

Informatics is no mystery: Studying community in the information revolution

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Abstract: The information revolution involves spaces and populations which have been devalued but which are foundational. A great deal is going on in these spaces and their populations are active in their own interest. This paper reviews and reflects on research on public computing places in the United States: first, a survey of public computing across an entire city (Toledo, Ohio), and second, ten years of involved observation at a public computing center in the African-American inner city of Toledo.

Keywords: community informatics, information revolution, public computing, cyberpower, cyberorganizing

1 Introduction

The information revolution is now a generally acknowledged historical transition of rapid technological change, a paradigm shift. No region of the world has escaped this process of global transformation that has redefined time and space, the actual and the virtual, synchronous and asynchronous forms of communication, and activity being simultaneous with archiving. We are in a new technological stage of history. The critical question that is not yet so generally accepted is the nature of the twin of the technological revolution, the social revolution.

In general the main trend is that certain sectors of society that control the hardware, software, and content production based on massive capital investment also have control of state and corporate policy that is socially engineering the society for greater profits and social control. These policies are transforming government, the military, and the corporate domination of the economy.

The vast majority of people in every society are generally atomized in the framework of the government (as individual citizens, voters), the military (as individual recruits), and corporation (as individual consumers). Yet we are not merely individuals, but members of groups connected to social institutions tied together in a complex network of social relationships. Much of the social reality of our everyday lives gets neglected and is less understood that the aggregated individual data picked up via surveys.

Our focus is on community informatics, the study of how a society participates in and is transformed by the information revolution from the bottom up and not the top down. Our focus is on the spatially defined organic historical community. We are interested in how the least

or marginalized in every society is joining the information revolution in their own collective self-interest.

There is a dialectical tension in perspective between the general view of social informatics, focusing on the early adopting informatics in the realm of government, military and corporate affairs, and the particular view of community informatics that focuses on those not fully participating in the use of digital tools as part of their normal behavior. From one perspective the issue is how to reach across the digital divide to help the less fortunate be like us in the mainstream of society. From the standpoint of the marginalized community the issue is how the social capital, resources and leadership, of a community can be the basis for joining the information revolution on terms set by a community in their own interest. It's the difference between the technological haves and the have nots, but also a difference between social control and community self-determination.

At a theoretical level the issue is like a glass of water: is it half full or half empty. From the top the glass appeared to be empty and is now half full. Progress achieved. From the bottom, viewing the norms of society the marginalized still see the glass as half empty until parity is reached with the mainstream. This can best be expressed in three theoretical concepts: cyberdemocracy, collective intelligence, and information freedom.

Cyberdemocracy: Access can be defined by at least four measures: motivational, material, skills, usage (Van Dijk 2005). So much like measuring the extent to which individuals or households have telephones, so this is about their ownership and use of computers and Internet connectivity. We focus on the informatization of social life, i.e., to what extent have community based social institutions (familial, neighborhood, religious, social,

educational, recreational, cultural) embraced informatics and become digital institutions.

Collective intelligence: We are now at the highest level of being to contrast the brilliance of one thinker with the aggregated thoughts of all of us. People were taught to fear the crowd in deference to an elite, and now the mass has become the source of knowledge about the world. What we collectively think is a more in depth and nuanced view of social reality than any one or small group can come up with under an individual by-line. With our new digital tools noise can be turned into meaningful sound, even if we all talk at once (which is after all what is going through the cables linking together the net) we can still make sense of what we are all saying as well as the single voice of any one of us.

Information freedom: There are times when a society is facing a new historical challenge and must rely on the creativity, energy, and ambition of the masses of people for innovation and productivity. At a certain point in the early history of industrial society in the US it became pragmatic to have public schools and public libraries as they created qualitatively better labor that quantitatively increased production. Today the crisis of industrial society is that this labor is not longer required hence the society has lost the will to provide democratic education for everyone in the society in favor of more elite niche forms of education and socialization. We are in a period that demands democracy in access to information. One major aspect of this is how information strives to free on the net as expressed in Wikipedia, Project Gutenberg, and in a more limited way Google books. The main way so far has been the global reach of open source software. For culture to survive it must be free for all, which is why spoken language is always more profound than the printed word you have to buy in book form.

These are the concepts that allow us to entertain the glass being completely full. The basic research problem is how to measure how each society is moving toward the ultimate realization of this information revolution. The emerging global social order that is being created by the information revolution can be judged on the basis of these three criteria.

Having set this framework I will now review a program of research in community informatics that suggests models for paradigmatic research in the field of community informatics.

Public computing

People enter virtual space—to browse the Web or a play a game of virtual Solitaire—via technology that is located in actual space. That space is a social environment, the result of a confluence of social forces, institutions, and histories. People negotiate their way through and into social spaces when entering a public computing site, and operate in social space when online. The social environment of public computing includes four aspects. First is the hardware and software configuration. Second is the institution which hosts a given public computing site. Third is the immediate surrounding community. Finally, each community is located in a larger territory or

macroenvironment: a city, country and region. This social environment in turn impacts and shapes our use of ICT and of cyberspace.

Castells has categorized various macroenvironments according to their position in the global transition to the networked society. Relying on Castells, we see three categories: the technopole, the unconnected areas, and the dual city. In the technopole, almost everyone is connected to and with ICT. In the world's unconnected regions, almost everyone is generally delinked from ICTs. In the dual city, some communities and strata of people are connected, and other communities and strata are not. Most of the world's industrial cities in transition to the information society are dual cities. So are most national capitals, even if the only ICT-connected are the armies, the NGOs, the state and supranational institutions, and the inevitable business and luxury hotels.

Castells and Hall discuss four kinds of technopoles: industrial complexes, science cities, technology parks, and certain regions with a comprehensive technopolis program for regional development. Their summary points to three main functions of these cities: reindustrialization, regional development, and synergy for innovation. Castells also advances the concept of the Fourth World, the world's delinked regions and countries. He explores²³ how the typical "informational city" is a dual city and asks whether and how the digital and other social divides in such a place can be reversed. There are many empirical measures being discussed in these works, but it appears that public computing is not in the picture.

Public computing places are those places other than home and work where people can go to use computers and the internet. Our search for public computing in Toledo, Ohio found 253 sites hosted by a variety of institutions, as shown in table 4 below. We coded these 253 public computing sites as community, government, commercial and university, according to their host institutions. Government public computing sites are those located in public institutions, a direct reflection of public policy and political forces. Community public computing sites are those hosted by non-governmental, not-for-profit organizations. These represent the diversity of civil society. Commercial public computing sites are those operating for a profit, in response to market opportunities. University public computing sites are those established at colleges and universities. While they will always be fewer in number, they will likely be the most technology intensive public computing facilities in any community. Each type of public computing has its own economic imperatives, social dynamics, and spatial realities or demographics.

We found that in the case of the city of Toledo, Ohio, USA, the four kinds of public computing fit three patterns in relationship to the social environment.

- Government sites are randomly located, the same proximity to rich and poor.
- Community sites are located close to the opposite ends of the social spectrum, the rich and the

poor having community sites but not the middle strata.

- Commercial and university sites are located according to market demand, closer to upper income and students.

Our data suggest this pattern, but weakly. We expect that a broader dataset would make a more compelling case.

The marketplace has a direct impact on the location of commercial and university sites. There are however, two important particularities. University sites combine upscale owner occupied single family homes with low cost apartment complexes for students. Further, a large concentration of ICT users live in relatively affluent suburbs of Toledo, which transforms this urban pattern into a metropolitan one.

The U-shaped pattern of the predicted community public computing sites may prove to be the best counter-motion to the market as a foundation for democratic traditions. The role of the church and other institutions of bonding social capital is to give poor and working populations a basis for collective consciousness and action, including self-empowerment projects with ICT.

Government public computing sites are a result of public spending that reflects increasing commitment to an ICT transformation of education at all levels. The informatization will be equal, but the level of access and use is a matter of available state revenue and relative level of commitment. In times of expanding revenue, an egalitarian state is a major factor, but in dire times the impact can be relatively negligible.

Each type of public computing expresses a structural force, an aggregation of institutions, people and spaces, constituting a power dynamic. All together it is the configuration of all the power dynamics of a society that determines the likely course history will take.

We envision two stages of future research. First, to confirm this description of public computing and measure variation in different urban and rural areas as well as in different countries. Second, to examine what is going on in public computing sites, what users are doing, and what cyberpower emerges. We believe the stakes to be the nature of democracy in the information age.

A public computing center operated by the community: Murchison Community Center

With this general perspective we delved into an extensive case study of a public computing center. The concept that best fits the dynamics of people crossing over the digital divide is cyber power first articulated by Tim Jordan. We used his framework of three kinds of cyberpower: individual, social, and ideological cyberpower. We used this framework to interpret the meaning of what goes on in a public computing center.

For close to ten years we studied and worked with a center that was operated by members of the African American community in central Toledo, Ohio. We found that the center indeed produced (and in turn relied upon) all three forms of cyberpower:

- individual cyberpower: new human capital

- social cyberpower: collectives engaged in cyber organizing
- ideological cyberpower: ideas and policy promoted by individual and social cyber power

Individual cyberpower

As soon as the center got computers, adult beginners were taught to use the computer, to type, and to produce resumes. Once educational games were available on CD-ROM, children came in to do that as part of tutoring. As computers modernized and more computer-savvy staff and volunteers were on hand, these job and/or school-related classes grew more sophisticated. For instance, one resourceful staffperson made use of the "What Color is Your Parachute" job hunters' web site and computerized the intake process for new job-seekers signing up at the center. By 1999, adults were learning Adult Basic Computing (Windows and Wordpad), Word, Excel; children were using CD-ROM games but also learning Kids Basic Computing, Word, Powerpoint, and being guided through using educational Web sites.

The individual power that resulted was seen in adult's job skills development and job hunt successes, their individual mastery over the software. It was also seen in their moving to teach others, either the student sitting at the next computer or a whole room of students, as they moved from learning to teaching a class. At this point individual cyberpower becomes social cyberpower.

Social cyberpower

Long before "community based cyberpower" was part of the Murchison Center mission, it was in evidence. The first sign of this was in 1994 when Debbie Hamilton explained her "field promotion" from board secretary to executive director. "I had been to college and I knew computers." At that point computer knowledge was seen as something to be shared with the community. According to Mrs. Hamilton, the board at that time was not just looking for her to word process letters, but to teach others.

When the center and its community and university partners began the Community Math Academy in January 1999 a local father began to volunteer at the monthly practice proficiency tests. When attendance at these was taken, it included not just name and phone but also email. His email address was `piesqd@[...]`. Pi is the ratio between the diameter and the circumference of a circle. (48) Asking about this creative screen name, other volunteers learned that he was a UT student, a working engineering technician and, for the neighborhood, an early adopter of computers. Within a few months he volunteered to teach the evening Word/resume production class. Soon after he was promoted to computer lab manager. He computerized the attendance records so that the monthly quantitative reports were produced by Access instead of by pencil and paper.

The Community Math Academy itself was a product of and a generator of social cyberpower. Students in our Poverty Seminar had found the Murchison Center's computer lab in an online listing on the CATNeT site, and

the partnership that resulted came from the shared attitude that computers were a key to Black community empowerment. Where the seminar managed to show its participants the Web and perhaps get a few people Hot-mail accounts, the Community Math Academy went further, using Egroups to cement its volunteer leadership core and thus build social cyberpower. This involved some private computers as well as some loaners that went into people's homes, although they then decided to return the loaned computers and get their own more powerful units. In addition, center staff and volunteers contact school officials were by email instead of phone or letter writing, which was either unsuccessful or cumbersome.

A year after first inquiring about it, the Community Math Academy was able to make use of the school's computerized automatic phone message system to notify parents about the practice proficiency tests. In this way the voice of the newly elected King School Parent Teacher Organization (PTO) delivered a message to 600 King families. Just as with loaner computers from the university, this board of education system was a case of bridging social capital and bonding social capital investing together in building the center's programs.

Perhaps the pinnacle examples of social cyberpower were the two classes, Cyberchurch and Cyberschools, which began in 1999 and 2000 respectively. Here, though, we cross over once again, as social cyberpower becomes ideological cyberpower.

Ideological cyberpower

The university brought to the scene the language of the digital divide, the Black liberation struggle, and the community technology movement. This language expressed, clarified, and advanced what the center was already doing to some extent. The ideology of community uplift using computers, rooted also in the concept "Knowledge is Power," was elaborated in the day-to-day work, the plans and the mission statement of the center. Embedded here was an ideological orientation towards the community as a set of assets as well as needs, best evidenced in the last sentence of the mission statement developed by the Community Math Academy (emphasized below). The goal of "ending poverty once and for all" was an early critical ideological issue.

The Community Math Academy aims to improve the math skills and change the math attitudes of young people in central city Toledo. We see math as an academic subject and a tool for social transformation. We see math as part of ending poverty once and for all.

The academy is a project of UT, the Murchison Center, and King School. We join with children and their parents to conduct educational activities in the school, the community and the home. Parents are the leaders of the academy because parents love their children and, more than anyone, determine their futures.

Operating as it did over the Internet as well as through face-to-face meetings and sessions, the Community Math Academy program was itself an instance of ideological cyberpower.

But two classes, Cyberchurch and Cyberschools, begun in 1999 and 2000 respectively, also illustrate the ideological cyberpower generated through the center.

Cyberchurch emerged as an assignment in a university course on the Black Church. When each student went to complete a web site for a local church, they came to the center to build their site. This class then took on a life of its own, with word of mouth bringing more students, one student stepping forward to teach it, and more skills and web space being applied. The course assignment originated as an idea the director of Africana Studies sold to the instructor for Black Church. The instructor, a local pastor and high school guidance counselor, had pastored in various Toledo churches for 27 years, and provided his church space to the local Black Panther chapter when it formed. While the web site building assignment in his course was a burden to him at first—he was asking students to do something he hadn't done—one day after hearing a lecture by this author he said, "I've heard you talk about this 'eBlack' many times, and I always agreed. But now I really, really get it! I have it so much on my mind that I'm thinking of taking out all the pews in my church and using folding chairs, and getting in some computers. It can still serve on Sundays but can be a lab the rest of the time." His plans began to unfold.

The ideological content of this form of cyberpower is the vision that if the Black church is online, then a good portion of the Black public sphere can be kept intact as our personal, cultural, political, and spiritual lives move into cyberspace, as more and more Black people get online. If the Black church is intact, then the Black liberation struggle has that important institution, with all the social capital imbedded therein, to rely on.

While Cyberchurch was a class that expresses the dynamic combination of university social capital (bridging) and church social capital (bonding) within the context of the center, Cyberschools had a slightly different origin. It originated from a combination of university social capital with community social capital (bonding), again within the context of the center.

Murchison's Community Math Academy project put the center and its volunteers, especially the university students, in close proximity to King Elementary School. The CMA, especially the involved parents, who were all grandmothers, attended the school's PTO meetings, seeking more parent involvement. CMA volunteers worked in the schools as classroom teacher aides and after school as tutors. As a result, new officers were voted in as PTO leaders.

The King PTO had two members, who were a couple with one son in the school, but had been unable to organize parents to do little more than bake sales and an annual book sale. The Murchison Center began to do outreach to get more parents to the PTO meetings. Thus the annual election brought in a full slate of PTO officers

with new energy and a plan to build the library up, participate in practice proficiency testing, etc.

Cyberschools was begun to support these parents and others like them. Like Cyberchurch, it meets one night a week. Cyberschools sessions are dedicated to two things: organizing to get more families to the practice proficiency tests, and helping local PTOs get their plans and contact information posted onto web pages devoted to their schools and their families, plus email.

PTOs across the country have web pages and use email to keep parents in touch and organized. But these PTOs do not often appear to be in the Black community. With computers moving into homes and workplaces, anyone can take advantage of the Internet to organize. Not only that, the web sites that Cyberschools takes people to explore include the Toledo Public Schools, the teacher's union, the University of Toledo, the Ohio Board of Education (which posts information about schools, testing, standards, the Ohio 4th Grade Guarantee (no fourth grader failing the reading test will be advanced to 5th grade), and more. So the Internet is a source of information as well as a communication tool used by parents to impact children's experience in public schools. Parent involvement is proven to be perhaps the deciding factor in student and school success.

Implications of the experience of the Murchison Center/public computing center

We are now able to elaborate further the theoretical framework emerging from our analysis. We will move beyond the particularity of this case study to conceptual implications for our general research focus, community technology centers in urban poor communities, especially communities of color. First we will concentrate the lessons of this case study into several propositions that in turn can serve as guidelines for further research. Second, we will discuss the implications of this research for the public sphere, especially the Black counterpublic sphere.

The first point is that these centers are social organizations, and therefore part of the structure of social relations in a community. This understanding requires a paradigm shift from the current dominant trend to study individuals who pass through the center, to the centers themselves as social units.

A second point is that the digital divide has to be understood as a community attribute, part of a broader phenomenon called public computing. The digital divide as community descriptor can be determined by how extensive and effective are the local organizations which provide and promote public computing.

A third point is that the public computing center as community organization is the locus for the concentration of resources. These resources can be conceived as different forms of capital:

- Physical capital: buildings and equipment
- Human capital: staff
- Financial capital: budget
- Social capital: social background and ties of board members and the organized partnerships of the organization

A fourth point is that social capital is the key. Bonding social capital is the fundamental resource that makes something belong to a community. Without this form of community wealth and legitimacy the organization is an artificial construct. Bridging social capital is essential in acquiring temporary resources and external support. Whenever bridging social capital is dominant the organization is in crisis and in danger of dying or being transformed as an extension of external interests rather than the interest of the original community and its bonding social capital.

A fifth point is that the investment of these resources produces a social value, cyberpower. As above, there are three forms of cyberpower.

A sixth and final point is that the success and sustainability of a center is a function of whether point five loops back and feeds into the capital resources of the organization. The organization produces bonding social capital or it fails the litmus test of success and sustainability.

On the basis of these six points it is critical to raise the issue of democracy and social inclusion of people who are living in the social isolation of the poor part of the dual city. The existence of a democratic system is not merely the actions of individuals at the polls. Democracy requires informed citizens who are socialized and live in a complex set of overlapping social networks. Each network is an interest group, and multiple memberships mean multiple interests, sometimes congruent and sometimes in conflict. This complexity is the basis for democratic discussion and compromise. We argue and compromise because while we have differences with others, on other issues we share common interests.

Building sustainable democratic equality in the information age means more than how many individuals are online. The key is to stabilize and support people working with information technology in the form of social organizations rooted in the legitimate social capital of the community. The key is to invest all forms of capital to produce social capital for the socially isolated inner city Black poor. In turn, this investment should be utilized to produce Black cyberpower. Powerlessness, especially the lack of cyberpower, is anathema to democracy in the information society.

Conclusion

Our approach focuses on four factors: historical community, cyberorganizers, cyberspace, and the networked community.

1. The historical community: We have found the content of the historical community in the institutional structures that sustain and reproduce the community. We have concentrated on the family, the church, the school, and the beauty salon as key institutional contexts. In addition to digitizing the content of institutional life, two other points of focus emerged. The first is to pay attention to the antagonisms that the community faces because these struggles create the social future of the community; and the second is the recruitment of emerging cyberorganizers from the indigenous activists that keep these institu-

tions going. The search is for the ways in which social cyberpower contributes to the sustainability of an institution and the overall community.

2. The cyberorganizer: Social cyberpower is associated with public computing, especially the school, the library, and the community technology center. Organizing forces for actual social struggle in this way is emerging as a new field for research and curriculum development as there is a growing need for the kind of work reported in this article. We anticipate that information technology will induce changes in the fundamental methods of social research and social activism alike. The challenge is for academic programs to learn how to link research and practical experience. The land grant college system did it for agriculture and mass production industry, and now we need to do it again in terms of information technology.

3. Cyberspace: The work thus far has emphasized collecting and uploading content into dynamic databases that are configured to assist poor communities in organizing efforts for their own behalf. In addition, all of our databases must be configured to interface with each other so we will in fact be reaching higher and higher levels of collectivity.

4. Networked community: We have merely put basic ingredients together for the virtual reincarnation of a community. The magic of cyberspace's future will be created as more of humanity gets online. It is in this context that the virtual struggle for the future is on. In general what is at stake is the fundamental social structure of cyberspace, and that is one of the most critical factors that will be influencing democracy and quality of life. We have the polar opposite choices of the corporation or the community. Our action-research is to learn about and work for the community paradigm as the future of the information age.