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The Information Revolution in Illinois:
A Community Informatics Perspective

by Kate Williams, University of Illinois at Urbana-Champaign, USA[1]

Introduction

A social transformation is underway worldwide,toward using digital technology as the basic infrastructure. This has been called an information revolution.[2] It has rapidly impacted all aspects of society, as a boon for some and a digital divide for others.This paper presents research on ten local communities in the state of Illinois, USA.[3]

Community informatics (CI) research asks big questions and yet is also very practical.In this sense, it is what has been called Pasteur-quadrant research.[4]Not pure research, not applied research, but posing and answering big questions and providing solutions to current practical or policy problems.The big question for this paper and for community informatics as a whole is this: Is community possible in the information society?That is, does it exist, and how?As agricultural and industrial societies around the world meet the economy-shattering digital modes of production, community as we know it is under attack.But just as when industrial societies replaced agricultural ones, community did not vanish; it reemerged in new forms.It is this destructive-constructive process we are interested in, but in our information era.

Libraries are community-serving and community-based organizations, even though they are also usually government agencies.So community informatics knowledge is also needed in order to plan the libraries of the future.This is especially true for public libraries, which serve local, geographic communities.So community informatics has taken root in library and information science programs and ischools[5] in the West, through research, coursework and service.

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[2] Williams (2001) provides a short list of terms for this phenomenon. In chronological order from 1962 to 1996, they are: computer revolution, knowledge economy, global village, scientific-technological revolution, third wave, post-industrial post-service revolution, information revolution, informationalism, and network society. A key source for the earlier terms is a list assembled by Beniger (1986).

[3]What if we had 1, 2, many such reports from provinces all over the world?This is what the field of community informatics produces.It uses empirical research to build theory that all of us need in order for our societies to function.

[4] Louis Pasteur solved the problem of people getting sick from drinking spoiled milk by inventing pasteurization, but he also proved the germ theory of disease, that is to say, he was among those to establish the existence of micro-organisms. Stokes (1997) discusses the unique value of Pasteur-quadrant research.

[5]Ischools are a group of schools and programs which have rebranded or reorganized themselves in response to the centrality of digital technology. Most but not all are also LIS program and are in North America; Chinese members include Nanjing University Department of Information Management and Wuhan University School of Information Management. Their focus is on the intersection of people, information and technology and their research funding is above a certain level. For more see http://www.ischools.org.

The specific research question in this paper is to find the social origins of the information revolution in the local community. What is going on? Who are the actors? How is it unfolding?

There are certainly important problems to solve as we see massive human energy and funds invested in reorganizing societies into information societies.In the US, policy and funds are targeting broadband as the digital divide of the moment.What is the result?What can we now do better with broadband?In 2013 the US government is completing a three year, $7.2 billion effort to install broadband in un- or underserved areas of the US.This effort was part of the Obama administration's economic stimulus legislation in early 2009.[6]Funds were distributed via two programs: the Broadband Initiatives Program (BIP) and the Broadband Technology Opportunities Program (BTOP). BTOP defined unserved areas as census block groups[7]where fast internet is not available at all.Underserved areas were defined as census block groups where fewer than 40% of residents subscribe to broadband service. (Smeltzer 2009)

Along with the fiber installations ("below ground projects"), close to 10% of the BTOP funds is allocated to promotingbroadband use by outreach and education, especially at public computing centers but also by data collection and sharing ("above ground" projects). Estimates of the number of libraries involved in these projects range from 1,205 to 3,408,[8] and many are multi-site libraries so they signify an even broader involvement.Champaign-Urbanahas its project, Urbana Champaign Big Broadband (UC2B), which has installed internet fiber across the area along streets and offered fiber-to-the-premise to homes in underserved areas and to local government and non-profit agencies, including local public libraries.[9]The other major federal program is nicknamed eRate;it spent $2.23 billion in 2011,subsidizing telecommunications and internet providers to enable schools and libraries to get discounted access.(Universal Service Administrative Company, no date) These two programs illustrate how broadband is the current focus of national digital divide policy and spending, and everyone can learn from them if we study the situation.

The Community Informatics Research Lab, a research team of students and scholars led by UIUC Professor Abdul Alkalimat and the author,has been involved in this since the start.The activities illustrate the Pasteur-quadrant approach of community informatics.They also reflect CI's close integration of research, teaching and service.This is crucial for two reasons.First, there is rarely funding to study local communitiesaround the world with large paid research staffs.Second, professional training for librarians and information professionals needs to include actual experience in communities.Our work has included:

- consulting on the design of the federal program and helping convene interested researchers,
- drafting a successful broadband proposal from Champaign-Urbana, UC2B, and helping guide that project

[6]National Telecommunications and Information Administration (2013) and Rural Utilities Service (2010). The first agency is part of the US Department of Commerce and has administered BTOP. The second is part of the US Department of Agriculture and has administered BIP.

[7] A census block group is a geographic unit used by the US Census Bureau for many decades. It is an area that is home to roughly 1,500 people. These units are kept as stable as possible over the years to make comparisons possible over time. (http://www.census.gov/geo/www/geo_defn.html#BlockGroup)

[8] This estimate is based on data from Gwenn Weaver, Federal Program Officer, National Telecommunications and Information Administration of the US Department of Commerce, and ALA 2013.

[9] Urbana Champaign Big Broadband, http://www.uc2b.net.

- convening Illinois project leaders for annual reports and discussions at eChicago
- collecting data on local non-profit and government agencies in Champaign-Urbana and nine other lllinois communities to understand current digital practices and how they might change once broadband is available
- helping develop a local wiki, cuwiki.net, as part of a national movement towards better information sharing by and about local communities[10]
- teaching graduate students who are preparing for librarianship and other work in communities by immersing them in
    - interviews
    - surveys
    - technical report writing
    - local wiki editing
    - tech support in local public libraries,[11] and
    - participation in public meetings.

This paper will discuss the key concepts and assumptions driving the research ("Theory"), methods used, and selected findings. In conclusion it will summarize and discuss the implications of the findings.

Theory

There are at least three complementary approaches to the study of the information revolution: Technical, historical and sociological.Each of these three approaches operates at a different level.The technical approach is found in engineering and computer science. It operates at the micro-level in the sense that it designs something to solve a practical problem.If the problem is widespread, micro-level research can have big implications.This is the research that invented many of the devices that have become the infrastructure of the Information society.[12]The historical approach, by which I mean macro-level, focusses on changeover long periods of time, observing large scale social shifts as new technology becomes normalized or becomes infrastructure.[13]Both the technical and the historical approaches should always be accounted for in any analysis of the information revolution.

The third approach, which I call the sociological, examines phenomena at the meso-level. Rather than focusing on inventing a new deviceor on broad historical transformation, this research focusses on social interactions and context surrounding a new device or system. This research has focused on the workplaces and organizations that were the early adopters of information technology (IT).Scholars argued that technological innovation canbe disruptive, in the way Schumpeter (1942, p 83) argued that capitalism was "creative destruction." Destruction and construction occur almost

[10] Local wikis are growing around the world based on an open source tool; see http://www.localwiki.org. While there are also popular commercial tools for aggregating human knowledge, from Facebook to QQ, the local wiki movement reflects people's interest in locally controlled, locally-focused non-commercial crowdsourcing and information sharing that might outlive the vagaries of the marketplace. Studying these is yet another opportunity for community informatics.

[11] Williams (2012, reprinted in Williams et al 2012) examines this role in Chicago Public Library; Roy et al (2010) report a volunteer program connected with an LIS program; and Urbana Free Library currently partners with the University of Illinois to offer its patrons a "tech volunteer" service.

[12] Just two examples of this approach include Bush (1945) and Nelson (1965).

[13] Examples of this approach include Marx (1867/1887), Mumford (1934), Jones (1982), and Castells (1996).

simultaneously. This has certainly been true of digital technology. Kling (1980, 1999) discovered that workplaces did not simply adopt technology in the way early engineers and developers had envisioned; rather there was contention, adoption, refusal to adopt, repurposing, and so on.As others were seeing the same reality, his name for the new field was accepted: social informatics.

Emerging later, community informatics uses social informatics and other theory to focus on the social justice question, that is to say, on the local community and civil society.As the digital became the infrastructure for our economies and cultures, societies split. An early term for this was the "digital divide"(Williams 2001, van Dijk 2005) and later "digital inequality." (DiMaggio and Hargittai 2001) There arose digitally literate elites using IT to manage society and participate fully in the economy and so on.And alongside them are others not able to manipulate electronic networks in their own interests, or to the same degree.Along with the social justice foundation, community informatics relies on the "hacker ethic." Himanen(2001) explained this concept in his study of the technical workers who carry out computer innovation.The hacker ethic includes the awareness that digital technologies have the potential to make life better for people.[14]Local community is the terrain for community informatics research because it is the space for daily life (especially for the socially excluded) that all else depends on. (Williams and Durrance 2010)

Local communities adopt technology in three ways.One, the marketplace.The challenge here is that new technology costs more, so poor communities make do without, with less, or with older tools.Two, public policy.Government programs at various levels (local, provincial, national) equip communities according to their plans.This can solve the financial challenge, but there is still the challenge of whether the technology-by-public-policy achieves what the community needs.Three, community self-organization. Even have-less or have-not communities can adopt technology by marshaling social capital—resources available through social networks.[15]There are instances where public policy and local social capital can work together; the Technology Opportunities Program which preceded the federal broadband rollout and inspired its name (*Broadband* Technology Opportunities Program) managed this in at least a few instances; it is the problem of bottom-up change using resources that come from top-down. (Williams 2007, 2007a)Another way of putting this is the problem of local grassroots change using resources from the center, from an elite.

Close to twenty years of research on the digital divide has demonstrated that it is more than just access to technology; skill, support, and motivation are other aspects of digital inequality.[16]The objective of the study reported on here is a portrait of IT use in local institutions in Illinois.From this bottom-up portrait, we can estimate how broadband might be useful in these locales and suggest future research, policy and practice.

[14] A good example of how researchers do combine approaches (technical, historical, and/or sociological) is Nelson's book, *Computer Lib: You Can and Must Understand Computers Now* (1974), which is in fact an early community informatics text.

[15] For more on social capital see Lin (1999); for two studies of social capital facilitating local technology use, see Alkalimat and Williams, 2004, and Williams, 2011.

[16] Helpful explanation of the multiple dimensions of the digital divide, or of digital inequality, can be found in Clement and Shade (1998), DiMaggio and Hargittai (2001), and van Dijk (2005). Williams (2001) summarizes and comments on earlier empirical data on the digital divide. Yan and Sun (2012) provide an analysis based on the Chinese experience.

This paper uses data from our broadband research to investigate the origins of the information revolution.Community informatics is interested primarily in people's use of digital tools, and secondarily in the tools themselves.This is because it sees the information revolution as a social process and not purely a technical one.

Our question here is how are local leaders using information technology now? How did they get there? Where are they going with respect to IT use?In a typical large national project, as we have said, the model is that transformation is sparked or enabled from the top down—from the federal planners to the community.Our experience is that there is also a process of innovation from below.Sometimes these two processes can join together.Sometimes they conflict.Sometimes they are like the saying, "Two ships passing in the night."This means they interact very little or not at all.

So the data here concerns innovation from below.It was collected by visiting and interviewing local organization leadership and IT staff across the state of Illinois.[17]

Method

Illinois is a state in the central or Midwestern United States, 613 kilometers miles north to south and 340 kilometers east to west. It is home to 13 million people. At the north is the third largest US city, Chicago (3 million people), and a spreading metropolitan area of many towns and cities. At the edge of the metropolis the corn and soybean fields start. Crop and meat production continue to the southern tip of the state. Other much smaller cities are spread across the rural landscape. So the first methods task was to sample this state.

We identified the cities and communities where federal broadband projects were underway so that we could later examine those projects for a study looking at innovation from the "top down." To represent the city of Chicago and the entire state, we selected four community areas[18]in Chicago and six cities in the state, two northern, two central, and two southern, as in Figure 1. We investigated both Champaign and Urbana as one city because they are so closely linked on account of the very large university located on the boundary between the two cities, dominating the economy.

[17] The interview questions and written questionnaire are available by emailing the author.

[18] Urban sociologists at the University of Chicago in the 1920s divided the city into more than 70 community areas, which are sometimes held equivalent to neighborhoods. With very few adjustments, these same geographies continue to be used in research and planning.

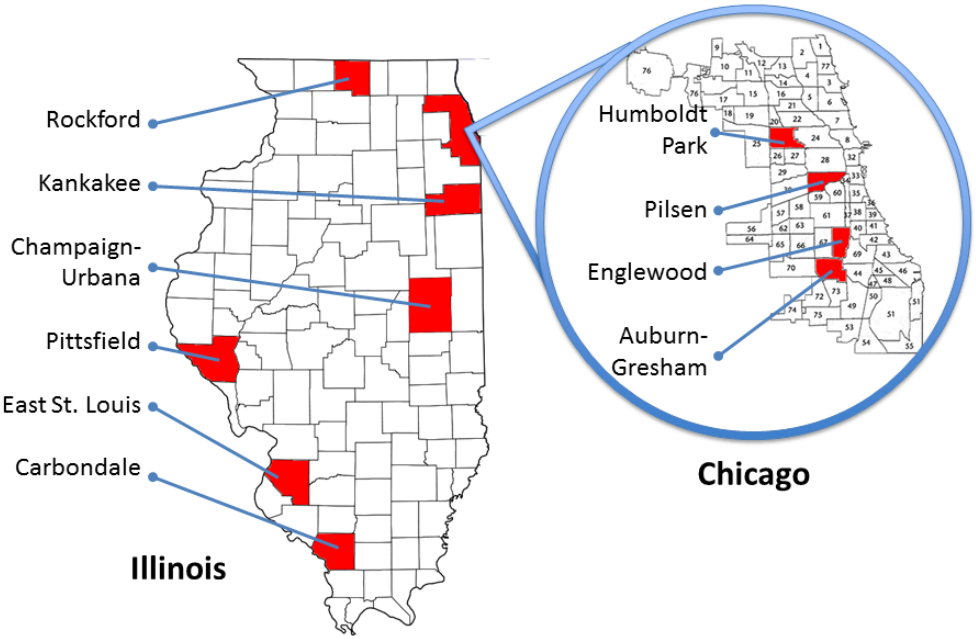

Figure 1. Map of Illinois showing all 102 counties with enlargement of Chicago showing all 77 community areas. Shading indicates the six cities and four Chicago community areas in the study sample.

Table 2 below profiles the ten communities. Populations in the four community areas in Chicago are predominantly ethnic minority: African American, Puerto Rican, or Mexican.These are the largest ethnic minorities in the city.They are also typically poorer than other Chicagoans, either not employed or working mostly service jobs for inadequate pay.They also experience greater digital inequality than other parts of the city, including less access to broadband.

In the six cities outside Chicago, the largest employers in the counties are hospitals, K-12 schools, and local government.Considering each city from highest to lowest median annual household income, Champaign-Urbana comes first.Its largest employer by far is the state's flagship university.There is also a large community college.Second is Rockford, which has two large industrial employers: auto and aerospace systems. Third is the small town of Pittsfield, which has a nearby prison that employs local people; it is a small town very closely tied to agricultural activity.Fourth is Carbondale, a large university town in a rural county.The fifth and six cities by income each have large ethnic minority populations.Kankakee is 62% African American or Latino. One of their largest employers is a human blood processing facility.East St. Louis, 99% African American, was once a thriving industrial center.It suffered such factory closings and white flight (Hamer 2011) that many city blocks are now overgrown with weeds, street signs and lights have been removed, and public services are weak or non-existent.The only new large employer in 40 years is a casino located on a large boat moored in the Mississippi River facing the town.Table 1 provides other measures for each city, complementing these brief profiles.

Location	City or Community Area	Population	Percent African-American	Percent Latino	Median family income	Poverty rate	Democrat/ Republican
Chicago	Auburn-Gresham	48,743	98%	1%	$34,767	25%	na
	Englewood	30,654	97%	0.1%	$19,743	42%	na
	Humboldt Park	56,323	41%	53%	$29,605	33%	na
	Pilsen	35,769	3%	82%	$34,573	27%	na
North	Rockford	152,871	23%	16%	$48,211	19%	52/46
	Kankakee	27,537	43%	19%	$38,692	25%	47/51
Central	Champaign-Urbana	122,305	17%	6%	$69,497 and $57,253	14% and 12%	52/45
	Pittsfield	4,576	6%	1%	$44,897	12%	31/67
South	East St. Louis	27,006	99%	0.5%	$23,016	39%	56/42
	Carbondale	25,902	28%	5%	$39,785	31%	55/41
Chicago		2,695,598	34%	29%	$54,077	21%	74/25
Illinois		12,830,632	15%	16%	$69,658	13%	58/41

Table 1. Demographics of 10 communities: 2010 population; percent African American; percent Latino; median annual family income; percent living in poverty; and the ratio of those voting Democratic in the 2008 presidential race compared to those voting Republican.[19]

In approaching each city, we collected news stories about technology from local newpapers, used directories to find local organizations, and recruited a pair of people to interview from the following types of organizations:

- County government
- City government
- Public library
- Public school district
- Community college
- Hospital
- Community-based non-profit organization
- Church
- Labor union
- Local newspaper
- Community media (local radio, TV, media project or a second local newspaper)
- Internet service provider
- Local chamber of commerce

[19] These statistics come from the US Census Bureau, http://factfinder2.census.gov; City of Chicago, https://data.cityofchicago.org/Health-Human-Services/Census-Data-Selected-socioeconomic-indicators-in-C/kn9c-c2s2; Illinois State Board of Elections, http://www.elections.il.gov/electioninformation/electionresults.aspx; and Illinois Action for Children, Population and Poverty Data by Chicago Community Area, September 2011, http://www.actforchildren.org/site/DocServer/2010_Census_Data_Fact_Sheet_by_Chicago_Community_Area.pdf?docID=1741.

We spoke with the director or a senior manager designated by the director (referred to here as "organization leader") and a person they identified as their information technology person ("IT leader").Interviews (N=101) lasted one hour or less and included 26 questions asked verbally, a two page written questionnaire (N=100), and an internet speed test run on one of the organization's computers. (N=117, using additional speed tests at organizations in Champaign Urbana from a parallel study: Williams, Alkalimat and Sackmann 2012) Following US regulations, data collection was carried out after a brief process of getting each person's written consent to proceed and to record the interview for transcription.

Findings

There are four main areas to report on.First, the internet speed tests reveal continuing digital divides.Second, despite that, IT use is generally well developed, but differences persist betweenthe IT leaders and the organization leaders.Third, surprising local IT-origin stories can be drawn from the participants in any given town.And finally, particular networks appear to be resources for these local leaders.

Speed gaps persist in each sector

Every sector that we studied is experiencing a digital divide between those with faster internet and those with slow, as Table 2 indicates.That table shows wide ranges of uploading and downloading speeds measured in each sector. Uploading is generally slowerthan downloading, discouraging people from creating sizeable content.Table 2 also shows that while government agencies are in some cases working with faster broadband than non-profits, there are exceptions. This is true across all ten locations.So the market has indeed failed to bring affordable and fast broadband to all these communities; the public policy is warranted.

Certain organizations in several sectors, especially the government agencies, are already accessing fairly fast broadband.These are primarily the sectors recognized by the federal broadband program as eligible for the new broadband services: local government, libraries, colleges, schools, and hospitals. (Hospitals in the US are either public, government funded, private non-profit, or for-profit) Exceptions to this rule are the media organizations and churches.Some of them are already working with fast broadband without any federal broadband attention. Some local media have seized the opportunity presented by digital content delivery. Some churches too are seizing the opportunity to interact with their members and others via digital channels: Sunday services and choir performances videorecorded and even webstreamed for people who cannot get to church, and other forms of outreach.

The broadband project in Champaign Urbana was unique in the nation for reaching deeper into the community, past the government agencies and large non-profits to connect many more local institutions: churches, community organizations, labor unions, and the chamber of commerce. These organizations are typically smaller and more vulnerable than the government funded ones and their measured speeds are slower.

Of course all types of organizations are needed for a healthy community. But on the whole the national broadband program is targeting the broadband have-less, not the broadband have-nots, when you look at the types of organizations in our study and in Table 2.

Range of Internet speeds (megabits per second)	Economic basis	Downloading	Uploading
Media (N=13)	Private or non-profit	4.4 - 678	3.5 - 517
City/County Government (N=11)	Public	9.1 - 562	10.1 - 280
Public Library (N=10)	Public	1.6 - 556	5.0 - 92
College (N=7)	Public	27.0 - 534	11.2 - 272
Church (N=18)	Non-Profit	10.5 - 516	0.04 - 513
School (N=9)	Public	10.6 - 496	7.9 - 340
Hospital (N=9)	Private or non-profit	13.8 - 313	19.3 - 206
ISP (N=5)	Private	11.1 - 209	10.9 - 281
Community Organization (N=24)	Non-Profit	2.1 - 198	1.0 - 57
Labor Union (N=6)	Non-Profit	5.7 - 92	3.2 - 44
Chamber of Commerce (N=5)	Non-Profit	10.2 - 36	2.0 - 21
All (N=117)	--	1.6 - 678	0.04 - 517

Table 2. Internet speeds measured at the offices of each organization, reported as a range from lowest to highest, downloading speed and uploading speed, in megabits per second. Also shown is the economic basis for each sector: public (tax funded); private, that is, for profit; and non-profit, that is, funded by membership and/or donations. Speeds were measured using a Communications Workers Association tool online at http://speedmatters.org.

Local organizations forging ahead with IT use, IT leaders too

While some organizations had not adapted their workflows to computers and the internet, most had.This was true of every type of organization.A hospital provides free WIFI for visitors and patients, a VPN for doctors to work from home, and comments that the radiology department “eats up the bandwidth” sending digital images.A church holds services using a big screen, four people on videocameras and 2 on still cameras.Another minister uses a tablet in the pulpit.A school system has just installed 56 data projectors in its classrooms; another is teaching virtual high school classes; another brings parents in at night for computer classes.A labor union is using twitter although not many of the members are on twitter yet, to their surprise; the webpage with job listings is the most useful.A community college is teaching app development. A radio station says their website is no longer an appendage to their on-air broadcasts because their audience is spread beyond the local area; a local newspaper without websites uses Facebook instead.A number of organizations report building public computer labs with State of Illinois Digital Divide grant money.Public libraries maintain web-based circulation systems, and many organization operate databases and other central function via the web.One library hosts servers or virtual servers for 110 other local libraries. A Chamber of Commerce builds websites for local economic development projects. Perhaps the most remarkable to us was this report from one city:

> GIS [Geographic Information Systems] is a big thing for us, because about 85 percent of what we do is based on spatial work. […] All the infrastructure that the city owns, streetlights, signs,all have to be inventoried, all have to be tracked and we use the GIS system to put all this together.We can even tie payroll to GIS, and we also tie GIS to our financials, so we can do some analysis. We can call up a building and look at where the network jacksare, we can

see what equipment is where and in what office, so that's been very helpful.Right now our network is choking on some of the existing applications, GIS being one of those.

So, in general, local leaders are transforming their organizations. They may do so with lots of help: "Our IT department is 11 people with 23 degrees supporting 2,000 users."They may only have a little help: "I'm it, a one-man IT department."

At the same time, the IT leaders are ahead of the organization leaders as far as using IT broadly.Table 3demonstrates this.It is based on 28 yes-no questions we asked of interviewees.Asterisks in the last column mark the IT uses where many more IT leaders than organization leaders answered, Yes, I do this.Gaps in programming and using open source software are easy to understand.But what about in using Wikipedia? Editing Wikipedia?Here and in a total of 11 uses, IT leaders are out in front.The IT helper role, what is called the cyberorganizer,[20] is still crucial.

Specific uses of IT among organization leaders and IT leaders: Do you…	All (N = 100)	IT Leaders (N=51)	Organization Leaders (N=49)	Difference
...look for information on the Web?	100%	100%	100%	0%
...create documents on a computer?	99%	100%	98%	2%
...talk on a cellphone?	98%	98%	98%	0%
...send/receive e-mail as part of group activity?	96%	94%	98%	-4%
...use wireless to connect to the Internet?	96%	100%	92%	8%
...take digital photos?	94%	98%	90%	8%
...use a spreadsheet?	94%	100%	88%	12%
...text on a cellphone?	92%	94%	90%	4%
...share photos, audio or video or that you have made?	90%	94%	86%	8%
...use instant messaging?	88%	94%	82%	12%
...send/receive email on a cellphone?	86%	90%	82%	9%
...use social network sites?	86%	90%	82%	9%
...use Wikipedia?	85%	92%	78%	15% *
...browse the web on a cellphone?	84%	88%	80%	9%
...read an online bulletin board?	75%	75%	76%	-1%
...record digital video?	73%	84%	61%	23% *
...use online chat?	73%	84%	61%	23% *
...record digital audio?	71%	80%	61%	19% *
...talk over the Internet as you would on a telephone (like Skype)?	67%	76%	57%	19% *
...create or maintain web pages?	60%	71%	49%	22% *
...belong to an electronic discussion list?	60%	73%	47%	26% *
...post to a discussion list or bulletin board?	60%	67%	53%	14%
...use bookkeeping software?	57%	63%	51%	12%
...post information on the Web in some other way, blogging for instance?	55%	57%	53%	4%
...use Linux or any open-source software?	41%	67%	14%	52% *
...write a program?	35%	57%	12%	45% *
...host or edit a discussion list or bulletin board?	25%	35%	14%	21% *
...add to or change a Wikipedia entry?	18%	29%	6%	23% *

Table 3.Specific uses of IT as reported by the organization leaders and IT leaders, shown from most to least commonplace.Asterisks indicate uses where organization leaders and IT leaders differed the most; in each case the IT leaders were more likely to report those uses.

Origin stories

Local leaders and IT leaders mentioned early developments in the 1980s; organizing to get a local community information network in the 1990s; and ways that early work kept the town ahead of times. In the six small towns, early leaders seem to remain leaders: the university, the library, the

[20]Alkalimat, Abdul. "Social Cyberpower and Everyday Life," in *Community Practice inthe Network Society: Local Action/Global Interaction*, Peter Day and Doug Schuler, editors. London: Routledge, 2004. Available at http://eblackstudies.org/grbk/

newspaper.In the four community areas, our study participants generally did not have the long background, but those who did had early IT victories to tell us.

In the 1980s Champaign-Urbana's city government switched over from typewriters and a mainframe to personal computers; in 1984 a Humboldt Park community organization got its first computers, Macs, since the volunteer in charge worked as tech support in a company that had Macs.In 1986 a Pittsfield radio station got its first PC and used it for audio processing.In 1986 the state university in Carbondale got its internet connection: the speed was 56K per second. In 1989 a public library opened in Pilsen with four public access computers.

In the 1990s, a town not in our study, Peoria, Illinois, was the first to establish a free-net. Free-nets started in 1986 and were catching on: free, open access computer systems that many people could reach at any given time by modem from their own computer, to get local information, share email, newsgroups, chat, and so on. Two of the cities in our study followed Peoria and created Free-Nets:Champaign-Urbana and Rockford.[21]These early and free avenues to the fledgling internet introduced many individuals and organizations in those towns to what computers could do.For instance, the Champaign-County Board, which is the top legislative body at the county level, was posting its agendas and minutes on PrairieNet by 1994. Sinnissippi Valley Free-Net galvanized Rockford in much the same way. PrairieNet was founded by library school faculty.SinnFree was founded by library school students who worked in local libraries. These projects prepared local leaders to partner with each other and grab opportunities for new technologies and grants.

Similarly, in Kankakee, a local newspaper opened a dial-up internet service in order to increase subscriptions to its daily paper.And a school organized its local community to back a plan to get internet access starting in 1986-1987.This set the tone for school-community collaborations.And The success of the newspaper's internet service provision in the dial-up age positioned the paper to spearhead a local Kankakee Fiber project to get broadband in 2012.

Key networks 'out of the limelight'

There were two relatively visible networks that appear in the interview transcripts as helping these local organization.One is the State of Illinois Digital Divide grant program, which has been making grants each year until this year's state budget crisis emptied the program.[22]The other is the federal eRate.An interviewee explained that eRate requires its funded organizations to develop and keep in use a three year technology plan; since receiving funds, her organization has practiced a three year planning cycle and found it very helpful.In addition, ten key networks appeared in our discussions with these organizations and are listed in Table 4.We call them "out of the limelight."What this means is that they are typically not IT networks, but the interviewees mentioned them as helping them learn and implement new technologies.

So local leaders, even in small or disadvantaged communities, are plugged into national discourses regarding the information revolution via professional associations.We call these associations 'out of

[21] Newby (1995) and Fox (1995) provide historical accounts of Champaign Urbana's Prairienet and Rockford's SinnFree.

[22] Eliminate the Digital Divide grant program, http://www.ildceo.net/dceo/Bureaus/Technology/Technology+Grants+Programs/4-Eliminate+the+Digital+Divide.htm

the limelight' because they are not well known sources of information on IT.But they are expert on the activity of that sector, which is evidently more important.According to our interviewees, they are trusted and helpful when it comes to IT adoption. They are key sources for ideas, best practices, and support for new and effective uses of IT.

Ten regional or national networks were mentioned in the interviews.In nine of the ten cases, it was the IT leader who mentioned depending on them.It seems asif the IT leader is better connected to IT help and new ideas thanthe organization leader.The only exception was the Farm Bureau director working in rural Illinois.It is reasonable that the broadband stimulus was partly directed through the Department of Agriculture, because the fomer has a longtime special relationship with organizations in rural America.

Network	Sector	Key interview contact
Metropolitan Chicago Healthcare Council	Health care	Medical IT director
IL Health Information Exchange Authority	Health care	Hospital CIO
College of Healthcare Information Management Executives	Health care	Hospital CIO
Counties of Southern Illinois 911 Next Generation project	Public safety	County IT manager
Illinois Chapter of the National Emergency Number Association (INENA)	Public safety	County IT manager
Illini Cloud	Schools	School IT director
Illinois Computing Educators	Schools	School IT director
Advanced Engineering Taskforce	Tech Leaders	Library IT director
Illinois Chief Technology Officers	Tech Leaders	School IT director
Illinois Rural Affairs Council	Agriculture	Farm Bureau director

Table 4. Ten respondents mentioned professional networks that helped them learn, plan and adopt IT. Nine of the ten were IT leaders; only one was an organization leader.

Summation and Implications

This study of ten Illinois communities is only the first report from a research program to map the transformation of the local community, the basic social footprint of the information revolution.

Our findings point to three key factors in local community change: Cyberorganizers (IT leaders working with local organizations); local organizations that are a base for early adoption of digital technology and the Internet; and computer literacy based on how local leaders use digital technology. These are the main components of how a community has been able to cross the digital divide.

Now that we have focused in on the key aspects of leadership, we need to find out how this leadership connects with the rest of the community. Building a bridge across the digital divide is one task, but motivating and mobilizing people to cross over is quite a different set of tasks. Further, from a community point of view the question is also how these institutions interact with each other: To what extent does this add up to a culture shift in the community toward becoming an information city?

In addition, as we have said, what is the impact of the federal broadband projects in these towns? How did they work? These interviews were done just as that work was beginning.

Finally, this research is based on a set of communities in one part of the USA.We need more extensive work toward a representative set of communities so that we can generalize our findings to represent the entire US.We also need to replicate this research in many countries so that we can move toward the global knowledge we need.

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