

Informatics Moments: Digital Literacy and Social Capital in Civil Society and People's Everyday Lives¹

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Abstract

The informatics moment is the moment when a person seeks help in using some digital technology that is new to him or her. This paper examines the informatics moment in people's everyday lives as they sought help at a branch public library. Four types of literacy were involved: basic literacy (reading and writing); computer literacy (use of a mouse, buying a computer), library literacy (navigating online catalogs and databases), and domain literacy (most commonly and urgently, looking for work in a world where practically all job postings and applications are online). Social capital is also associated with many of these informatics moments: people seek help from those with enough skill who are close at hand, approachable, and familiar, and they collaborate with others in their networks to do so. Understanding the informatics moment could accelerate people's (and society's) anxious transition to an inclusive digital age.

1 Background and Purpose

This study identifies and describes a phenomenon taking place in Chicago's branch public libraries—the informatics moment—and its relationship with social capital. This moment has two meanings, one empirical and one abstract.

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Empirically, it is a moment when a library patron is seeking and getting help using a computer or the internet. Abstractly, the informatics moment is a phase in the transition of a society or a social sector to the information age, with all the dislocations and transformations that are entailed in introducing digital tools and infrastructure.

As observed in this study, the informatics moment has a structure and a process. The structure consists of the technological infrastructure of the public access computers provided in the library (and also as this study will help to show, an emerging human infrastructure). The process consists of the interaction of the patron with a staff member called a CyberNavigator as the patron uses the computers. In this moment, the patron is bridging a digital divide that he or she faces in trying to do something. In fact, the CyberNavigator faces the digital divide with the patron, as they quite literally face the computer screen side-by-side.

The term “digital divide,” first used in 1996 [1], is most typically defined as the gap between those who use computers and those who do not. Experience with and scholarship on this phenomenon, also referred to as digital inequality, shows that it is both multidimensional and changing. This study looks at the digital divide from the perspective of the person experiencing it. It relies on the CyberNavigator staff—who also experience the digital divide—as witness and participant, but emphasizes the agency of the person seeking (and by and large getting) help. He or she sets out to do something that involves computers or the internet, and he or she seeks help.²

Empirically, this study collects data about informatics moments that last a few minutes, an hour, or perhaps through multiple encounters in the public library. Any particular informatics moment as experienced in the library may be successful or may end in frustration.

As of 2008, 16,671 US public library outlets (central and branch locations) were serving 97% of the population [5], thanks in large part to the long-standing practice of local tax support that has made US libraries both free³ and permanent. Some 3% of Americans reside outside of the taxing district or service area of any library; but some of them are close enough to travel and pay an annual fee for user privileges (\$50–\$200 in several Illinois locales, for example). American libraries provide local residents with free book lending, reference assistance, information

² Some [2] have identified seven dimensions to the digital divide, others [3] five, and most recently one more scholar [4] has identified four. All noted the role of help in surmounting the digital divide, using different terms: social facilitation [2], social support [3], and social resources/learning from others [4].

³ U.S. public libraries are popularly considered free, and many of them have the word “free” in their name, because local residents can use them (and borrow materials) without cost apart from small charges for printing, overdue items, and the like. Local taxpayer support keeps the libraries funded, so technically they are not free.

and referral services, study and meeting spaces, and free access to computers and the internet. Helped again by tax dollars (particularly the federal eRate subsidy), 99.8% of public libraries provide on average 12 public access computers per location [6]. Fifteen years of surveys and analysis of public access computing in the libraries by Bertot and his colleagues have detailed the structural aspect of the informatics moment in the branch public library. More recently Bertot [6] has used interviews and library visits to investigate the social and institutional implications of information technology in libraries. Complementing that work, this study examines and theorizes on the IT help-getting and -giving moment that (almost always) takes place sitting in front of the library's public access computers.

Those computers are used for life's necessities as well as for homework, leisure, and life-long learning. Forty-two percent of those using library computers nationwide did so for formal education (doing homework, attended remote classes, or applying to school), and 40% did so for employment or career purposes [7]. . It is also relevant that a study of recent change in digital reference questions⁴ discovered that:

people seem to turn to public libraries when they face a difficult question. . . . In addition, unsuccessful searching of the Internet seems to motivate people to ask questions in the libraries. Library face the challenge of developing their skills for answering questions of increasing complexity. [8, p. 1257]

Others have examined the process of surmounting the digital divide in a community. A disregard for community members' own predicaments, knowledge, connections, and goals set a technology training program on a course to reproduce and reinforce the digital divide [9]. The ethics of libraries are to start from and support the patron's own objectives and requests [10]. So, to recap, relying on the model in Figure 1 below: This study examines the process whereby people in their everyday lives bridge some digital divide they face, making use of public access computing in the branch library and seeking and getting help there.

Our interest here is to empirically investigate how the local community—ordinary people in their everyday lives—is navigating the information revolution. We turn away from a consideration of deficits (the digital divide) to a focus on the process of crossing that divide (the informatics moment). The branch public library is a rich site of informatics moments: people using the public access computers and seeking (and getting) help in doing so. What does the informatics moment look like in this setting?

⁴ Lankes defines digital reference service as “an Internet-based, professional question and answering service [whereby] users address their questions to the service typically through Web form, e-mail, or chat” [8, p 1250]

Figure 1. A model of the informatics moment in the public library. (all figures and tables are appended)

This study aims to understand the informatics moment and how social capital affects its process and outcome. It takes up digital divide research (see footnote 1) which proposes social support as an aspect of the digital divide. Social capital is defined here as the resources that people access through their social networks rather than on the marketplace or through bureaucratic channels [11]. Social capital has been found to be one of the widest used frameworks for understanding sustainability of technology in community settings [12]. Research on community use of information technology suggests a positive role for social capital in helping individuals and groups overcome digital inequality [13-14]. The present study asks, then: What role does social capital play in the informatics moment?

As in Figure 1 above, help seeking and help giving are part of the informatics moment. The library and its staff are a neighborhood bureaucracy available to the public. In what way might this entail social capital? A bureaucracy is quite often necessary but not sufficient in providing resources [11, 15]. Translating this to the branch library, the patron may get help in the informatics moment not only because the bureaucracy works, but also because social capital is in play.

2 Method

To understand the informatics moment in people's everyday lives, we chose the setting of the branch public library in Chicago, Illinois. The CyberNavigator, who works 20 hours a week to support people in their informatics moments, was our entry point. The study thus includes data about the informatics moments in which the CyberNavigator participates, not the informatics moments when a patron helps him or herself. We turned this limitation to our advantage, because with the CyberNavigators as the primary reporters, the study gained participants with an average of 12 months' experience of many informatics moments.

The CyberNavigators program was launched by the Chicago Public Library in 1999 and operates in 40 of the library's 79 locations (as of summer 2010). CyberNavigators are recruited by the library and hired by the Chicago Public Library Foundation to work for 20 hours a week at \$14 per hour. They are assigned to a particular library to help people use the library's public access computers and internet, in coordination with other activities in that library. (An historical background to the CyberNavigators program is provided below in section 3.1).

Who are the CyberNavigators? They are evenly divided between men and women. They average 27 years of age. They are diverse like their patrons: 48%

African American, 25% Latino, 20% European American, and 5% Asian-American. Thirty-two percent of them help people in Spanish as well as English; 8% in Mandarin or Cantonese. They are locals: 68% were born in Chicago, 84% attended Chicago-area elementary schools; 81% attended Chicago-area high schools.

They are well educated: Half are currently enrolled in college or university and 91% of them are completing or have completed an undergraduate degree or more, for the most part in Illinois. Twenty percent report studies in science or technology fields; 47% in professional/pre-professionals fields; and 34% in social science or humanities.

They are new to CPL: for 81%, this is their first job in the library system; the rest are most likely to have been pages or interns. And they are highly active digitally, with broadband at home (89%), a home computer (59%), sometimes two computers (38%), smartphones, games, microphones, DJ equipment, webcams, and game devices, all to carry out 150 different IT activities in one week, ranging from vlogging to fixing a friend's Blackberry to making a movie to paying bills and reading the comics online. While only 12% had ever written a program and only 15% contributed to Wikipedia, these are generally upwardly mobile, plugged-in young Chicagoans. As one CyberNavigator said, laughing (recognizing that she is a good CyberNavigator for her 'people skills' more than her breadth of tech skills): "I'm supposed to be this internet expert and I still haven't been to Twitter, I *just* got on Facebook and Myspace!" As a group, they are comfortable with knowing enough about technology, and knowing how and where to find out more.

In fact, a particular selection criterion is "good with people," and that means people in specific Chicago neighborhoods. Managers interview candidates with particular branch library assignments in mind and often the candidate hired has a personal history with that neighborhood. Depending on time of year and how many are hired at one time, training may consist of shadowing another CyberNavigator for a few days, or attending a small group training which focuses on library policies and the library's online resources. Ongoing one-day training sessions every six months alert CyberNavigators to new resources; recent sessions discussed legal assistance and job searching tools (illinoislegalaidonline.org and illinoisworknet.com).

Ten years ago the program manager was a former reference librarian; today he is an engineer and one-time community technology center staff member. In sum, the CyberNavigators are upwardly mobile, plugged-in Chicago natives, the young netizens who have been identified as the leading force in the information revolution.

Data for this study was collected in four ways: via documents, ethnographies, focus groups, and questionnaires. With limited resources, the

ethnography required decisions on sampling; the focus groups and questionnaires targeted the entire population of CyberNavigators.

This methodology triangulates from three sources of data about the present, informed by sources from the past. (See Figure 2.) In other words, each subset of data is used to validate the others, yielding a rich description.

Figure 2. Starting from documentary evidence (1), which tells about the past, and then triangulating between three field methodologies (2, 3, and 4) to collect data on the present.

2.1 Files and archives

Chicago Public Library and its foundation made available the administrative files on the CyberNavigators program from the mid 1990s on. We also queried the library's archive for earlier documents. Administrative files amounted to three boxes of files which contained press clippings about the program; related articles; promotional materials; and internal planning and evaluation documents that recorded significant discussions about the program as it came into existence and evolved. It was possible to access these files because library administrators had an ongoing interest in learning from the program.

The CyberNavigator manager also shared internal reports and facilitated the research in many ways. The library's archives staff provided at least one key historical document.

2.2 Unit of analysis, unit of observation, and sampling

The unit of analysis is the informatics moment; the unit of observation is the CyberNavigator. He or she is to a certain extent a proxy for the branch library and the community served. As of 2010, 40 of Chicago's 79 public library locations had CyberNavigators on-site. For the focus groups and the questionnaires, we set out to study the entire population of 40. Thirty-seven CyberNavigators answered the questionnaire and 27 participated in focus groups (93% and 68% response rates, respectively).

Limited resources dictated sampling for the ethnographic work. Two sites were included from each subdivision of the library system (South, Central, and North). As part of a research program that focuses on underserved communities, this study excluded libraries serving more affluent areas. As a result the six sites in the sample are more representative of Chicago's population with regard to income, that is, lower income. To represent the population ethnically and catch any differences across ethnicity, locations were selected that serve major ethnic groups of Chicago: African-American, Mexican, Puerto Rican, Chinese, and

Polish. This is important given Chicago's ethnic diversity: 37% of the city's population is African American, 36% speaks a language other than English at home, and 22% is foreign born [16].

2.3 Ethnographies

We carried out week-long ethnographic observations in six branch libraries. According to Burawoy [17, 18] our theories, our questions, allow us to do ethnography. We cannot possibly perceive everything, so we look for specific aspects of a culture, setting, or social process and use our limited perceptions to test our beliefs. So it is better to be explicit and conscious about the theories and questions we take into the field. Ethnography complements other social scientific methods such as surveys or interviews.

To implement this approach, our ethnographies were highly structured by a set of questions that the field notes had to answer. To start, the focus of the field workers was on the patron-staff (or patron-observer, see below) interactions. From the study's field handbook:

For every request for help, or [staff/CyberNavigator] interaction with a patron, note down:

- Time of day?
- What did the patron ask about?
- What was the patron trying to do?
- Who did they ask for help?
- What language did they use?
- Did they seem to know the CyberNavigator?

We also practiced involved observation following Clark [19]. He directed a community organization and developed social scientific findings from that experience. Leading the work of that organization, trying to effect social service delivery and social change, yielded a great deal of data. The check on his subjectivity was his regular discussions—debriefings—with an uninvolved research colleague. Likewise, we aimed not to be outside, impartial observers. We thought of ourselves, and explained ourselves to staff, as learning by shadowing, and we all shared a commitment to seeing Chicagoans across their various digital divides. All of us helped the CyberNavigator at times. If he or she was busy and a patron was seeking help, we provided that help or referred him or her to another staff person. In this way, allowing for the short time in the field, we observed and we also became insiders. Since staff resources are frequently outstripped by demand, this was the only way to respect the staff and patrons. We tried to give (service) as much as we got (data), and formed closer relations with the CyberNavigators as a result.

In total, six people carried out the ethnography. Each person spent 3–5 days in a library location, jotting notes each day and typing them up each evening.

To encourage reflection and stimulate serendipitous findings in this first stage of the fieldwork, a day's notes had to include one paragraph on each of the following topics:

1. The most interesting moment
2. The greatest problem
3. The greatest solution

At the heart of the notes were the descriptions of 157 interactions with a patron seeking help. We hand-coded these interactions. The three daily reflective paragraphs helped to shape the focus group agenda and the survey questions.

2.4 Focus groups

A total of 27 CyberNavigators participated in 6 focus group discussions. These discussion groups ranged in size from two to seven people and averaged 4.5 people per group. These focus group discussions were guided by Orr's study of copier repair technicians [20]. He found that stories were central to their work; telling each other stories helped them do, make sense of, and enjoy their work. If we could gather stories from the CyberNavigators, we reasoned, it would help us understand the informatics moment.

In the process of recruiting the focus groups, we asked participants to think about and bring one best story and one worst story from their experiences as CyberNavigators. To start the discussions, everyone shared at least two stories. As with Orr's copier technicians, these stories were fun for participants to hear. They validated their experiences. They were the same, and different. They were causes for mourning and celebration of the patrons and the communities, many in crisis, and also of the CyberNavigators themselves. And unlike the copier technicians, who shared their repair stories every day on the job, the CyberNavigators were in their own branches 20 hours a week and hadn't had the chance to sit down together. They themselves recognized this, as one transcript recorded:

CyberNavigator: This is therapy! You're paying us to have therapy.
[*Everyone laughing and talking at once.*]

The stories tumbled out in vivid detail.

The ethnographic work showed the pressures of the informatics moment for the staff: always on call, providing public service in distressed communities, in the branch library but not quite *of* the branch, since they were paid by the Chicago Public Library Foundation and supervised by their own manager first, and by the branch manager second. So another line of questions was: How would you make your job better? How would you make the program better, along various dimensions: technology, space, training, and so on?

Once the focus groups were transcribed, we identified and hand-coded 598 distinct chunks of narrative.

2.5 Questionnaires

Thirty-seven CyberNavigators completed questionnaires. Twenty-seven of these were self-administered at the focus group sessions, ten others at a CyberNavigator training soon after. Participants answered 80 open- and closed-ended questions. Some questions were adopted from an earlier study of social capital and community technology use [21]; others were developed from the ethnographic data. Questions covered demographics; technology use; technology help given and received; and social capital.

Taken together, the documents, ethnographies, focus groups, and questionnaires resulted in both texts and data—narratives and numbers—that the research team analyzed.

3 Findings and Discussion

What does the informatics moment look like in the setting of the Chicago Public Library? What role does social capital play? There are three overarching findings:

1. Social capital made contributions at key moments in the history of the CyberNavigators program itself.
2. The informatics moment involves four types of digital literacy work.
3. Social capital is a positive influence on the informatics moment.

3.1 Social capital at work in the origins of the public computing library

The public computing library is a concept that emerges particularly from the ethnographies, building on the work of Bertot [6]. It consists of the library with public access computing, where the networked computers have taken their place alongside the book stacks as a fundamental service of the branch public library. It is expressed visually in many libraries, where the computers are in the center and at the fore as the patron enters. The book stacks *appear* to be secondary in terms of their spatial arrangement and level of use, although this is a research question in itself. What is clear is that the branch library provides access to printed matter and other physical materials, to online content, and to computers that get a patron online.

The initiative for the public computing library bubbled up from the branches and the patrons. In 1981, the North Pulaski Branch librarian and a patron brought the first public access computer into a branch, along with an online bulletin board system accessible remotely by computer modem. They also launched activities to help both the public and staff to learn about and use computers. They were the first CyberNavigators. A branch newsletter explains:

The equipment (hardware) at the Personal Computer Center was made possible by a generous grant from the Friends of the Chicago Public

Library.... Software has come from several sources 1) non-book materials library budget, 2) computer club software library, and 3) donations of software by individual microcomputer enthusiast....

The Personal Computer Center now has two active volunteers, we would like more.... The job involves learning the use of the equipment and then helping to orient others in the use of the computer and how to run most of the major programs and how to work your way through the others. [22, pp. 1-2]

A decade later the Rogers Park Branch Library became the second public computing library in Chicago, according to the president of the Friends group at that branch:

The Friends bought two 386 computers in 1992. They were set up for word processing and for reference work. Later on, we got a couple of older computers from Alderman Moore's office that were set up to play arithmetic and typing games for kids around 1994.... With the opening of the new library building in 1999, it had six work stations set up for Internet access. (K. Chiu, personal communication)

In Chicago, the Friends groups did not connect with the Chicago Public Library Foundation [23]. So it was staff and patrons in the branch libraries who were the first to find funds and volunteers and equip and staff community-based computer facilities.

As milestones in library automation were achieved, and after a new library commissioner took over in 1994, the central library leadership joined in and took the lead in public computing. In 1995 the foundation had explicitly shifted from funding construction of a central library, which had been completed, to raising several million dollars for information technology. From a 1996 letter signed by Cindy Pritzker and James Donnelly, leaders of the foundation and members of the city elite:

Project MIND: Meeting Information Needs Democratically: This new program is bringing computer literacy and information access to the neighborhoods of Chicago and eventually will provide free instruction and access to the Internet at all public library locations throughout the city. [24]

By 1997 every branch library had public access computers and internet access. The system-wide rollout involved mobilizing city elites to raise funds; the Bulls basketball team equipped a number of branches with public access computers. Today, typical layouts in new branch libraries feature public access computers in the center or in the front, and the print collection around the sides or in the back. Either way, computers are highly visible and they are typically always in use.

As soon as public computers were in most of the branches, library administrators were working to meet the pressing challenge of helping patrons with a staff that was mostly hired before public computing service existed:

After consultation ... we have decided that all staff, Clerk II and above, must take one of the following two basic classes: "Internet Basics" or "Hands-on Instruction to the Internet for Reference at CPL." This is so that they are aware of the Internet and the directions the Library is taking... [25]

In 1998 the CyberNavigator program was conceived and funding to start in 1999 was obtained.

This program has seen three phases: experimentation, affirmation, and expansion. The library administration, the foundation, branch staff, and volunteers led the way together. From 1999 to 2002, CyberNavigators was an experimental summer program funded by the telecom company AT&T in roughly one-third of all branches. Then the funding ended, but branches asked for a continuation, so from 2002 to 2007, the program operated year-round, placing part-time CyberNavigators in approximately five branches. In 2008, having secured major new funding from the Bank of America, the library expanded it to more than half of its branches.

As of 2010, the experiment has become a major system-wide effort towards digital literacy in the library and across Chicago. Its character as an ongoing experiment can be seen in the fact that CyberNavigators are not paid staff of the library, but continue to be paid by the Chicago Public Library Foundation, outside the occupational structure of the library, on "soft" money raised from grants or donations. At least one Friends group has raised the entire year's wages for their own CyberNavigator.

The lesson here is that social capital in the branches—resources available through social networks—led the innovation and continues to partner with the library at all levels, to keep the public computing library going.

3.2 Four types of digital literacy in the informatics moment

The informatics moment, as observed in this study, centers on a helping interaction between someone seeking to use computers and the internet and a helper in the public library. The ethnography suggested literacy as an organizing concept for these interactions, using the following definition but also including nontext records (images, sound, etc.):

Technological literacies may be defined as social practices in which texts (i.e., meaningful stretches of language) are constructed, transmitted, received, modified, shared (and otherwise engaged), within processes employing codes which are digitized electronically, primarily, though not exclusively, by means of (micro)computers. [26, p. 141]

Put more plainly, the North Pulaski Branch librarian himself referenced literacy at the time, attributing his motivation to

the belief that computers are becoming so commonplace that learning how to use them is almost as important as learning how to read and write. [27, p. 21]

The helping interactions recorded in the ethnographies break down into three types. Answers to the questionnaires added one more type and the focus group discussions provided more detail on all four. Four main types of literacies are involved in the informatics moments:

- Basic literacy, that is, reading and writing. None of these appeared in the ethnographic data;
- Computer literacy, using the computer and applications running on it;
- Library literacy, using library-specific technologies; and
- Domain literacy, using technology in order to carry out tasks in specific domains of modern life.

Quite often one informatics moment has several of these literacies embedded in it. When this was apparent, we coded for domain literacy first, then library, then computer, and then basic.

Table 1 presents a quantitative summation of findings. The four types of literacy were operationalized in the questionnaires as various tasks that patrons seek help with. The CyberNavigators reported how often—daily, weekly, monthly, or less than monthly/never—they helped people with these tasks. The last column in the table indicates how often the four literacies were observed in the ethnographies. Narratives from the focus groups tell more about basic literacy, computer literacy, library literacy, and domain literacy in the informatics moment.

Table 1 Patron tasks in the informatics moment.

Basic literacy

People who cannot read or write do not often make their illiteracy plain for all to see. They hide their illiteracy out of a fear and often desperation that is based on an intelligent understanding of their vulnerability in a text-based world. They overcompensate and create distractions [28]. Their sense of fear and shame is perhaps perpetuated by the “state of grace” school of literacy theory, which holds (completely incorrectly) that people who cannot read or write also cannot reason logically or think abstractly [29, p. 14; 30, pp. 20–21].

This helps to explain why the ethnographies did not reveal basic illiteracy. The focus groups, however, told of patrons who say, “Can you just type it for me?” Among the “worst stories” CyberNavigators told, one theme was “They don’t want to learn, they just want you to do it for them.” In these situations, CyberNavigators reported frequently helping by doing rather than by teaching, because the hard-luck stories of the patrons—these moments are usually tied to applying for jobs—were compelling. A librarian commented that it’s very hard to draw lines between helping, teaching, and doing. A more common strategy is to explain that job hunting involves several steps—introduction to the computer, then email, and so on, and thus moving the patron into a sequence of help sessions, sometimes including the printing of job-search resources. This entails domain literacy (more below) and reflected how the types of literacy in an informatics moment can be layered over each other.

A total of 90% of Cybernavigators help people read something at least weekly; 76% help people write something at least weekly. Not being able to read will prevent a person from using computers or the internet, except perhaps to play video games. Many patrons we observed, who were not asking for help, were looking at Youtube; could it be some of them were *limited* to Youtube, because most websites require more reading?

Teaching people to read and write has been a priority in Chicago Public Library for many decades; even when they ended direct literacy services in 1996, the library continued to facilitate programming by partner literacy organizations [31]. How could illiteracy have disappeared? Data in this study is *suggestive* of illiteracy. Between patron need and CyberNavigator frustration, it could be helpful to train the CyberNavigators in spotting illiteracy so that a different intervention could be applied than attempting to press on past a possible foundational problem. As the CyberNavigators often say, every job today requires an online application. For some manual or semiskilled labor, applying may require more literacy than the job itself. On the other hand, the information-age job transformation can mean that the same job, driving a long-haul truck, for instance, now requires working with a laptop in the cab.

Computer literacy

A rich definition of computer literacy can be drawn from a synthesis of work from computer science, education, and literacy studies [29]:

1. Having contemporary skills (e.g., browsing or text editing)
2. Knowing foundational concepts (e.g., networks)
3. Possessing intellectual capabilities (e.g., evaluating sources)
4. Understanding computer literacy as an aspect of life in an information society
5. Being familiar with at least the basics of computer programming
6. Practicing computer literacy that is tailored to individual needs, interests, goals

7. Being part of the community of people who can use IT, which means knowing a) how to keep learning, b) who or where to go for new concepts and skills (including software help features and online sources) and c) how to solve problems with others in that community
8. Not assuming that someone with computer literacy is better than someone who isn't computer literate.

Each of these eight aspects is in evidence in the informatics moments in the library. Part of what makes this remarkable is that the public access computers in Chicago Public Library are very limited and locked down. Most machines provide only Internet Explorer. From that browser window, patrons can surf, open .pdf documents, view word processing files, interact with forms, watch videos, and initiate a print job. There is nowhere to save files except "on the cloud," unless the CyberNavigator shows you a trick to saving in the Temp folder. The machines wipe all user data upon logging off. From one dedicated machine in every location, patrons make or change a reservation. From another machine, they forward a print job to the printer. At three locations (Harold Washington downtown, Sulzer on the North Side, and Woodson on the South Side), public computers also provide Microsoft Office and flash drive functionality so patrons can open, create, and save documents, including from the web.

Focus group comments from the CyberNavigators demonstrate how each of these eight aspects of computer literacy appears in the library's informatics moments.

1. Skills. Most basic of these is using the mouse.

[I first tried to teach with online mouse exercises] and I'm like: "Dude, this is awful." Like, patrons hated it, I hated it. So I take them to Yahoo games. I'm like: "All right, pick your favorite game. Let's go play." And there they are, going: "Oh, this is fun," and then they just, like, learn it so much faster.

2. Concepts. The concept of electronic mail that you come to a computer to check, that waits for you only—and your password—is fundamental. This story demonstrates how informatics moments are not always completely successful, and is also an example of the CyberNavigator solving the universal problem of forgotten passwords:

[Job hunters] need to have an email address. And so they're like: "Well, I'm not going to be checking my email address." And I'm like: "Well, they're only going to respond to you, you know, via email. They're going to respond to you via email, and you need to be able to respond and have a conversation back and forth via email." And they're like: "Well, I don't even use it that much. I don't even have a computer." I was like: "Well, you're always welcome to come here during library hours so you can use your email address." "Well, I don't even know how to login and logout."

And I'm like: "Well, I'll be here. You can schedule—you know, at a certain time, I'll be here. We can log in together," and things like that. They're like: "No, I'm not going to have all this time. If I just give you my information, can you be checking my email?" I'm like: "I can't do that. Imagine if everyone requested me to check their email." Right. Checking everyone's email. I was like: "That wouldn't work." I was like: "As much as I would like to help you," I was like, "it's the best I can do for you. You come to me, and you have to save your username and password." That's another thing, that they lose that also. When you make it for them, and they're like: "I can't remember." But the good thing is that I've created a format—I've made it that it's their first initial, last name, and then last two...

3. Intellectual capabilities. In this story a patron learns an online service that is critical for his community and then assumes CyberNavigator-type responsibility for others who need it:

The truth is, if you're filling out a Circuit Breaker [applying to a state grants program for seniors and disabled], you probably have some hard luck stuff going on in your life. Period, you know? But there was this guy. He would come into our branch, and he asked me for help filling out a Circuit Breaker one day. Really nice guy. I mean, totally, was like, typing on the computer like he had no idea how to use it. Was intimidated but also, like, not so intimidated that he couldn't do it. Like, he was willing to learn.

And so we filled out a Circuit Breaker, and then he comes back, like, later in the week and he's like: "Hey, remember me? I'm back. I got more Circuit Breakers." And I was like: "OK." Turns out, in his world, he was, like, the Circuit Breaker Man. He filled them out for him, for his wife, for his mother. It was just—he was, like, the Circuit Breaker dude. I don't know if I was supposed to be helping him fill it out for everybody, but it was, like, he took a lot of pride and joy in being able to help his friends and family get their paperwork done.

And so each time he came back to do another one, he would get a little bit more proficient, but sometimes he would make mistakes and, like, get bumped back to the beginning of the form. I was like, you know, "Come to my classes," and he's like: "OK."

4. Understanding computer literacy as part of life in the information society. The two examples above illustrate the informatics moment as a leap in the patron's understanding and practice, accepting computers in their life. Contrary to the frustration detailed above, many stories were told of email success. The patrons and the CyberNavigators (several explained a similar approach) explicitly agreed to collaborate on passwords in a way which secured the password for the patron. In effect, patrons are constructing their own IT support network by agreeing to rely on the CyberNavigator in this way.

5. Familiarity with at least the basics of computer programming. The data only supplied one instance of this, but this story is important in two ways. First, Word Macros are a programming language that is available to any Word user if they can navigate it. Second, programming is an activity that only 4 of 37 CNs report doing. Third, it illustrates that library staff are passing through informatics moments alongside the patrons.

Even the branch librarian, like, sometimes she gets stuck in Microsoft Word, and she's trying to work in Word Macros, or something, things like that, and she'll be like: "Oh, the CyberNavigator!" And luckily, I do know how to do it, but they do expect me to know. It's like, that's your job, that's what you're supposed to know.

6. Practicing computer literacy tailored to individual needs, interests, goals. This story alludes to the fear people have who cannot use computers—much like those who cannot read and write, and understand the power that computers, like written text, has over our lives. It also shows, again, the paradigm shift—patrons find entirely new ways to approach a task:

A lot of people come in, and they have a big anxiety about using the internet. And I'm just like: "OK, go to Google and talk to Google like you were talking to me. What exactly do you want to do?" ... That's rewarding to me, you know, in a way because it's just like: "Oh, OK. I didn't even think about that."

7. Being part of the community of people who can use IT, practicing continuous learning, knowing how to find help, and helping others. In this example someone has crossed the digital divide and the CyberNavigator is happy to have her in her own help network:

She started out being afraid of, like, breaking the internet. Wouldn't even touch the computer. ... [It] took a little over two weeks before she was able to get the hang of, like, the whole thing. ... Then she's so excited ... [and] the best part of it was that she actually started schooling me on little things.

Circuit Breaker Dude above is another example of this. Other stories featured patrons coming in groups of two or more and helping each other, or being strangers and helping each other or the CyberNavigator.

8. Not being better than people who aren't computer literate. The development of a helping network, as above, expresses this last aspect of computer literacy. In talking about their own skills, the CyberNavigators returned time and again to the core skill: patience. Respect for the patron navigating the informatics moment was critical. One CyberNavigator had adopted a slogan he told his patrons in order to teach them patience and respect for learners: "Practice makes permanent."

Library literacy

Library literacy means the skills and knowledge to use the particular systems in the library. These include two tools set up to manage the scarce resources of printing and the computers themselves. A pay-as-you-go printing process starts at the patron's workstation but finishes at a printing station. And software for reserving computer time runs on another workstation, as well as on staff machines. Then there are four tools for accessing the library's online offerings: the library website, the catalog, the databases, and downloadable books and other media. These tools run on at least six different platforms, or software, depending on how the databases are delivered.

1. Printing. New computer users can print wildly; every public computer lab has to deal with controlling costs. Chicago Public Library has in place a complex system that only daily users can remember and all staff spend time supporting patrons:

That print system is the worst thing, seriously. It's just too complicated for new people. New people come in, you know, you got to print from over here. They're already having a problem because the print button on the screen [Internet Explorer] doesn't work. So they have to go to File, then Print. Then they come over to you: "Where's it going to come out at?" Now let's take your library card and go to the circulation desk [to pay]. Then after they do that, still, nothing's going to come out 'cause there's too many steps.

[Assents from other CyberNavigators]

It's too extra.

2. Reservations. Likewise, time on the computer is scarce and hard-won. A "worst story" of a CyberNavigator was the day two men got into a fight over their reservations. This story illustrates the cooperation required to manage reservations, which are made and changed by patrons and staff—except at some branches, not the CyberNavigator, because of their foundation-not-library status:

So I can't cancel reservations for people. I can't look up reservations for people that they made on the computer. But I was able to do that at my first branch. So it's kind of handicapping me at my new branch cause then I have to go a clerk and say, "Hey, can you cancel this for me?"

3. Library website. The library's website is complex and content comes from the central administration. This is an example of a resource that CyberNavigators have to stay on top of, even for basic information.

I had a patron call not so long ago. They're like, "I saw on the website that these are your hours." And I'm like, "My hours are on the website?"

They're on the website. Everyone's hours are on the website.

[Another CyberNavigator: What website?]

The CPL website. They're on there.

4. Online catalog. This is an area where other library staff are poised to help a patron.

The handing off of patrons between library staff and the CyberNavigator adds another level of complexity to the supporting of their informatics moments:

The cool times are when, you know, like, you help a student find an article or there's a really long line in the computers, and someone thinks that they have to get on the internet, and I'm like: "No, we can use the catalog for that!"

5. Databases. Here, again, the informatics moment calls for a librarian, because he or she will be trained and expert at database use:

This high school student from ——— came in the other day, and she knew how to use the computer. Like, I could have showed her, like, you know, database stuff on the computer, and she was doing some kind of research paper for her school class on cottonwood trees, you know? And I'm going to be perfectly honest with you. Like, as much as – I mean, I do have a rough idea of, like – I mean, I do know how to use the databases. But, like, again, going back to efficiency and, like, not giving people the runaround. Am I going to be able to give her, like, the fastest way online to, like, find age-appropriate, or whatever, information for school about cottonwood trees? Heck no. I took her to the children's librarian, you know? I'm like: "This is a reference query."

6. Downloadable books and other media. Here the CyberNavigators are limited to explaining, not demonstrating or teaching, because the downloading runs on software which does not function on the public access computers.

Domain literacy

Identifying this type of literacy makes references to the concepts of multiliteracies [32-35], and to domain analysis work [36]. The multiliteracies concept emerges from findings that a person can be highly literate in one setting but not in another. School-sanctioned literacy skills and unsanctioned literacy skills are not always transferable—for instance, writing a term paper and writing a rap lyric [34]. Learning is situated—someone can do arithmetic in the supermarket, but be stymied in a high school math class [37]. Information science is overlooking the issue of domain: information flows in one domain can be very different from those in another, and in order for new information systems to effectively serve various domains the information scientist must attend to a domain's particularity [36].

Applying the concept of domain here highlights the fact that patrons bring tasks that require a certain amount of domain expertise. The CyberNavigator's expertise varies, but quite often life experience rather than specific training or education is the basis for their helpgiving. Here is an example from a CyberNavigator who is not a lawyer or paralegal:

A lady had just lost her son, and her grandchild—his children’s mother came and grabbed him and took him to Indiana. She had no way of getting in touch with her grandson, so I helped her get through the legal parts online and everything, and finally, she got custody. By the way, she started signing up for my basic internet class!

In another example, a CyberNavigator—who is in college for a psychology degree, but no more—guides someone through an extended informatics moment towards a job. Job seeking is such a leading activity at the library’s computers that staff and administration have created an online resource guide, and CyberNavigators are getting a half-day orientation to it:

One of my best success stories was a young lady I was assisting with job searching. We originally started out with just the internet basics and, you know, she just wanted to learn how to use the computer. And it went from learning how to use the computer, then she wanted to do a resume, and then—she seen me helping someone else do a resume prior to her session, and then she was interested in, wanting to make a resume. We went from resumes to applying for jobs online. And she was coming out of a [battered] relationship, and it went from—she wanted to have her own identity, her own income, and she went from, like, not really having a job or having a lot of experience, but I was able to utilize just her volunteer experience and some of—you know, just some of the life experiences that she had, to be able to articulate it into a resume format. And we applied for a job, and she actually got the interview and the job and everything. She was like: “This is, like, the most money I ever made in my life,” and she’s like: “I would never have made it if it wasn’t for you,” and everything, and I just felt good because she was looking for something and she got it, you know what I’m saying?

The next story from the ethnographic observation echoes the same themes, but it is explicit that the CyberNavigator’s expertise is from his own job-seeking experience. He is not a career counselor, but rather a valued peer helper:

A woman wanted to apply for a management position at McDonald’s. She had an advertisement for McDonald’s employment: “Apply now! www.mcdonald.com...” The McDonald’s website requires you to enter all your resume information as well many questions about past experiences and so on. The patron has the information, handwritten. The CyberNavigator helped her, reading it out loud and teaching her how to use a mouse and how to click. In the middle, when it asks for social security number, he then told her, “You need to fill in the all the blanks, there are 60 questions you have to answer. For management jobs, you have to answer a lot of questions.” He also offered her an extension of her computer reservation time, past 60 minutes. Later on, he approached her again seeing her screen said “complete.” She showed a little bit of anxiety, saying “Is it really done? Do I need confirmation or anything like that?” The CN suggested

either go to the shop directly and tell them you applied online or call them. He told me later, I learned that from experience helping and from my own experience. And he is just 21 years old!

All library staff work together to help:

At one point I was wasting a lot of time trying to help the person, like, write an objective in their resume. What goes in an objective? So one of the librarians, she does a resume workshop. She sits down with the patrons. She has, like, a mock resume—objective, experience, stuff like that—and she had books and everything and flyers, and from a certain time to a certain time she assists people with resumes. Then when they're ready to actually type it up and put it on the internet, I help. We work hand in hand.

As many examples have shown, quite often one informatics moment entails several types of literacy. The best examples, as above—and far and away the most common, since job losses have spiraled in the US and nearly all job applications are on the internet—is the job search.

3.3 The informatics moment draws on social capital

A book-length visual-sociology study of a rural repair shop explains how a fundamental aspect of work done at the repair shop is building and maintaining community [38]. A branch library is like that small shop, and the patrons in their informatics moments are seeking a repair so that they can go about their task. While the public library is structurally a government bureaucracy, sometimes its best work is done via social capital [39-40] and the present study found social capital at work in the informatics moment.

Table 2 presents the operationalization and the measurements of social capital in this study. Three types of social capital are identified: the social capital of the CyberNavigators; that of the community, which includes the patrons; and that of the library staff. These types of social capital are documented in a modest portion of the observed informatics moments (19%, 22%, and 7%, respectively) and more deeply documented in the surveys and focus groups. Certain forms of social capital are very much in action; others are not. From this emerge six main findings.

Table 2. Social capital in the informatics moment.

1. Names and recognition are key. As with reference interactions [41-42], informatics moments are associated with the parties knowing each other's names or recognizing each other: "I grew up locally, go to church down the street, so they either know my name, or a lot of them at first called me Circuit Breaker Lady." Many references are made to regulars, patrons who come every day or enough to be known. Regulars on occasion help smooth a rough moment or even help another patron. One CyberNavigator began to encourage this in order to

accelerate progress. Again, this is like the repair shop operator [38], or like waitressing work [43]; the bureaucracy or the business is the substrate for the growth of social capital, to the extent that this is understood, valued, and feasible.

2. Private laptop use is another measure of social capital. Given anyone's sense of urban crime, a remarkable one-third of Cybernavigators bring their own laptops and even help patrons use these laptops. This "going the extra mile" is sometimes frowned upon by branch managers but it gets around the obstacle of library computers that are overbooked and locked down with few applications. Related to this is the practice of CyberNavigators putting their own hands on patrons' laptops—"It's against the rules but people do it, cause sometimes you just have to"—in order to help.

3. Most CyberNavigators are known *in* the library, not outside in the community. They aren't a *visible* community resource. We investigated other public computing sites near the libraries and generally these were unfamiliar to the CyberNavigators, even though sending patrons there might help them and lighten the load at the library. One CyberNavigator recognized this, relating approvingly that at another branch, "People from all the local agencies meet once a month, keep each other informed so that referrals can be made."

4. Given that, however, the community is clearly networked into its CyberNavigator. They know his or her name, they are referred by non-staff, they come in family and other groups. This takes some time: "Once I helped someone, then others began to ask questions," and "I've only been here three weeks so it's slow still; at my old branch patrons knew me."

5. Are some community members excluded from help in their informatics moments because they are not networked even indirectly with the library or the CyberNavigator? One CyberNavigator estimates that 30% of his help is to regulars, and two of the six ethnographers saw such a stream of regulars that they wondered if word of mouth through existing networks was enough to reach the whole community.

6. The library staff per se is actively collaborating with the CyberNavigator. They refer patrons and they help patrons themselves. There is also conflict, but by and large the public library is embracing the public computing library, as these stories demonstrate:

The staff respects me and my job, so if I know something, like, I even see them telling patrons the same thing I tell them now, because they, they listen. They watch. And we talk. So, you know, it's good information because giving patrons outdated computer advice, it does make you cringe. You have to find a way to say, hey, buddy. You know, before the patron gets out the door, but not in a disrespectful way.

[The guard] sits right next to the reservation station so she just hears me doing things and I talk to her cause I stand right next to security. So she knows basically more about how to make [an] appointment for somebody with me.

Now that [we've settled into a working relationship] the clerks are assisting with printing or making reservations, and they normally won't interrupt me if I'm in a session.

If patrons start a sentence with 'computer,' the staff directs them to me.

Finally, this field observation:

I'm too old to learn, the librarian said. Then the CyberNavigator comforted the librarian with a story of a 70-year-old patron who has gotten good at the computer. The librarian and the CyberNavigator keep a close warm relationship.

All in all, social capital appears to be closely associated with successful informatics moments, that is, people being able to get the IT help that they need to complete tasks which are quite often urgent. The library provides this resource by activating a social network: staff-CyberNavigator ties, CyberNavigator-community ties, library-community ties, and within-community ties. The close-up view afforded by this study validates social support as a component of the digital divide, affirms past findings for a positive relationship between social capital and IT use, and validates the public library as a resource for growing social capital and thus maintaining community.

Summary of findings

In short, we find from our historical research that social capital (resources available through social ties) was an enabling factor in the origins of the CyberNavigator program itself, and also in the public computing library that is its setting. The public computing library is a term for the historical stage of the public library when the public access computers take physical preeminence in the branches.

Triangulating between ethnographies, focus groups, and questionnaires, we find that informatics moments in the branch public libraries focus on one or more literacy tasks: basic literacy (reading or writing text), computer literacy (a variety of skills, concepts, and behaviors appropriate to the digital age), library literacy (using systems in order to print, make computer reservations, search the catalog, retrieve items from databases); and domain literacy (having a current understanding of and functioning well within various domains of daily life, most commonly, looking for work).

Informatics moments in the library are indeed enabled by social capital. This social capital takes such forms as: patrons and helper being familiar with

each other, knowing each others names; patrons referring others to the helper, or bringing each other; the helper lending his personal laptop to the patron to use during the informatics moment; and library staff connecting patrons to the helper and providing help themselves in an ongoing, cooperative way.

4 Designing the branch library of the future: A call for theory concerning the informatics moment

People experience informatics moments when they seek help to do something with information technology. This is their moment of bridging a digital divide. In the setting of Chicago Public Library, they are helped in these moments by a CyberNavigator.

The informatics moments observed in the library entail one or more of four different literacies: basic literacy, computer literacy, library literacy, or domain literacy. These informatics moments succeed, that is, the collaboration between patron and CyberNavigator are successful: people looking online for jobs get them, people who were afraid of computers become computer users and even cybernavigators in their own right. Their gratitude expresses the paradigm shift, the giant leap, they have made: they return to say thank you, they press food and other gifts on the CyberNavigators, they even try to pay them.

People also recommend the CyberNavigator to others, and this is just one way that social capital is involved in the informatics moment. The CyberNavigator becomes familiar and trusted by patrons and staff based on a track record of success in helping and his or her approachability.

In sum, in their informatics moments, people get help via their social network: local people they know recommend the CyberNavigator; library staff recommend the CyberNavigator; and they turn to the CyberNavigator. They seek and get help from someone who is both close and approachable: a particular person in their own neighborhood library. In this moment and at its best, the library represents both government- and community-based social capital at the same time; this is understood in the library profession [39] and beyond [44], although professional, paraprofessional, and security guard training does not necessarily cover this aspect of library work.

After witnessing hundreds of informatics moments unfolding before them, staff and patrons at one branch library began to talk: Will the library be a temple to books? A friendly place to use computers? Will it be both? As their CyberNavigator explained:

I think, actually, we get used more than the librarians. Like, especially at my branch because I feel like nobody goes to the library for books anymore. Everything seems to be online. So it would only make sense that, you know, with books came the librarian, and with computers came the CyberNavigator, you know?

Additional data we have collected from the traditional library staff will certainly shed more light on this. It does appear that by their words and deeds, the creators of the CyberNavigator program—senior administrators, managers, and frontline staff—are designing the branch library of the future.

Practice can proceed further if informed by robust theory. The informatics moment in people’s everyday lives merits closer examination and wider understanding if we are to accelerate it. Libraries are grappling with this moment. A 2009–2010 national survey asked public libraries if they carried out technology training [45]:

- Informal point-of-use assistance, 76.6% of libraries
- Formal technology training, 37%
- One-on-one technology training sessions by appointment, 23.5%
- Online training material, 21.7%
- No training offered, 10.9%

How effective these activities are, who staffs them, and to what extent libraries are keeping ahead of demand, is not terribly well known. Yet 76.6% of public libraries means close to 13,000 outlets nationwide.

Interviews with state library staff and surveys of 35 public libraries found that supporting patrons who need help with IT is just part of the major challenge of public access technologies [6]. A key solution emerging from that analysis is building “a community approach to public access with the library as one of the foundational institutions” [6, p. 88, and similarly p. 89]. By partnering with its foundation and its branches’ friends groups to raise funds and hire a special category of staff, Chicago Public Library has sustained a critical service for patrons. At least three library schools and one community college—Dominican University, University of Texas [46], University of Illinois, and Champaign’s Parkland College—mobilize students as volunteer CyberNavigators in their local libraries, because staff cannot answer patron demand and educators recognize CyberNavigating as a new skill that their graduates need. The social capital reflected in institutional ties like these, as well as the social capital and successful informatics moments documented in this study, point to a vital library service *and* the resources to sustain it.

A particular direction for future research is further theory-building regarding these findings in the context of the literature on the reference encounter. This can clarify how the informatics moment is a continuity, but also something new, as the data from Chicago Public Library suggests.

Other helping professions and our information society as a whole also need an understanding of the literacy and the social capital involved. The informatics moment is in fact quite ubiquitous. Who has not either helped someone use computers, or been helped? Within and beyond the branch public

library, there is something hopeful to be learned about our information society by looking closely at these interactions.

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Figure 1.

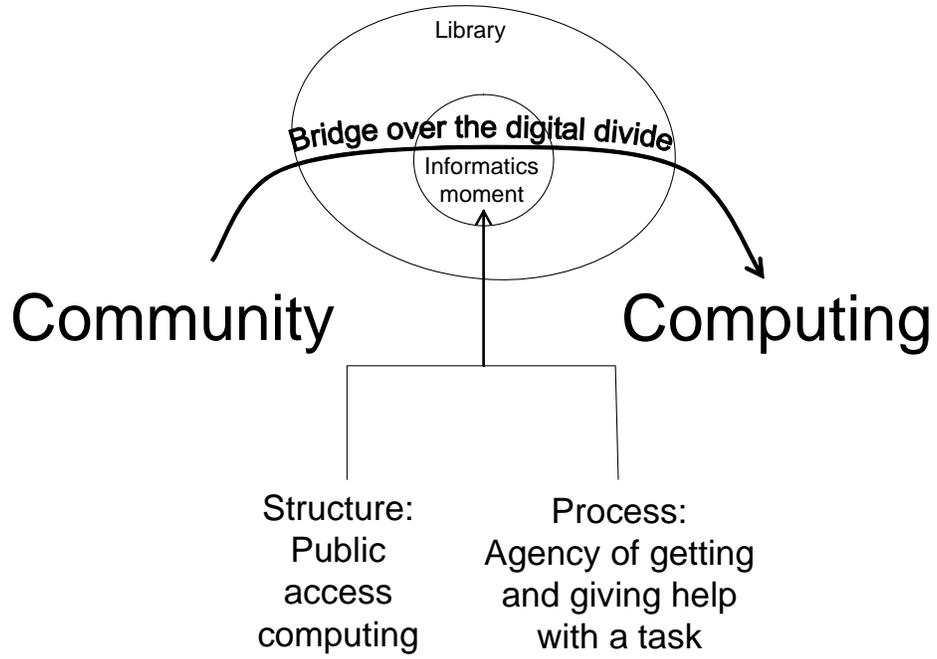


Figure 2.

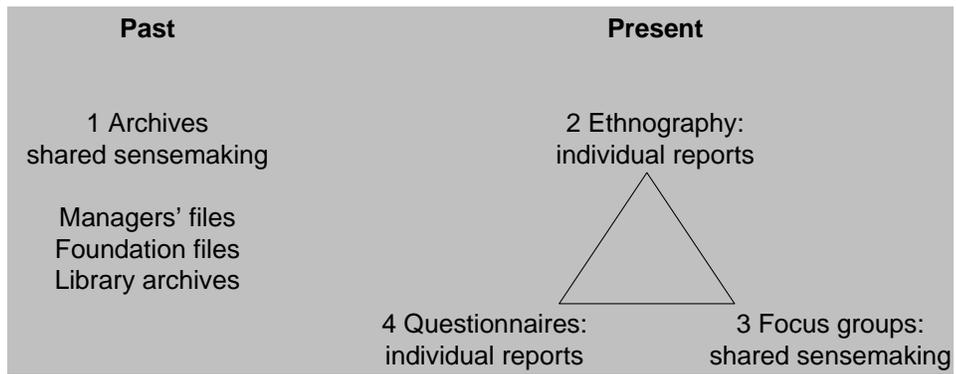


Table 1 as image. Also provided as .xls file and as tab delimited text file.

		Percent of CyberNavigators providing help with this at least weekly, n = 37	Informatics moments observed
Basic literacy	Reading text	90%	0 (0%)
	Writing text	76%	
Computer literacy	Using a mouse or browser	100%	51 (32%)
	Setting up or using email	97%	
	Producing a document	87%	
	Using social network sites	52%	
	Learning computers in a structured class	48%	
	Playing games online	38%	
Library literacy	Printing	100%	64 (41%)
	Making or changing a computer reservation	100%	
	Using the online catalog	87%	
	Using the library's databases	73%	
Domain literacy	Searching for work	94%	42 (27%)
	Doing non-job-seeking research	89%	
	Applying for work	87%	
	Producing or updating a resume	79%	
	Using other government websites	68%	
	Doing homework	67%	
	Applying for or checking on government benefits	50%	
	Seeking news or cultural information	46%	
	Doing e-commerce	23%	
	Seeking health information	19%	
	Seeking resources relating to being homeless	19%	

Table 2 as image. Also provided as .xls file and as tab delimited text file.

		Percent of CyberNavigators experiencing this at least weekly, n = 37	Informatics moments observed
CyberNavigator (CN)	CN knows patron's name	95%	30 (19%)
	CN recognizes patron	84%	
	CN brings own laptop to use in helping patrons	35%	
	CN allows patron to use CN's laptop to get help	30%	
	CN helps someone he/she knows from outside work	16%	
	CN sees/gets together with patrons outside work	14%	
Community	Patron knows CN's name	95%	34 (22%)
	Patron referred by someone other than library staff	78%	
	Patrons come in 2s, 3s, more for help	54%	
Library	Librarians connect CN to patrons seeking help	100%	11 (7%)
	Guard connects CN to patrons seeking help	84%	
	Paraprofessionals connect CN to patrons seeking help	81%	
	Library staff helps patrons (not including printing/reservations)	76%	
	Library staff sees/gets together with CN outside work	3%	