Approaches to Studying Public Library Networked Community Information Initiatives: A Review of the Literature and Overview of a Current Study

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In a world characterized by the use of rapidly advancing technology, public libraries are championing the rights of the individual to equitable public access to information provided over the Internet. But beyond general connectivity, libraries are also facilitating citizens’ access to networked community information (CI) by actively linking users with relevant sites, by hosting pages for other service providers, and by participating in community networking initiatives. For individuals, the availability of networked CI means that they can access it at anytime and from any place, including the home, office, and public library. This article reviews recent trends in the networked CI literature, including public library involvement, and then discusses a major study underway for which multiple methods are being used to collect data from users, librarians, and service providers in three states. Particular attention is given to explaining the use of theory specification to apply Dervin’s sense-making framework in an online environment.

In 1993, public library leaders and managers suggested that “real ‘down-to-earth’ information services and products would be necessary if John Q. Public...
was to use [the] public library to access the Internet” (McClure, Ryan, & Moen, 1993, p. 26). They suggested that libraries provide public Internet access to “community-based information services in health care, community activities, and unique local resources; ‘Job-net’; government databases; and practical listservs such as autorepair-1” (pp. 26–27), and that libraries participate in community networking initiatives (at the time referred to as Free-Nets). But what has happened since 1993? Have public libraries started offering services and products that address the public’s everyday information needs? If so, how is the public using networked community information (CI) services?

According to Bertot and McClure’s (1998a) latest systematic study of public library connectivity, 83.6% of U.S. public libraries are connected to the Internet in some way and 87.7% of those connected also offer public access. However, questions remain regarding the types of networked CI services libraries offer and how these services are used by the public. To date, comprehensive data regarding public library participation and citizen use of networked CI services are unavailable. Little is known, for example, about how many and what types of libraries are involved in community networking initiatives and what this involvement entails with regard to such organization concerns as funding, staffing, and programming. In-depth examinations are also lacking regarding citizens’ information behavior in networked CI environments, such as the types of situations that prompt citizens to seek CI online, how the information helps, and the role of intermediaries, such as reference librarians. Other imminent questions concern the community-wide impact of networked CI provision and whether such initiatives foster effective community building. If a primary purpose of networked CI services is to strengthen communities by facilitating the public’s information needs through interagency cooperation, then these questions (among others) must be addressed. Answers will assist practitioners in deciding whether and how to offer networked CI services, and will contribute to general knowledge of citizens’ information behavior.

The purpose of this article is threefold: (1) To provide a brief historical overview of public library involvement in CI services; (2) to review recent research trends in the networked CI literature; and (3) to introduce a large-scale study entitled “Help-seeking in an electronic world: The impact of electronic access to community information on citizens’ information behavior and public libraries.” This study is described in terms of its methodology, which includes a nationwide survey along with in-depth case studies of public library—community networking a systems in three states, and its conceptual framework. In response to calls in the library and information science (LIS) literature for more rigorous use of theory in LIS research, particularly in studies regarding information seeking (e.g., Vakkari, 1997), we further explain how Dervin’s (c.f., 1992) sense-making framework was specified to fit the empirical social setting and online environment of the field study. In particular, we demonstrate how sense-making was specified as a unit (or substantive) theory from its metatheoretic form. Finally, the value of theory specification as a technique for conceptualiz-
ing problems and incorporating theory within a study is explained, along with how theory specification may facilitate the identification of theoretical growth elements. While this paper will interest readers who are concerned with either basic or applied aspects of networked CI provision, the focus on theory specification may prove useful to other researchers who are interested in theory application.

HISTORICAL OVERVIEW OF COMMUNITY INFORMATION AND PUBLIC LIBRARIES

As intimated by the respondents in the 1993 McClure et al. study, citizens require equitable and easy access to local resources that can help them deal with the myriad of situations that arise in daily life, such as finding new jobs or daycare services for children, meal delivery or visiting nursing for an aging parent, or state regulations for solving tenant disputes with landlords. Such CI may be defined broadly as:

any information that helps citizens with their day-to-day problems and enables them to fully participate as members of their democratic community. It [includes] information pertaining to the availability of human services, such as healthcare, financial assistance, housing, transportation, education, and childcare services; as well as information on recreation programs, clubs, community events, and information about all levels of government. (Pettigrew, 1996, p. 351)

Public librarians have long recognized the importance of CI for creating and sustaining healthy communities. For almost three decades they have facilitated citizens’ access to CI by providing information and referral (I&R) services, and, perhaps more importantly, by organizing and supporting community-wide information initiatives with local service providers (Baker & Ruey, 1988; Childers, 1984; Durrance, 1984b; Pettigrew, 1997a). Public library CI services arose in direct response to white flight to suburbia, the decay of the inner city, and the urban riots of the late 1960s. Researchers during this period found that “citizens are uniformed about public and private resources, facilities, rights, and programs . . . and frustrated in their attempts to get information required for everyday problem solving” (Kochen & Donohue, 1976, p. 20).

Public library I&R services were aimed at connecting individuals with appropriate community resources that might assist in solving particular problems. While librarians identified, organized, and managed large files of data about their communities, they also became effective intermediaries who engaged in active question negotiation, developed services designed to meet everyday information needs, experimented with emerging information technologies, embraced marketing concepts, and learned to collaborate effectively with other
community agencies (Durrance & Schneider, 1996). Helping clients overcome obstacles (advocacy) and ensuring that appropriate resources were obtained (follow-up) were also described as I&R activities; however, these activities largely failed to become incorporated into standard public library I&R practice (Childers, 1984; Durrance 1984b). During this same period, the funding of many I&R initiatives by external agencies provided researchers with opportunities for studying ways that CI service delivery might inform or enrich the practice of public librarianship (including reference) as well as service evaluation, and signaled a growth in the knowledge of citizens’ everyday information needs and seeking (Childers, 1984; Dervin et al., 1976; Durrance, 1984b; Harris & Dewdney, 1994; Zweizig, 1979).

Findings from this body of research on everyday information seeking indicate that all citizens—despite their occupation, education, financial status, or social ties—encounter situations for which they require CI and thus turn to varied formal and informal sources. Research shows that many people encounter great difficulties in recognizing and expressing their needs for such information and in navigating the local human services web (Agada, 1999; Chatman, 1985, 1990, 1996, 1999; Chen & Hernon, 1982; Dervin et al., 1976; Durrance, 1984a; Harris, 1988; Harris & Dewdney, 1994; Palmour, et al., 1979; Pettigrew, 1998; Savolainen 1995; Warner et al., 1973; Wilson, 1997). Financial, physical, and geographic barriers also prohibit citizens from successfully seeking CI (Childers, 1975). As a result, many citizens cannot obtain needed services or participate in their community’s democratic processes. According to a recent report from the National Telecommunications and Information Administration:

Significant segments of the population still remain unconnected by telephone and/or computer. [There] are still pockets of “have nots” among the low-income, minorities, and the young, particularly in rural areas and central cities. . . . These populations are among those, for example, that could most use electronic services to find jobs, housing, or other services. Because it may take time before these groups become connected at home, it is still essential that schools, libraries, and other community access centers provide computer access in order to connect significant portions of our population. (McConnaughey & Lader, 1998)

Substantial literature suggests that citizens prefer face-to-face communication when seeking help for everyday problems, and that institutional resources—including libraries—are often consulted as a last resort (c.f., Harris & Dewdney, 1994, Chapter 2). For these reasons it is important to note that libraries exist as only one among many distinct access points through which individuals might obtain CI. Moreover, different communities follow different models, including those in which libraries play supporting roles as CI managers that collect and channel CI to other service providers that the public might call upon for assistance.
Recent initiatives of the National Telecommunications and Information Administration (1999), the Gates Foundation (1999), and the W. K. Kellogg Foundation (1999) aim at ensuring full connectivity in all of America’s public libraries by the early part of the next century. While the purpose of these initiatives is to promote viable communities through equitable computer and Internet access, a result is greater collaboration among libraries, service providers, and other groups for improving public access to information about local resources.

One such collaboration in which librarians have participated since the 1980s and which is proliferating throughout the world is community networking. In addition to those networks currently operating in each state, others are flourishing throughout the world in such countries as Australia, Canada, Finland, France, England, Russia, and Singapore. In 1996, the European Economic Commission commissioned a large study of how citizens could benefit from electronic access to CI (Schwabe, 1997), and the BRLIC recently sponsored a similar study regarding citizenship information needs in the U.K. (Marcella & Baxter, in press).

These electronic consortia provide citizens with Internet access to CI and facilitate communication with other people through E-mail, community-oriented discussions, and question-and-answer forums (Cisler, 1996; Durrance, 1993, 1994, 1997; Durrance & Schneider, 1996; Schuler, 1994; 1996). The inaugural publication of the Association for Community Networking emphasized community-building aspects and defined community networking as occurring “when people and organizations collaborate locally to solve problems and create opportunities, supported by appropriate information and communication systems.” A community network was defined as a “locally-based, locally-driven communication and information system” (Gonzalez, 1998, p. 1).

CI is often a central community network feature that appears in many forms. I&R agencies and libraries, for example, may mount their databases on the Internet, while individual service providers may post information about their programs and services. Thus, the architecture of the Internet makes networked CI possible by linking information files created not only by single organizations such as libraries, but by agencies, organizations, and individuals throughout the community (and, of course, the world). This is a major departure from traditional I&R services in which librarians and other CI agency staff work with files about the community that are created on an internal library system.

The roles played by libraries and librarians in community networking vary considerably. Library directors, for example, help community networks create a physical community presence that negates an otherwise virtual existence. As community network partners, libraries sometimes serve as physical headquarters, training centers, or places for housing equipment, and may provide public access terminals (thus providing access to those who lack it) along with meeting space. Librarians and library administrators also use their skills to (1) train people to understand and use the Internet, (2) answer questions on how to participate in a community network, (3) help people gain E-mail access, and (4) de-
velop and provide brochures and other materials. They also provide leadership through writing funding proposals, providing staff for community networking activities, and fostering collaboration among community partners (Durrance & Schneider, 1996).

Library participation in community networking is a particularly important partnership. While participation holds significant potential for improving citizens’ access to CI, and hence, needed resources, it also requires substantial resource and staffing commitments of the public library along with serious consideration of its service mission. The implications for library participation in Internet access initiatives were discussed recently by McClure and Bertot (1998), who remarked:

Libraries’ use of the Web significantly increases the range and extent of resources and services available to the residents of Pennsylvania and results in numerous benefits. These benefits, however, do not come without a price. The site visits found that the Web presence for many of these (and other libraries in the state) resulted from individually dedicated librarians and community volunteers who contributed significant time and effort to developing and maintaining the Website. The study found that many librarians wonder where the funding for maintenance and for the continuous upgrading of Web-based service that the public demands will come. Further, many libraries, particularly small libraries and branches are overwhelmed by the tremendous demand for such services. (p. 25)

But as a result of community networking and the Internet, citizens can access networked CI through terminals in their public library while seeking help with related search problems from librarians. In short, networked CI means that citizens can access CI at any time and from any place, including the home, office, and public library.

Life in an electronic world poses several fundamental problems for research by the LIS community. Questions that are just beginning to be addressed include:

- How do citizens seek help using networked CI?
- How are public libraries facilitating citizens’ CI needs by participating in networked CI initiatives such as community networking?

These questions reflect those succinctly articulated by Savolainen (in press) and Bishop (1997). In her course syllabus at the University of Illinois, Bishop raises important questions about community networks, such as:

- The degree to which they strengthen social bonds as opposed to weakening them by reducing face-to-face interactions;
- The extent to which they are used by people representing the full socioeco-
nomic spectrum; the degree to which their use helps solve community problems;
• Their ability to maintain valuable and accurate online community information resources;
• The extent to which they present people with usable interfaces and information retrieval mechanisms; and
• The degree to which they are sustainable as organizations.

Schement (Benton Foundation & Libraries for the Future, 1997, p. vi) also stressed the importance of understanding the context in which citizens seek information and adopt new technologies. In reference to citizens in the information and technology age, he observed that while “the real transition is local, its implications are global,” and forewarned that libraries “lag in [their] understanding of the [this] social context—a context in which libraries will have to justify themselves.” He suggested that libraries should consider “how Americans [will] live their lives as citizens, as economic actors, and as social beings” in the coming decades. Putnam (1995) made similar observations on the decline of social capital in American communities.

**RESEARCH TRENDS IN THE NETWORKED CI LITERATURE**

Across the spectrum, academics, professionals, service providers, government, and funding agencies agree that both basic research and empirical evaluation of existing networked CI services is needed. However, as a review of the literature reveals, only small pockets of systematic research are underway and this body of work is spread across different countries and is sometimes incorporated as a subsection of a larger report on a related topic, such as connectivity (e.g., the McClure & Bertot studies). In general, the literature can be divided into three categories: papers that focus primarily (albeit some overlap does occur and thus categories are not entirely mutually exclusive) on networked CI services through (1) public libraries, (2) community networks, and (3) other service providers that make information about their services available online. Paper focusing on networked CI may be then subclassified into five categories:

• Basic research—the authors discuss results from an empirical study of, for example, networked CI design or users’ information needs, seeking, or use that is grounded in a conceptual framework and is aimed at making contributions to a particular area of knowledge.
• Policy research—the authors assess the impact of federal, state, or local government policy on such issues as universal service and public access on the ability of public libraries to provide networked CI services.
• Applied research—the authors discuss results from an empirical study of, for example, networked CI design, or users’ information needs, seeking, or
use, where the primary aim is to produce results that can be applied in a particular empirical context.

- **Argumentation** — the authors discuss reasons for service-provider (including public library) participation in networked CI provision, etc.
- **Descriptive** — with respect to a particular organization(s) or network(s) the authors describe how networked CI services were implemented, discuss policy such as acceptable use or posting standards, or focus on technological aspects such as interface design, telecommunications, or hardware/software requirements in networked CI provision.

Table 1 shows a matrix formed by listing these three major and five subcategories for types of papers. Each cell contains the author(s) and publication year of

### TABLE 1

**Networked Community Information Literature- Paper Types**

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<thead>
<tr>
<th>Type of Paper/NCI Focus</th>
<th>Public Libraries</th>
<th>Community Networks</th>
<th>Service Providers/ Government</th>
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(continued)
representative papers. Schuler’s works from 1994 and 1996, for example, are grouped under “community networks—descriptive” because he described different community networks in terms of their organization, requirements, services, etc. In a similar vein, Bluming and Mittleman (1996) discuss benefits of the Los Angeles Free-Net for health information users. Milio (1996), on the other hand, addresses the need for electronic health networks to include CI, while Borgstrom (1998) argues that community networks should seek external funding and nurture outside contacts more aggressively, and Howley (1998) explains the significance of human computer interaction for networked CI provision. Thus, these three papers are grouped under “community networks—argumentation.”

Although the matrix is not inclusive of all papers published on networked CI provision, the distribution nonetheless suggests that the vast majority of papers, whether they focus primarily on public libraries or community networks, are of an applied or descriptive nature. Also of interest is that four of the nine papers considered “community network—basic research” were masters’ theses. The overall richness of the papers examined suggest that several research directions are emerging that warrant systematic investigation. As shown in Table 2, the 46 research papers (applied, basic, and policy) encompass varied aspects of networked CI services, including community development, evaluation of public library initiatives, government CI, history and organization, human computer interaction, human information behavior (i.e., how individuals need, seek, and

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### TABLE 1
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<tr>
<th>Type of Paper/NCI Focus</th>
<th>Public Libraries</th>
<th>Community Networks</th>
<th>Service Providers/Government</th>
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<tr>
<td></td>
<td>Fietzer (1996)</td>
<td>Bluming/Mittelman</td>
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<td></td>
<td>Gall/Miller (1997)</td>
<td>Fichter/Martin (1997a&amp;b)</td>
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<td>Stearns (1996)</td>
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**Note:** Cells contain authors’ names and publication year of representative papers (*MA Thesis).
Several authors, including those of descriptive papers, discussed networked CI services with regard to specific types of information such as health (Bluming & Mittelman, 1996; Clark, 1997; Fichter & Martin-Brownell, 1997a; Guard et al., 1996; Milio, 1996) and transportation (Rathbone, 1997), or particular geographic areas (Guy, 1966). Others focused on cross-cultural comparisons (e.g., Ormes & McClure, 1997; Surak, 1998), and interagency cooperation (e.g., Fichter & Martin-Brownell, 1997b; Gall & Miller, 1997; Pettigrew & Wilkinson, 1994; Schuler, 1997). Although questionnaires remain a popular form of data collection, multiple qualitative and quantitative methods were used, especially by authors whose papers were grouped under “basic research.”

As one might expect, the conceptual frameworks authors employed were as varied as the research topics. Toms and Kinnucan (1996), for example, used theoretical models of metaphor and visual representation in interface design, while Bertot and McClure (1997) developed a “national data collection paradigm” for evaluating public library Internet connectivity that they have used in several studies. Bishop, Tidline, Shoemaker, and Salela (in press) studied users’

### Table 2

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<thead>
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<th>Topic</th>
<th>Examples</th>
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<td>Government CI</td>
<td>Wyman et al. (1997)</td>
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<td>Training</td>
<td>Yerkey (1997)</td>
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<tr>
<td>Transportation CI</td>
<td>Rathbone (1997)</td>
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*Note:* Right column contains authors’ names and publication year of representative papers.
information behavior from an information poverty perspective, while Pettigrew and Wilkinson (1996) used an information access policy framework, and Savolainen (in press) and Morgan (1997) drew upon “way of life” and community attachment theory, respectively.

In answer to the questions posed at the outset of this paper (Have public libraries started offering services and products that address the public’s everyday information needs? If so, how is the public using networked community information (CI) services?), there is little doubt that libraries are participating in networked CI provision in varied ways. However, systematic research on the types and degree of service provision is lacking; the evidence only confirms that the phenomenon is occurring. While self- and anecdotal reports, along with the results from large, general studies conducted by McClure and Bertot (with others), the Council on Library Resources (1996), and the Benton Foundation and Libraries for the Future (1997) as well as from small-scale investigations (e.g., Resnick, 1997), for example, indicate that public libraries are involved in networked CI provision (frequently through community networking), comprehensive data regarding indicators of nationwide participation and organizational impact are currently unavailable.

Correspondingly, there exists a paucity of solid evidence regarding citizens’ information behavior when interacting with networked CI, specifically on the situations that prompt users to seek networked CI, their perceptions while seeking and interacting with networked CI providers and systems, and the uses that individuals make of the information, i.e., how the CI helps (c.f., Dervin & Nilan, 1986). Instead, and consistent with Julien’s (1996) observations of the general needs and uses literature published from 1990–1994, most related networked CI studies are from the professional literature, and report user and use statistics. Thus it seems that the early networked CI literature is akin to the general public literature that Zweizig and Dervin (1997) criticized as providing little insight into the uses that people make of information and information systems. Moreover, the findings from these studies often conflict, especially with regard to user sociodemographics. In short, while respondents, such as those in Geffert’s (1993) survey, indicate that they value public access to networked CI in libraries, systematic research is sorely needed.

The more encouraging note—as witnessed by the 18 papers grouped under human information behavior—is that research interest in citizens’ use of networked CI is increasing. Savolainen (1998), in his typology of empirical research on networked information use, concluded that “use studies in the context of non-work activities still form a minority but interests towards this subfield seem to be growing.” In remarking on the rising popularity of triangulated qualitative research methods, he added that such studies might be rendered “more profound” by employing “approaches [that] discuss the use of networked services as part of everyday life practices” (p. 342). On the whole, Savolainen’s observations are equally tenable in this review: while a majority of the applied and descriptive studies employ questionnaires or analyze transac-
tion log data that reveal user sociodemographics and system- or page-use frequency (e.g., Harsh, 1995; Harvey & Horne, 1995; Patrick, 1996, 1997; Patrick & Black, 1996a, 1996b; Patrick et al., 1995; Schalken & Tops, 1994), there is a definite movement toward using multiple qualitative methods (e.g., in-depth interviewing, structured observation, participant diary-keeping, focus groups, etc.) in conjunction with quantitative approaches.

Three studies of particular note are Bishop et al., (in press) and McClure & Bertot (1997, 1998), which used multiple methods to investigate the types and uses of information that citizens seek online. Rich findings were reported by Bishop et al., regarding household interviews and focus groups in low-income neighborhoods with users and potential users of the Prairienet community network. The most frequently cited CI needs concerned “health, parenting, education, leisure activities, and employment opportunities.” As Bishop et al., further reported:

Interview respondents also wanted more easily accessible information about available and affordable services of all kinds . . . services provided by organizations like the Urban League or Salvation Army, and those relating to rent subsidy and food banks were frequently mentioned. In addition to subsistence information, participants . . . sought information about church, sports and recreational activities, local government, creative pursuits, legal services, and volunteer opportunities.

Responses regarding needs for networked CI were similar. Bishop et al., identified the following areas in order of frequency: community services and activities, resources for children, healthcare, education, employment, crime and safety, and general reference tools. When seeking CI, respondents identified personal contacts at community organizations and close members of their social networks as the most important sources, and valued these sources for their “advice” and “recommendations.” For obtaining networked CI, respondents “consistently recommended public libraries, community and public housing recreation centers, and social service organizations as public access computing sites. In discussing the advantages and drawbacks of both home and public community network access, Bishop et al., remarked that “computer use will not readily take hold among low-income community residents until they are able to find a way around the splintered ecology of access within which they currently live.” Their recommendations for how libraries might provide more effective networked information services are aimed at complementing citizens’ lifestyles, constraints, and information-seeking patterns.

Two other major studies that examined citizens’ needs for networked CI were conducted by McClure and Bertot (1997, 1998), who focused on Pennsylvania public library use. From desk log anecdotes, they identified several types of library impact, including: impacts of critical information, local history/gene-
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ology benefits, educational benefits, economic benefits, medical/legal impacts, technological impacts, benefits from pleasant environment, socialization/networking impacts, and impacts on the hard-to-serve. Similar to Bishop et al., the 1998 findings reported by McClure and Bertot are very rich, especially with regard to the specific types of situations that prompt citizens to seek CI—including networked CI—at libraries. Of the many concrete examples they offer, one includes a patron who was a victim of a physical attack and needed legal information (beyond that provided by the authorities) about her rights. A second example involves a patron who works with welfare recipients who are about to lose their benefits. A third situation shows a patron who needed information about admitting someone to a long-term care facility. As one respondent explained, “the library is a resource for the community to use to solve its most difficult problems and to resolve life’s worst troubles” (p. 26). With regard to Internet use (1997), in particular, it was public access that drew 26% of survey respondents to the library (n = 1,925). Moreover, 34.5% of respondents had no other form of Internet access, and while the majority reported positive experiences with system use they comprised both experienced and novice users.

In sum, it appears that public libraries have begun offering networked CI services as part of renewed efforts at meeting the needs of John and Jane Q. Public, and that citizens do access this CI through library terminals and from other venues. However, as our review of the literature indicates only a few researchers have begun to address the situational or contextual factors that prompt citizens to seek CI online, how networked CI helps (or does not help) citizens with daily living, and how it affects their overall help-seeking or information behavior, especially with regard to public libraries. Moreover, little research has focused specifically on the national impact of networked CI provision on public libraries, the degree to which public libraries are participating in community networking, the role of reference service in networked CI provision, and on how public libraries and their service provider partners expect networked CI will help their clients and communities. Without appropriate tools for evaluating their participation in networked CI provision and community networking specifically, libraries cannot entirely justify the receipt of public support and cannot fully adapt their services to meet the growing needs of the public for information in new formats. Tools designed in the 1980s and 1990s (e.g., Kindel, 1995; Robbins & Zweizig, 1988; Zweizig et al., 1994) are not entirely adequate for evaluating electronic service delivery because they do not account—in Bertot and McClure’s (1997, p. 12) terms—for the complex “multi-dimensionality of electronic networks.” Indeed, the W. K. Kellogg Foundation held an invitational conference on the topic of evaluation, and developed a guide (1998) to effectively evaluate social programs and services. As a result, planners are encountering difficulties with measuring the impact of networked CI services on users, communities, and libraries (as organizations), and therefore cannot determine whether such Internet initiatives are effective and cost-efficient in terms of resource and staff allocation.
In response to these trends a major study is underway. The next section discusses the objectives, methodology, and conceptual framework of this study.

CURRENT STUDY

Overview, Objectives and Methodology

“Help-seeking in an electronic world” is a two-year study supported by the U.S. Institute of Museum and Library Services, and the Social Sciences and Humanities Research Council of Canada. This unprecedented, large-scale investigation of networked CI attempts to address gaps in the research literature regarding citizens’ online information and communication behavior when seeking help for everyday situations. The results will be used to develop an evaluation framework and instruments for use by librarians. Through conducting a nationwide survey regarding public library involvement in community networking, followed by case studies in three U.S. communities, we will address how public library initiatives for providing Internet access to CI are affecting all players in the community, including the public library. Within the social context of anytime and multiple place use, this broad, holistic framework includes the perceptions and expectations of:

- Citizens who access CI on the Internet;
- Librarians who assist citizens with Internet searches for CI;
- Library administrators and staff who are involved in networked CI initiatives (community networking, specifically) on behalf of the library;
- Service providers who post information about their services on the Internet; and
- Citizens who use the services on which CI is posted but who do not access that information through the Internet (i.e., non-Internet or potential users who may lack access to infrastructure, skills, knowledge).

Thus, our primary objectives are as follows:

- To gather systematic evidence of citizens’ online information behavior while searching for CI on the Internet (these impact indicators will include users’ perceptions and expectations).
- To compare citizens’ perceptions and expectations of networked CI with those of the service providers who post that information.
- To investigate the role of librarians in assisting the public with Internet searches for CI.
- To determine the organizational impact of public library participation in networked CI initiatives.

Data are collected using multiple methods. The first is a national general survey with 1000 medium- and large-sized public libraries regarding the types and
degree of their participation in networked CI provision. Then, using a standard design or template (see Appendix), triangulated methods are used to conduct intensive case studies in three communities (in three different states) nationally recognized for their community network and in which the local public library system plays a leading role. Data collection methods at each site include an online survey, in-depth interviews, field observation, and focus groups. The online survey is available to adult users who access CI pages. Equal numbers of respondents from each community are then interviewed and included in focus groups. Qualitative data are examined for such themes as best practices, while quantitative data are analyzed for such patterns as the relationship between users’ perceptions of how they were helped by the electronic CI and their willingness to access it again for help in similar situations. Beyond gathering systematic evidence of citizens’ online CI behavior, this study will result in a suite of methods and tools that librarians can use to evaluate their community contributions through networked CI. These tools include survey instruments that can be implemented in electronic environments, interview and focus group guides that can be adapted for use in different settings, and best-practice guides.

Conceptual Framework

The study is grounded in Dervin’s sense-making framework, which is a set of user-centered assumptions and methods for studying the uses individuals make of information and information system (c.f., Dervin, 1992; Harris & Dewdney, 1994; Savolainen, 1993). According to the framework, as people move through life they encounter gaps in their current knowledge that can only be bridged by making new sense of their situations. To this end, people use varied strategies to seek and construct information from different resources or ideas. In Dervin’s terms, sense-making rests on the “discontinuity assumption” and views communication and information use (i) as a construction (ii) from the actor’s or user’s perspective, and as a (iii) process condition (1992, pp. 61–67).

Sense-making facilitates the study of different aspects of human information behavior. Our research includes two aspects: (1) Users’ assessments of the helpfulness of networked CI, and (2) users’, nonusers’, and service providers’ constructions or images of these systems. For the latter, we will gather and compared the perceptions of different players regarding how CI is constructed and used through electronic communication. This interest in the public and social contexts in which individuals seek and use networked CI reflects Tuominen and Savolainen (1997), who advocate using social constructionism to study information use as discursive action. Broadly defining discourse as all formal and informal forms of spoken interaction and written text (which we assume to include electronic), they describe information use as an activity that can be analyzed for individuals’ discursive (1) construction of information, and (2) active use of that constructed information. Hence, their view that information use is “constructive and functional in the sense that it is oriented to action,” and their focus on
“discursive constructions of previously received or sought information and on how those constructions are put to use in talk or writing” (p. 82). Tuominen and Savolainen’s approach complements Dervin’s framework because it seeks further explanation of how individuals construct and use information. Our use of their combined approach is novel because we are testing its applicability as a framework—and as a methodology with respect to sense-making—for understanding electronic communication in online environments. But, how will this framework be employed? And, how does it relate to the study’s parameters? We address these questions next.

How LIS researchers apply theory in their work and its effects on the discipline is a topic of both study and debate. Chatman (submitted) and Grover and Glazier (1986), for example, discuss aspects of theory building, while McKechnie and Pettigrew (1998) describe an increase in theory use in the journal literature and the emergence of a theoretical core unique to LIS. But attention has also focused on the need for tools that researchers can use for applying theory and for measuring different aspects of theoretical activity and growth. One such framework is a structuralist approach recommended (and explained in-depth) by Kuokkanen and Savolainen (1994), Vakkari (1997, 1998), and Vakkari and Kuokkanen (1997), which is based on the work of sociologists Wagner and Berger (1985). Useful on many levels, their framework is particularly germane to researchers who want to apply a theory within a particular setting and later analyze its usefulness. Their technique—referred to here as theory specification—facilitates both theoretical rigor and the identification of such conceptual growth elements as elaboration. For these reasons we used theory specification to apply sense-making to our current study.

According to Vakkari (1997, p. 452), sense-making is an orienting strategy (a type of metatheory) because it contains “ontological, epistemological and conceptual presuppositions of a very general nature [that] are not so much about processes like information seeking that occur in the social world as they are about the ways of thinking and speaking about those processes.” In other words, the “cognitive function” of these presuppositions “is to offer guidelines for actual theory construction.” Sense-making also qualifies as a working strategy (a second type of metatheory) because Dervin discusses it in conceptual and methodological terms (e.g., “circling the moment,” “verbing”) using her situation-gap-use triangle metaphor. In this sense, she is “orienting the theorist to a specific set of substantive research questions” and is providing “a general model of the research object” (Vakkari & Kuokkanen, 1997, p. 500).

As a metatheory, sense-making is not testable. Instead, it must be specified as a unit (or substantive) theory by placing it in a concrete or empirical social setting. As a unit theory sense-making can be tested empirically because it deals directly with a social process (i.e., information seeking), and contains “a set of concepts and a set of assertions relating those concepts in an account of some social phenomena [that] are intended as answers to specific research questions” (Vakkari, 1997, p. 453). In the remainder of this section we provide
a brief overview of how we specified sense-making using the following four steps that were shortened from Pettigrew (1997b):¹

- Step 1. State the metatheory’s key concepts.
- Step 2. Specify the field study’s research questions and key concepts.
- Step 3. Specify the field study’s concepts in relation to the metatheory’s and look for emerging concepts.
- Step 4. Derive the unit theory concepts.

**Step 1: State the Metatheory’s Key Concepts**

Central to the sense-making metatheory are three concepts: the individual’s situation, the gaps or information needs that accompany that situation, and the uses that the individual makes of information as a result from information seeking, which Dervin models using the situation-gap-uses triangle (1992, pp. 68-73). However, two other concepts that might be implicitly derived include: the process (including barriers) of information seeking, and how the individual is helped as a result of seeking and using the information (i.e., Dervin’s “helps”). These five metatheory concepts (MC) are labeled:

- MC1: The individual’s situation;
- MC2: The gaps or information needs that are a result of that situation;
- MC3: The process of information-seeking;
- MC4: The uses that the individual makes of the information; and
- MC5: How the individual was helped as result of seeking and using information.

**Step 2: Specify the Study’s Research Questions and Key Concepts**

Our field study is guided by the following research question: How is community information socially constructed and used by users, service providers, and intermediaries through discursive action in networked environments?

This question was made more specific by addressing ten components,² which are listed in column one in Table 3. We distinguished questions five through

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¹ In Pettigrew (1997b) additional steps comprise stating the research problem in terms of the study’s concrete social setting and modeling the metatheory’s and unit theory’s key concepts. In her example, Pettigrew specified Granovetter’s (1973, 1982) theory of the strength of weak ties as part of her dissertation research on communication between nurses and the elderly at community clinics.

² Questions we are investigating but which are excluded from the specification exercise include: (1) how are libraries participating in networked CI services and with what effect? (2) how has library access to networked CI affected reference service, in particular? (3) what
specific tools and processes do librarians require for evaluating the organizational impact of networked CI services? (4) what “best practices” for library participation in networked CI provision can be identified that will benefit other libraries and communities? and (5) what tools can be developed that will facilitate these best practices? Our investigation of these questions, (1) in particular, is guided by Bertot and McClure’s (1997, p. 12–13) national data collection paradigm for network environments.

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Field Study Concept (FC)</th>
<th>Metatheory/S-M Concept (MC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What factors prompt citizens to use/not use the Internet for obtaining CI?</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2. What specific types of help are citizens seeking?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3. What are users’ perceptions of CI as they seek it online?</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. How do users deal with barriers that they encounter?</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. What do users do with networked CI? (i.e., uses)</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. What assistance do users receive from services on which they sought networked CI?</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>7. How does networked CI actually help users with their situations?</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>8. How do service providers perceive posting CI on the Internet using particular techniques will help (a) clients, (b) their organizations, and (c) the community?</td>
<td>4</td>
<td>nga</td>
</tr>
<tr>
<td>9. How do librarians expect participation in networked CI delivery will help (a) clients, (b) the library, and (c) the community?</td>
<td>4</td>
<td>nga</td>
</tr>
<tr>
<td>10. How do the public’s perceptions of networked CI relate to those of service providers and librarians?</td>
<td>2 and 4</td>
<td>nga</td>
</tr>
</tbody>
</table>

*a, ng, not given

**Field Study Concepts (FCs):** FC1, contextual factors that prompt an individual to seek help through CI online; FC2, individual’s construction and seeking of CI online; FC3, effect of obtaining networked CI on the user; FC4, service Provider’s and other individuals’ construction of networked CI.

**Sense-Making Metatheory Concepts (MCs):** MC1, individual’s situation; MC2, gaps/information needs that result; MC3, process of information-seeking; MC4, uses the individual makes of the information; MC5, how the individual was helped as a result of seeking and using information.

seven on information use, tangible assistance, and overall helpfulness, respectively, because findings reported by Pettigrew (1998) suggest that they are unique phenomena. As shown in column two (Table 3), these 10 questions were then paired with one or more of the following four field study concepts (FCs).
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- FC1: Contextual factors that prompt an individual to seek help through CI online;
- FC2: Individual’s construction and seeking of CI online;
- FC3: Effect on the user of obtaining networked CI; and
- FC4: Service providers’ and other individuals’ construction of networked CI.

The fourth study concept, “service provider’s construction of networked CI,” includes both service providers, who post information about their services on the Internet, and librarians, who might interact with users as they seek CI online or who facilitate networked CI services in other ways.

Collectively, these conceptualizations intimate a user who is motivated by different contextual factors (c.f., Pettigrew, in press) to seek help through networked CI. As part of seeking CI online, the user interacts with different service providers through their websites or pages, and may also interact with intermediaries, such as librarians, or with other individuals. The discursive interaction between the individual and service provider via electronic print, as well as with other individuals who are present during the search through oral communication, results in the construction of networked CI. Throughout this interaction the individual’s perceptions of the situation and its inherent factors may change. As part of seeking, constructing, and receiving networked CI the individual is affected in different ways that may lead to using the CI in varied ways that are equated with different forms of instrumental, cognitive, and affective help. This notion is supported by findings regarding CI use reported by Bishop et al., (in press) and McClure and Bertot (1997, 1998). Mismatches are expected to occur among the individual’s, service providers’, and intermediaries’ perceptions of networked CI. Similar incongruence regarding users and service providers’ perceptions of CI need and use were identified by Childers (1975), Harris and Dewdney (1994), Ontario Ministry of Culture and Communications (1991), and Pettigrew (in press, 1998).

Step 3: Specify the Field Study’s Concepts in Relation to the Metatheory’s and Look for Emerging Concepts

As further shown in Table 3 (columns two and three) as well as Figure 1, when the concepts from the field study and the metatheory are cross-listed, only one concept exists for which the sense-making metatheory does not readily account: “service provider’s construction of networked CI,” which relates to research questions eight, nine, and ten. The remaining three unit-theory concepts are related in some explanatory way to the five sense-making concepts. Because an understanding of service providers’ construction of networked CI is critical for gaining a holistic understanding of how CI is constructed in electronic environments, the sense-making metatheory requires adaptation or elaboration. In its current form, sense-making depicts the user as isolated from other players who might play important roles in the construction of CI online. To derive the final unit theory, the metatheory must be elaborated such that the social construc-
FIGURE 1
Correspondence between Field Study Concepts and Sense-Making Metatheory Concepts

<table>
<thead>
<tr>
<th>Field Study Concepts (FCs)</th>
<th>Sense-Making Metatheory Concept (MCs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC1 Contextual factors that prompt individual seek CI online</td>
<td>MC1 Individual’s situation</td>
</tr>
<tr>
<td>FC2 Individual’s construction/seeking of CI online</td>
<td>MC2 Gaps/information needs that result</td>
</tr>
<tr>
<td>FC3 Effect of obtaining networked CI on the user</td>
<td>MC3 Process of information-seeking</td>
</tr>
<tr>
<td><strong>FC4 Service Provider’s/other’s construction networked CI</strong></td>
<td>MC4 Uses the individual makes of the information</td>
</tr>
<tr>
<td></td>
<td>MC5 How individual was helped as result seeking/using information</td>
</tr>
</tbody>
</table>
tion of networked CI is depicted clearly as a communication process between two or more individuals.

**Step 4: Derive the Unit Theory Concepts**

The results from specifying the field study concepts in terms of those in the sense-making metatheory suggest our unit theory should contain the following concepts (UCs):

- **UC1**: Contextual factors that create information gaps or needs that prompt individuals to seek help through networked CI;
- **UC2**: Process of how individuals construct and seek networked CI;
- **UC3**: Instrumental, cognitive and affective effects on individuals as a result of constructing networked CI; and
- **UC4**: Service providers’ and other individuals’ construction of networked CI.

These concepts are cross-listed with the study’s research questions in Table 4, and are considered to encompass concepts from both the field study (which were partially phrased in terms of Tuominen and Savolainen’s information use as discursive action) and the sense-making metatheory. As a result of specifying sense-making from its metatheoretic form, unit theory concepts were derived that are used to guide data collection and analysis.

A final step in the specification process, to be implemented upon completion of the study, comprises reviewing the unit theory’s concepts with regard to related findings that emerged during data analysis and interpretation. The results from our empirical investigation will either confirm or refute our expectations of how CI is constructed in online environments and how its construction affects and is affected by different individuals. Moreover, the results may reveal other unit theory concepts that will further elaborate upon the sense-making theory and thus indicate other areas of theoretical growth. In Vakkari’s (1997) and Wagner and Berger’s (1985) terms, a theoretical research program comprises a metatheory and its set of interrelated unit theories (as derived by other researchers). By comparing the varied elaborations that researchers derive within their respective unit theories, it is possible to observe whether elements of theoretical growth and activity are occurring within the larger research program. This enables researchers to pinpoint actual developments within a particular theoretical research program.

**CONCLUSIONS**

Answers to the questions that were posed at the onset of this paper remain elusive. While it is evident that public libraries are offering public Internet access and that they are participating in community networking initiatives, researchers
have just begun to explore citizens’ seeking and use of networked CI. In short, while communication technologies continue to permeate society, it is unlikely that they will alleviate the multitude of daily problems that John and Jane Q. Public might encounter. But the Internet and its networked CI byproduct can assist citizens in obtaining appropriate sources of help, and, perhaps more importantly, can facilitate individuals’ needs for social interaction. From a research perspective, a challenging and intriguing problem presented by the Internet is its adaption by individuals and particular uses as an information and communication vehicle.

Findings from a few key studies suggest that networked CI use is a complex phenomenon complete with different players and multi-level communication that may potentially meet both cognitive and affective needs for information. As librarians seek to redefine their contributions to communities, greater understanding is needed of the niches they can fulfil in improving citizens’ daily lives. But as McClure and Bertot (1998, p. ii-iii) point out, such investments carry a cost, and librarians must know whether their efforts are organizationally

<table>
<thead>
<tr>
<th>Unit Theory Concept (UC)</th>
<th>Subsumed Research Question(s)</th>
</tr>
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</table>
| UCI Contextual factors that create information gaps/needs that prompt individuals to seek help through networked CI | 1. What factors prompt citizens to use/not use the Internet for obtaining CI?  
2. What specific types of help are citizens seeking? |
| UC2 Process of how individuals construct and seek networked CI                            | 3. What are users’ perceptions of CI as they seek it online?  
4. How do users deal with barriers that they encounter? |
| UC3 Instrumental, cognitive and affective effects on individuals as a result of constructing networked CI | 5. What do users do with networked CI? (i.e., uses)  
6. What assistance do users receive from services on which they sought networked CI?  
7. How does networked CI actually help users with their situations? |
| UC4 Service providers’ and other individuals’ construction of networked CI                | 8. How do service providers perceive posting CI on the Internet using particular techniques will help (a) clients, (b) their organizations, and (c) the community?  
9. How do librarians expect participation in networked CI delivery will help (a) clients, (b) the library, and (c) the community?  
10. How do the public’s perceptions of networked CI relate to those of service providers and librarians? |
feasible. To this end, easy-to-implement evaluation tools are needed by librarians that fit with the “anytime, any place” nature of Internet-related service initiatives.

The current study will contribute to the efforts of other researchers in addressing systematically obvious gaps in the research literature on the nature of networked CI. Such research needs to examine the role of networked CI for individuals, public libraries, service providers, and the community-at-large. The findings might shed light or raise new questions about information behavior in terms of related technologies, different settings such as the workplace, or particular types of information or populations. From one theoretical perspective, the we will test the usefulness of sense-making for conceptualizing how individuals use the Internet when seeking CI. The current study might yield insights into how individuals socially construct CI in online environments and might indicate whether tenets of everyday information seeking—such as those summarized by Harris and Dewdney (1994)—govern networked CI seeking. It will be interesting to learn, for example, whether such principles as the following hold true in online settings: (1) People tend first to seek help or information from interpersonal sources, especially from people like themselves; (2) information seekers expect emotional support; and (3) people follow habitual patterns in seeking information. If Internet technologies do not succeed in facilitating individuals’ needs for affective support and social interaction during information seeking, then they may not prove as fruitful as many Internet activists envision. For information professionals such findings would affect trends in disintermediation, levels of information quality, and methods of service delivery.

At a different theoretical level, this paper presents a novel technique for incorporating theory within a field study. By deriving a unit theory that fits a particular study’s empirical setting, researchers can increase the theoretical rigor of their work and more easily identify elements of theoretical growth and activity within a particular theoretical research program. In the current study we benefitted from a more in-depth understanding of the research problem and identified areas within the initial framework that required conceptual elaboration. One such modification involved viewing information seeking and use as discursive actions that occur among two or more individuals. As the investigation nears completion, it is anticipated that specification will help identify theoretical growth elements that might contribute to the framework at the metatheoretic level.

While it is yet impossible to say whether Internet technologies actually facilitate citizens’ information and help-seeking behavior and if a utopian information world is unfolding, networked CI services undoubtedly open many questions for future research. As researchers and practitioners work together on these problems, creative solutions may emerge that are actually capable of meeting individuals’ needs for information in holistic ways. An understanding of how individuals—users, librarians, and service providers—interact in networked CI environments is a first step.
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**APPENDIX**

**SUMMARY OF RESEARCH TECHNIQUES**

**Public Library Survey**

Purpose: to obtain reliable data on the degree and types of public library involvement in networked CI (including community networking). Sample comprises 1000 medium and large size public libraries from across the U.S. Survey indicators include financial commitment, space, staffing, and training. Also collecting and analyzing general documents and statistical data on the provision of networked CI and library involvement.

**Data Collection Stages at Each Field Site:**

- **(a) Online exit survey with adult community network users who access its CI.** Purpose: to gather baseline data regarding user socio-demographics and online CI use, including from where users access the network (e.g., home, work, library). Using Dervin’s (c.f., 1992) sense-making approach, the survey includes questions regarding the reason(s) the user accessed CI pages, how the user intends to use the CI, what type of help he/she expects to receive, and what kinds of barriers he/she has encountered in seeking help for the situation. The survey appears only to those who access a page that contains CI since previous research indicates that some users primarily use community networks to communicate with other members. The results are being used to design interview guides for the subsequent interviews with users in public libraries, and to base evaluation tool design in Phase Two.

- **(b) In-depth interviews with sixteen users who completed the online survey** (in the survey, respondents are asked to participate in a 30-minute, interview about their use of the Internet). For comparison purposes, eight par-
Participants are citizens who indicated in the survey that they access CI from terminals in the library, while the remaining eight are citizens who access the network from other places. Interviews are based on Dervin’s micro-moment, timeline interview technique, and are held at times and using venues that are convenient for participant, i.e., by telephone or in-person. The purpose of these interviews is to gain insights into citizens’ use of the library and the Internet for obtaining CI electronically.

- **(c) In-depth interviews with eight service providers** whose Web sites/CI pages were accessed by users who participated in (b). Service providers are asked how they believe electronic access to their information helps clients, and why they present CI in particular ways. Their perceptions and expectations are being analyzed in context of users’ responses regarding the same, and for “best practices” among service providers.

- **(d) In-depth interviews with non-Internet using clients.** For each service provider that participates in (c), in-depth interviews are being conducted with two of their clients who do not use the Internet. The purpose of these 15-20 minute, in-person interviews is to gather data about the information behavior on non- or potential users. These non-users also are asked to describe barriers that they encounter and sources that they use when seeking CI for solving daily problems.

- **(e) Field observation and focus groups with 3-5 librarians** whose work includes facilitating citizen’s access to electronic CI. Through observation we are collecting contextual, environmental data about real-time incidents in which librarians assist users with Internet searches for CI. These results are then used to discuss generic incidents with the librarians in focus groups. Observation occurs at different times over a 3-day period. During the 45-minute focus groups we are gathering librarians’ perceptions of how their work, specifically, the reference interview, has been affected by providing networked CI. Librarians are being questioned about how users present initial questions that result in accessing CI online, the kinds of questions users ask and the kinds of help users require, how they believe this service helps clients, and how techniques such as metatagging facilitate citizens’ searches. Data also are being collected regarding best practices through both the observation and focus groups.

- **(f) In-depth interviews with 2-3 library administrators** and staff who participate in community networking. The purpose of these 30-minute, interviews is to gain their insights into administration concerns regarding library participation in networked CI services (and community networking) and its impact on their organization and the community at-large.