A White Paper Exploring Research Trends and Issues in the Emerging Field of Community Informatics

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Executive Summary

A small group of researchers and practitioners (Dr. Michael Bieber, Dr. Michael Gurstein, Richard Civille, Nancy White, Dr. David Silver and Dr. Beth Kolko) met for two days in late July in Friday Harbor, WA to discuss the strategic implications of and directions for the emerging field of "Community Informatics". The meeting was an initial activity of a one year NSF funded project "Virtual Community Informatics: Towards the Systematic Study of Technology-Enabled Virtual and Geo-Local Communities." The project, based at the New Jersey Institute of Technology is under the direction of Drs. Michael Bieber and Michael Gurstein (principal and co-principal investigators), and funded under NSF's Digital Society and Technologies Program.

The Executive Summary of the NSF proposal outlines a basic definition of Community Informatics and the primary objectives of the study:

> Community Informatics is the application of information and communications technologies to enable community processes and the achievement of community objectives. Community Informatics research and analysis has traditionally been concerned with "geo-local" communities – those identified with a particular local geographical area. "Virtual communities" are often identified only with the use of limited computerized tools as a support to on-line community processes. The proposed project has an objective of integrating the conceptual approaches which have developed in relation to the two areas and systematizing these so as to support the development of consistent Community Informatics theory, research and technical supports. A second objective is bringing Community Informatics researchers and practitioners active with "geo-local" and "virtual" communities together to actively collaborate in research and real-world projects. We call this collaboration Virtual Community Informatics. The seed money would support an initial round of workshops, and be used to attract additional funding from foundations and governmental agencies internationally. With this additional funding, we hope to develop a full research and applied environment supporting research, development and real-world applications of Virtual Community Informatics.

The purpose of this "direction setting" meeting was to explore a framework for collaboration to develop VCI as a potential "gathering place" for researchers and practitioners working in Community Informatics and Virtual Communities. The framework as developed would then be available as background for organizing future inquires and focus groups to further articulate the field.

The workshop sought to address basic questions such as whether (V)CI was the best term to use, ways to understand other terms such as Community Informatics or Community Networking, and other related definitional issues. The workshop also explored whether the correct problems and opportunities were being addressed based on the original proposal, and whether or how the approach undertaken by this NSF project might

succeed when other similar efforts have not. Specifically, the workshop sought to address the following themes and questions:

- What problems are the CI/CN and VC communities facing - both researchers and practitioners? What opportunities do they face? Which of these problems and opportunities could be realistically addressed in the context of this project?
- Are we providing solutions, or merely facilitating? What solutions could we provide? What facilitating could we provide?
- Is the focus on bringing together these four disparate groups correct? Will it address a core group of problems and opportunities, and will the approach be commensurate with the issues? Is the scope too wide or perhaps too narrow?
- Should the "2/3rds world" Digital Divide be explicitly addressed? Should this be an additional dimension which should be included, along with the other two dimensions?
- Why will this project succeed at bringing together disparate groups, where this approach often meets resistance?

The group, composed of academics and practitioners, asked where the IT "market" seemed to be heading. Is there evidence of growing interest, or market demand for more robust community information system applications? Would research institutions be proactive? What could be done to accelerate the process of embedding a new discipline into mainstream academic research agendas if a set of key indicators were positive?

Discussion on these questions helped to further refine the original project purpose as outlined in the NSF grant proposal Executive Summary into a new "mission statement". Restating the two key goals of the original proposal: to integrate systematically a set of existing concepts dealing with both "geo-local" and "online" communities into a common frame of reference and second to bring together key researchers and practitioners active within each domain together to collaborate actively in research and real-world projects.

This white paper summarizes and further structures these discussions, in an effort to frame a set of key trends, issues and prospects that the project will examine in further detail in the coming year. As such, it is hoped that the paper will be of interest to the broader spectrum of individuals and organizations concerned with improving the capacity of information and communication technology (ICT) to directly benefit communities both on-line and local.

Mission Statement

Further refining the original project's purpose over the course of two days led to a new "mission statement" that can be defined as follows:

> The purpose of the project is to establish an expansive mode of inquiry for Community Informatics through boundary spanning discourse among diverse researchers and practitioners concerning current and next generation information

and communication technology (ICT) connectivity, content and tools so as to better enable community processes and applications.

Several terms in this refined project mission statement are worth noting.

- "Establishing an *expansive* mode of inquiry" requires the project to proactively reach out to researchers and practitioners who may see themselves as peripheral to the field of Community Informatics, unaware of the term or perhaps critical of its value.
- The notion of "*Community Informatics"* should be understood as embracing both geo-local and on-line communities.
- The mission seeks to foster collaborations between researchers and practitioners, which suggests educational implications in such areas as credentialing and professional degree programs.
- The *mode of inquiry* itself may also need to reflect and incorporate a certain philosophical or ethical bias such as a belief in the value of "public goods" and the concept of the "commons", of citizenship, of technology as an enabler, and of the value and potential for human growth and development..
- The term *boundary spanning* reinforces the notion of reaching out across other fields and disciplines in a systematic manner to "connects the dots" linking these, and sparking new thinking and innovation among researchers and practitioners who often have little opportunity to talk to each other.
- The Internet and corresponding information and communication technologies (ICTs) is advancing through successive generations or platforms beginning with from text and moving to graphic interfaces, the growth of the World Wide Web, and more recently the availability of broadband enabled content and applications. The term *"next generation Community Informatics"* enables the project to include a forward thinking view incorporating emerging technology generations and platforms sometimes referred to as "G3" or third generation Internet technology of gigabit level broadband and multi-gigabit processing power.

Are We Addressing the Correct Issue?

The group examined their own motivations for becoming interested in a project such as this, often asking "Are we addressing the correct issue?" The group noted the enormous resources and institutional commitments invested in the field of Management Information Systems (MIS), built around the objectives of automating business processes and the presumption that business processes were knowable, replicable and capable of being translated into ICT tools for a marketplace willing to pay for them.

Community Informatics (CI), or alternatively community information systems (CIS) has not enjoyed anything near the level of recognition, research and development or market power as MIS. However, CI similarly presumes that community processes are capable of being translated into ICT tools for a marketplace willing to pay for them. However, this is not taking place with a speed, scope or scale sufficient to gain traction in the marketplace, to become a budgeted item for tax based public expenditure, or to gain a

corresponding recognition and resource investments from major research or academic institutions.

Will a greater recognition for Community Informatics result in a greater emphasis being placed on the development of new community information system tools? The group wondered if residentially or communally accessible, visually and computationally rich applications in the areas of *personal health care, learning, and public consultation and decision-making* would help to open up the underdeveloped broadband market place. It was further noted that the possible linkage of Community Informatics with local Broadband implementation could represent a very bright future not only in opening new markets, but also in effectively and simultaneously tackling the Digital Divide/effective use issue in local communities.

In this context it will become increasingly important to examine the academic frameworks that can best support the necessary research and development and professional accreditation to ensure that current and next generation ICT implementations will not only be applied to further automate *business processes* and thus achieve productive economic gains, but also to automate *community processes*, and thus ensure the achievement of important social gains as well.

The Time is Right for This Approach

While the draft framework for cross-sector collaboration developed in the workshop clearly needs further refinement, the group felt that the basic approach would be helpful in designing agendas and processes for workshops, side sessions at major conferences and the other types of meetings that the NSF project intends to undertake.

How can such an approach (a framework for cross-sector collaboration) establish a foundation for success when many efforts at bringing together disparate groups fail? The NSF project activities will encourage integration between related fields and among practitioners and researchers in order to strengthen the emerging Community Informatics discipline. The Community Informatics field, especially work to integrate virtual and geo-local practice and research is relatively new and moving quickly, which creates an opening for cross-sector dialog and collaboration. For example, there are no bureaucratic concerns over integration (such as resistance from entrenched academic departments). The scope of activities of the NSF project will help to accelerate and catalyze emerging trends towards a convergence of practice, and research-activities-focused online interactions on the one hand, and localized “real-world” interactions on the other. As the Internet grows, the need to achieve this kind of convergence of relevant research and practice becomes ever clearer as distinctions between physical interaction and virtual interaction begin to become less distinct through familiarity with the virtual processes and through the availability of high quality virtual experiences resulting from the availability of very low cost high capacity (Broadband based) electronic interaction.

Terms and Definitions

The group realized that clarifying terms and definitions was important to any investigation into an emerging discipline. How is the word "community" to be used? How is MIS to be understood and distinguished from CIS? What does "Community Informatics" mean and how is it distinct from other terms in use such as Social Informatics? Does the term Community Informatics mean something different from Community Information Systems? What is the distinction between a term like Community Informatics and the term "community networking" which has been informally used by many groups, organizations and policymakers from around the world for years? The group also wanted to emphasize a central role for the notion of "tool building" and "deployment processes" as a basic goal to any discipline that hopes to compare favorably to MIS. For CI to be a parallel and community focused effort it will need to be quite capable of engineering new tools in support of community processes in a manner parallel to MIS's support for business processes.

Community

"Community" is a broadly used term, but could perhaps be usefully (and minimally) defined as a "unified body of individuals.[1]" In this context "unity" could be understood as being achieved through shared interests, shared geography, or a combination of both and thus the present project's interest in systematically integrating research and practice concerning both "virtual" as well as "geo-local" communities. One of the group pointed out that the noted British professor of Literature Raymond Williams analyzed several hundred words that have come to have cultural and theoretical meaning and observed that the word "community" has no antonym. That is, there is no word in English that means the opposite of "community" and therein perhaps lays its weakness. It is implicitly positive regardless of how it is used.

Informatics

The term "informatics" is more commonly used in Europe than in the United States along with similar terms such as "telematics" referring to the use or application of technologies rather than to the technology itself. "Informatics" thus refers to the *use* of ICTs as for example in the terms "bioinformatics" which refers to the application of computer technology to the management of biological information while health and "medical informatics" refers to the use of computers in medical research, medical education and clinical medicine[2]. A complex definition of "biomedical informatics" is instructive when considering a corresponding definition of Community Informatics, as both can be described as emerging disciplines:

[1] Merriam Webster Collegiate Dictionary
[2] techdictionary.com http://www.techdictionary.com

> Biomedical Informatics is an *emerging discipline* that has been defined as the study, invention, and implementation of structures and algorithms to improve communication, understanding and management of medical information. The end objective of biomedical informatics is the coalescing of data, knowledge, and the tools necessary to apply that data and knowledge in the decision-making process, at the time and place that a decision needs to be made. The focus on the structures and algorithms necessary to manipulate the information separates Biomedical Informatics from other medical disciplines where information content is the focus.[3]

The importance of the notion of tool building as underlying "Informatics" both described earlier and in the above definition of biomedical informatics complements well the notion of effective use or application.

Community Networks

The term "*community network*" or as process, "*community networking"* has been in common use by thousands of community-based ICT projects in many countries for many years, and combines the sense of both the geo-local and online contexts depending upon its usage. However, the geo-local context is basic to nearly every attempt to define the term. The Association for Community Networking, in its inaugural organizational publication defined "community networking" as occurring: "when people and organizations collaborate locally to solve problems and create opportunities, supported by appropriate information and communication systems. A Community Network is a locally-based, locally-driven communication and information system." [4]

As we have already noted, Merriam Webster defines community as a "unified body of individuals" or "people with common interests living in a particular area". A Merriam Webster definition for "network" is "a system of computers, terminals, and databases connected by communications lines." The combined definition could be: "A unified body of people with common interests using a system of computers, terminals, and databases connected by communications lines." A somewhat broader definition that includes the technical wording while incorporating social values derived from the above variations might be:

> A community network is a locally based, locally driven communication and information system designed to enhance community and enrich lives.

The linkage between an ICT application area such as community networking and the academic discipline of Community Informatics is quite direct, and shows the potential for the kinds collaborations between practitioners and researchers that this NSF project hopes to encourage.

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[3] http://www.faqs.org/faqs/medical-informatics-faq/
[4] Community Networking, Vol.1. Issue 1. January-February, 1998 p.1.

Community Informatics

The NSF project that sponsored this workshop and white paper defined Community Informatics in the original proposal as: "The application of information and communications technologies to enable community processes and the achievement of community objectives." (Bieber and Gurstein, 2002 and Gurstein, 1999[5]) Other definitions proposed for Community Informatics also address the *use* of ICT by individuals engaged in unified activities, generally outside of the workplace and in the social or personal spheres, either around areas of common interest or locality. A major international conference 2001- Informing Science held June 19-22, 2001 in Krakow, Poland at Krakow University of Economics provided an overview of how Community Informatics is defined in a call for papers that states:

> "The term Community Informatics (CI) refers to an emerging area of research and practice, focusing on the use of Information Technology (IT) by human communities. It links economic and social development at the community level with emerging opportunities in such areas as electronic commerce, community and civic networks, electronic democracy, self-help, advocacy, and cultural enhancement. CI brings together the concepts of IT and information systems with the concept of community development. As an area of research, CI is a growing body of theory underlying one of the most exciting phenomena of the last decade, namely the diffusion and use of Internet technologies within communities" [6]

This definition highlights a linkage with the field of *community development*, an observation that has been increasingly made by practitioners in the field in recent years, such as those working with community technology centers, telecenters and local community networks. The common theme of an emerging discipline or research area can again be seen here, similar to the earlier definition of biomedical informatics.

It is quite likely the case that the rapid evolution of the Internet and ICTs are compelling a range of newly emerging informatics disciplines involving a wide range of subject areas. The word *informatics* may become increasingly prevalent along with the need for new approaches understanding how the Internet and ICTs can be *effectively used*.

A definition of social informatics is also worthy of note, in particular in how it seems to differ from Community Informatics:

> "Social Informatics (SI) refers to the body of research and study that examines social aspects of computerization -- including the roles of information technology in social and organizational change and the ways that the social organization of information technologies are influenced by social forces and social practices.[7] SI includes studies and other analyses that are labeled as social impacts of

[5] Gurstein, M. (Ed.) Community Informatics: Enabling Communities with Information and Communications Technologies, Idea Group Publishing, Hershey PA, 1999
[6] (http://www.is2001.com/CommunityInfo1.htm)
[7] http://www.slis.indiana.edu/si/concepts.html

computing, social analysis of computing, studies of computer-mediated communication (CMC), information policy, "computers and society," organizational informatics, interpretive informatics, and so on."

The terms Social Informatics and Community Informatics are both similar and distinct. By comparison, biomedical informatics and bioinformatics are also similar and distinct. For example, a focus on the use of ICTs in the field of biology (bioinformatics) is not the same as a clinical focus on timely medical decision making (biomedical informatics); they are related but distinct. Similarly, a focus on the study of the broad social aspects of computerization especially in organizational change (social informatics) is similar but not the same as a focus on the use of ICTs in social and economic development, democratic decision-making, and self-help and advocacy within human communities. (Community Informatics). Both fields are emergent, and they are related, and they can inform each other, but they are also as distinct from each other as biology is from medicine.

MIS and CIS

The relationship between medical or health informatics and Community Informatics was discussed in some detail, as a way to better understand the distinctions between management information systems (MIS) and community information systems (CIS).

Some analysts have begun to look towards key public service applications in the areas of health care, life long learning and political decision-making as important strategic drivers for the next generation broadband marketplace[8]. This is an important topic to consider, in a time of economic downturn and stalled technology stocks. The theory contends that healthcare reform will accompany massive use of broadband services over the next ten years both in terms of moving rich visual and computational content over long distances to better manage clinical situations but also for purposes of residential-based preventive health care, home care monitoring, the remote linkage of family and friends to the elderly and physician interaction with consumers from their homes.

Clearly, management information systems (MIS) will play a critical role in this scenario. However, Community Informatics systems (CIS) could become an equally important player. One example discussed dealt with the elderly in assisted living situations involving dementia. Systems designed to improve managed care, such as home-based telemonitoring of patients would be a natural applications focus for MIS. On the other hand and nearly of equal importance, are the electronically enabled support networks among home caregivers of patients with Alzheimers disease. These support networks lie beyond organizational or management systems boundaries and are part of the (partially physical and partially electronic) communities ("unified groups of individuals") that patient's caregivers reside in or might be enabled to turn to for support. A famous

[8] See: "Premier's Technology Council Second Quarterly Report April 2, 2002." http://www.gov.bc.ca/prem/popt/technology_council/

example in this regard are the well documented online Alzheimer's support groups established on the Cleveland Freenet during the 1980s, a seminal community network project based at the medical school of Case Western University.

The group wondered what might occur if the level of resource commitment dedicated towards the kind of MIS applications imagined in broadband enabled healthcare, were also devoted to providing electronic supports to the social networks and emotional support groups of care givers and others involved in preventive and home care. What would the overall social and economic impact be? Broadband enabled health care reform thus appeared to be an area where Community Informatics could come of age.

Mode of Inquiry

The group recognized the need to establish a mode of inquiry that could guide the approach the project would take. Scientific method seeks predictive models based upon empirical observation that appear to support theory that can be used to accurately predict future events. Occasionally, theory is based on a philosophical foundation or world view that over time is challenged by improvements in observation, analysis or even at times, "political" changes that lead toward new conclusions overturning earlier understandings and providing a context where new viewpoints might emerge. For example, the mechanistic universe of Newton gave way to the relativistic universe of Einstein.

In this respect, an investigation into Community Informatics (both online and "geo-local") may need to be grounded upon an ethical framework that assumes certain understandings about the social world. Potentially different research outcomes could result if, for example, Community Informatics research adopted the viewpoint of behaviorist theory or the viewpoint of humanistic theory, both of which have developed predictive models and canon. Certainly Marxism has had this effect in the social sciences for many generations as had Freudianism in the field of psychology. One was a predictive model for understanding industrial society and the other a predictive model for understanding the human mind. The relative success or failures of these philosophies or theories is a subject of robust debate far beyond the scope of this paper.

Generally, however, the group seemed to concur that the most useful philosophical foundation or ethical framework for investigating Community Informatics would be one favoring the potential for human growth and development, democracy and citizenship, and a recognition of human needs for individual freedoms, privacy and the free expression of ideas along with a drive towards both personal and community health and well-being. This seems obvious in a way; however by clarifying an underlying philosophical or ethical foundation it becomes possible to distinguish certain types of information systems and methodologies as either useful or antithetical in the construction of Community Informatics tools.

During this conversation about the appropriate mode of inquiry, the group continued to ask an earlier question: "Are we addressing the correct issue?" The group wanted to

know whether the original proposal's concept "Virtual Community Informatics" was correct, or whether it created an artificial distinction. In other words, was the concept of Community Informatics sufficiently broad as to embrace both "virtual" and "geo-local" uses of ICTs, or were the two domains sufficiently distinct as to require creation of another type of informatics to accommodate their linkage?

After discussion, a general consensus held that the field of "Community Informatics", as the group understood it, is a sufficiently broad umbrella to embrace both the virtual and geo-local sub-fields. At the same time, the group also re-affirmed the proposal's original observation that much work needs to be done to bring together researchers and practitioners who have specialized in either the one sub-field or the other. It is possible, that recognizing both (virtual and geo-local) as sub-fields to Community Informatics, may help in the process of systematically integrating the two sub-fields, one of the two key objectives of the study.

Target Audiences and Workshops

A key area of activity for the one year NSF project and beyond would be to

> Undertake to support three workshops a year for three years. The goal would be to bring practitioners and researchers together to develop a common understanding of research issues, to define research questions, to share research results and to provide a context for potential collaborations. At least one workshop would take place in a developing country each year.

Who should this study reach out to? What types of focus groups should be engaged? Which sectors of interest need to have equal, committed involvement in recognizing the Community Informatics field? A key goal of the study is to span boundaries across a number of disciplines to bring together key researchers and practitioners working in different fields, whose work increasingly involves them in either the virtual or geo-local aspects of Community Informatics.

Audiences and Stakeholders

This goal led the group to an extensive brainstorming session to identify categories of different audiences of interest, as well as key researchers and practitioners, who could be contacted and involved during the course of the study in activities such as interviews, surveys and focus groups. Eleven general categories were identified: Educators; Academics/Researchers/Scholars; Activists; Facilitators; Practitioners; End Users; Funders; Tool Builders; Policy Makers; Opinion Makers and Media; Students. Each category is briefly described here:

1. Educators: This category includes instructors from public and private institutions, and includes adult learning professionals, workshop instructors, special experts

and consultants who all are active in teaching others how to *use* ICT to support human communities ("unified bodies of individuals") either in virtual or geo-local activities;

2. Academics/Researchers/Scholars: Individuals involved in some type of organized basic or applied research (i.e. with institutional, corporate, government, or non-governmental affiliations) designed to increase understanding, practice or tool-building that will improve the *use* of ICTs to support human communities (as distinct from teaching or instructing);
3. Leaders and Activists: Passionate individuals who inspire others towards a common cause whether in a virtual (e.g. who use anlist for a campaign) or geo-local environment (e.g.using the Internet to extend local civic discourse) and often promoting a particular position or viewpoint.
4. Facilitators. A unique role often found in different types of ICT projects at different phases. These are individuals who tend to be process enabling, rather than goal-directed in their work. They may include professional moderators, facilitators, mediators, ombudspersons, etc.
5. Practitioners: These are people doing work on the ground, involved in day-to-dayactivities using ICTs.. Often these will be community-based project managers or directors of publicly funded ICT projects designed to provide public benefits and who take a more neutral stance in term of advocacy in their work. These individuals could include municipal MIS managers, librarians, and directors of community technology centers or community network projects.
6. End Users: Individuals who have grown increasingly interested or reliant upon a Community Informatics ICT tool or group of tools (and skilled in their use) to expand their reach or involvement as a member of a unified body of individuals either in the virtual or geo-local context, or both;
7. Funders: The broad range of individuals who are influential in funding decisions that shape the ability of individuals such as practitioners and researchers to pursue Community Informatics activities and research. These individuals may represent foundations, government, and private industry. They are often concerned over the "sustainability" issues facing struggling demonstration projects. They may be asking questions concerning ther strategic investments in local ICT projects can build key public service content sufficient to address the current issues of economic and social inequality.
8. Tool Builders: Individuals ranging from software engineers, computer scientists, interface designers, product developers and others involved in creating useful Community Informatics applications (set-top boxes, wireless devices, sensors, knowledge bases, etc.)
9. Policy Makers: Roles for all levels. Individuals ranging from elected officials to heads of agency at all levels of government. One value of the Digital Divide rhetoric is that it helped animate the debate at all levels of government.
10. Opinion Makers and Media: Individuals such as journalists, editorial and feature writers, industry trade analysts, and television personalities.
11. Students: Individuals who are formally studying any aspect of Community Informatics or seeking a degree program in the field or related field.

A Framework for Cross-Sectoral Collaboration

The mission statement devised during the meeting makes explicit the need for "boundary spanning discourse" that brings key individuals together across the categories of interest described above. Moreover, the group felt that identifying points of intersecting interests or convergences of activities, methods, or applications (or, "sweet spots") would be the best way to show different individuals that they needed to talk to each other. This is consistent with the approach outlined in the NSF project proposal, seeking to identify priority areas of activity that would attract practitioner and researcher engagement across interests and disciplines:

> We shall approach this undertaking in an integrative and emergent fashion. We would look to engage existing geo-local and virtual communities in initially identifying priority areas of activity and support for academic and practitioner engagement.

What kinds of topics would motivate useful discussion across categories of interest sufficient to promote the systematic integration of both the virtual and geo-local dimensions of Community Informatics? The notion of "sweet spots" was frequently referred to in discussions as a way to identify specific topic or convergence areas that could be thought of as the points of intersection between polarities, dyads, dichotomies or dialectics and useful points of departure for sparking constructive exchange across categories of interest. A cluster of "sweet spots" was subsequently brainstormed by the group with the notion that boundary-spanning discourse on a set of relevant dialectics or polarities could stimulate innovative thinking and lead towards systematic integration of both the virtual and geo-local dimensions of Community Informatics as illustrated in the interconnections identified in Table I (below). The group also emphasized that the globe-spanning nature of the Internet makes it a logical tool for boundary-spanning. It is both local and global – it is AND, not OR.

Boundary-Spanning

Boundary-spanning is the process of effectively bringing outside perspectives into highly specialized and complex discussions and decision-making. For example, customers and suppliers have increasingly become parties to product and market decisions, and thus managers must ensure both the inclusion of perspectives external to their organizations and that internal barriers to fulfilling customer needs are addressed and overcome. Boundary spanning is essential for "connecting the dots" or finding new patterns involving phenomena previously seen as distinct and not related (overcoming "stove-pipes"). Effective boundary spanning can result in new insight and innovation. Boundary spanning requires skills in engagement (dialog, active listening, conflict/agreement management), collaborative learning (social, reflective & experiential); systems thinking (individual to extended enterprise); and cultural insight

(seeing & acting upon cultural difference).[9] The Council of European Professional Informatics Societies has established a European Informatics Skills Structure (EISS). This is a set of standard statements of attributes and skills for professionals and practitioners covering the main functional areas of work carried out in Informatics. One of the key areas for skills development is in Boundary-Spanning Management. [10]

Sweet Spots

The term "sweet spot" comes from athletics, golf and baseball in particular, and refers to the ideal "zone" on the club or bat where contact with the ball results in the perfect impact with a minimum of effort and combined with a sense of personal satisfaction. In other areas, the notion of the "sweet spot" involves an understanding and intuition about pinpointing and marshalling the most useful resources in the most efficient and effective way possible to achieve the optimal result These sweet spots are not constant in business any more than they are in sports (different players with different bats have different sweet spots on different days) but rather they depend upon a variety of variables coming together in the best configuration at a particular moment in time. The notion of the sweet spot implies maximum leverage and optimal resource toward a desired goal.

Table I

Polarities, Dichotomies and Sweet Spots		
On-Line	AND	Off-Line
Geo-Local Community	AND	Virtual Community
Academics	AND	Practitioners
Open Source	AND	Proprietary
First World	AND	"2/3rds" World
Rural	AND	Urban
Global	AND	Local
Government	AND	Non-government
Public Sector	AND	Private Sector
Centralized	AND	Decentralized
Organizational Development	AND	Community Development
Management Information System	AND	Community Information System
Learning Styles	AND	Communication Styles

[9] What Are the Boundary-Spanning Skills? http://www.learnmaster.com/whatis.pdf. Dori Digenti
[10] http://www.cepis.org/org/index.htm

Why This Approach Can Succeed

While this framework for cross-sector collaboration clearly needs further refinement, the group felt that the basic approach would be helpful in designing agendas and processes for workshops, side sessions at major conferences and other types of meetings within the context of the NSF project. The question was asked though, why or how can such an approach (that is, meetings designed around boundary spanning "sweet spots" with a cross-section of stakeholders) succeed when many efforts at bringing together similarly disparate groups have failed?

The NSF project seeks to effect integration between related fields and among practitioners and researchers in order to strengthen the emerging Community Informatics "discipline"[11]. The group felt that the framework was a correct and logical approach to thinking about timing, topics and participants. Often, this kind of "bridge-building" fails because well-established fields are entrenched. In more traditional, established fields, differences between distinct if related groups often have become calcified. (E.g., computer science and information science; particle vs. theoretical physics; etc.). However, for the Community Informatics field, especially work to integrate virtual and geo-local practice and research is relatively new and moving quickly. There are few bureaucratic or interest related concerns over integration (such as the naming or resourcing of academic departments). The scope of activities that the NSF project will pursue simply serves to accelerate and catalyze emerging trends towards a convergence of those practice and research activities specializing in online interactions on the one hand, and localized "real-world" interactions on the other. As the Internet grows, the need for this kind of convergence of relevant research and practice is manifestly evident. Several examples identified in the discussions help to illustrate this trend:

- A recent set of large public meetings in New York City dealt with public response to architectural design alternatives to the Twin Towers destroyed on 9/11. A cluster of well-attended, face to face public meetings was followed up by professionally moderated online discussions designed to capture and extend the initial dialogues for several weeks further. The organizers of both the "real-world" interactions and the "online" interactions worked closely together to coordinate both.

- The World Bank is pursing new Knowledge Management efforts in some development projects to link global KM, K-creation, K-repository processes, with

11 There was considerable discussion in the group concerning the status of Community Informatics as a "discipline" and no final consensus was reached. One position which has been articulated elsewhere is that Community Informatics may be understood as a "practice" as well as or rather than a discipline in the classic academic sense cf. M. Gurstein "Community Informatics: Current Status and Future Prospects—Some Thoughts", Community Technology Review, Winter-Spring 2002 pp. 24-26.

processes of local development including the hiring of local KM content coordinators.

- Entire Dot-Com business models sought to build virtual communities for purposes of stimulating real-world purchases of products and services, often without success due in part to the lack of an established research base for such a new market.

Designing Workshops and Breakout Sessions

It is important to decide before structuring a particular workshop session what the goals of the session are, and what will be done with the outcomes. Is the session to inform the participants? Is the session to generate information for the project (in which case, what is the motivation for people to participate?). Can the session be presented as gathering information for this project which would then develop ideas and inform the field (help the field develop more effective techniques and to evolve)?

After working through the purpose and mission of the NSF project, its intended audience and their engagement, the group focused on specific activities and outcomes that the project might be expected to undertake and achieve. The second project objective deals directly with a need to bring Community Informatics researchers and practitioners together to actively collaborate in research and real-world projects. How can this interest be sparked and promoted? A set of potential workshop agendas and processes were explored and are described in further detail below. The importance of getting this work into print was explored, with two classic strategies discussed, that of securing special issues in "friendly" journals such as Information Society or to produce books or monographs composed of invited chapters prepared by key researchers and practitioners in the field. The need to quickly engage graduate students was also discussed, particularly to undertake literature and online information reviews and to construct detailed bibliographies of the emerging Community Informatics field.

Several different types of workshop designs were discussed, both in terms of being incorporated into upcoming conferences and as dedicated meetings organized specifically for the project. Other activities such as strategic pairing of specific researchers and practitioners (both domestically and internationally) were also addressed.

Each breakout session group combining an interest based cross-section of participants could discuss a different aspect of the dichotomy matrix, or be asked to focus on an intersection or "sweet spot" of one of the dichotomies. Alternatively, each group could be given a different case, or scenario to consider. Additionally each group, or each individual within a group, could be asked to take a different vantage point (the organization funding it, the client, a specific type of community member, etc.) Breakout sessions need to gather issues/information for the project directors who could provide a form for a moderator/facilitator/assigned scribe to fill out, or a scribe could just be assigned to take notes.

An alternate approach would be to put groups around tables of 8 or 10 people. Then a question could be thrown out, and people could discuss that question. (Perhaps each table could be asked to focus on a different aspect of the dichotomy or a different case study, and asked to take notes?) This method increases discussion but could reduce shared meaning.

Another option could be to use a variation of the Society of Information Systems (SIM) model to effectively bring key practitioners and researchers together. In the SIM model for example, a researcher works with a company to increase its productivity. Then the researcher and an officer from the company submit a paper to the annual SIM contest. The winner is then invited to submit a version of the paper to MIS Quarterly (the top MIS journal). Often the publisher works closely with the team to bring the paper up to academic quality.

The NSF Community Informatics project could do something similar. An annual issue of a journal could be coordinated where a researcher/practitioner and perhaps tool-builder team could write a paper (academic quality) describing an interaction/case study. The project directors could then potentially work with the authors to bring the paper to academic publishing quality.

Building a "Profession"

As noted earlier, the group came to a conclusion that studies of the use of ICTs in both virtual and non-local communities appeared to be aspects of the same emerging field – Community Informatics – and did not necessarily require creation of something new such as "(Virtual) Community Informatics" as the original NSF project proposal suggested. The group discussed the value of university degrees in Community Informatics. Is there an emerging profession somehow distinct from other professions that Community Informatics could credential and generate research opportunities for? Is there an emerging "business case" for such degrees sufficient that universities will be able to commit institutional resources to this area?

The group discussed other professional arenas presently producing skilled practitioners who choose to focus their work on the effective use of ICTs in human communities. Such other well-established disciplines include library and information science, community development, sociology, public administration, and computer science. There is some evidence of a growing demand for both professional (i.e. master's) level degrees in Community Informatics as well as more advanced doctoral degrees. For example, several of the group noted a complaint often expressed by practitioners that academic work in community and economic development rarely, if ever, includes formal instruction or research opportunities in the Information Sciences. And yet many practitioners who successfully fund raise and manage community technology centers and similar enterprises require the skills in both areas. Moreover, in the internationally arena, the field of ICTs for development as for example, promoted by both the World

Bank and the U.S. Agency for International Development has grown in recent years, stimulating demand for professionals skilled both in an understanding of ICTs as well as in the more traditional areas of community economic development.

The group discussed various institutions beginning to offer coursework that is either explicitly termed Community Informatics such as Central Queensland University in Rockhampton, Australia; or could be considered Community Informatics labeled otherwise in programs such as University of Michigan's School of Library and Information Science work in community networking and community technology. Other emerging programs of interest include the community technology program at University of Massachusetts Boston College of Public Service, the new Technical Communications doctorate program in the University Of Washington, School of Engineering and the flexible doctorate program at the New Jersey Institute of Technology, School of Computer and Information Sciences designed for the older professional. There are likely to be many more such degree programs offered in the future, under different names and conceptual frameworks.

Evaluation

The group asked how the utility of such emerging research and advanced degree programs could be measured. Suggestions included whether they increase employment opportunity and salaries of graduates; and are capable of cutting across other disciplines and effectively bringing together practitioners and researchers, tool builders and knowledge workers,; process expertise and technical expertise. Ultimately there should be a new canon, new textbooks and curriculum. Is a new canon indeed emerging within Community Informatics? Evaluation of the outcomes of the NSF project on virtual Community Informatics should concentrate on the objectives of this project. Evaluation measurements could include:

(1a) To stimulate research in the area of VCI, which reflects the interests of both researchers and practitioners and to (1b) Encourage collaboration between practitioners and researchers and including the:

- Number (and characteristics) of projects initiated
- Number of publications resulting from joint work
- Number of grants resulting from joint work
- Surveys of projects and grants initiated (to confirm this)

(2) To stimulate development of and interest in programs which are supportive of VCI

- Number of initiatives related to VCI themes
- Number of students enrolled
- Number of theses written
- Number and types of collaboration among programs already in place

(3) To stimulate awareness and utilization of formal research in these areas by practitioners

- Survey of project leaders
- Detailed examination of projects

Conclusion

The NSF grant has enabled a new collaboration to evolve between the two PIs. Both are active in their own individual research areas, and this grant has propelled this work as well as this collaboration for each of them. Their collaboration through this grant has also informed their respective research interests resulting in a greater appreciation of the requirements of for research communities in developing tools to support these types of activities. Similarly, it has impacted the understanding of how virtual communities and the ability to provide tools can benefit the processes within local communities. Moreover, the initial workshop held to further refine the project goals and explore approaches to future meetings and workshops brought together a disparate group of researchers and practitioners resulting in new relationships, intellectual discourse and the shaping of new ideas. On a small scale, this initial meeting and this resulting white paper, shows the promise on a larger scale, of the prospects for success in bringing many other researchers and practitioners together from various viewpoints, disciplines and skill-sets around a common interest to strengthen an emerging field in Community Informatics.