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NARRATIVE

1. NATIONAL IMPACT

The information confluence and its dilemmas for library-information science practice (*)

The changes in the global information environment are popularly called by a wide variety of names -- the electronic or digital revolution and the information society to name but a few. For library practitioners and for those who design information systems, this revolution is both a best of times and a worst of times.

The best of times. The idea of the digital revolution being a best of times is widely discussed. On the one hand, there are utopian commentaries -- predictions of vast changes in how electronic technologies will permit both quantitative and qualitative improvements -- in, for example, life-long learning, collaborative work, community life, respect for human rights, fostering of democracy, and forging of unifying global interconnections. (1*) The realities may be more modest but are still extraordinary. Study after study deems the diffusion of digital information technologies as remarkable, as probably the most rapid rate of technological adoption in the history of humankind. Recent evidence shows that 64% of adults in the USA use the internet for information searching and 75% of young people choose the internet as their primary information source for just about "everything." Clearly, the internet has already moved from its status as a new technological toy to that of a tool for everyday living (2)

Despite the amount of information available on the internet, research suggests that 91% of American adults believe libraries will play an important role in the future. In learning environments, the rapid increase in the development of online learning resources foretells even greater reliance on library services. (3) Simultaneously, there is a resurgence of interest in reading and the book (4), an interest sometimes expressed as an alarmist cry -- "Will books die? Will libraries die with them?" -- but more often as an understanding that we have entered an age where channels of information complement each other as often as they displace each other. (5)

The worst of times. The idea that the digital revolution constitutes a worst of times for library practice is more subtle. What emerges is a portrait of libraries as more needed and more in demand than ever before, yet facing numerous contradictory challenges. Across the many relevant writings and studies, we extract two major themes. One is a call for libraries to be more things to all people. The other is a call for libraries to return to their core philosophies and practices.

Increasingly, in the midst of diminished resources, libraries are expected to be more user-oriented in all possible ways. They are asked to be more flexible; to serve more diverse communities and cultures; to be mindful of how knowledge excludes marginalized points of view; to reach out to the disenfranchised -- not only to those who lack hardware access but also those who lack conceptual access. They are asked to assist those who find little value in traditional controlled access tools and to understand that there are diverse ways of evaluating information quality other than authority judgments. They are asked to be accountable to all this diversity, to help people grow, learn, and change at one and the same time, as individuals and as constructive members of communities, organizations, work environments, and society. (6)

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* Many references representing three disciplines -- library and information science, communication, and human computer interaction -- were consulted in developing this proposal. Because of space limitations, we cite no references directly in text. Appendix A contains notes and quotable quotes documenting our sources and arguments; Appendix B the entire list of references. Numbers in parentheses refer to Appendix A listings.

While addressing these myriad diversities, libraries are also being asked to return to their core philosophies and practices in order to meet changing demands amid the "lawlessness" of the cyberspace information environment where users increasingly turn to uncontrolled searching mechanisms while at the same time turning to librarians as mediators. Some suggest that libraries must become new kinds of intermediaries, experts not on content but on mapping and evaluating knowledge landscapes, and establishing information accountability, trust, and authority. Others see this as an old call issued with new vigor. Yet others see it as what librarianship should have been doing all the time. (7)

Not unsurprisingly, these challenges for librarianship are all occurring amid an astonishing overload of contradictory empirical findings about user information seeking and use in electronic environments. (8) Virtually every discipline and practice has advanced its own body of user research using more methods and approaches than could be counted. There is virtually no specific finding about user behavior that does not have a contradictory counterpart. Hence, there are a myriad of challenges to LIS practice coming from all directions. The intensity of the contradictions bear a cost to front-line practitioners, resulting in impacts like professional burn-out. (9)

The information confluence: Beginning to answer the riddle of research to serve practice and design

Few would contest the presence of a practice-research gap not only in LIS but in all fields fed by user-oriented research activity. Numerous authors argue that LIS research does not help LIS practice or the design of information systems. (10) Not surprisingly, these critiques draw yet another set of contradictory conclusions. Because research and practice can be conceptualized as emerging from the same source, not unexpectedly the research contradictions reflect the same demands launched at LIS practice.. But, the results are of little help -- we end up challenged to do more research of all kinds and in all ways -- more research on users, diverse users, user situations, user judgments, user use of system features, and so on, forming an endless list. The mandates to LIS researchers are as exhausting as those facing LIS practitioners. In the last few years, however, we begin to see a converging of critiques from European and American LIS research communities. Space does not permit reviewing the numerous writings.(11) Rather, we focus on their implications for generating research directly helpful to LIS practice and system design.

It is as if we face a riddle. On one hand, we have practice being asked to respond to diversity; on the other, to control and organize it. Simultaneously, the research community faces the same dilemma -- a call for multiple methods, perspectives, and attentions yet an inability to synthesize and bridge differences. The answer that is emerging is that both LIS practice and LIS research need to confront the very tensions between unities and diversities that are embedded in the challenges they face. This answer is depicted in Figure 1.

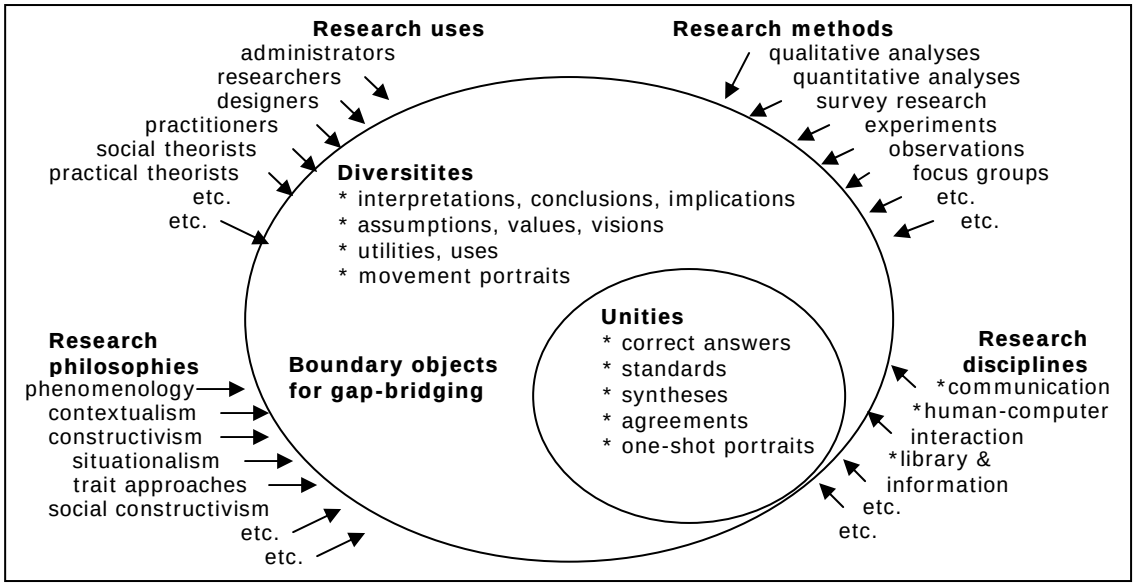

Figure 1: Unlocking the riddle of research to serve practice and design -- the mandate to focus on unities and diversities in research approaches

Only in confronting the tensions between unities and diversities can something more than chaos and contradiction emerge. Both practice and research are being directed by the same call. For practice, some observers suggests the path for libraries as they carve out an essential role in the electronic information future is to become boundary bridging institutions, experts at developing concepts and interfaces which permit those coming to information systems with different world views to be able to access both the centralities of knowledge (i.e. what is agreed upon, what is normative) as well as the dispersions (i.e. what is not agreed upon, what is contested, what is at the cutting edge). For research, the mandate is the same -- to conduct research in such a way that it serves librarianship in this mission. Figure 1 emphasizes the importance of systematizing both the unities and diversities that emerge from multiple inputs -- research uses, methods, disciplines, philosophies. The central idea is that something that is now left to chance must be made explicit -- the search not only for unities in research findings but also for creating boundary concepts and procedures that will permit sense-making across diversities. (12)

Current user research focuses primarily on identifying whos, whats, and wheres -- who uses what from what information source.(13) This is useful information. But the problem is that diversities of use cannot be explained in this way because diversities of use occur at specific times and in specific situations. We need a way of making sense of user diversities so that they become comprehensible. We need not only one-shot portraits of users but movement portraits that focus on varying whens, hows, and whys.

By addressing patterns and variabilities in movement (activities, practices, and uses of specific system features) we can begin to systematize our understanding of users. Indeed, sometimes users and groups of users may behave habitually (or even rigidly) as they move across time-space. However, the chaos of findings in LIS research suggests that the opposite is more often true -- users behave differently as they move across time-space (i.e. across systems, tasks, goals, purposes, etc.). We need to find patterns in that movement, and we need to link movement patterns to specific system design and practice features if we are to yield research results directly useful in practice. (14)

The call to focus on whys hows embedded in movement portraits is pictured in Figure 2 which emphasizes the cyclical, never-ending relationship between the whys and hows. This is an important thrust that has emerged from the chaos of contradictory LIS research findings. The challenge becomes to tease out when and under what conditions movement portraits account better for user information seeking and use than habitual or static portraits and what role specific system and service design features play.

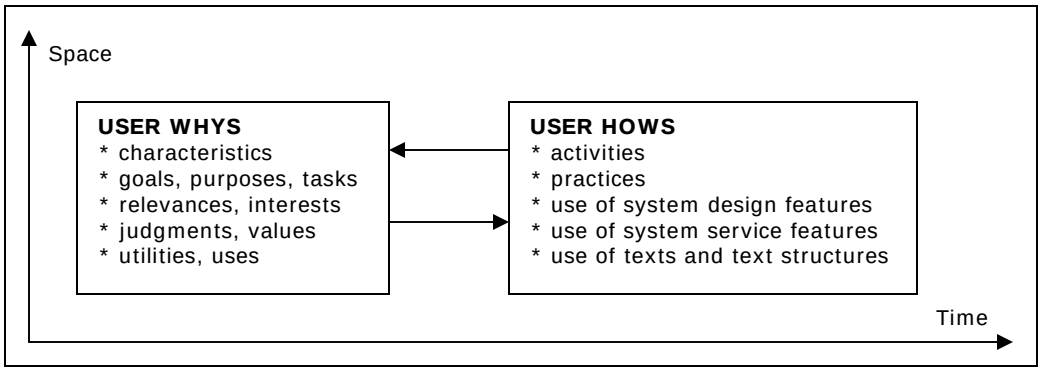

Figure 2: Unlocking the riddle of research to serve practice and design -- focusing on both one-shot and movement portraits of users whys and hows

Our research proposal, in brief: Extracting unity from the chaos of diversity.

Our proposal is for a research project that implements both Figures 1 and 2 above. Specifically we propose to do a multi-disciplinary, multi-method, multi-perspective study of the hows and whys of user information seeking and use in the emerging electronic information confluence so that we:

1) provide useful findings for the arena of information seeking and use studies repeatedly termed as under-researched -- the focus on the whys and hows and the ways system design and service features fit in;

2) emphasize in our data collections and analyses comparisons of portraits of users that are one-shot (e.g. demographic predictions) and those that are movement-based (e.g. how different users in different conditions move through systems); and

3) ask diverse research users (theorists, practitioners, researchers) to interpret our results by using established procedures for dialogue that focus on diversities as well as unities and develop boundary bridging concepts to enable more effective application and collaboration in both system design and research.

2. ADAPTABILITY

The results of this research will be relevant to: a) practicing librarians for the development of user centered services, systems, and resources based on findings interpreted by practitioners as well as theorists and researchers; b) user researchers because we aim to provide break-through portraits of user information seeking use in the information confluence as well as methods of attending to the hows and whys of user behavior; and, c) practitioners and researchers collaborating from different disciplines because we will provide a model of how to address unities and diversities in findings and interpretations. Both the designs for the research (e.g. instruments, analytic frames) and the designs for the interpreting of the research (e.g. multi-perspective dialogues) will be developed as tools available for future projects.

3. DESIGN

This is a multi-discipline, multi-method, multi-perspective study of user sense-making in the information confluence, focusing on the hows and whys that drive users as they satisfice their information needs. We use the terms: a) sense-making, to highlight that for users sense-making (and sense-unmaking) is the perspective from which they approach what experts call information seeking and use; b) confluence, to highlight the evolving geography of the information environment, its merging and changing with time, of often turbulent information streams; and c) satisficing, to emphasize how old models of searching for authoritatively correct answers to given information queries is no longer sufficient as a framework for studying user needs. (15)

Drawing from our presentation above, Figure 3 illustrates the multiplicity of perspectives we will systematically bring to bear on our study of user hows and whys. The three investigators represent between them three disciplines (library and information science, communication, and human computer interaction[*]); three research use perspectives (research, theory, and practice); and three user study approaches (survey research, focus groups, and structured observations). Our proposed project phases are presented below with details offered in the accompanying attachments.

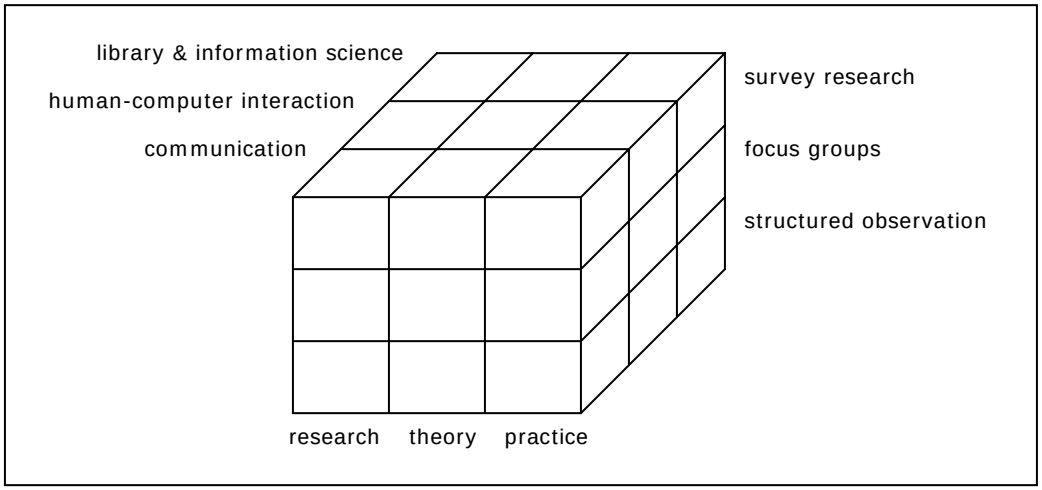

Figure 3: A multiplicity of perspectives for our research design -- disciplines, methods, applications

We propose a two-year research project that proceeds in four phases, all designed so that results and implications are drawn using the multi-disciplinary, multi-method, multi-application grid pictured above in Figure 3. There are many methodological components of our design that are common across phases: use of

[*] Human Computer Interaction (HCI) has long been part of the information science ASIST community. As a field of study, HCI today draws from computer science, cognitive psychology, and design.

units of analysis, specification of variables for attention, data analysis approaches, and procedures for interpretation. These are discussed in more detail after the descriptions of the four phases.

Phase I; State of the art literature reviews focusing on unities and diversities

Central to our project is bringing the multiplicity of perspectives in Figure 3 to bear on the existing literature on the hows and whys of user satisficing of their information needs. We will do three user study literature reviews relevant to LIS design and practice, drawing on the literatures of multiple disciplines. These reviews will focus on:

a) user whys -- evaluation of information inputs and the criteria users bring to bear in evaluations -- authority judgments, varying definitions of relevance, goals, purposes, tasks, values, uses, utilities;

b) user hows -- activities and practices, how users do their information seeking, task practices and their attention and use of system design, service, and text features;

c) linkages between whys and hows; and, in particular, the development of one-shot versus movement portraits in attempts to explain and predict user whys and hows.

Phase II: Sense-Making survey of 400 members of college and university communities

In Phase II, we will conduct in-depth interviews using a combined on-line survey and phone interview of 400 members of college and university communities. This phase of the project will be guided in data collection by Dervin's Sense-Making Methodology that has been documented as having a major impact on user studies of information seeking and use in LIS. The methodology has been developed specifically to address the challenges to practice and research we discussed above. (16)

The populations: Our intent is to study the satisficing of information needs by four user sub-groups -- faculty, graduate students, undergraduate students, and netLibrary subscribers. The four samples are targeted to represent the primary sources of documented differences in electronic information-seeking behaviors: between those with differing levels of scholarly interests (faculty and graduate students compared to undergraduates); those who are young and thus more technologically flexible (undergraduates and graduate students compared to faculty); and those who are early adopters of technology (netLibrary subscribers versus others).

Samples: The target is 100 completed interviews in each of the four sub-samples. Samples will be drawn from the 44 colleges and universities within 100 miles of Columbus, Ohio. (See Attachment C for sampling frame). A list of email addresses for netLibrary users will be provided by netLibrary, a division of OCLC. Other samples will be purchased from a survey sampling company. Estimates of cost and availability were obtained from seven companies. Sample lists will be stratified so that only 33% of the obtained interviews come from the larger class I research institutions, permitting a comparison of users and their situations based on institutional size. Three attempts will be made to contact each randomly selected potential interviewee. The budget includes respondent payments for cooperation. All required human subjects protections will be adhered to. Obtained sample demographics will be compared with population demographics both for Ohio and for the U.S. Past research suggests that our procedures will yield usefully representative samples.

The online survey: The data collection will be divided into two components. The first is an on-line survey based primarily on close-ended, quick-to-use online checklists. Respondents will briefly describe information need situations they have been in and record the sources they used for information input, how often they used them, when, and whether they got inputs electronically or with unmediated contact.

Pre-testing will be needed to solidify situation choice but based on 30 years of Sense-Making studies, we expect to be able to have respondents describe four specific situations: a) the most challenging they faced as a member of their college/university community; b) a situation that involved research or scholarship; c) a situation where most of the input came from electronic sources; and d) a most challenging situation in their lives outside the college/university community. Situations will be selected to address the requirements of studying user information seeking and use in the multi-dimensional ways mandated by recent research critiques . Specifically the aim will be to allow respondents to describe themselves in the contexts of their own worlds, communities, and histories. Emphasis will be placed on "input" rather than "information" so as not to circumscribe user behavior to a system-imposed worldview. Attention will be paid to both college- and university-relevant situations as well as others to permit comparisons. Respondents will be asked about their use of a master list of sources representing the full range of categories of sources

documented in information seeking and use literature. The online survey will also elicit demographic profiles and will form the foundation for all further contacts with respondents. See the draft online survey, Attachment D.

The phone interview: The phone interview, expected to last about one hour, will ask respondents to describe in detail their four selected information need situations elicited in the online survey. The specific questions asked and variables measured will be guided by prior literature and will focus on teasing out, in as much depth as possible, the whys and hows of user information seeking and use as pictured in Figure 2 -- how users saw their situations, what they were trying to do, how they tried, how they saw system features as helping and/or hindering, what would have helped, and what criteria they used each step of the way for judgment. A draft of the phone survey is included as Attachment E.

Phase III: Focus group interviews

From the chaos of findings regarding user information seeking and use, two critiques of user studies have emerged as explanation of the chaos. One says that the source of the difficulty is that users do not know what they want and are inarticulate in expressing their needs. The other says that this happens as a consequence of using research approaches inappropriate to particular aspects of user behavior. In particular, commentaries challenge that addressing hows requires deeper and more contextualized approaches because hows are not only cognitive and emotional but physical as well. We need interviewing approaches that facilitate articulations about practices and that build trust relationships with respondents so that they will be interested in sharing fully their recollections and perspectives. Sense-Making surveys, as designed for Phase II, have been shown very useful in this regard. Sense-Making studies require multiple data collection approaches and, in particular, the three proposed in this project -- surveys, group interviews, and structured observations.

Focus group research has a solid tradition of use in LIS studies as well as the social sciences generally. It is identified as particularly useful for unraveling mysteries in user behaviors. (17) Our plan is to intersect the results of our Phase I literature reviews and our Phase II surveys to draw out questions to be addressed in a series of focus groups to be conducted with sub-sets of the original user samples. Using our design for multiplicities of input (as shown in Figure 3) and focusing on unities and diversities of this input (as shown in Figure 1), we will extract from Phase I and Phase II specific issues relating to our research foci (as shown in Figure 2). We will concentrate on situations where we see riddles that can be unraveled when users have the opportunity to compare and contrast their own perspectives and approaches with those of others and when users can benefit from the memory-jogging synergies of community interaction. During the actual conduct of the groups, participants will be asked to attend to agreements and disagreements in such a way that consensus emerges only where natural and disagreements are anchored in grounding explanations and boundary bridging possibilities.

We plan to identify three topics of attention that capture best the contradictions that emerge from Phases I and II. In each sub-sample (faculty, graduate students, undergraduates, and netLibrary subscribers), we will conduct two focus groups per topic. As is common for focus groups, each group will have eight participants. In this way, it is planned to re-interview 192 of the original 400 Phase II respondents (4 sub-samples x 3 topics x 2 groups per topic x 8 participants each). Respondents will be selected judgmentally to illuminate our interest in diversities and contradictions emerging from Phase I and II results. All the usual human subject protection procedures will be used. The budget request includes participant payments.

Phase IV: Structured field observation

Our final data collection phase will involve in-depth structured observations with 32 of our original Phase II respondents (8 from each sub-sample: faculty, graduate students, undergraduates, and netLibrary subscribers). The specific directions for Phase IV will be drawn from Phases I, II, and III. Our purpose in Phase IV will be to provide an interview situation most conducive to learning from users about their information-seeking and use activities and practices in their usual environments, and, in particular, the ways in which users connect their activities and practices to system design features. It is the hows with attention to system design, service, and text features that past work suggests is the forte of structured observations. (18)

The use of structured observation has about a ten year history in HCI studies and is recently emerging as an approach applied by HCI researchers to information users. We plan to ask 32 respondents to allow us to visit their primary places of electronic information system use (i.e. either their homes or work)

where we will interview them as they are engaged in specific information-seeking and use activities. We will design for each Phase IV participant a set of task activities which represent both their interests and the research questions which earlier project phases suggest as most useful for attention. Informed by a meeting of HCI's approach to contextual inquiry and Sense-Making's contextually-anchored interview approaches, Phase IV interviewers will both observe participant use of system, service, and text features and ask questions especially designed to facilitate user articulation of their information seeking whys and hows.

The intent will be to facilitate user talk about many of the usually unstated aspects of system use as they work through their tasks. Respondent payments are built into the budget request and the usual human subject protections will be implemented. We expect the observation-interviews to last two hours. As in Phase III, participants for Phase IV will be judgmentally selected for the ways in which their explanations of their activities will help us illuminate diversities and contradictions.

Procedures common to all project phases

Transcribing user input. In all research phases, we will capture user qualitative inputs on tape and transcribe them using standard research procedures. Respondents will be given code names so that no respondent's specific contributions can be linked to respondent identity. In Phase III, procedures will be used to map individual user contributions onto the group transcriptions so that individual contributions can be coded both at individual and group levels. In Phase IV, procedures will be used to map observations of user activities and use of system design and text features to user comments and explanations.

Units of analysis. In all analyses we will focus on two different units of analysis. 1) the person -- the individual respondent described with such across time-space attributes as age, gender, academic discipline, rank, institution size, institution type, institution focus; 2) the person-in-situation where we will focus on attributes of specific moments in time-space such as task focus, involvement, constraint, and purpose. In both cases our interest will be in accounting for user whys and hows. The two units of analysis allow us to compare one-shot portraits of users with movement portraits. (19)

Advisory inputs for research analysis and interpretation. Multiplicities of input are central to analyses and interpretations in this project. We will bring to bear the diversities represented by the three project investigators and systematically seek input from two advisory committees using a specially developed listserv for asking questions and eliciting inputs. In addition, we will talk with each committee member at least once a year (and preferably twice) by phone, in invited meetings, and/or at individually arranged talks linked to conference travels. Input from our meetings with advisory committee members will be treated systematically as data -- transcribed and analyzed for its attention to our proposed foci. The two committees are:

a) Local Advisory Committee: We will ask the public and academic library directors associated most closely with each of the 44 academic institutions drawn into our sample (see Attachment C) to serve on a Local Advisory Committee. Our intent is to bring the research versus practice distinction and differences in practice to bear on our plans, results, and interpretations. We plan to hold a once a year one-day conference for the Local Advisory Committee in which a combination of whole group presentations and small group discussions will be designed to elicit input guided by Figures 1 and 2. Informal talks with local library directors indicates high willingness to collaborate. Attachment F includes letters of support from the library directors of the Columbus Metropolitan Public Library and The Ohio State University Library.

b) National Advisory Committee: We will organize a nationally advisory team of 10 experienced researchers who focus on user information seeking and use (6 from LIS studies, 2 from communication studies, and 2 from HCI studies). One-third of these advisors will be researchers selected because of their focus on how research can better serve system design and practice. The national advisors will be chosen after Phase I literature reviews are well underway.

In working with advisory committees, we will use tested dialogic procedures developed for cross-disciplinary, cross-application work. Major emphasis will be placed on attempting to explain diversities in terms of what leads to their existence and to tease out boundary bridging potentials. (20)

Content and thematic analysis. We will use content and thematic analysis in all four phases. Content analysis is the systematic extraction of variables or factors that are then quantified either nominally for qualitative analysis, or numerically for quantitative analysis. When doing content analysis we will use established procedures and tools that permit systematic quantification while retaining qualitative nuances. Standard quality control procedures such as interjudge coding reliability will be used. For thematic analyses

we will use the well-developed procedures of grounded theory and extract both thematic patterns and, wherever possible, scenario exemplars. (21)

The very nature of our design requires that both inductive and deductive procedures be used in all phases. Figure 2 will be guiding foci for all analyses -- the attention to space differences, time differences, and user whys and hows. In addition, the Phase I literature reviews will direct use to unities and diversities which require further study. At the same time, the continuing input from differing research users -- theorists, researchers, and practitioners -- will influence analyses

Guiding research questions. It is not possible to specify hypotheses and research questions as one normally would in quantitative analytic studies because, by definition, our methodology requires an iterative interconnection between all our research phases. The guiding research questions can be listed as follows:

1) What accounts best for user whys and hows and their uses of system designs, services, and text features -- one-shot portraits (based on demographic, institutional, and domain distinctions) or movement portraits (based on tasks, situations, and activities)?

2) Where multiple perspectives arrive at different conclusions and interpretations, what boundary bridging concepts or procedures enable sense-making of these differences?

Pitting one-shot portraits of users against movement portraits. A primary purpose for all Phases is to focus on the conditions under which one-shot versus movement portraits of users are more useful and appropriate and to explain contraditory portraits. This requires not only looking at variables and factors, or even themes, but looking at linkages. We will use all the analytic approaches enumerated above for this purpose but it is here, in particular, that we will use statistical analysis.

In Phase I we will develop quantitative assessments of when, how often and under what conditions one-shot versus movement portraits account for user whys and hows. In Phases II, III, and IV we will explicitly pit these two kinds of predictive portraits against each in accounting for variations in user hows and whys. To do this we will use well-tested multiple regression and correlational approaches for analyzing quantitatively displayed qualitative measures.

4. MANAGEMENT PLAN

Responsibility for the intellectual integrity and directions of the project will reside with the principal investigator (Brenda Dervin at Ohio State University - OSU) and two co-investigators. (Lynn Silipigni Connaway and Chandra Prabha at OCLC). In addition, Michael Prasse at OCLC will serve as a consultant specifically for the HCI focus of the project. Dervin has supervised approximately $4 million (in today's currency values) in grant and contract research. A project manager will be hired to oversee operational management, and will be supervised by Dervin. The team of investigators -- Dervin, Connaway, and Prabha, supplemented by consultant Prasse -- represent long-term involvement and experience in the three fields brought to bear on this project -- communication, library and information science, and human computer interaction. They also bring to bear expertise with the three proposed research methods/approaches -- Sense-Making studies; focus groups; and structured observations of user interactions. Each investigator has some overlapping expertise; each has familiarity with both qualitative and quantitative approaches to research analysis. Conceptual responsibility for Phase I and II will rest primarily with Dervin; III with Connaway; and IV with Prabha although the interdisciplinary mandate of the project will involve all investigators attending to all three phases. Technical assistance with data collecting and analysis systems will be provided by personnel hired specifically for the project at Ohio State University (OSU) and personnel whose expertise will be contributed in-kind by both OSU and OCLC. A graduate student research assistant will be hired to complement the analytic strengths of the project manager. Hourly undergraduate and graduate student research assistance will be hired through OSU to support the extensive literature reviewing, interviewing, and analyses. Fiscal responsibility will reside with the Ohio State University Research Foundation.

5. BUDGET NARRATIVE

The estimated cost for the project is $1,004,845 of which the applicant is requesting $480,542 (48%) from IMLS. The magnitude of the project and the depth of its focus into the hows and whys of user information seeking and use, and the unities and diversities of differing research user perspectives requires a combination of exceptionally deep quantitative and qualitative approaches. This depth of inquiry would not be possible without the extraordinary levels of in-kind contributions offered by OSU and OCLC. For this proposed study, most of the intellectual guidance for its conduct comes from in-kind contributions. The

budget request to IMLS focuses primarily on hiring operational labor and paying respondents for their time. Specific details are provided in Budget Notes, following presentation of the yearly and summary budgets.

6. PERSONNEL

The proposed project involves a large scale collaboration between researchers at OSU's School of Journalism and Communication (Principal Investigator Brenda Dervin) and OCLC's Office of Research. (Co-investigators Lynn Silipigni Connaway and Chandra Prabha, supplemented with consulting expertise from Michael Prasse). Collectively, the researchers have expertise in the following: a) the substantive foci of communication, user studies, information seeking and use studies, information needs assessment, interdisciplinary and intercultural-group communication, library administration and management, information system design; b) the methodological foci of: user-oriented inquiry, survey research, in-depth interviewing, focus groups, structured observation; and c) analytic approaches including text, theme, context, content and variable analytic analyses using both qualitative and quantitative (statistical) approaches. The project team will hire a project manager, envisioned as a recent post-doctoral student recruited from the fields of LIS or communication. In addition the team will include one graduate student research assistant, hired to complement the strengths of the project manager; and a team of approximately five undergraduate assistants working an average of 12 hours per week. Student workers will be recruited from the large pool of able OSU students seeking research apprenticeship training.

Two-page resumes for each of the three investigators are appended. In brief overview, the investigators are:

a) Brenda Dervin, PhDs in communication research (Michigan State University) and social science (honorary, University of Helsinki) and Full Professor of Communication at Ohio State University. Her research is grounded in the communication field and she served on an LIS faculty, is widely cited in LIS literature and is described as having the largest impact on user studies of information seeking and use in the field. Dervin brings to the team expertise in user-oriented interviewing and surveys, dialogic practices, and quantitative and qualitative statistical analysis. She specializes in sense-making information needs and seeking studies. Dervin has supervised approximately $4 million in grants (in today's currency values), including the landmark USOE Bureau of Libraries and Learning Resources 1976-8 studies of the information needs of urban residents. Forty percent of Dervin's time will be contributed in-kind by OSU for each nine-month teaching year. The budget request solicits one-month salary for Dervin's three-month non-teaching, non-salaried off quarter each year.

b) Lynn Silipigni Connaway, PhD in Library and information science (University of Wisconsin-Madison) and Consulting Research Scientist III at OCLC. She is a twenty-four year LIS practitioner, educator, and graduate school director and an expert in the use of focus group, in-depth, and case study interviewing. Connaway also has experience in usability testing and is a frequent author on issues of information organization, comparative collection assessment, information use, and in particular, use of electronic resources and e-books. Connaway was the recipient of one of the first ALA grants focusing on electronic sources (1995 Carroll Preston Baber Research Grant) and has supervised nine research grants in total. Connaway's contribution is offered in kind by OCLC at 33.3% for each year of the two-year period.

c) Chandra Prabha, PhD in Library and Information Science (University of Illinois at Urbana). She is a Senior Research Scientist at OCLC where she has worked for eighteen years. Prabha has experience in public, academic, and special libraries. She has conducted structured interviews and observations of users interacting with library systems and has numerous publications identifying users' interactions and perceptions of information systems, collection use studies, and web technologies in libraries. Prabha evaluated patrons' perceptions of the CIC Virtual Electronic Library (VEL) and identified their awareness of this service, the ease of use of the system, and their satisfaction with VEL's performance. She also has extensive experience working with the OCLC Usability Lab. Prabha's contribution is offered in kind by OCLC at 30% for each year of the two-year period.

In addition, Michael Prasse, Manager of the OCLC Usability Lab and the Human-Computer Interaction team will serve as a project consultant. Prasse has a PhD in Experimental Psychology

(Ohio State University), MA in Experimental Psychology and BA in Psychology and Mathematics (University of Southern Los Angeles). He is a Consulting User Interface Designer at OCLC, responsible for the development of internal ISO 9000 procedures for usability testing and heuristic review and, the development of the internal Development Life Cycle procedures for user interface design. He is the Company consultant and instructor on HTML, JavaScript, interface design, prototyping, and human-computer interaction issues. Prasse's contribution to the project is offered in kind by OCLC for the two-year period.

7. EVALUATION

The specific products planned as outcomes for this project include:

1) Final reports from the four research phases: I) State of the art literature reviews; II) Sense-Making survey; III) Focus-group interviews; and IV) Structured observations;

2) A series of nine papers, each designed to serve both as conference papers and as journal article submissions (See dissemination plan below).

The evaluation of the project will be measured by the extent to which both its findings and its models for collaborative interpretation of research are cited and used by researchers and practitioners in the LIS, HCI, and communication fields.

The very nature of the project with its emphasis on multi-discipline, multi-perspective, multi-method approaches has inherently built into it an on-going evaluation by the two advisory committees -- national and local. Each project phase will be pre-tested and evaluated by multiple inputs before proceeding.

8. DISSEMINATION

All project outputs will be placed on an OSU web-site, and linked to the OCLC web-site. Press releases on pertinent findings will be prepared and distributed to national and professional press. Conference papers and journal articles will be targeted to represent the disciplines of the three investigators -- LIS, communication, and HCI; and will be designed to provide appropriate reports to both researchers and practitioners. We plan scholarly presentations to: 1) Association of College and Research Libraries; 2) American Society for Information Science and Technology; 3) Information Seeking in Context Conference; 4) International Communication Association, 5) Special Interest Group on Computer Human Interaction of the ACM (SIGCHI), with scholarly journal article submission to at least: 1) Journal of the American Society for Information Science and Technology; 2) Information Processing and Management; 3) Journal of Communication; 4) Library and Information Science Research; 5) the ACM SIGCHI Proceedings; 6) College & Research Libraries; 7) International Journal of Human Computer Studies; and 8) The New Information Review. In addition, we plan to generate practice-oriented extrapolations for conference presentation at the American Library Association and Public Library Association, with paper submissions to American Libraries and Library Journal..

To further facilitate dissemination, the data bases that result from this project will remain available for use by both OSU and OCLC for internal research and development. In addition, it will be made available at the cost of reproduction only to other researchers at non-profit institutions who apply for access.

9. CONTRIBUTIONS

Of the $1,004,845, this project is budgeted as costing, 52% comes from in-kind contributions -- 21% from Ohio State University; 31% from OCLC. The collaborating institutions deemed this level of contribution as warranted because of the deliberately innovative focus on interdisciplinarity and multiple perspectives, and the sadly under-researched whys and hows of user information seeking and use.

10. SUSTAINABILITY

Our intent is to provide a model for conducting multi-disciplinary, multi-method, and multi-perspective research useful to practice that will be highly cited and used in LIS, and also in related fields, in particular the user studies terrains of the LIS, HCI and communication fields. We expect this project's findings and models to be highly cited and relied on for the following resources:

a) the state-of-the-art reviews which we see as providing significant anchorings for research in the near future;

b)the specific findings our three-interlocking studies will yield on user whys and hows, and on linkages between the whys and hows and system design and practice;
c)a first large scale project that trades off alternative portraits of users in systematic ways; and
d)a systematic model bringing to bear multiplicities of interpretation in research processes in ways that the resulting diversity and seeming chaos can be made useful.