

Social and Community informatics
Past, Present, & Future: An Historic Overview
Keynote Address
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Abstract

In keeping with the title of this session, “Community/Social informatics and ICT for Development”, this presentation takes a brief look at the origins, meaning, development and current status of the concepts “social informatics” and “community informatics”. Although the relationship between technology and society has been studied since the industrial revolution in the 19th century, the concepts “social informatics” (IS) and “community informatics” (CI) represent relatively new fields of multi-disciplinary study that developed out of seeming separate and unconnected discussions between computer scientists, sociologists, educationists and others on the role of computers and Information and Communication Technology (ICT) in society.

Although community informatics shares many similarities with Social informatics, community informatics focuses more specifically on the **relationship** between communities and information technology and how information technology can be designed or redesigned and used to the benefit of the Community.

While Rob Kling, a computer scientist and sociologist from Indiana University, is closely associated with the formulation and popularization of the concept social informatics in the 90s, Michael Gurstein, a contemporary of Kling, is generally associated with the development and definition of the term community informatics. Although Kling died in 2003, his views, philosophies and numerous publications on the complex relationship

between society and technology have become the foundation of the various schools of informatics around the world. One particular area that both social informatics and community informatics concern themselves with is what is referred to as the “digital divide”, i.e. the causes and general consequences of lack of access to computers and the Internet and its associated information technologies.

This presentation briefly examines the origins and development of these new research areas since the late 90s.

[KEYWORDS: Social informatics (SI), Community informatics (CI), Information and Communication Technology (ICT), Information Technology (IT), Social Determinism, Social Constructivism, Digital Divide, Social Shaping of Technology]

1. Introduction

Mr. Chairman, honourable guests, speakers, ladies and gentlemen, allow me to kindly thank the organisers for the invitation to deliver this keynote address at this fourth session of the 10th Annual DIS conference entitled: “***The Research Challenges and Opportunities in Information Studies in a changing National and Global Environment***”.

In keeping with the title of this session, “Community, Social informatics and ICT for Development”, this presentation takes a brief look at the origins, meaning, development and current status of the concepts “social informatics” and “community informatics”.

Although the relationship between technology and society has been the subject of numerous studies and debates since the beginning of the industrial revolution in the 19th century, the concepts “social informatics” (IS) and “community informatics” (CI) represent relatively new fields of multi-disciplinary study that grew out of seeming disparate and unconnected discussions between computer scientists, sociologists, educationists and others on the role of Information and Communication Technology (ICT) in society. While both social informatics and community informatics developed out

of the complex relationship between society and information technology in the 1990's, community informatics | unlike social informatics | focuses more on the **relationship** between communities and information technology and how the former shapes the latter.

Developments in computer and information technology, especially the transformation of the Internet over the last 20 years, have played a major role in the popularisation and acceleration of social informatics and community informatics as new independent schools of thought that study the relationship between society and ICTs. The popularity of these new multi-disciplinary areas of study and research is clearly reflected in the fact that Google returns no less than 97,000 hits for the term "social informatics" and 83,500 hits for the term "community informatics" (<http://www.google.co.za/>).

2. The Etymology and History of the Terms "Social Informatics" (SI) and "Community Informatics" (CI)

While Rob Kling from Indiana University in the US is widely associated with the development and popularisation of the concept of social informatics, he was not the first to examine and study the influence of technology, particularly computer technology, on society and vice versa. This honour belongs to the German computer scientist Karl Steinbuch who first used the term "informatik" in 1957 in a paper entitled "*Informatik: Automatische Informationsverarbeitung*" (Informatics: Automatic Information Processing) [<http://www.absoluteastronomy.com/topics/informatics/>].

Initially, the term "Informatiks" (English: Informatics) referred to computer science as the science of computing and information automating interactions. In 1962, the term "informatique", referring to computing science, was adopted by Philippe Dreyfus in France. The term was subsequently adopted by computer scientists in other parts of Central Europe. "Informatics" thus initially had a restricted connotation referring to computer or computational sciences.

By 1966-67 the term had, however, come to attain a wider interpretation thanks to the work done by the Russian information scientist, Alexander Mikhailov. Mikhailov, who worked at the Russian Scientific and Technical Information Institute of Russian Academy of Sciences (VINITI)¹, a soviet documentation centre for science and technology, redefined “informatika’ as an independent discipline that refers to the “theory of scientific information”, and not merely applied information technology, that investigates the structure, properties and specific content of scientific information, as well as the regularities of scientific information activity, its theory, history, methodology and organisation. He was recognised for his research and work by the Soviet Academy of Science in 1983 (Wilson, 2006) [see also

<http://www.absoluteastronomy.com/topics/Informatics#encyclopedia>;

[http://www.db.dk/bh/Core Concepts in LIS/articles a-z/mikhailov.htm](http://www.db.dk/bh/Core_Concepts_in_LIS/articles_a-z/mikhailov.htm); and

[http://informationr.net/ir/reviews/ revs223.html](http://informationr.net/ir/reviews/revs223.html)].

Today the term “informatics” is more broadly defined as a field that covers artificial intelligence, cognitive science, computer science, information science (processing, management, and the retrieval of information), social science and information technology (the study, design, development, implementation, support, or management of computer-based information systems). The restriction to scientific information has thus been removed, as for example in business informatics or legal informatics. Since most information is now digitally stored and processed, computation has become central to the concept of informatics, and the representation, processing and communication of information have been added as objects of investigation since they are fundamental to any scientific account of information (see <http://www.merriam-webster.com/dictionary/informatics>; and <http://www.absoluteastronomy.com/topics/Informatics#encyclopedia>).

Social and community informatics, the subject of this presentation, are therefore seen as sub-categories of the more general field of “informatics” or “informatika”.

¹ Vserossiiskiy Institut Nauchnoy i Tekhnicheskoy Informatsii (VINITI)

Kling first introduced to the concept of social informatics by the Norwegian sociologist, Dr. Stein Bråten, and his computer science colleague, Kristen Nygaard, during a visit to Oslo in the early 1980s. Bråten and Nygaard used the term “**sosioinformatik**” to refer to the relationship between society and ICT (<http://rkcsi.indiana.edu/index.php/history-of-the-term>).

Community informatics (CI) as a field of practice in applied information and communications technology was brought to prominence by Michael Gurstein in the early 21st century (Gurstein, 2000). While Gurstein is associated with the first representative collection of academic papers on Community informatics in 2000, others, such as Brian Loader and his colleagues at the University of Teesside, already used the term in the mid-90s (Loader and Keeble, 2002).

A comprehensive online research network for community informatics was established in 2003. Community informatics, unlike social informatics, places specific emphasis on the application of ICTs to enable and empower community processes that aim to overcome the “digital divide”. (Gurstein, 2008:11).

Because of its obviously close association with social informatics’ research and study areas, such as computer science, sociology, information science, library science, education, and rural, regional and development studies, many, including Kling, have argued that it is not a new or independent discipline but a mere subset of social informatics. Gurstein (2008:42) disagrees with this notion and argues that while it is true that Community informatics shares many of the research areas of social informatics, community informatics is nonetheless a separate and independent discipline like social informatics.

3. Technological Determinism and Social Constructivism

From the above, it is evident that social informatics and community informatics share many similarities. Since this is the case, it can also be argued that they share many similarities as well as differences with other dominant social theories, such as those

pertaining to the schools of “technological determinism” and “social constructivism” (Oostveen, 2007).

Summarily, the school of technological determinism argues that:

- The development of technology itself follows a predictable, traceable path largely beyond cultural or political influence; and
- Technology has "effects" on societies that are inherent rather than socially conditioned, and thus society organises itself in such a way as to support and further develop a technology once it has been introduced.

Technological advances are therefore seen as the primary or causal element in processes of social change. As a technology stabilizes, its design tends to dictate users' behaviours, thus diminishing human society in the process, meaning that human society becomes subject to technology development. The weakness of this theory is that it ignores the social and cultural circumstances under which the technology was developed in the first place. Technology, as the main driver of social and cultural change, thus bypasses the cultural “payload” or influence of human activity in terms of its possible uses. Technology’s role in cultural advancement is therefore completely ignored by the technological determinists. (Smith and Marx, eds: 1994).

The philosophy of the determinists is perhaps best summarized by the early 20th century historian, Charles Beard, who described technology “as a force that marches in seven-league boots from one ruthless, revolutionary conquest to another, tearing down old factories and industries, flinging up new processes with terrifying rapidity.” Beard viewed ideology and technology as a product of economic-capitalist interest. ([http://en.wikipedia.org/wiki/ Technological determinism](http://en.wikipedia.org/wiki/Technological_determinism)).

A staunch 20th century supporter of technological determinism, was the Canadian academic and English language specialist Marshall McLuhan, who is famous for the phrase, “The medium is the message”. McLuhan was of the opinion that the form of a

medium embeds itself in the message, thereby creating a symbiotic relationship by which the medium influences how the message is perceived (Gordon, 2002).

In contrast to the determinists' school, the school of social constructivism, variously referred to as the "social shaping of technology" or the "social construction of technology (SCOT)", argues that society and thus knowledge is not technologically but sociologically constructed through the creation and sharing of social artefacts and their collectively shared meaning.

Organizational, political, economic, and cultural factors are thus seen as important in the development of technology. The downside of this thinking is that it tends to concentrate on social groups and communities rather than on society as a whole. Thus, whereas Social informatics operates at micro, meso and macro levels (Robbin, 2005; Oostveen, 2007), social constructivism tends to concentrate mainly on the micro-level. The origin of this school of thinking has been largely attributed to the cognitive psychologist, Lev Vygotsky, in the 1960s (Vygotsky, 1978; Williams and Edge, 1996).

An example of social constructivist thinking being applied to the design of information technology or ICT is the web-based, open-source, distant learning and management system called MOODLE (**"Modular Object Orientated Developmental Learning Environment"**), designed and developed by the Australian computer scientist and educationalist, Martin Dougiamas, at the Curtin University of Technology in Perth Australia at the dawn of the 21st century. Moodle was designed to use pedagogy and group learning rather than tools or tool sets as the core of its learning philosophy and functionality (http://www.martin_dougiamas.html;<http://www.Moodle.org/>). Moodle is currently being used in 204 countries, representing almost 40,000 registered sites worldwide. It is currently also the official e-learning platform at the University of Zululand.

4. Social informatics (SI) Defined

Kling defines Social informatics as: "The systematic and interdisciplinary study of the design, uses and consequences of information technologies (IT) that takes into account

their interaction with institutional and cultural contexts”. Because it concerns itself with the study of information and communication tools in cultural and/or institutional contexts (Kling, Rosenbaum and Sawyer, 2005), Social informatics is different from both the determinists and constructivists’ schools in that it takes an holistic or global approach to the study and examination of how the social aspects of computers, telecommunications, and related technologies shape organizational and social relations on the one hand, and how society and social forces influence the design and use of information technology on the other (Kling, 2001).

Broadly framed, Social informatics seeks to answer a range of questions about the present and future consequences of ICT developments and their influences on society and vice-versa. Moreover, Social informatics places extensive emphasis on the fact that understanding which social changes are possible, which are plausible, and which are most likely to have an impact on the future, is empirically rather than purely theoretically based (Kling, 2001) [<http://www.rkcsi.indiana.ed/archive/SI/si2001.html>].

5. Community informatics Defined

According to Gurstein, Community informatics differs from Social informatics because it examines a different “*problematique*” (Gurstein, 2008:43-44).

Furthermore, while Social informatics is concerned with:

- I. The “research and study of society and ICT”, Community informatics is concerned with both the “practice and the research” of the use of ICT in a Community;
- II. The general and abstract category of “society” or “societal” aspects of computerisation, Community informatics is more concerned with how ICT is used in specific concrete identifiable communities;
- III. The more general or overall social or organisational systems level, Community informatics is concerned with more specific applications of ICT in the Community context, such as health, economic development, education, etc.;

- IV. The general description and understanding of the role of ICT in the world, Community informatics sees itself as being actively involved in changing the role and significance of ICT in a Community; and
- V. While Social informatics appears to have little or no direct interest in the design or development aspects of ICT, Community informatics has a particular interest in the design and development of ICT hardware and software and its application in and impact on communities (Gurstein, 2008:42-43).

While these differences are significant, Gurstein (2008:44) concedes that confusion may arise because an informatics' approach to social structures is in many ways parallel to the Social informatics approach to Community structures and Community processes. Moreover, there is also a clear link and nesting of Community structures and Community processes within these social structures and processes.

6. Social informatics Research Areas

Social informatics research largely comprises three empirical based approaches, namely **normative**, **analytical** and **critical**. The normative approach refers to research aimed at recommending alternatives to professionals who design, implement or develop policy about ICT. The second, i.e. the analytical approach, refers to research theories about ICT in institutional and social or cultural contexts. The third and last approach refers to research examining ICT from a multi-dimensional perspective that does not automatically or uncritically accept the goals and beliefs of the groups or entities that design or implement specific ICTs (Kling, Crawford, Rosenbaum, Sawyer and Weisband, 2000:16-18). Because of its strong multi-disciplinary nature, the Social informatics study and research spectrum covers areas and topics that include:

- Social software development for online social and Community networks,
- Citizen journalism
- Convergent media
- Information literacy
- Web-based multimedia and social software (blogging, Wikis and RSS)
- E-society

- E-learning
- The impact of ICT on the micro-, meso- and macro-organisational levels
- Social networks and social virtual worlds
- Knowledge management
- E-government
- Social influences on information systems' development projects in government agencies and rural information issues
- Social capital
- Digital and social exclusion
- The history of information systems and management
- The history of software development
- Organizational informatics
- The technical, economic, political, psychological, aesthetical and ethical considerations in the design and use of information technology
- What should and should not direct the development and application of information technology
- The digital divide

7. Community informatics Research Areas

Many of the research areas covered by Social informatics referred to above are also covered by Community informatics. The concept "Community" and its connections to different forms/types of social networks have been endlessly studied and examined by both Community/social and computer scientists since the 1960s. According to definitions of Community informatics, the concept "Community" can be seen as both a "lived" and a "working experience", such as in rural Community areas, and as an applied concept designed to enable and explore the reality and significance of neighbourhoods, ethnic and cultural associations, and provide frameworks for social meaning and social action

(http://www.absoluteastronomy.com/topics/Community_informatics#encyclopedia).

Thus communities are defined as people coming together to pursue common goals through shared practices that are both physical and electronic. While there has been considerable investment and support in the electronic development of applications for individual use or for business communities -- corporate intranets and extranets and the development of social networking services (e.g. Ebay, MySpace and Facebook) -- there is far less investment in human-technical networks and processes that can be used to bring about social change, particularly in communities where electronic communications are of secondary interest (http://www.absoluteastronomy.com/topics/Community_informatics#encyclopedia).

Community informatics therefore extensively concerns itself with Community-based approaches to the design and implementation of ICT and how such developments can be used to enable and empower those who live in physical communities, especially in communities that practice communal ICT access (i.e. through telecentres, Community libraries, multi-media centres, etc.). Information and Communication Technology for Development or ICT4D has become a key approach to Community informatics research over the past decade. No less than 200 Community informatics researchers representing some 50 countries around the world are currently doing research on ICT4D in areas ranging from ICT in Community development, to development studies, computer science, information science, social science, planning, management, and social administration (<http://www.ciresearch.net/about>). ICT4D initiatives that aim to assist with social and economic development in Less Developed Countries (LDC) have been initiated by NGOs and private sector agencies concerned with development, such as the UN, the International Monetary Fund (IMF), the World Bank and the Swiss Agency for Development and Cooperation (SDC), which have all emerged as key players in the poverty relief component of the UN's Millennium Development Goals for the developing world (http://www.absoluteastronomy.com/topics/Community_informatics#encyclopedia).

Since its introduction in the early 21st century, there has been growing interest among social and computer scientists in Community informatics as an academic discipline

examining the impact of different ICTs on communities and how they can enable and empower poor communities in the developing world and thus help to breach the “digital divide”. The term “digital divide” had its origins in America in the early 90’s, and originally referred to the gap or divide in ownership of computers among certain ethnic groups in the US. By the mid-90s, the term had largely shifted in meaning to refer to those who do not have computers and broadband access to the Internet or what has been termed as the “new economy”. Computer ownership alone was no longer seen as the “dividing” norm - high-speed connectivity to the Internet was (Williams and Kate, 2001)

[<http://www.osmond-riba.org/lis/DigDivide.htm>; <http://www.umich.edu/~katewill>].

8. The UN Millennium Development Goals and the Digital Divide

In September 2000, world leaders from 189 countries, including representatives from the World Bank, the International Monetary Fund, and the International Telecommunications Union (ITU), came together at the United Nations Headquarters in New York to adopt the United Nations Millennium Declaration (MGD). The declaration committed the signatory nations of the world to a new global partnership that set eight goals with 21 quantifiable targets and 60 indicators.

The 8 Main goals are:

- Goal 1: Eradicate extreme poverty and hunger
- Goal 2: Achieve universal primary education
- Goal 3: Promote gender equality and empower women
- Goal 4: Reduce child mortality
- Goal 5: Improve maternal health
- Goal 6: Combat HIV/AIDS, malaria and other diseases
- Goal 7: Ensure environmental sustainability
- Goal 8: Develop a Global Partnership for Development

The 8 goals were revised in 2007 and reduced to consist of 18 targets and 48 indicators. Section (f) of Goal 8 commits the United Nations (UN), in cooperation with

the private sector, to make available the benefits of new technologies, especially ICTs, to developing countries and commit the International Telecommunications Union (ITU), a special agency of the UN, to monitor the progress in terms of the number of fixed telephone lines, cellular mobility and Internet users per 100 units of population (<http://www.un.org/millennium/declaration/ares552e.htm>; [Road Map towards the Implementation of the United Nations Millennium Declaration, A/56/326 \[PDF, 450KB\]](#)).

According to data collected by the International Telecommunications Union (ITU), there has been a steady narrowing of the digital divide in terms of the number of fixed phone lines, mobile subscribers and Internet users over the last 10 years. And yet, despite this positive development, more than half of the world's 6.8 billion people (as of 2008) [<http://www.xist.org/default1.aspx>] have yet to make their first basic telephone call, let alone have access to the Internet and the new economy. These people remain completely shut off from the digital revolution and the social, economic and educational promises it holds. As the pace of the technological revolution increases, so does the digital divide for all sectors of society, from governments to the private sector, multilateral organisations, financial institutions, non-governmental organisations and everyday citizens (<http://www.itu.int/wsis/tunis/newsroom/stats>).

The ITU has been credited with having played a major role in breaching the digital divide in some developing countries, such as Malaysia, Korea and Singapore, since the adoption of its six-point Valletta Action Plan (VAP) in 1998. VAP aims to address the key elements needed to bridge the digital divide, namely:

- (1) Sector reform
- (2) Access to new technologies
- (3) Gender issues
- (4) Rural development and universal service/access
- (5) Finance and economics, partnerships with the private sector
- (6) Human resource development.

VAP also includes a special programme to take into consideration the needs of Less Developed Countries (LDC), 35 of which are in Africa, 15 in Asia and 1 in Latin America and the Caribbean (<http://www.itu.int/ITU-D/digitaldivide/strategy.html>; <http://www.digitaldivide.org>; <http://www.unohrls.org/en/ldc/related/62/>).

9. Africa and the Digital Divide: The Current Status

Although Africa is falling behind the rest of the developing world in breaching the digital divide, there are encouraging signs that the delivery and uptake of broadband Internet services by African businesses and consumers are steadily gaining momentum in parts of the African continent, such as South Africa and the North African countries of Morocco, Tunisia and Egypt.

According to the Arthur Goldstuck of World Wide **Wrox** , the number of Internet users using ADSL technology in South Africa grew by 12.5% in 2008 and is expected to continue to grow at a similar rate, pushing the number of broadband Internet users to 9 million over the next five years. High prices rather than infrastructure or inadequate capacity seem to be main reason most people, at least in South Africa, have thus far avoided mobile technology as an Internet connectivity tool (<http://engineeringnews.co.za/>).

Below are two tables showing statistics on the digital divide collected by the ICU up until April 2008. Table 1 shows that some **13.3 percent** of the developing world's population had access to information via fixed telephone lines by the end of 2007, compared to **48.8 percent** of the developed world. At the same time, some **12.7 percent** of the developing world's population had access to the Internet. This suggests that those with access to fixed telephone lines were probably the same people with access to the Internet in the developed world. The Internet access figure for the developed world, however, was **65.5 percent**.

As far as mobile devices (mainly cellular phones) are concerned, 38.6 percent of the developing world compared to 100.3 percent of the developed world had access to such devices by the end of 2007 (http://www.itu.int/ITU-D/ict/statistics/at_glance/af_ictindicators_2007.html).

Table 1 further shows that North Africa, when compared to Sub-Saharan Africa as a region, had a higher rate of connectivity in terms of **fixed telephone lines** (12.1% as to 1.5%), **mobile devices** (57.3% as to 22.9%) and the **Internet** (14.4% as to 3.7%) by the end of 2007.

Table 1 ²						
ICT Trends in the Developing World compared to those in the Developed World 1990-2007						
	Fixed telephone lines per 100 population		Mobile cellular subscriptions per 100 population		Internet users per 100 population	
	1990	2007	1990	2007	1990	2007
World	9.9	19.0	0.2	50.3	0.3	20.6
Developed region	44.2	48.8	1.2	100.3	0.3	65.5
Developing region	3.1	13.3	0.0	38.6	0.0	12.7
Northern Africa	2.9	12.1	0.0	57.3	0.0	14.4
Sub-Saharan Africa (SSA)	1.0	1.5	0.0	22.9	0.0	3.7

Table 2 ³	
ICT in South Africa as Compared to North Africa, Sub-Saharan Africa and South Africa as a Percentage of the Population by April 2008	

²http://www.itu.int/ITU-D/ict/statistics/at_glance/af_ictindicators_2007.html.

³http://www.itu.int/ITU-D/ict/statistics/at_glance/af_ictindicators_2007.html.

	Population	Main telephone lines		Mobile subscribers		Internet users	
	000s	000s	p. 100	000s	p. 100	000s	p. 100
AFRICA	963'530	35'411.2	3.77	264'475.0	27.48	50'406.4	5.34
North Africa	157'070	18'670.9	11.91	83'865.0	53.39	21'402.2	13.64
Sub-Saharan	757'880	12'098.3	1.65	138'310.0	18.28	23'904.2	3.23
South Africa	48'580	4'642.0	9.56	42'300.0	87.08	5'100.0	10.75

Conclusion:

The Future of Social informatics and Community informatics

There can be little doubt that Social informatics and Community informatics have established themselves as new and highly popular multi-disciplinary disciplines that examine the complex relationships between modern technology and society. Both disciplines have acquired a dedicated following typified by academics, students and researchers from around the world, and one can safely assume that they will continue to grow their inter-disciplinary support-base in the future. The debate as to whether Community informatics is a sub-category of Social informatics is also long from settled. In 2006, the authors Berleur, Nurminen and Impagliazzo argued that for Social informatics to continue expanding its potential as an alternative and insightful approach to studying ICT, scholars in this area must capitalise on the empirical work done to date and at the same time be prepared to move into the realm of theorising, more specifically on the nature and role of ICT (Berleur, J. Nurminen and Impagliazzo, 2006). They further argued that while Social informatics research will continue to borrow theories, concepts and approaches from other disciplines and apply them to ICT, an improvement in existing analytical methods would assist practicing, educational and IT professionals (Berleur, Nurminen and Impagliazzo, 2006:53).

The same can be said for the school of Community informatics, since borrowing ideas, concepts and theories from other disciplines and applying them to ICT applies as much to the future of Community informatics as it does to the future of Social informatics.

Likewise, exporting Social informatics and Community informatics' theories to other fields allows them to become referenced disciplines in their own right. In this way, these new disciplines communicate their findings and results to other researchers and thus develop unique and distinct multi-disciplinary identities

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