[INTRODUCTION ONLY]

Community Informatics in China and the US: Theory and Research

Edited by Kate Williams, Han Shenglong 韩圣龙, Yan Hui 闫慧, and Abdul Alkalimat

National Library Press (Beijing)

Introduction by the editors

This book is the result of research collaboration between US and Chinese scholars. Our mission is to advance the field of community informatics by coordinating a research program in China and the US. This program includes an annual summer school, a conference, coordinated research and publications that contain the emerging scholarship. This volume is the foundational volume in this research program as it contains chapters on theory as well as empirical chapters that demonstrate research methods and findings. Chapters are from North America, that is to say, Canada and the US, and China. Most were used in the 2011 Peking University Community Informatics Summer School. They are assembled to serve as a text for introductory courses in community informatics in both China and the US.

The four of us represent the University of Illinois at Urbana-Champaign, Peking University and Nankai University. Encouraged by Chen Jianlong, Yan Hui came to Illinois as a visiting doctoral student during 2008—2009 and we began a productive partnership. Supervised by Lai Maosheng, Yan Hui completed what we think of as the first community informatics dissertation in China (although, please, we want to hear of any earlier one!). Once on the faculty at Nankai, he invited us to bring a group of researchers to China where Peking University faculty led by Lai Maosheng organized a community informatics conference and other leading information management departments also welcomed us. Han Shenglong at Peking University, familiar with the United States and informatics from his 2008-2009 year in Champaign-Urbana, and with informatization from his own experiences and teaching, stepped forward to organize a summer school. Our research collaboration continues as Yan Hui and a fifth partner, Wang Sufang of Zhejiang University, carry out research closely linked with ours in rural and urban China, respectively.

What is community informatics?

A number of reflection pieces and review essays, most cited in this volume, have attempted to explain what is community informatics. For us, this question is best answered by careful theoretical framing. Technology is created by society and in turn impacts the nature of society and social change. Critical technological innovations have made a great impact, such as the railroad, the automobile, jet air planes, telephone, radio, and TV. Community informatics focuses on how communities interact with digital technology, both how they create technology and how using it impacts their social and individual lives.

In the grand sweep of world history, after the hunter gatherer communities, there have been three kinds of socioeconomic communities combining social organization and class with technologies (tools and techniques): agricultural, industrial, and informational. Agricultural communities were relatively small, relying on the domestication of plants and animals to develop economies and culture. The power driving this system was human and animal effort, the power of organic muscle. People did not travel far, and most politics were feudal with hereditary systems of rule.

The industrial period of history led to a total transformation of society. The farm was joined by the factory as the center of material production. Animal power was replaced by machine generated power being fueled by water, wood, and coal. This new environment meant that new forms of socialization nd education were needed because change was happening too fast for the apprenticeship system to keep up with what was needed.

The US was the first anti-colonial war of independence in the 18th century, breaking free from the feudal rule of England and its King. However the US economy was held captive by the slave system so it took about 90 years later and a civil war to end the backward system of slavery and unleash the full industrialization of the US economy. The industrial system meant rapidly changing civil society and raising standards on education and vocational skills. China, in the words of Mao Tse-tung, faced the three mountains of feudalism, bureaucratic capitalism, and imperialism. So it was the revolutionary victory in 1949 that unleashed the industrial revolution in China. There have been these two roads to industrialization, the US and the capitalist road and China and the socialist road.

Now there is another systemic change taking place that has shaken the foundation of industrialization in all political forms, the information revolution. The early adopters of the digital technologies, especially computers and the Internet, have been the military and government, the corporations, and education especially higher education. This has spread to the masses of people all over the world in the form of digital telephones (cell phones) that are smart meaning Internet enabled. Our focus is not on the individual but on the community. And we translate community in community informatics as She Qun (社群), not She Qu (社区) as some others have done.

People live in social groups and it is these groups that make up the historical form of social life, how we eat, sleep, work, play and practice our culture. Out of the agricultural and industrial period we have a narrative of spatial (physical location) , organic (family and bonding social capital), and historical (trans-generational) experience. People lived in social groups that interacted daily on a face to face basis, shared trust and common culture, and linked their fate to the quality of life of the group/community. All of this is now in turmoil.

In any basic social transformation there is both destruction and construction, the old gets replaced while the new emerges. This relationship between construction and destruction is a central feature of the sustainability of social progress, especially whether they are in sync and continue to provide the necessary environment for socialization and education for everyone. While this applies to all aspects of society, the distinguishing feature of the information society is the inequality referred to as the digital divide, differential access and use of digital technology. Community informatics defines the digital divide not in terms of individuals but in terms of social groups and the community in general. The CI questions focus on social groups and institutions that impact the collective experience in a community.

The three universal institutions in most societies that provide good empirical focus for community informatics are the family, the school, and the library.

The model

Social studies of computing, what some call the field of social informatics, contributes a fundamental concept that people and organizations adopt and use computer technology when and how it suits them. This concept of *agency* means that the community, not the technology, is our starting point. We are studying transformation, so community (at a later point in time) is also our end point. Our full model can be described as a circle or spiral whereby a community C exists, adopts and uses technology T, and that leads to a measurably changed community, or C', that is,

$$C \rightarrow T \rightarrow C'$$

The earliest time-sharing machines, for instance PLATO (1961) afforded a space for communication as well as for running programs. William Gibson 1984 novel Necromancer popularized a name for this

space—cyberspace. Howard Rheingold explored and explained it in his 1993 book *The Virtual Community: Homesteading on the Electronic Frontier*. This gives us a more generalized model,

Actuality → Virtuality → Actuality'

which we express as A-V-A prime and which has been the focus of social informatics, internet researchers as well as community informatics.

The model needs one additional component, because all virtuality is accessed through the tools which comprise a digital information infrastructure that exists in the real world. Moreover, as several of the chapters here explain, access to and use of this infrastructure is uneven across and within our societies. It is helpful to conceptualize the digital information infrastructure in three aspects: the content, the code, and the conduit. Content is the data. Code is the software. These are virtual. But conduit is the devices, the infrastructure, and the human IT help that enables people to we manipulate the content and the code. Those exist in the physical world. In chapter 11 we conceptualize this "conduit" as personal (at home), private (at work), and public (shared in other locations). While all these are important, in light of the digital divide and scarce resources for most of the world's population, community informatics emphasizes the public. So our complete framework for community informatics research is in figure 1 below:

<IMAGE TO BE INSERTED IS APPENDED>

Figure 1. Research framework for community informatics.

The model finishes with the community, but at a later time. What has changed? Compared to the community at an earlier time, is there an observable difference?

Community informatics in the US

Because chapter 8 of this volume provides a detailed US history of the research field known as community informatics, it is worth reviewing here the practical activity that the research studied. The earliest evidence of community informatics, in fact, was not scholarship but practice, variously known as community networking, community computing, and community technology. But before any of these names came PLATO (1961), the first time-sharing computer system used for formal and informal education at all levels, including terminals in schools, universities, libraries and elsewhere. Teachers as well as the interested public got free accounts, used curriculum, development curriculum, and began to communicate and even play online games. PLATO was funded at least in part by the Office of Naval Research in the US Department of Defense, and invented by researchers at the University of Illinois.

In 1973 Berkeley Community Memory began as a timesharing system with terminals in two local shops and the public library where anyone could post or read messages. An early book theorizing about computers in people's everyday life was Ted Nelson's *Computer Lib: You Can and Must Understand Computers Now* (1974). By the 1980s, community networks (online resources, some providing public computing resources) and community technology centers (public computing sites) were flourishing. Libraries were involved since the so-called "card catalog" was becoming a database and public librarians moved their local information files onto the computer.

As these experiments multiplied, university researchers became involved, often as practical partners since large grants were typically not given to small organizations. Campus-community conferences

fostered discussion and then publication of case studies that explained "what we did and what happened."

In the 1990s the Clinton Administration popularized the term digital divide, began to measure this divide via large household surveys, and launched a $230 million funding stream called the Technology Opportunities Program (TOP) through the federal Department of Commerce. The "dot-coms" and the telecommunications companies brought corporate funding to this movement. The community technology movement, as it was called, was in full swing. The National Science Foundation granted $2 million to a leading community technology center, Playing to Win in New York City, to build a national network of such centers and carry out surveys on what was happening in them. Community Technology Center Network, or CTCNet, informed and galvanized community organizations and city agencies across the US. Along with CTCNet numerous state and local associations of community technology organizations formed during this time. The dot-com bust and certainly the Bush administration that entered the White House in 2001 signaled the end of some funding and ridiculed the digital divide as a Mercedes divide ("I don't have one, but I want one," said one official). But so much had been accomplished that many institutions had already crossed a line. The informationization of US communities, imperfect of course, was well underway.

Skipping over many more historical events, we direct people to two long-running surveys: Charles McClure and John Carlo Bertot's studies of the take up of computers and internet by US public libraries, and the US government's computer and internet use population surveys. The latter compares to the work of CNNIC and is discussed in the chapter by Yan and Williams. We also point to a second important federal funding program, the Broadband Technology Opportunities Program, which is an echo of the original TOP funding (1994-2005), but larger and focused on expanding broadband construction and use in under-served areas of the US (2009-2012).

Community informatics in China

In China, there was no discourse regarding community informatics by that name, for instance, as a keyword for research papers, until Yan Hui's "Community Informatics: an emerging field" (社群信息学：一个值得关注的新兴领域) was published in 2010 in issue 4 of *Library and Information Services* (《图书情报工作》). However, from the 1990s, a large number of research or work papers on community informatization, which refers to the processes of applying information and communication technologies to the official issues in community neighborhood committees (the basic-level government agencies) and local residents' daily lives, was published in journals or proceedings. CI research in China relies heavily on policy background and practice advances.

In 1954, two famous scientists, Hua Luogen and Qian Xuesen proposed to Chairman Mao Tse-Tung to develop electronic computer technology. Soon after, in 1956, computing technologies was listed as one of the badly-needed technologies in "Science and Technology Development Strategy in Future Twelve Years" (《十二年科学技术发展规划》). The first college students majoring in computer science in China graduated from Tsinghua University in July 1957. At the same time, Peking University started its first computing mathematics and software training classes. In 1979, the State Council founded the State Administration of Computer (SAC) under the Fourth Ministry of Machinery Industry, which is the first government agency related with computing technologies.

ICT application practices in China's communities started as early as the beginning of the informatization movement after the implementation of Reforming and Opening Up in 1978. In 1992, the State Council announced an official document on spreading decision support systems in governments and this

moment is always regarded the starting point of informatization. In 1996, The State Council's Working Group on Informatization was established and originally chaired by Zou Jiahua, Vice Premier of the time.

The first time that community informatization appears in a national policy document was in "National Informatization Development Strategy in 2006-2020." The strategy declares that community Informatization should include:

- integrating different kinds of community information systems and resources
- developing uniform community information platforms
- strengthening the management of local residents and floating population using ICT, and
- improving community services.

Although there was an opportunity for China's Ministry of Civil Affairs to enact "A National Guide to Promote Community Informatization" (《关于推进社区信息化工作的指导意见（征求意见稿）》) in 2007, no such document has been signed to date except the draft calling for citizens' comments. Some large cities and provincial governments such as Jiangsu, Fujian, Tianjin, Qingdao, and others have implemented local community informatization strategies.

As the administrative agency for domain name registration and DNS root server operations in China, CNNIC (China Internet Network Information Center) began to publish its *Internet Development Report* (IDR) in 1997. The latest of these is the 29th Chinese Internet Development Report issued on January 16, 2012 and included here as Chapter 15. As Yan and Williams discuss in Chapter 14, IDR reports include many important aspects of ICT in China, for instance uses, connecting, places, attitudes, devices, frequency, identity, and discourse.

The discourse concerning community (she qu, 社区) in Chinese policy documents and community informatization practice is characterized by its geographical, administrative, bureaucratic meanings. The scope of community in the Western academic community informatics discourse is much wider, with research objects not limited to the local administrative community but focusing on what we call the local, historical, organic community and the virtual communities, disadvantaged social groups and the like in relation to that. Local, historical, organic communities sometimes align with administrative communities, and sometimes not. That's why we decide to translate "community" as she qun (社群)。

Guide to this volume

The content of the book is selected and organized as an introduction to community informatics theory and research in both the US and China. Chapters 1 through 7 provide foundational concepts and frameworks for the field of community informatics. More are from the West than we would like, but as Lai Maosheng suggests in his preface, if we all look more carefully in the Chinese literature using better search terms, Chinese-born theory will surface. This section, then, is an opening move for community informatics theory in China, and we look forward to China's return move.

In chapter 1, Barry Wellman and Barry Leighton reflect on an earlier search for community in the industrial age. Community and its persistence in the face of overarching social change was the original and driving concern of urban sociology. Wellman and Leighton lay out a framework for thinking about whether and how community can survive and transform in the digital age. This is the question of

community informatics, expressed at its most abstract. It is well complemented by Chen Jianlong's 'informatics of happiness' formulation in chapter 13.

In chapter 2, Nan Lin explains social capital. This concept became very popular correction to the theory that a person acts rationally and in their own narrow self-interest at all times, offering a way to explain the conditions under which people make choices. Perhaps because of its popularity, social capital requires rigorous definition and use. Lin provides intellectual anchors for the concept of social capital, first in Marx's capital and other usages that emerged later, and then in the social networks that exist in all societies. He also proposes a research agenda that intersects with community informatics.

In Chapter 3, Manuel Castells challenges us to find and learn about solutions to the social polarization that has accompanied informatization. He explains this polarization using key concepts from his work on the technopoles, of the world and proposes where to look for solutions. Chapter 4, also by Castells, is an answer to the questions he poses in chapter 3. He reviews the ways in which people are actually using information and communications technology to respond to and even overcome social polarization. Network society, informational city/dual city, space of flows/space of place, and grassrooting are powerful and accessible concepts for scholars and the public alike, as are the other concepts in this section of the book.

In Chapter 5, Pierre Lévy offers and explains his widely adopted concept collective intelligence. While humans have always shared (and not shared) knowledge, his definition highlights what is new about the sharing in the information society. To pass from *cogito* (Latin for I think) to Levy's digitally enabled *cogitamus* (we think) where no one knows everything, everyone knows something, we have to transcend our dual city gaps. As he puts it, "If you are tempted to judge someone as ignorant, look for the context in which his knowledge can be turned into gold." We see collective intelligence exactly as he has defined it as one of three core values of the information age, alongside cyberdemocracy (everyone can access the technology) and information freedom (no cost or other barrier to the information).

In chapter 6, Lai Maosheng explores the origin and development of the digital equity movement, introduces methods and indicators for measuring social equity and digital equity, analyzes the measurement data and research results regarding the condition of digital equity, and then reviews the major obstacles, principles and possible approaches towards realizing digital equity.

Chapter 7, by the editors of this book, is our first joint effort to explain the reasons and the possibilities for community informatics in China. It recapitulates key ideas and proposes a research program. Lai Maosheng was very helpful in posing the four questions to us and our intended audience was the Chinese academy, especially information management scholars and students.

The second part of the book has two parts: five chapters with our most relevant empirical work from the US and eight chapters about China which each constitute a first step in the direction that we propose in chapter 5. We hope that the US work included here provides a standard that Chinese scholars can grasp and then go beyond.

First, in chapter 8 Kate Williams and Joan Durrance provide a definition of community informatics and a brief history, especially in relation to libraries, librarians, and library scholars. Like the theory section of this book above, this chapter is Eurocentric and US-centric, and invites a Chinese answer, from inside the Chinese field of information management but also from beyond that field to others in China.

Chapter 9 is the first community informatics study done by Abdul Alkalimat and Kate Williams. This chapter emerged from practical work that they did for close to a decade. This work linked the university

to an existing community technology center. A case study where the research is invested in the community's own success is a tremendous learning opportunity quite unlike "learning to grow crops on the blackboard." Scientific method keeps the researcher honest and the memories continue to inform and inspire. This study presents a model whereby social capital, from outside the community but more importantly from within a community, is invested in a public computing site, generating cyberpower, that is, the ability to effect change using computers and the internet.

In chapter 10, Abdul Alkalimat explains five projects which emerged out of the work analyzed in chapter 9. These were all experiments at virtualizing community and generating cyberpower, and can be reinterpreted today, with all our communities so much more connected to the internet.

Chapter 11, by Kate Williams and Abdul Alkalimat, is a survey of public computing sites in the same cities as the studies in chapters 9 and 10. This research method follows naturally from a case study, because when you have learned a lot about one instance of a phenomenon, you can post questions to many and collect data that can show trends. The typology of public computing (government, commercial, higher education, and community or non-profit) suggests that different outcomes result from each type and that effective digital divide policy takes all four into consideration.

In Chapter 12, Kate Williams applies community informatics theory and methods to the public library and identifies a new phenomenon, the informatics moment. Unlike the digital divide, or digital literacy, which are each states of being, informatics moment is a process. It is a process that is repeated across society and (as long as new technologies emerge) in each of our lives as we set out to do something new. Her finding that social capital, especially bonding social capital, matters here, even in a bureaucratic organization such as an urban public library, is also a policy proposal: Digital literacy programs will succeed if they allow for and encourage the contribution of bonding social capital.

The remaining chapters shift the focus to China.

In Chapter 13, Chen Jianlong summarizes field work in the economic, social, technological and information strengths and weaknesses of the Lao Shao Bian Qiong areas—the old revolutionary areas, ethnic minority areas, remote border areas, and underdeveloped areas-- of China. His conclusion: community informatics is the informatics of happiness. That means that for information management researchers, it is a high ethical and moral priority.

The remaining chapters reflect a recent burst of this type and style of research. From Jack Linchuan Qiu, chapter 14 is a description and analysis of the rise and fall of the internet café, focusing not on rural China but on urban Beijing. Nevertheless, it also addresses human happiness, but using a different conceptual framework: working-class network society. Here the author is extending the ideas of his dissertation advisor Manual Castells.

After that in-depth case study, in chapter 15 Yan Hui and Kate Williams look from a great distance at the national population surveys of both the Chinese and US internet agencies. "A great distance" because at the time, from the US, we could not get in touch with CNNIC itself, so we backwards-engineered their reports to estimate what questions they asked, and this combined with the actual US survey questions suggested a set of standard questions that all national surveys should ask. We were gratified to later meet CNNIC researchers and find them on the same path towards international standards.

As a result of that meeting, we are able to include chapter 16, the most recent translated report of the actual statistics from The China Internet Network Information Center (CNNIC). No work in this area can

go forward without using and grappling with the national census data their researchers collect, analyze and publish every six months.

In chapter 17, Han Shenglong and Yang Xueling walk us through the development of the internet in China, especially national status quo of internet, wireless internet, network devices and products, electronic government movement, electronic commerce, internet governance, etc. They provide a whole picture of China's internet since the 1980s.

Chapter 18 from Yan Hui offers the voices of leaders of what he calls "non-profit information organizations." His method is exactly in line with the theory of emphasizing bonding social capital: to understand community informationization, you must listen to local people with the social capital to effect change.

In chapter 19, Wang Sufang, helped by others in the 2011 Community Informatics Summer School, provides us with a solid critique of a commercial public computing site, the world-famous Starbucks café. This is the type of case study produced in the first summer school and we hope it will inspire readers to carry out more such case studies.

Helping us conclude this volume, Yu Liangzhi in chapter 20 lines up theory from China and abroad on information inequality and digital inequality. She finds theoretical unity between these two research threads and her findings, not to mention her approach, can only help us go forward faster in the US, Chine and elsewhere.

We are grateful to our publisher, the National Libraries Press (Beijing); Brian Zelip for editorial assistance; Kang Zhao for her graceful translation of the preface; each author in this volume for his or her contribution; and to our four families. We hope they forgive us for our absences from the family challenges and victories experienced as we carried out the work in this volume, and we deeply appreciate their support for the values and goals expressed here.

Kate Williams, Han Shenglong, Yan Hui, and Abdul Alkalimat

March 2012, Champaign, Beijing, and Tienjin

Figure 1. Research framework for community informatics.