is heard in many forms in recent LIS writings with the discussions rotating around the same polarities -- research versus practice or research versus design. A third polarity -- theory versus applied research -- also plays a role. Whatever the particular emphasis, the challenges all have in common the idea that there is a divide between research and practice that is extraordinarily difficult to bridge. For some, this is one reason research does not serve practice (system design and service) well. Examples of writings in LIS that have

attended to these issues include: Budd & Connaway (1998); Connaway (2001a); Hjorland (2002b); and, Raber and Connaway (1996),

Calls for better research to inform user-oriented system design, particularly electronic system design, are so numerous that it is impossible to keep track. They come from virtually every field that in some way addresses end-users: arts policy, comparative literature, foreign languages, mathematics are but a few examples. The fields most centrally involved with information transmission to end-users and the design of systems for doing so -- communication, library and information science, and human computer interaction -- are all manifesting renewed vigor in these calls. Examples can be found in: Belkin, Cool, Kelly, Lin, Park, & Perez-Carballo (2000); Dervin (1992, 1989b, 1999a, 1999b); Dervin & Foreman-Wernet (in press); Dervin & Schaefer (2001); Dillon, 2000a, 2000b); Hjorland (2002a); Ingwersen, 1996b); Kuhlthau (1993); Landoni & Aedo (2002); Marchionini (2000); Nardi & O'Day (1999); Smith, Newman & Parks (1997).

(11) Just as there are an astonishing number of empirical studies on user information seeking and use in electronic environments, there are also an astonishing number of writings critiquing this or that research approach and advocating alternative approaches. This note focuses at a high abstraction level on the general thrusts that cut across critiques admittedly ignoring the many nuanced and helpful attentions paid to details. It is those details that will become of interest to us in Phase I of our proposed project when we would aim to find centralities and make sense of disparities across divergent authors. In terms of the general thrusts one finds in these critiques, they converge on two themes. One is a call for a changing the primary focus of user research. The second is a call for changing how research is conducted.

The first call asks for a different kind of user research that goes beyond attention to the whos, whats, and wheres -- which users exhibiting which characteristics use what information resources from what sources. This approach takes as its unit of analysis the person and characterizes people with attributes -- demography, access. personality, domain focus -- that are assumed to apply across situations and time. This approach also usually assesses what aspects of the system -- as defined by the researcher -- have been used with what reaction and outcome. Such approaches have been shown useful in, for example, marketing research, opinion polling, and social indicator research, although even in these terrains critiques are emerging which echo those emerging in LIS (see, for example, Dervin, 1999a, 1989; Dervin & Frenette, 2001).

The critiques emerging in the LIS field (supported by critiques emerging in communication and human computer interaction) call in a variety of ways -- sometimes conflicting -- for user-oriented research that is anchored in the worlds of users rather than seen through the lens of system defined categories. The call is for research that is more contextually, situationally, and socially anchored, that focuses on real moments of information use at specific moments of time in real situations as users set about meeting needs that change as they move through their searching activities. The call is for focusing on the whys of user behavior -- their relevances, goals, purposes, tasks, interests, judgments, values, uses. The call is for focusing on user hows -- how users go about information seeking and use in real situations using different system features and where ctivities change moment to moment. The call is for linking understandings of user whys and hows to specific system features so that the resulting research can directly inform system design and service. The user of interest becomes not someone seen as moving statically across time, but rather a user characterized by potentially changing whys and hows and changing uses of system features. These calls assume there is pattern to be found in movements through time-space which have been missed by focusing only on whos, whats, and wheres but which can be found by focusing on whys and hows.

The second call emerging from research critiques is related to the first. It is a call for changing how research is done. There are two aspects of the call. One addresses how one does research in order to get this new kind of portrait of users. In general, critiques merge on the call for a socially anchored epistemological approach to user studies. Further details on these discussions follow below. The second aspect focuses on the idea that no matter how research is conducted, results will show diversities between both the users being studied as well as those who use the resulting research. The diversities, then, pertain to both the watchers and the watched. The call is for attending to both these diversities in very much the same conceptual way -- by first attending to the contextual, situational and activity conditions that lead to the differences; then by explicitly searching for bridging concepts between diversities to locate places where seeming disparities converge into unexpected unities and, at the same time, to anchor diversities in their situational and contextual origins in such a way that they inform our sense-making.

This emerging idea -- that research must attend not only to unities (long the primary focus of all research) but also to diversities is one of the driving ideas behind many of the calls for a changed approach to user research. It is also behind the call for a new kind of interdisciplinarity that brings the diversities of views of research users with differing interests and practices to bear on research. These themes above have long been a focus of the work of Dervin. See, in particular: Dervin (1977, 1989, 19997, 1999a 1999b); Dervin & Frenette (2001); Dervin & Nilan (1986); Zweizig & Dervin (1977).

Examples of sources particularly helpful in addressing the emerging research critiques include: Anderson (2002); Bates (1999, 2002); Bishop, Mehra, Bazzell, & Smith (2001); Blomberg (1995); Chang & Lee (2001); Chatman (1999); Dillon (2000a, 2000b); Doty (2001); Durrance & Pettigrew (2001); Frohmann (1994; 2001); Hjorland (1996, 1998a, 1998b, 2000); Ingwersen (1996a, 1996b); Introna (1999); Johannessen (1996); Kling, Hert, & Rosenbaum (1998); Kling & Star (1998); Kuhlthau (1993); Limberg (1999); Marcella, Baxter, & Moore (2002); Marchionini (2000); McCreadie & Rice (1999); McKechnie & Pettigrew (2002); McKechnie, Pettigrew, & Joyce (2001); Nardi (1996b); Nardi & O'Day (1999); Olaisen (1996b); Olaisen, Munch-Petersen, & Wilson (1996); Pettigrew & McKechnie (2001); Solomon (1999); Sonnewald (1999); Sonnewald & Livonen (1999); Spink (1999); Spink & Wilson (1999); Star (1989); Vakkari (1996, 1997); Wilson, P. (1993a, 1996a, 1996b, 1996c); Wilson, T.D. (1997, 1999, 2000).

(12) The focus on anchoring diversities in contextual roots and developing conceptual bridges that both span diversities as well as allow us to make sense of them crops up in recent literatures organized around the idea of boundary concepts or boundary objects. This thrust moves beyond the mere call for attention to diversities that research critiques suggest has not worked because of lack of unifying frameworks for conceptualizing diversity. Dervin, for example, had long argued that conceptualizing users -- both users of our information systems and users of research about users -- as bundles of habitual behaviors that stay the same across time-space ends up relegating to caprice behaviors that could otherwise be studied as patterned. She has termed this a fall into solipsism (1999a, 1989b). What is needed is the application of communication procedures for attending systematically to diversities in such a way that diversities become valuable.

One version of this call focuses on the development of boundary objects where diversities can meet and make sense of each other. User chat rooms are an often referred to example, along with other naturalized mechanisms for soliciting genuinely user-oriented input for system design. Theng, Duncker, Mohd-Nasir, Buchanan, & Thimbleby (1999) provide a sample definition in their vision of design guidelines for user-centered digital libraries: "We envision the development of boundary objects between different cultures assessing shared information resources. Boundary objects organize shared but simultaneously distributed cognition [and]...are used by different communities without presupposing a fully shared definition of an object. They are flexible enough that each community can read a specific meaning from a boundary object sufficient to its needs. Simultaneously, they are [here, the authors quote Star & Griesemer (1989, p. 393)] 'robust enough to maintain a common identity across sites.' As such, they enable collaboration and communication across cultural boundaries on equal terms, for example, without recourse to a single-side dominant mode of symbolization." (p. 180).

Another version of this call focuses on the more general idea of boundary concepts which go further than merely allowing unstructured user participation but rather address the idea of how to conceptually develop boundary concepts that can be directly used in system design and service. Those who critique LIS from within this framework call for focusing on whys, hows, and on movement through situations because these are conceptualized as more likely to be boundary bridging ways to study user behavior than emphasis on whos, whats, and wheres. Likewise, the call for attending to diversities of interpretation by research users (e.g. practitioners, researchers, and theorists) is also addressed in the context of this same idea -- that boundary bridging concepts will facilitate better collaboration, interdisciplinarity, and application). Dervin's Sense-Making Methodology (proposed for use particularly in Phase II of this project and for the dialogues with diverse researcher users) has been explicitly developed as a methodology for the development of boundary concepts. See, in particular, Dervin (1999a, 1999b); Dervin & Frenette (2001). The following sources were relied on heavily for our address of boundary concepts: Albrechtsen & Jacob (1998); Fisher (1990); Hjorland (1996); Olaisen (1996a); Nardi (1996b); Palmer, (1996); Pinch (1990); Star (1989); Star & Griesemer (1989); Theng, Duncker, Mohd-Nasir, Buchanan, & Thimbleby (1997).

(13) There is a long history of research on the whos, whats, and wheres of information seeking and use in library and information service settings both before and after the introduction of electronic technologies. While it would be impossible to account for the vast numbers, this is a list of some of the references consulted (in addition to the Pew studies listed in Note 2) in developing this proposal with the aim of getting as broad a picture of research activities as possible. Of course, many of these studies emphasized more than whos, whats, and hows; and many struggled with the research critiques discussed above. Given a renewed synergy of interest in improved user studies, few researchers look only at whos, whats, and hows. Most, however, do not yet reflect the kinds of changes in research attentions to situational and contextual processes that are the primary focus of the research critiques described above. Adams & Bonk (1995); Bates, Hulsey, and Jost (2002); Berger & Hines (1994); California State University Libraries Electronic Access to Information Resources Committee (2002); Cherry & Duff (2002); Cmor & Lippold (2001); Connaway (2001b); Connaway, Budd, & Kochtanek (1995); Connaway, Johnson, & Searing (1997); Cooper (2001); Cunningham & Connaway (2002); Davis (2002); Friedlander (2002); Fry (1995); Gibbons (2001); Grimes & Boening (2001); Hildreth (1985); Iyer (1998); Jackson (2001); Jansen & Pooch (2001); Littman & Connaway (2002); Lynch (2002); Marchionini (1995); Markey (1984); Matthews, Lawrence, & Ferguson (1983); Minkle (2002); Montgomery (2001); OCLC--Online Computer Library Center (2002); Pedersen & Stockdale (1999); Pope (1999); Randall (1930); Rogers (2001); Savolainen (1999, 2001); Silverstein, Henzinger, Marais, & Moricz (1999); Spink, Bateman, & Jansen (1999); Spink, Wolfram, Jansen, & Saracevic (2001); Summerfield (1996); Summerfield, Mandel, & Kantor (1999)`

(14) The call to focus on user whys and hows is a complex one. Studying user whys has a long tradition in LIS user studies, albeit called by many names -- e.g. satisfactions, evaluations, judgments, relevances, uses and gratifications, interests, goals, purposes, and so on. What is very different about recent research critiques, however, is the call to study user whys in combination with hows. The emphasis on hows points to activity and pointing to activity challenges researchers not to attend to averaging portraits of users across activities but to portraits at specific moments of activity. The other aspect about recent calls that is very different from prior attentions in research to user hows is the call to link whys and hows to specific features of system design and service. In a sense, there is still a concern for whos, whats, and wheres but within the framework of a different and much larger conceptual net.

It is beyond our purpose to do a deep review of the specific ways in which authors call us to conduct user research differently at this time. This would be a purpose of our proposed Phase I if this proposal is funded. But we can list the roster of methodological mandates that are emerging. These will be stated here for ease of presentation as oppositions although given the complexity of current arguments this is a decided simplification. The mandates include focusing on humans that are: a) not just rational, cognitive and purposive but also emotional, value-filled and struggling; b) not just solitary and individualistically driven but also socially anchored and networked; c) not just free to pursue individual aims but constrained as well by societal structures and power; and, d) not just driven by habits which are assumed to manifest activity repetitions across time but propelled as well by adapting and constructing moves in changing situations.

In actuality these calls are not new. They have been emerging in the social sciences and their applied fields for more than 20 years and have been brought forth in whole or part under a large array of names. An important characteristic of these recent calls, however, is the quantity of authors making the calls in the three fields that focus the most attention on user information seeking and use -- communication, library and information science, and human computer interaction. The other important characteristic of recent calls is the synergy that is beginning to emerge from interdisciplinary collaborations between these fields. This synergy, alas, obviously comes at high costs because each field has its own vocabularies, discourse styles, philosophic assumptions, and methods. This is one aspect of these calls that we would attend to in our proposed Phase I project.

Sources which have been helping in addressing these issues include, as examples: Anderson & Perez-Carballo (2001); Bodker (1991); Bogdan (1994); Cole & Engestrom (1993); Decortis, Noirfailise, & Saudelli (2000); Dervin (1999a); Jonassen & Rohrer-Murphy (1999); Engestrom & Middleton (1996); Hjorland (1997, 2000); Holt & Morris (1993); Nardi (1996a, 1996b, 1996c); Ng (2002); Olaisen, Munch-Petersen, & Wilson (1996); .Pejtersen & Fidel (1998); Shneiderman (1998).

Many of these authors focus on one or both of two major theoretic thrusts that are currently permeating the social sciences: activity theory and structuration theory. The roots of the former are most often associated with Vygotsky (1925, 1929); the roots of the latter are most often associated with Giddens (1984). The root theories both involve attention to the linkages between persons, activities, situational conditions, contexts and structures although neither expresses this attention in these words. Both root theories have evolved markedly through use by scholars in many fields. Not unexpectedly, the variants sometimes look as if they did not have the same grandparents.

In LIS research, the impact of these root theories can be seen in virtually every nook and cranny, not just in terrains that have become accepted as user-oriented. Thus, for example, both domain and subject analyses have become foci for user-oriented research driven in good part by research critiques such as those reviewed above. Attending to whys and hows has become a clarion call, albeit a chaotic and disorganized one Here we list the sources we used in organizing our attentions to, in turn: a) user whys; b) user hows (using use of system design features); and c) rigidities versus flexibilities in user information seeking and use across time-space. These are the three foci of attention mapped in Figure 2 in our proposal. We list the sources as a single group because it is a rare source that focuses on only one of these terrains. Thus, for example, a source focusing on user-oriented assessments of relevance may well do so while looking at impacts of relevance on specific searching activities vis-a-vis one or more specific system design features. A second reason for collapsing sources in that in fact attention to whys and hows is not clearly demarked in the literatures. For example, across discourse communities user browsing is conceptualized as task, situation, activity, goal, and use. Or, as a second example, one discourse community's relevance is another's utility, another's authority judgment, another's task; and even another's situation or context.

In addition to focusing on user whys and hows, Figure 2 in our proposal directs attention to the question of trading off conceptualizations of users as constant across time-space versus changeable across time-space. Inherent in attention to activity is the idea of change across situations and time. This is a primary reason why the call to attend to activity which dominates recent research critiques usually includes within it a requirement that research explicitly look at users in changing situations across changing times. This contrasts with most current research on users which holds time-space constant. The argument isn't that there are not human constancies. Rather it is that if we are to trade off one-shot portraits of user information seeking and use (i.e. portraits that assume constancies across time-space) with movement portraits (i.e. portraits that assume changes), the only way we can do so is by looking explicitly both at the potential for change and the potential for constancy in different situations at different times.

We plan to play the two kinds of portraits off against each other in all our project phases, including the state of the art literature reviews. Our aim is to identify agreements and conflicts in the literature regarding these portraits and then to use the results in our empirical work in an attempt to begin to build bridging concepts across the time-space riddle and to identify the conditions under which one portrait is more useful than the other.

As one looks at the current literature there is a clear tension mounting between these alternative portraits. For example, the concept of domain of expertise has long been used as a predictor of user information seeking and use. Users were characterized by their domain of expertise and then compared. Recent work, particularly in electronic environments, begins to challenge this way of categorizing users. Some authors have been examining the concept of domain as more an attribute of user sense-making than an attribute of the knowledge system.

Another example is the call for attention to user differences beyond demographic characteristics. A number of authors have called for a turn of attention to user cognitive style, characterizing users as exhibiting this or that characteristic approach to searching, or problem solving, and so on. Other authors call for focusing on cognitive style only in interaction with situational conditions, suggesting that style is a situational condition not a personality attribute.

These are but examples of the tensions and contradictions in current literature. It is only when readers confine their readings to a single discourse community with its in-bred concepts, definitions, that it is possible to build a stable picture of these conceptual landscapes. When, however, one cuts across fields and discourse communities within fields, the stability collapses. In our proposed Phase I, our efforts will focus on mapping these attentions -- both centralities and diversities -- and developing boundary bridging concepts for making sense of them, and applying them in collaborative efforts. We will explicitly apply the results in our Phases II, III, and IV in order to both arrive at better empirical data, and, at the same time, develop a framework for making the resulting research reports more useful to more users.

For purposes of this proposal, we drew primarily from our three fields -- communication, library and information science, and human computer interaction -- to inform our attentions to user whys and hows and our emphasis on comparing one-shot versus movement portraits of users. Our sources included: Adams & Bonk (1995); Agosta (2002b); Alexander & Tate (1999); Allen (1996, 1997); Allen & Kim (2001); Anderson, T. D. (2000); Baker (1998); Barry (1994); Bateman (1998); Bates (1989); Bilal (2002); Bishop, Bazzell, Mehra, & Smith (2001); Brockman, Neumann, Palmer, & Tidline (2001); Budd & Connaway (1997); Bystrom (2000); Chang & Lee (2001); Cherry & Duff (2002); Choi & Rasmussen (2002); Choo, Detlor, & Turnball (2002); Chu (1999); Cole (1997); Costa & Meadows (2000); Delgadillo & Lynch (1999); Dillon (1991, 1992, 1994); Dillon, McKnight, & Richardson (1988); Dillon, Richardson, & McKnight (1988); Dyson & Haselgrove (2001); Davenport, Higgins, & Somerville (1997); Decortis, Noirfalise, & Saudelli (2000); Dillon & Gabbard (1998); Dilevko & Gottlieb (2002); Egan, Remde, Landauer, Lochbaum, & Gomez (1989); Ellis (1989); Ellis & Haugan (1997); Ellis, Wilson, Ford, Foster, Lam, Burton, & Spink (2002); Ennis, Sutcliffe, & Watkinson (1999); Erdelez (1997); Ferguson, Burch, & King (1993); Fidel (1993); Fitzgerald & Galloway (2001); Fogg & Tseng (1999); Ford, Wilson, Foster, Ellis, & Spink (2002); Ford, Wilson, Foster, Ellis, & Spink (2002); Friedlander (2002); Fritch & Cromwell (2001); Griesdorf & Spink (2000); Griffiths & Brophy (2002); Harmon & Ballesteros (1997); Hjorland (2002a); Horney & Anderson-Inman (1999); Hughes (2001); Klein, Kaempf, Wolf, Thorsden, & Miller (1997); Klobas (1995); Korthauer & Koubek (1994); Kuhlthau (1993, 1999); Limberg (1999); Lopez, Rodriquez, & Hildago (1999); Hornbaek & Frokjaer (2001); Lynch (2001a); Marchionini (1995); Marchionini & Liebscher (1991); Marchionini & Shneiderman (1998); Marshall & Ruotolo (2002); Maughan (1999); Meho & Hass (2001); Mizzaro (1997); Morris (2001); Nahl (1998); Nilsson & Mayer (2002); Normore (1991) Olaisen (1990); Olsen (1994); Paay & O'Brien (2000); Park (1992); Pedersen & Stockdale (1999); Pejtersen & Fidel (1998); Princeton Survey Research Associates (2002); Reed & Tanner (2001); Reid (1999); Rho & Gedeon (2000); Rieh (2002); Rieh & Belkin (1998, 2000); Romanos de Tiratel (2000); Rouet & Levonen (1996); Schamber (1994, 2000); Shneiderman (1997, 1998); Schneiderman, Brethauer, Plaisant, & Potter (1989); Smith, Newman, & Parks (1997); Snyder (1997); Solomon (1999); Sonnewald (1999); Sonnewald, Wildemuth, & Harmon (2001); Spink (1999); Spink & Wilson (1999); Spink, Wilson, Ford, Foster, & Ellis (2002a, 2002b); Talbot, Lowell, & Martin (1998); Tenopir & King (2001, 2002); Tenopir, King, Hoffman, McSween, & Ryland (2001); Tomney & Burton (1998); Tang & Solomon (1998); Thatcher (2001); Toms (1999); Tseng & Fogg (1999); Vakkari (1999); Vakkari & Pennanen (2001); VanNimwegen, Pouw, & van Oostendorp (1999); Walthen & Burkell (2002); Wang (1997); Wang & Soergel (1998); Wearden (1998); Wilson, P. (1983); Wilson, T.D. (2000); Wilson, T.D. & Allen (1999); Wilson, T.D., Ford, Ellis, Foster, & Spink (2000, 2002); Wilson, T.D, Landoni, & Gibb (2002).

(15) Our use of the term "satisficing" needs some explanation because it, too, is the subject of differing definitions and contradictory, even opposing, perspectives in both LIS and the social sciences generally. The term comes originally from the work of Simon (1955, 1956, 1979). As originally conceptualized, the term was intended to describe how humans make decisions in conditions of bounded rationality -- i.e. conditions where time constraints, cognitive limitations, and available information make it impossible to conceptualize decision-making as informed by information on all options. Simon was one of the founders in a sense of a branch of organizational and management theory which has been popularized as "garbage can management". (see, for example, Warglien and Masuch, 1996).

The term is controversial because some authors see a focus on satisficing as a kind of coping out. Wilson, P. (1993b) refers to the focus as limited, narrow, and sub-optimal. Hjorland (1996) charges that an emphasis on satisficing results from short-term pragmatism. In contrast, those who find the term useful anchor their interests in the variety of systems-oriented theories that focus on humans as operating in a world at least partially described by chaos. (See, Dervin 1994, for a discussion of these issues). Agosta (2002a) recently applied the satisficing concept in a study of young people's web-based decision making).

(16) Dervin's Sense-Making Methodology is a generalized approach to studying user information seeking and use in any setting (Dervin, 1999a; 1994; 1992). As a Methodology, it has been developed in response to the kinds of research critiques offered above. It has been a source of such critiques, as well, as indicated below. While it is impossible to count, it is estimated that some 300 studies -- most of them focusing on some aspect of information seeking and use -- have been informed by Dervin's methodology.

Dervin describes Sense-Making as a communication-based methodology because it lays out a set of assumptions that must be met if the interactions between information systems and their users are to be looked at as communication processes rather than simply transmission processes.

The Methodology was developed in beginning form during execution of the U.S. Office of Education funded three-phase study focusing on the development of strategies for dealing with the information needs of urban residents (Dervin, Zweizig, Banister, Gabriel. Hall, & Kwan, 1976; Dervin, Zweizig, Hall, Kwan, & Lalley, 1977; Dervin, Zweizig, Gray, Hall, Kwan, Lalley, Schnelle, & Jung, 1977). This development led to the much cited Dervin & Nilan (1986) ARIST chapter on information needs and uses which has been described as having had a profound effect on studies of information seeking and use in LIS turning the studies to user-orientations (Morris, 1994; Neill, 1987; Vakkari, 1997; Williamson, 1997). A citation analysis by McKechnie, Pettigrew, & Joyce (2001) named Dervin along with Kuhlthau (1993, 1999) as one of the two most cited theorists in human information behavior research.

The Methodology has been applied since 1972 in studies utilizing in-person, phone, focus group, and self-administered interviewing approaches in a wide variety of contexts with sample sizes range from a low of 20 to a high of 1000. Some 30 dissertations (completed and in progress) have utilized the Methodology, including these examples from LIS: Cheuk (1999); Dewdney (1986); Dresang (1981); Ellen (2000); Morris, 2001; Rice-Lively (1996). In addition, a large number of studies of information seeking and use in a variety of fields have used the approach. See the Sense-Making web site for a complete list of dissertations, studies, and authors citing Dervin's work: http://communication.sbs.ohio-state.edu/sense-makig/bib/biblist.html/

There are a variety of Sense-Making informed approaches to interviewing. All focus on having respondents describe real situations that stopped them sufficiently to require new input of some kind from self and/or others. Respondents are then asked to examine their situations in terms of past, present, and future horizons -- history and connections to their lives, questions faced, helps sought, and the various hows of their situation-facing. The central Sense-Making metaphor, focusing on situation, gaps, bridges, and helps, is conceptualized as a boundary object in that it provides an across-diversity tested approach to conducting interviews in such a way that respondents can describe circumstances on their own terms.

Sense-Making has been developed to utilize both qualitative sensitivity and quantitative systematization with applications ranging for entirely qualitative approaches (e.g. Moore, 2001) to highly quantitative. A recent example of a large-scale quantitative application is Dervin & Shields (1999) that does the kind of one-shot portrait versus movement portrait comparison of user sense-making that is envisioned for this proposal. This study used a variety of statistical tools (i.e., analyses of variance, multiple regression, partial correlations) to identify the conditions under which respondent sense-making was predicted by across time-space characteristics (i.e. demography), a priori time-space characteristics (e.g. involvement), or time-space bound characteristics (i.e. situational conditions). The line of inquiry has been a focus of Sense-Making studies for almost 30 years and has produced a series of five award-winning empirical studies: the Dervin & Shields study reported above focused on citizen perceptions of telecommunication privacy issues, the actions they had taken to protect themselves, and their assessments of the utility of these actions in their life conditions. The other four studies all focused on various aspects of information seeking and use: Dervin, Harlock, Atwood, and Grazona (1980); Atwood & Dervin (1981); Dervin, Nilan, and Jacobson (1981); Dervin, Jacobson, & Nilan (1982).

Sense-Making's approach to interviewing utilizes open-ended and close-ended items. Some studies are entirely open-ended. The phone questionnaire envisioned for Phase II of our proposed project uses both and is a typical example of how a Sense-Making interview is constructed. (See Attachments D and E). Thirty years of data document the extent to which this interviewing approach breaks through usual barriers in interviewing situations.

(17) Our approach to focus group interviews envisioned for this project has been informed by: Connaway (1996); Covey (2002); Fern (2001); Krueger & Casey (2000); Merton, Fiske, & Kendall (1956); Morgan (1988, 2002); Robbins & Holst (1990); Scharf & Ward (1986); Walters (1988); and Widdows, Hensley, & Wyncott (1991). Our intent is to build on Phase I (the state of the art literature reviews) and Phase II (the online and phone surveys) extracting in particular issues and contradictions that can best be addressed with the kinds of deep attentions that focus group interviews when well conducted can provide.

(18) Our approach to the structured observations for this project will be informed primarily by approaches to contextual field observation in natural environments that have been developed and used in HCI. The development of field studies in HCI was motivated by researchers who noticed that products that performed well in usability lab studies did not always work well when they entered the real world. A turn to field studies in the 1990s became a way to "bring to light facts in the background of the context of use...." (Carroll, 1997, p. 507). Inspired by the work of researchers trained in anthropology (e.g., Suchman working at Xerox's Palo Alto Research Center (PARC) and Nardi (originally at the Human-Computer Interaction Department at Hewlett-Packard Labs), new approaches to gathering user data began to filter into the HCI research and practice communities. In Europe, a parallel trend, derived in part from legally mandated worker protection laws, focused on the active role of the user in the context of work.

Our approach to structured observations in this proposal is informed, in particular, by these sources: Ball & Omerod (2000); Bannon (1991); Beyer & Holtzblatt (1998); Bodker (1991); Bhavnani & Bates (2002); Card, Moran, & Newell (1983); Carroll (1997); Ehn (1988); Ford & Wood (1996); Greenbaum & Kyng (1991); Human Factors and Ergonomics Society (1988); Macauley, Benyon, & Crerar (2000); Maguire (2001); Nardi (1993); Nardi & O'Day (1999); Normore (2001); Smith & Mosier (1986); Suchman (1987); Viller & Sommerville (2000); Whiteside, Bennett, & Holtzblatt (1988); Wixon & Ramey (1991). As with the focus groups, we plan to draw on earlier project phases to isolate particular issues and riddles that need the kind of contextualized activity attention that field observations can provide. We plan to develop a series of tasks for respondents to engage in, selecting the tasks in such a way that we can best address contradictions emerging from prior project steps. We will especially adapt the observation context to each user's interests based on interviews in Phases II and III. The structured observations will combine observing and interviewing in order to dig deeply into the whys and hows of the way people use system features.

(19) Central to the design of our proposed three-phase empirical inquiry is the use of varying units of analysis -- both the person and the person-in-situation. The latter will look at instances of user sense-making at specific moments in time-space. The use of varying units of analysis is common in Sense-Making studies. See, in particular: Dervin, 1999a; Nilan & Dervin, 1999. Jonassen and Rohrer-Murphy (1999) argue for a unit of analysis smaller than the person because a focus on activity inherently suggests attention not to the person assumed to behave habitually across time-space but to the person acting in specific moments in time-space. Holt & Morris (1993) made a similar call.

(20) Soliciting input from our two advisory committees is a central part of the entire research design in this proposal. There are three major sources of inputs on diversities of research user interpretations of information seeking and use research. The first is the interaction planned between the three investigators who between them represent the diversity of foci plotted in Figure 3 in the proposal text. Each investigator will attend from the framework of her own perspectives to all project phases. The second source of input on diversities of user interpretations is state of the art reviews planned for Phase I. The third is input from the two advisory committees.

The diversities of interpretations and attentions from these inputs will be used to inform our search for boundary concepts. The intent is to use the resulting boundary concepts to enable collaboration in research and design by those with differing interests and practices. Systematic and well-tested procedures for dialogue will be used drawn from Dervin's applications of Sense-Making Methodology to systematic communication practice. (See, in particular, Dervin, 1989, 1999a, 1999b).

Members of the National Advisory Committee will be selected during the Phase I literature reviews. Members of the Local Advisory Committee will be drawn from the library directors for sampled colleges and universities and from their associated public libraries. They will all be invited to participate at the project's initiation. Attachment F includes letters of support from Joseph P. Branin, Director of the Ohio State University Library and from Patrick Losinski, Director of the Columbus Metropolitan Library.

(21) We plan to analyze our data using both quantitative and qualitative approaches -- content analysis for quantification; grounded theoretical approaches for qualitative extraction of themes and patterns, and the development of case scenarios as a means of infusing the results with narrative life and providing additional linkages to design potentials. Our thinking about the complementarities between our varying research approaches and our dual use of quantitative and qualitative analytic approaches are informed, in

particular, by: Carroll (1995); Cresswell (2003); Flick (2002); Jensen (2002). The three proposed investigators are experienced both in qualitative and quantitative approaches. Appropriate computer software packages are available or will be purchased. In-kind contributions from both OSU and OCLC provide ample technical help and access to most software resources.