Community Informatics

Kate Williams
University of Illinois at Urbana-Champaign, Champaign, Illinois, U.S.A.

Joan C. Durrance
School of Information, University of Michigan, Ann Arbor, Michigan, U.S.A.

Abstract
Community informatics is an emerging field focusing primarily on the interaction between local communities and information technologies and a more particular focus within social informatics. It is rooted in library practice, most notably the outreach that led to information and referral (I&R) services, as well as other innovative practices, for example the community technology center and the community network, aimed at strengthening communities faced with the digital era and its attendant disruptions and opportunities. Community informatics research and teaching is carried out at a growing number of library/information schools and elsewhere, as appropriate to this interdisciplinary endeavor.

Community informatics is an emerging field that encompasses both study and practice, although the focus here is on the former. Loader (2000, cited in Ref. [1]) has described it as navigating the interaction between *transformation* as expressed in information technology and *continuity* as expressed in a local, historical community. This is a specification of Kling's definition of the field of social informatics, of which community informatics is a part: "the interdisciplinary study of the design, uses and consequences of information technologies that takes into account their interaction with institutional and cultural contexts."[2] While social informatics historically most often concerned itself with business and government settings, community informatics looks at a third realm of social activity, the community. The concept of community and the tensions within that concept, set in the context of the nascent information society, are the basis for the core ideas of community informatics. Community informatics practitioners can be found in public libraries, community technology centers, community networks, and in an increasing range of community and economic development activities, employed in the private, public, or nonprofit sectors. Researchers come from the disciplines of library and information science, communications, community development, computer science, informatics, sociology, urban and regional planning, and other fields. Fortunately, the discussion in this encyclopedia entry is informed by the fact that one author (Durrance) comes to community informatics through library practice and scholarship, and the other through community practice and study of the digitization of society, or social informatics (for example, see Ref. [3]). This allows the entry to trace multiple paths that have led to a single, if fuzzy-bounded, interdisciplinary field. By all accounts, however, the starting point is very much the local, historical community.

COMMUNITY AS THE BASIS FOR COMMUNITY INFORMATICS

Most scholars have defined information technology very concretely as a particular, if evolving, set of digital tools and applications. But defining and understanding community is a challenge that has productively engaged more than a century of scholars. With the last major wave of U.S. migration from country to city, the fate of community within the metropolis occupied a generation of scholars, who themselves referenced the scholarship of those who had earlier grappled with the meaning of the European migration to the cities. The earlier discourse was very much driven by the ideas of Marx, Tönnies, and Durkheim, while the Chicago School (including among others Frazier, Mead, Park, and Wirth) was the most influential in the United States.

Community is variously defined in the social sciences and has been examined in many of its guises in community informatics literature. Most often, it refers to a population living within certain geographic boundaries (geographic community), and this gives rise to a local history and culture which is the context for whatever else happens. This definition is bolstered by the fact that planning and funds flows are channeled according to those boundaries and political battles are often fought within these jurisdictions. This can be seen during the 1980s when various cities implemented community technology projects. (For a comparison of four cities, see Ref. [4].)

Encyclopedia of Library and Information Sciences, Third Edition DOI: 10.1081/E-ELIS3-120043669

But there can be communities within these geographic communities, as for instance the communities of interest that contended—homeless and their allies, and local business and real estate interests—within Santa Monica's Public Electronic Network.[5] Or Bishop et al's[6] work on a Web tool for local African-American women working on health issues. And there are communities with a particular geographic, historical origin that are now spread across large or small distances. Diasporic communities have taken to the Internet to maintain close ties with people far away, for example Trinidadians.[7] And one's community may be spread across a single metropolis, as in Ref. [8]. Wellman, in fact, later proposed[9] and then tempered his assessment[10] that every individual with their ties now represents a distinct personal community, more or less place-based.

Benjamin[11] used a recursive definition of community—"people living in a geospatial area who define themselves as part of a community"—in order to analyze why some telecenters succeed and others fail to attract local involvement. This definition has a history in ethnography and acknowledges that communities are quite often self-identified or socially identified.

Human activity itself has been theorized as taking place in communities.[12] Rheingold documented the arrival of the virtual community[13] and the cell phone based social network.[14] Rheingold's online or phone based communities interact in particular ways with the local, the historical community. Online discussion lists, games, and other social computing phenomena have generated interesting work that enriches and is enriched by community informatics per se.

There are tensions and overlaps between these various communities. The field of community informatics, by studying the interaction between transformation and continuity, between information technology and local community, is building up a picture of how the social, historical places we live in are evolving as we move from the industrial age to the information age, with particular attention to social and digital inequalities. Moreover, it has done this very much based on practice, both inside and beyond libraries.

ROOTS OF THE FIELD OUTSIDE THE LIBRARY: THE SOCIAL INFORMATICS PERSPECTIVE

Setting aside for the moment the important role of libraries and library scholars in community informatics, several other interrelated but distinct social trends have also given rise to and continue to shape the field. These can be summed up as the network society, the hacker ethic, and the digital divide.

For some time now the network society has been unfolding on and in local communities. What does this term mean? It means that today society is characterized by networks rather than organizations; flexible production with a flexible workforce; an economy that is globally coordinated in real (or chosen, as with e-mail) time. A new space has been identified that contrasts with the space of place, that is, the geographic communities where we live and breathe. This new space is the space of flows that is based on digital tools and systems; in other words, the sum total of all the communications and transportation flows that link the global, mobile, network of human networks.[15] The world's economies, east and west, adopted digital technologies even as they experienced the economic crises of the 1960s and 1970s; what has resulted is spaces of place that are threatened, because they are mostly bypassed, by the space of flows. In the industrialized countries, one can think for example of Rust Belt, United States or vast stretches of the North of England as thus threatened. Other spaces of place, Silicon Valley, for example, have certainly not been bypassed, and yet even there the space of flows has left toxic dumps for the space of place to cope with.

Faced with this, local governments responded with digital initiatives of their own. Among many: In 1989, Santa Monica, California, offered its residents free online discussion lists, accessible in public libraries or from home, and access to city officials, as mentioned above.[16] In 2000, Lagrange, Georgia, offered its entire population free cable Internet.[17]

An interesting reflection in academia of this space of place-space of flows or network-communities tension was the 1996 colloquium that became the edited volume *High Technology and Low Income Communities*.[18] This arose from a dialogue between two mutually exclusive groups in urban planning at MIT, one focused on opportunities for Information and Communication Technology (ICT) and the other on low-income communities. They recruited Manuel Castells to the event and produced a proceedings volume that discussed, but did not name, community informatics.

On the heels of early experimentation, the second social trend that has given rise to community informatics is the discourse and the activity around the concept of the digital divide. This emerged in the mid 1990s as a popular phrase for the gap between people who access and use information technology and those who do not.[19] In the United States, the Department of Commerce was an early implementer of both research and policy on this. The department launched a (continuing) series of survey reports on individuals' access to and use of computers and later the Internet and other particular tools such as cell phones.

In the realm of practice, the same agency within the Department of Commerce began more than a decade of annual rounds of grantmaking (Telecommunications and Information Infrasture Assistance Program (TIIAP), later the Technology Opportunities Program, or TOP) to organizations in local communities to support their community technology projects. The Department of Commerce

initiative was rooted in the economic imperative to develop a market for computers and for e-business and to develop a skilled workforce via education and public provision of information technology. Such experiments as TOP were echoed by private and other public funders, including technology companies and even the National Science Foundation, which helped Playing to Win launch the nationwide Community Technology Centers Network. One could certainly say that the dot-com technology bubble fueled the digital divide discourse in the United States, with corporations supporting local and national projects.

A third social trend giving rise to community informatics can be summed up as the hacker ethic, which took hold as computers and software became a hobby and a profession. In contrast to the media's definition of hacker as thief, the hacker ethic is the practice of building computers and writing code for the fun of it, for the creativity of it, and for the community-building. This is what[20] calls "the spirit of the information age." The hacker ethic expressed itself in the origins of the personal computer out of the milieu of the Homebrew Computer Club and in the production of Linux and other such software. It also expressed itself in projects where hackers joined up with others to produce tools such as:

- PLATO, where by 1972 hackers and teachers were writing online courses for all levels of students.[21]
- Berkeley Community Memory, the public terminals established in 1973 that provided an online bulletin board for all passers by.[22]
- Community technology centers such as Playing to Win, opened in 1983 by math teacher Antonia Stone in a Harlem housing project (Stone 1986),[58] and
- Freenets or community networks such as the Cleveland Free-net, which began life in 1984 as St. Silicon's Hospital and Information Dispensary, an online communications tool for doctors and patients.[23]

The community network and community technology center phenomena each grew into international movements, with associations, publications, and annual conferences for practitioners. Community technology projects emerged out of the grassroots—as in Toledo, Ohio[24–27] and inner-city Wilmington, North Carolina[28]—and blossomed in both virtual and actual space. Community network developers soon connected with librarians and library scholars, for reasons given below.

ROOTS OF THE FIELD WITHIN LIBRARIES

Urban social unrest provided the backdrop for librarians developing new approaches to service that resulted in the creation of early community information services. The riots of the late 1960s marked the beginning of change in the nation's urban libraries. The decay of the inner city had resulted in a mismatch between the services that agencies such as public libraries offered in the mid-1960s and the needs of a changing population. Librarians had traditionally used library circulation figures to measure their effectiveness in the community. As the middle class left the nation's major cities, urban libraries suffered a drastic drop in circulation. At the same time researchers found that, "citizens are uninformed about public and private resources, facilities, rights, and programs... and frustrated in their attempts to get information required for everyday problem solving." [29, p. 20]

By the early 1970s, the federal government had provided funding for both the development of information and referral (I&R) services and a series of educational programs and guides aimed at helping professionals gain skills in developing I&R services.[30–32] The federal government's active fostering of the development of I&R services by various institutions drew in both practitioners and academics, including a group of pioneering urban libraries and a small cadre of LIS researchers.[29,33,34]

Academics who focused on community information in the 1970s worked with practitioners through associations and consultancies, analyzed practice, contributed articles and reports, made public presentations and developed academic curricula in the established LIS programs at Syracuse University, the University of Maryland, Drexel University, and the Community Specialist Program at the University of Toledo.

Clara Jones, then Director of the Detroit Public Library and its first African-American leader, argued at the time that:

> The welfare of the public library is inextricably interwoven with the destiny of the city, the financial dilemma of libraries being one manifestation of characteristic urban ills. Although we are a predominantly urban nation, there is widespread indifference or resignation to the desperate plight of cities... It seems increasingly evident that we can no longer depend solely on the traditional cornerstone of public library service to adults-reference work, reading guidance, and programming–to stimulate sufficient interest and satisfy a broad enough range of needs. [35, pp. 85–86]

The purpose of I&R was to provide a link between a person with a need and the resources in the community that would meet that need. To accomplish this, pioneering I&R staff created community information files, provided information about community services, and engaged in active question negotiation. Information and referral services, considered essential to avoid fruitless agency ping-pong—people seeking services bouncing from one office to the next in an environment where social services by hundreds of agencies and nonprofit organizations were delivering social services. Information and referral work was considered by many to be a radical departure from standard public library services.

At their outset, I&R services were also confusing and lacked definition.[33] The Alliance for Information & Referral Services in 1973 defined I&R and outlined a set of activities including: file development, simple and complex information giving, actively helping clients make contact with a resource (referral), working with the client to overcome obstacles (advocacy), and assuring that clients actually reached the appropriate resources (follow-up); some of these were divergent from traditional library practice. In the late 1970s, Childers conducted a benchmark study of I&R in public libraries and found that while public libraries in his study embraced the information role, for the most part they did not engage in referral and follow-up.[33]

In spite of the limitations in adopting the I&R model in the 1970s, library engagement in the community-focused information services discussed above laid the groundwork for the public library's community-focused roles in the digital age and the beginnings of academic response to community problems.

By the 1990s, librarians and library scholars were ready to join forces with the grassroots activists, local government staffers, foundations and other nonprofits, and businesses who were experimenting with technology in communities. A particular series of three conferences helped to catalyze the community networking movement. The Ties that Bind conferences (1994, 1995, 1996) were sponsored by Apple Computer's Library of Tomorrow Project and the Morino Foundation. They brought together a wide range of individuals and groups to foster community networking.[36] The encompassing goals of these conferences were:

> to provide information and case studies on the types of community networks that have proven viable, including economic, collaborative, and technical models; to help individuals representing schools, non-profits, foundations, businesses, media, and government agencies realize how community networking can be used as a tool to help advance the goals and needs of the community; to understand the importance of community networking in the formation and effective use of the National Information Infrastructure; to understand the emerging context – the social, economic, technical political, and sustainability issues which characterize the challenges and potentials for Community Networking.[37]

These conferences, led by Steve Cisler of the Apple Library of Tomorrow, resulted in the creation of the Association for Community Networking and strongly influenced the encompassing thought processes that resulted in the development of the community informatics framework.

A major study funded by Institute of Museum and Library Services (IMLS) and conducted in 1999–2000 by Durrance & Pettigrew found that community information provision had undergone major change as a result of Internet adoption by libraries. They found increased use of networked community information, a variety of digitization projects, a strong Internet presence, adoption of digital reference, increased collaboration between libraries and other community organizations, and, as a result of these innovations, increased visibility and community support.[38,39]

One noteworthy example of library-community information projects is the Tallahassee FreeNet (TFN), Florida's oldest community network. It was started in 1993 by faculty from the Florida State University supercomputer center. Quickly the LeRoy Collins Leon County Public Library became an operating partner and the TFN became one of the nation's first library-university community networking projects. Tallahassee FreeNet's mission statement reflected the aims of all the early collaborative community networks:

> TFN is more than an operator of an information system. It is the agent guiding Tallahassee and to some extent Florida, into the Information Age. Therefore, it is further the mission of TFN to precipitate community cooperation that is the basis for having community-wide electronic communication.[40]

University Contributions

During the 1990s, a number of universities, armed with excess computing power and aware of the digital disparities between the universities and communities, worked with local agencies to form community networks. Several of the long-lived projects among these are worth noting:

1. The Community Networking Initiative (later joined with the Alliance for Community Technology) at the University of Michigan School of Information and Library Studies, now School of Information. The University of Michigan Community Networking Initiative (UM-CNI) began with support from the W. K. Kellogg Foundation in 1994. This project enabled faculty and students to take a leadership role in Internet-based community networking (see for example, Durrance[41]). A collaborative venture involving the UM-CNI, the Flint Public Library, the Mideastern Michigan Library Cooperative, the Library of Michigan, and the Apple Library of Tomorrow Program created in 1995 the Flint Community Networking Initiative, a model public library Internet training laboratory featuring an extensive training program first for staff and later for community members—especially teens—and an ongoing community-focused Internet presence in Flint. Today the Alliance for Community Technology carries out a variety of teaching, research, and service projects.
2. Prairienet and the Community Informatics Initiative at the University of Illinois at Urbana-Champaign Graduate School of Library and Information Science. Prairienet, a partnership between the university and

local community members and nonprofit organizations, was founded in 1993. It seeks to:

> promote equity of access to computer resources for everyone in the community; facilitate information and resource sharing in support of community development efforts; empower individuals by teaching computer skills and providing access to the Internet; and strengthen community organizations by assisting them with access and the sharing of information.[42]

The Community Informatics Institute focuses on research and teaching, especially through Prairienet and its other community partnerships, among them the East St. Louis Action Research Project and the Puerto Rican Cultural Center in Chicago.[43,44]

3. Blacksburg Electronic Village at the Virginia Polytechnic Institute and State University. This program is connected to researchers in architecture and design (and later information architecture) as well as human-computer interaction. This collaboration included the Town of Blacksburg and a major communication company in order to bring high-speed Internet and social computing to the community. Planning began in 1991; the Blacksburg Electronic Village became operational in 1993. It has been an international model for networked community through its innovative collaboration and citizen involvement.[45]

EMERGENCY OF COMMUNITY INFORMATICS AS A UNIFYING CONCEPT

Allowing for the caveats summed up by Stoecker,[46] a loose network of scholars can today be seen to comprise a core of community informatics research. The scaffolding of the field features two processes that have contributed to drawing together scholars via conferences, proceedings volumes, and at least one journal. The first of these two processes is the series of seven Dimensions in Advanced Computing (DIAC) conferences sponsored by Computer Programmers (later Professionals) for Social Responsibility since 1987; this has generated both proceedings volumes and edited books (most recently Day and Schuler[47] and Schuler and Day[48]). Dimensions in Advanced Computing's organizer Doug Schuler, a cofounder of Seattle Community Network, launched an undergraduate program in community informatics and authored *New Community Networks: Wired for Change*.[49]

The second process has been anchored in the north of England, where Brian Loader and others have generated a flow of edited and authored volumes,[1,50–55] several conferences, and the quarterly journal *Information, Communication and Society* (since 1998), all while guiding several community technology projects.

Other integrative processes are: 1) the work of[56] defining community informatics and bringing particular attention to work in Australia, Canada, and elsewhere; 2) the annual Community Informatics Research Network meetings; 3) the broader biennial Conference on Communities and Technologies; 4) the also more broad but still highly useful conferences of the Association for Internet Research (annual since 2000) and; 5) the journals *First Monday* (launched 1996), *The Information Society* (1981), *Journal of Computer Mediated Communication* (1995), *New Media and Society* (1999), and the *Journal of Community Informatics* (2004).

NEW DIRECTIONS

As technology has evolved, converged, and diffused, the binary concept of the digital divide has revealed itself as containing multiple digital *inequalities* bearing deeper analysis. (For a recent example see Ref. [57].) Four trends are worth noting: datasets, globalization, a turn towards theory, and a recent expansion of community informatics curriculum in library information science schools.

First, academic and policy researchers have produced hundreds of case studies, and the color and texture of these continue to be highly valuable. The multitude of studied and not-yet-studied community informatics projects and practices and the need for research to guide policy present scholars with an opportunity to standardize our approach to case studies and to collect and analyze larger datasets. This will allow us to generalize and confirm trends in communities. Second, related to this, is the imperative to study community technology as a global phenomenon rather than a national one. The search for community development through technology, for community sustainability in the digital age, is turning up lessons in one part of the world that others cannot afford to ignore.

Third, as researchers turn increasingly to theorizing as well as describing, our work on communities can be usefully placed alongside the work of others on the informatics of our government, education, and business sectors. A number of theoretical concepts and frameworks are already proving powerful in this regard: information use, community inquiry, civic intelligence, social networks and social capital,[59] and the public sphere among them. These summations will help community informatics and others scholars to revisit and update our conceptions of the Information Society, which first took shape with very little actual data from the localities where we all live.

A fourth trend is not within the research but relies on it: the expansion of community informatics and community information in the curricula of the library and information science schools. The iSchools conferences are playing a role here; offering sessions focusing on community informatics. Today courses in this area are taught at the graduate level at 7 of the 57 library and information science programs in the United States and Canada. It is expected that such efforts will grow, in and beyond the LIS programs.

REFERENCES

1. Keeble, L.; Loader, B.D., Eds. *Community Informatics: Shaping Computer-Mediated Social Relations*; Routledge: London, U.K., 2001.
2. Kling, R. What is social informatics and why does it matter? D-Lib Mag. **1999**, *5* (1), http://www.dlib.org/dlib/january99/kling/01kling.html.
3. Williams, K. Social networks, social capital, and the use of information and communications technology in socially excluded communities: A study of community groups in Manchester, England. Unpublished Ph.D. dissertation, University of Michigan, Ann Arbor, MI, 2005.
4. Guthrie, K.K.; Dutton, W.H. The politics of citizen access technology: The development of public information utilities in four cities. Policy Stud. J. **1992**, *20* (4), 574.
5. Rogers, E.M.; Collins-Jarvis, L.; Schmitz, J. The pen project in Santa Monica: Interactive communication, equality, and political action. J. Am. Soc. Inf. Sci. **1994**, *45* (6), 401–410.
6. Bishop, A.; Bazzell, I.; Mehra, B.; Smith, C. Afya: Social and digital technologies that reach across the digital divide. First Monday **April 2001**, *6* (4), http://www.firstmonday.org/issues/issue6_4/bishop/.
7. Miller, D.; Slater, D. *The Internet: An Ethnographic Approach*; Berg: Oxford, U.K., 2000.
8. Wellman, B.; Leighton, B. Networks, neighborhoods, and communities: Approaches to the study of the community question. Urban Affairs Q. **1979**, *14* (3), 363–390. Available at http://www.chass.utoronto.ca/∼wellman/publications/index.html.
9. Wellman, B. Physical place and cyberplace: the rise of networked individualism. In *Community Informatics: Shaping Computer Mediated Social Relations*; Keeble, L., Loader, B., Eds.; Routledge: London, U.K., 2001.
10. Wellman, B. The rise (and possible fall) of networked individualism. Connections **2002**, *24* (3), 30–32.
11. Benjamin, P. Telecentres and universal capability: A study of the telecentre programmes of the universal service agency, 1996–2000. Ph.D. dissertation, Aalborg University, Aalborg, Denmark, 2001.
12. Lave, J.; Wenger, E. *Situated Learning: Legitimate Peripheral Participation*; Cambridge University Press: Cambridge, U.K., 1991.
13. Rheingold, H. *The Virtual Community: Homesteading on the Electronic Frontier*; Addison-Wesley Publishing Company: Reading, MA, 1993.
14. Rheingold, H. *Smart Mobs: The Next Social Revolution*; Perseus Publishing: Cambridge, MA, 2002.
15. Castells, M. *The Rise of the Network Society. Vol. I, The Information Age: Economy, Society and Culture*; Blackwell Publishers: Oxford, U.K., 1996.
16. Rogers, E.M.; Collins-Jarvis, L.; Schmitz, J. The pen project in Santa Monica: Interactive communication, equality, and political action. J. Am. Soc. Inf. Sci. **1994**, *45* (6), 401–410.
17. Youtie, J.; Shapira, P.; Laudeman, G. *Transitioning to the Knowledge Economy: The Lagrange Internet Access Initiative;* Impacts of Public Infrastructure Access Working Paper 3; Georgia Institute of Technology, Atlanta, GA, 2002.
18. Schön, D.A.; Sanyal, B.; Mitchell, W.J. *High Technology and Low-Income Communities: Prospects for the Positive Use of Advanced Information Technology*; MIT Press: Cambridge, MA, 1999.
19. Williams, K. What is the digital divide? In *d3: Proceedings of the Digital Divide Doctoral Students Workshop*; University of Michigan School of Information: Ann Arbor, MI, August 2001.
20. Himanen, P. *The Hacker Ethic and the Spirit of the Information Age*; Random House: New York, 2001.
21. Woolley, D.R. *Plato: The Emergence of On-Line Community*; University of Illinois at Urbana-Champaign Computer-Based Education Research Laboratory: Urbana, IL, 1994.
22. Felsenstein, L.; Aboba, B. How community memory came to be, Part 1: The origins of community memory. Internaut **1994**, *1*, http://madhaus.utcs.utoronto.ca/local/internaut/comm.html (accessed August 24, 2005).
23. Bluming, A. *History of the Los Angeles Free-Net*; Los Angeles Free Net: Los Angeles, CA. n.d.
24. Stoecker, R.; Stuber, A.C.S. Limited access: The information superhighway and Ohio's neighborhood-based organizations. Comput. Hum. Serv. **1997**, *14*, 39–57.
25. Stoecker, R.; Stuber, A. Building an Information Superhighway of One's Own: A Comparison of Two Approaches. Research in Politics and Society **1999**, *7*.
26. Alkalimat, A.; Williams, K. Social capital and cyberpower in the African American community: A case study of a community technology center in the dual city. In *Community Informatics: Shaping Computer Mediated Social Relations*; Keeble, L., Loader, B., Eds.; Routledge: London, U.K., 2001.
27. Williams, K.; Alkalimat, A. A census of public computing in Toledo, Ohio. In *Shaping the Network Society: The New Role of Civic Society in Cyberspace*; Schuler, D., Day, P., Eds.; MIT Press: Cambridge, MA, 2004.
28. Mele, C. Cyberspace and disadvantaged communities: The Internet as a tool for collective action. In *Communities in Cyberspace*; Smith, M.A., Kollock, P., Eds.; Routledge: London, U.K., 1999; 290–310.
29. Kochen, M.; Donohue, J. *Information for the Community*; American Library Association: Chicago, IL, 1976.
30. Cronus, C.L.; Crowe, L., Eds. *Libraries and neighborhood information centers,* Allerton Park Institute Proceedings 17, University of Illinois at Urbana-Champaign Graduate School of Library and Information Science, Champaign, IL, 1971, http://www.ideals.uiuc.edu/handle/2142/1552 (accessed online October 3, 2007) .
31. Long, N. *Information & Referral Services: Research Findings. Volume One of the Interstudy Information and Referral Center Study*; U.S. Administration on Aging, Department of Health, Education, and Welfare: Washington, DC, 1975.
32. Croneberger, R.; Luck, C. Analyzing community human information needs: A case study. Libr. Trends **January 1976**, *24* (3), 515–525.
33. Childers, T. *Information and Referral: Public Libraries*; Ablex: New York, 1984.
34. Durrance, J.C. Community information services: An innovation at the beginning of its second decade. Adv. Librarianship **1984**, *13*, 100–128.

35. Jones, C.S. The urban library: Proving utility. Libr. J. **1976**, (101), 81–86.
36. Hallman, J. Community networking [hyperlinked timeline] 2006, http://www.ibiblio.org/rtpnet/community-net.html (accessed October 10, 2007).
37. Cisler, S. Ties that bind: Community networking (conf. announcement); March 2, 1995. http://scout.wisc.edu/Projects/PastProjects/NH/95-03/95-03-14/0014.html (accessed October 10, 2007).
38. Durrance, J.C.; Pettigrew, K.E. Community information: The technological touch. Libr. J. **2000**, *125* (2), 44–46.
39. Durrance, J.C.; Pettigrew, K.E. *Online Community Information: Creating a Nexus at Your Library*; American Library Association: Chicago, IL, 2002.
40. TFN (Tallahassee FreeNet), About us, n.d. http://www.tfn.net/TFN/ (accessed October 10, 2007).
41. Durrance, J.C. Community connector. University of Michigan School of Information Community Networking Initiative, 1994, http://www.si.umich.edu/Community/ (accessed October 15, 2007).
42. PrairieNet Community Network, 2005, http://www.cii.uiuc.edu/prairienet (accessed October 10, 2007).
43. Bishop, A.P.; Bruce, B. Community informatics: Integrating action, research, and learning. B. Am. Soc. Inform. Sci. Tech. **August/September 2005**, *31* (6), 6–10.
44. Bruce, B.C.; Bishop, A.P. New literacies and community inquiry. In *The Handbook of Research in New Literacies*; Coiro, J., Knobel, M., Lankshear, C., Leu, D., Eds.; Erlbaum: Hillsdale, NJ, 2007; 703–746.
45. Cohill, A.M.; Kavanaugh, A.L., Eds. *Community Networks: Lessons from Blacksburg, Virginia*; Artech House: Norwood, MA, 1999.
46. Stoecker, R. Is community informatics good for communities? Questions confronting an emerging field. J. Commun. Inform. **2005**, *1* (3), 13–26.
47. Day, P.; Schuler, D., Eds. *Community Practice in the Network Society: Local Action/Global Interaction*; Routledge: London, U.K., 2003.
48. Schuler, D.; Day, P. *Shaping the Network Society: The New Role of Civil Society in Cyberspace*; MIT Press: Cambridge, MA, 2004.
49. Schuler, D. *New Community Networks: Wired for Change*; ACM Press: New York, 1996.
50. Loader, B. *The Governance of Cyberspace: Politics, Technology and Global Restructuring*; Routledge: London, U.K., 1997.
51. Loader, B.; Hague, B. *Digital Democracy: Discourse and Decision-Making in the Information Age*; Routledge: London, U.K., 1999.
52. Loader, B.; Thomas, D. *Cybercrime: Law Enforcement, Security & Surveillance in the Information Age*; Routledge: London, U.K., 2000.
53. Loader, B.; Dutton, W.H. *Digital Academe: The New Media and Institutions of Higher Education and Learning*; Routledge: London, U.K., 2002.
54. Loader, B.; van de Donk, W.; Nixon, P.; Rucht, D. *Cyberprotest: New Media, Citizens and Social Movements*; Routledge: London, U.K., 2003.
55. Loader, B.; Keeble, L. *Challenging the Digital Divide? A Literature Review of Community Informatics Initiatives*; Joseph Rowntree Foundation: York, U.K., 2004.
56. Gurstein, M., Ed. *Community Informatics: Enabling Communities with Information and Communications Technologies*; Idea Group Publishing: Hershey, PA, 2000.
57. Mossberger, K.; Tolbert, C.J.; McNeal, R.S. *Digital Citizenship: The Internet, Society, and Participation*; MIT Press: Cambridge, MA, 2007.
58. Stone, A. *CTCNET: History, Organization and Future*; CTCNET: Newton, MA, 1996.
59. Williams, K.; Durrance, J.C. Social networks and social capital: Rethinking theory in community informatics. J. Commun. Inf. forthcoming. **2008**, *4* (3).