

Communities, Technology, and Civic Intelligence

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ABSTRACT

In this paper, we ask what it would take to envision and support collective intelligence that was socially and environmentally ameliorative. To help answer that question we introduce the concept of "civic intelligence" as a manifestation of collective intelligence that could serve the needs of researchers and practitioners working at the intersection of communities and technology. We build a case for its importance and relevance, and provide several examples, and some preliminary models and frameworks. We also discuss implications for members of this community. We argue that an examination of the social context is critical and that a civic intelligence orientation surfaces important research questions. We present some thoughts on future projects that would help promote understanding about civic intelligence while improving it. Finally we present some choices before us as we move forward in an environment that is dynamic and uncertain.

Categories and Subject Descriptors

K4.0 [Computers and Society]: General

General Terms

Design, Human Factors, Management

Keywords

Civic intelligence, collective intelligence, democracy, Web 2.0, social cognition, social learning, collaboration.

1. INTRODUCTION

According to conventional wisdom, communities and technology, like oil and water, are inherently incompatible. *Or at least they used to be.* Relatively recent circumstances — including especially the worldwide buildout of the Internet and the services which it supports — have suggested that the two *can*, even *should*, be considered together in something other than an unnatural union.

This "shotgun marriage" forced upon humankind (once again) through historical circumstances brings up the question at the core of this conference: *Why focus on the relationship between communities and technology?* The implication is that the two

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somewhat ill-defined entities are involved in a dynamic and possibly antagonistic interplay and, at the very least, each has the potential to influence the other. One provocative yet reasonable response to the question is that it enables us to explore the broad potential of *collective intelligence* made possible by new ICT. Through the increased and increasing amount of information sharing and new collaborative processes (that are informal and formal, free-form and engineered, tacit and explicit), groups of people, organizations, corporations, and, even, society as a whole, it is asserted, can become more *intelligent*.

Collective intelligence can be defined in various ways. In a general way, it exists whenever groups of people (collectivities), whether formally organized or not, behave intelligently. Broadly speaking collective intelligence is a new way of characterizing the truism that "intelligence" is distributed throughout society and is in a constant process of transformation. Intelligence "resides" in — and is shaped by — individuals, organizations, institutions, and informational systems and artifacts that people create, modify, and interact with. Collective intelligence is manifested and modified by people everyday through their cognitive and communicative practices. One of the axioms of collective intelligence is that in general the group knows more than the individual. The hope is to develop approaches where the "smart" aspects of individual minds can be elicited and used in conjunction with other smart aspects to create even smarter results.

Currently the evidence for collective intelligence assumes as many forms as it has discussants. These forms vary from the prosaic (such as weighing an ox by averaging guesses [12]) to the global (devising appropriate responses to climate change [42]). These expressions of collective intelligence can be examined in many ways. The basic terms of the expression would necessarily include: (1) *who did what*, (2) *under what conditions*, (3) *to produce what*, (4) *with what degree of competence or efficacy* (5) *yielding benefit* (6) *for whom or what*. Note that (2) could include the broader social context that gave rise to the effort while (5) and (6) could relate to the effects of the effort on society. It will be through the exploration of the terms of this expression that an assessment of collective intelligence will emerge. Dutton [11] and his colleagues, for example, pay particular attention to where and how the value was created (points 2 and 3) and who benefited from the activities (points 5 and 6).

Civic intelligence is a type of collective intelligence that exists but is generally overlooked as a capability that could be consciously developed. It is non-exploitive and focused on shared civic issues. It isn't just a phenomenon of researchers and "book knowledge." Everybody can be part of it, yet some inevitably will be more involved than others. In a general way, civic intelligence can be seen as the dynamic ability of collectivities to perceive and

address social and environmental problems in ways that are just, and sustainable. Civic intelligence helps a community or society cope with, say, the current economic crisis, while simultaneously figuring out how to avoid the next one or to lessen its impact when it arrives. The exploration of civic intelligence also introduces the critical, though largely unacknowledged role of information and knowledge in *opposing* civic intelligence. And, as with civic intelligence, uncivic intelligence is an everyday practice that can take many forms [34]. This acknowledgement admittedly introduces politics and "gray areas" but that acknowledgement is not a sufficient reason to deny the reality of the clash of knowledge systems.

Civic intelligence is expressed through social institutions like schools, libraries, public health campaigns, news media, religious institutions, scientific research, non-profit organizations, professional associations, and everyday discourse. It shows up in innovative projects that are increasingly needed to address local and global challenges of growing complexity and severity. Information and communication technology has the potential to alter civic intelligence in ways that go far beyond the informational content of any particular message that is transmitted or received. This observation applies to any efforts at encouraging civic intelligence. It is in fact the central tenet of the design philosophy that would undergird civic intelligence.

1.1 An Abbreviated History of Collective Intelligence

Democracy (and the "rights of man" generally) is an important and relevant development in regard to collective intelligence as it has been (and is) a conscious attempt to increase the number of people and the opportunities for participation in governance through public decision-making in public affairs. (Although these efforts, at least historically, have excluded significant sectors of the population.) John Dewey's long life (1859-1952) as an educator, philosopher, psychologist, and public intellectual was devoted to exploring, formulating, and popularizing an enriched concept of democracy [9] that informs the civic intelligence effort. Briggs [4] states that Dewey is the most important proponent of the conceptualization of democracy as a "tool for public problem solving" (as opposed to it being "a contest among interest groups" or "an instrument for deliberation"). The basic questions that the various views of democracy raise are (1) what are the legitimate processes whereby people participate in governance? and (2) what is the role of the citizenry, the people who are not within the government or ruling groups? Within the problem-solving perspective, the processes are not rigidly circumscribed (limiting participation to voting once every few years, for example), nor is access to other participatory processes denied to them. Citizens, moreover, have much freer range as to what their roles are.

The Twentieth Century was marked with sporadic support for the problem-solving version of democracy using a variety of names for similar concepts. "Civic agency" [3], "strong democracy" [1], "civilizational competency" [5], "democratic reason" [20], and "civic capacity" [4] have been advanced. Interestingly, the term "civic intelligence" has intermittently and independently been invoked over the last century (see [21] for example). This has generally been not in the service of a full-blown program or a central concept within social research. The study of how states and intergovernmental organizations negotiate can be tied into the broader idea of social learning [42] and the study of (citizen-led) social change, once considered a social pathology, examines how

social movements become organized and influential [44, 19]. Since social progress (women's' suffrage, environmentalism, abolition of slavery, etc.) has typically been attained as the result of citizen mobilization, this is an important expression of civic intelligence. Putnam [30] highlighted the concept of social capital which is seen as the foundation for thriving community and civic life. Civic intelligence captures a wide range of ideas in a conceptualization that I think would be acceptable to the civic proponents listed above.

Finally, it should be noted that although this paper focuses on democratic countries, collective intelligence and civic intelligence are found in non-democratic countries as well. Their expression will take different forms and some forms that are acceptable in democratic countries may be met with hostility in less democratic ones [22].

1.2 The Internet and Collective Intelligence

The Internet helped ignite strong interest in collective intelligence since it has exponentially increased the speed, reach, and potential of communication and information sharing. And since the information is digital and exists on a programmable platform, the opportunity for patterned, algorithmic processing of the data is expanding in ways that only now are being explored. The Web enabled data to be linked to other data on the Web in a more active and liberated way than footnotes and references in scholarly papers afforded or, even, hypertext in the early (pre Web) days that was limited to a single user linking to other pieces of information on their own computer. A communication medium that is connected via open protocols, is extensible, potentially open to all, ostensibly limitless, digitally based and programmable is essentially a *meta-medium* [33] upon which novel interactive venues could and will continue to be developed. What shape they actually take and what is done with them is an open question.

As the web evolved from a mainly static, broadcast medium to a more interactive one, interactions became faster and multi-directional and the lines between information consumer and producer became increasingly blurred (see, e.g., [45] and [41]). While the idea of collective intelligence was already being discussed, Tim O'Reilly's depiction of "Web 2.0" [29] galvanized the community of web developers who sensed a historic shift in the utility of the web. While understanding the enormously popular Web 2.0 phenomenon is important to a consideration of civic intelligence, Web 2.0 does not capture the idea of civic intelligence. For one thing, the Web 2.0 designation places the focus on the Web itself, the technology (or medium) rather than the social processes that use Web 2.0 technology. Although I don't foresee (or recommend) that the designation should fall into disuse, I believe that it frames the most pertinent question that we should be asking as a technical one for researchers and web developers and the people who fund and hire them, rather than a social one that asks *What could or should the new medium look like? What should the Web and other elements of the evolving information and communication infrastructure allow and encourage people to do?*

Although O'Reilly is probably not opposed to the idea of civic intelligence, nor are people obligated to abide by the implications of his definition, it's worth noting how the originator of Web 2.0 defines the concept [29].

"Web 2.0 is the business revolution in the computer industry caused by the move to the internet as platform, and an attempt to understand the rules for success on that new

platform. Chief among those rules is this: Build applications that harness network effects to get better the more people use them. (This is what I've elsewhere called "harnessing collective intelligence.")"

Although a broad paradigm shift may ultimately be necessary if humankind is to make progress addressing the problems it has created for itself, Web 2.0 with its focus on business seems unlikely to result in a paradigm shift. On the one hand, if the expression implicitly addresses the larger issues (in addition to the needs of business) then it explicitly suggests doing so via a "business revolution." If this is the case then we are acting under a conceptual frame that precludes non-business solutions. Whether the Web 2.0 approach turns out to be useful in addressing public issues in the long run, the idea that we are intellectually restricted at the onset into thinking only of business-oriented approaches to public problem solving is unsettling. If, on the other hand, the Web 2.0 efforts are strictly for business then it becomes even more obvious that a paradigm that is neither technology-centric nor business-centric, but society-centric needs to be designed, defined, and employed. Moreover, the concept of "harnessing" though obviously intended in a non-literal way seems to carry with it some baggage that needs unpacking. Harnessing, of course, has the idea of domination at its core. The view of a two-tiered system that has those overseeing the system (whether the state or the market) at the top and those whose intelligence is being harnessed at the bottom can be contrasted to a more equality-based approach. Finally, a focus on the technology presupposes that everybody has access to the Web and that all other means of communication are not relevant, although non-wired or less-wired citizens deserve a voice as well.

2. CIVIC INTELLIGENCE

Civic intelligence has been proposed as an important variant of collective intelligence that is worthy of research and development. Does the phenomenon warrant a name? Naming something distinguishes it from things without names and from things with other names. The question can be answered affirmatively if civic intelligence is distinguishable from other things and whether the new term could serve a useful function in communication. In what ways would designating certain types of phenomena as manifestations of civic intelligence help our research and practice? What value is this community likely to obtain from using the concept?

Sartori [32] makes two important points about the semantics of terms used within social science. The first point is "what is *not named* remains *unnoticed* or, in any event, impervious to cognitive development." This suggests that if civic intelligence is not used explicitly it is unlikely to become an object of focus. His second point, "that the *naming choice* (selecting a given word within a given semantic field) involves a far-reaching interpretive projection" suggests both that dissecting the Web 2.0 designation is well-warranted and that civic intelligence needs to be dissected similarly to help us consider its potential utility.

Collective intelligence is certainly an appropriate concept to consider given the challenges and opportunities that our era has in unprecedented abundance. For example, in early 2008, food crises broke out simultaneously in several locations around the world [27]. Later in the year the most serious financial crisis since the worldwide depression of the 1930s and 1940s, broke out. Moreover, the specter of massive climate change and other potential environmental emergencies are also haunting us.

Humankind will require increased collective intelligence if there is any realistic hope that we will successfully face these challenges. Diamond [10], who studies how societies face challenges that have potentially catastrophic consequences, has noted that the "commonest and most surprising" of the four ways in which societies fail to address their problems is their "failure even to try to solve a problem that it has perceived" — even one that ultimately results in that society's collapse. Clearly those societies who observed the problems they faced and ignored them lacked the necessary civic intelligence. Whether or not humankind successfully navigates itself away from the rocky shoals it faces will depend to no small degree on whether the right type of socio-technological infrastructure is conceptualized, developed and used.

Prefixing the modifier "civic" to "intelligence" signifies that it is something that is activated in service of civic aspirations. The term acknowledges the *potential* of an intelligence that can be cooperative, that isn't evaluated or accomplished by "winning" or by profits or market share. And although the idea of intelligence, is hard (if not impossible) to define precisely, people agree on its general characteristics and it resonates with people from diverse communities who rely on it every day. Naming the phenomenon helps highlight a class of critical issues, problems, and opportunities related to modern complexes of knowledge and social organization. Tainter [43] for example, sees *societal complexity* as a critical factor in relation to the collapse of civilizations. This is an intriguing idea that an engaged civic intelligence enterprise would necessarily seek to understand.

The multiple danger signs that we are receiving from the environment should be adequate to assert the importance of the civic intelligence point of view — even if it is just one among many. The civic intelligence assembling around climate change includes the huge and complex example of nations negotiating and evaluating the Kyoto protocol, as well as the work done in neighborhoods to reduce their carbon footprint illustrate the development and mobilization of civic intelligence. One of the most important outcomes of a civic intelligence perspective might be the creation of a civic intelligence frame in which civic goals both large and small act as a type of conceptual focus. This could help establish an invisible tug towards thinking about civic work that addressed shared problems and better lives for the earth's inhabitants. While there is no guarantee associated with this approach (or others), adopting it — if only sporadically and provisionally — is likely to result in visions of the future that are possible, even if not likely. We can choose to at least try to be part of the solution.

2.1 Rationale

It's not necessary to catalog the massive challenges facing society here. A glance at the newspaper and some contemplation of the matter should suffice. It might, however, be useful to suggest that the institutions that are ostensibly charged with addressing these challenges seem to be incapable of gaining the upper hand in tackling these challenges. Through his study of community problem-solving, Briggs [4] points out that "societies cannot do without effective local systems for acting on public problems." He points out that these features are being recognized as indispensable by many organizations and projects: "As governments, aid agencies, and ambitious nation-building efforts increasingly acknowledge, developing more collective problem-solving capability, closest to the citizen, is a worldwide

imperative." These reminders, including the fact that civil society initiated many of the social advances that we now take for granted, should help encourage us to develop conceptual perspectives that channel more attention on understanding and promoting society's problem solving capabilities.

Xavier de Souza Briggs uses the term "civic capacity" similarly to the way that I'm using civic intelligence here; both are more action-oriented than having knowledge about civic life and issues. Although the fate of the two concepts will be determined by what meanings are attributed to them and how the concepts are employed (or not) over time, I argue that "civic intelligence" as a term has certain advantages over "civic capacity." For one thing, intelligence is seen as a coherent and purposeful phenomenon (not a set of "capabilities") and would presumably resonate better with potential users of the concept. Moreover, while the use of the word intelligence may prove to be inadequate or misleading in some cases, the idea surfaces an enormous amount of research and practical knowledge from many disciplines that may be relevant and insightful.

Civic intelligence transforms collective intelligence from an engineering challenge into a broad social initiative. Just to take one example, it may be the result of "collective intelligence" according to some calculus, for two countries to wage war with each other. From the point of view of the people who are killed or otherwise harmed and the environment that is likewise assaulted, the war may not seem so wise. In a less flawed world, one that is somewhat imaginable, there would be a better use of the world's resources than consuming them to destroy more of them. Civic intelligence may help us see that certain systems of knowledge, however well-informed and well-resourced they may be, may be perpetuating our problems.

Adopting civic intelligence as an orientating theme or frame has advantages beyond redirecting attention and resources towards important issue areas. Because civic intelligence suggests a systems orientated approach to the use of knowledge in society, it lends itself to the creation of frameworks or models (two of which are discussed below). Civic intelligence can be used to integrate concepts from a variety of disciplines into more coherent and purposive systems of inquiry. Civic intelligence also implies an active, contextual (therefore flexible), and adaptable approach to information and communication use that supports social learning. Its systems-oriented approach explicitly introduces evaluation and metacognition [24]. Conducted with care — and peer review, and other academic practices — a civic intelligence enterprise can focus rigorous inquiry in a realm that currently receives somewhat haphazard attention.

2.2 Examples

Many of the problems we now face are global and they will require global solutions. This doesn't mean that there will be one solution but it does mean that the "local" solutions must be coherent with each other in a global framework. We believe that a civic intelligence orientation can help guide policy and expose research questions that are useful in performing the tasks that history has provided us with.

Examples of civic intelligence are so numerous that no subset is likely to be representative. It's also unlikely that reasonable taxonomies will be developed without first considering a wide range of examples. Nevertheless, some broad categories (reflected in the descriptive model described below) such as *orientation* (goals, for example) and *organization* (formal or informal, for

example), assist us in comparing civic intelligence projects with each other and with other forms of collective intelligence projects. At any rate, a brief discussion of actual examples (selected admittedly from my personal standpoint) can suggest the diversity as well as the ubiquity of the work that the abstract sounding "civic intelligence" doesn't necessarily convey.

Any conscious collective effort to solve shared problems or avoid future ones in peaceful, non-exploitive ways can be considered to be a civic intelligence effort. These efforts can be as vast as the series of United Nations sponsored climate change conferences in which the world's countries are negotiating with each other or as small and informal as a group of two or three people looking for ways to make their neighborhood safer and healthier for kids. Many civic intelligence projects are not necessarily technology-oriented but may increasingly incorporate technology as they discover ways in which it can improve their processes.

Studies by the Social Learning Group [42] chronicle civic intelligence processes in nine diverse countries around the world as they wrestle with three specific major environmental challenges. In this collaborative comparative study the 41 authors developed a "detailed research protocol to guide the research and ensure comparability across cases, arenas, and functions." To help avoid confusion and to increase the chance of learning across the various case studies they also agreed on the definitions of the main terms they'd be using. Their "issue histories" included how the problem became perceived initially and how the various actors (including the media, the state, international organizations, and non-governmental organizations) participated. Margaret Keck [18] presented a multi-year case study about public engagement around the watershed in the Sao Paulo region in Brazil. Her article is particularly important for the discussion of the various groups that are engaged (the "ecologies of agents"), the importance and idiosyncrasy of social and historical context, and the potential role of documents and other artifacts with symbolic meaning.

The New Tactics in Human Rights Project [28] is a coalition of international organizations and individuals in the human rights community that uses "tactical innovation and strategic thinking" to support their objectives. One of their important functions is sharing tactics and strategies from around the world with each other and exploring the use of media, theater, workshops, etc. One of their primary goals is promoting "healing and reclaiming civic leadership." Truth and reconciliation commissions (TRC) are an increasingly common approach to healing in the face of national or regional trauma. They represent a general approach to understanding and truth-telling in which unpleasant history is faced directly but without reprisal in the hopes of securing justice and ending cycles of violence and oppression. Although the most prominent TRC was in post-apartheid South Africa, it has been used in dozens of places around the world. Meyer-Knapp [23] suggests that this approach could be explored in historical cases such as the slave trade in the United States as well in more recent cases involving nuclear and other accidents.

The World Social Forum (WSF) was first launched in 2001 after the demonstrations against the World Trade Organization in Seattle. Although it was formulated in opposition to the World Economic Forum (WEF), an annual meeting of the world's economic elites, it didn't emulate the structure of the WEF. The WSF was founded on some radically simple principles (that are still being wrestled with [17]) especially the idea of providing open communicative spaces that are not dominated by the state or economic interests [40]. The multitude of self-organized events

creates opportunities for creating larger and more diverse activist networks than the organizers could have anticipated. The question of how best to use ICT to support the mission of the WSF is an ongoing discussion [26].

People are developing a variety of innovative action research projects at the community level that demonstrate civic intelligence. Bishop and Bruce, for example, adopted the ideas of John Dewey into a pedagogical approach called "community inquiry" that they use with middle school students and is supported with ICT [2]. They have also worked with community groups in the Chicago neighborhood of Paseo Boricua to host "Community as Intellectual Space" [2] conferences in which cultural and other forms of knowledge within communities are explored and celebrated. Neighborhood Networks [25] is a unique research project that uses "community arts and participatory design to provide opportunities for the creative exploration and application of sensing and robotics technologies" to address neighborhood concerns such as air pollution and traffic safety. The community members developed prototype "community robotics devices and services" in Pittsburg and Atlanta using the Canary robotics platform and other technologies while incidentally engaging in technological critique exploring the opportunities and limitations to the use of technology in the context of community activism.

Increasingly people are developing online deliberative systems that can be used by groups to help develop strategies and make decisions more effectively [7]. Work is also proceeding in augmenting community networks [33] with deliberation capabilities [8]. One project, e-Liberate [39] uses Roberts Rules of Order [31] to help coordinate online meetings with distributed attendees. Although the set of rules is viewed as unwieldy by many, the protocol evolved over several decades to accommodate actual needs and prevent to manipulation (and other "gaming" of the rules) by attendees. Moreover Roberts Rules is in widespread use by non-profit organizations and civil society organizations in the United States and elsewhere. Online versions have the potential to incorporate interesting extensions (such as sharing and constructing complex objects, and training during use) that face-to-face meetings don't provide — or provide effectively.

Over the past eight years I have been working with a core group of about 85 people (out of a larger group of over 300) to develop a pattern language for social change based on information and communication [36, 35]. Each "pattern" is intended to present an intervention or detour to what we see as persistent social habits that are antithetical to human conviviality. Each pattern is a conceptual "seed" that will produce different results in different times and places depending on how it's adapted and used by different groups with different objectives. An online pattern language management system was developed that gradually changed over time to support changing needs. If we are successful with our software redesign, groups will use the patterns as "social objects", modify the pattern language, and develop additional resources over time [36, 37] in addition to using the pattern language to inform their projects. In this case, the desire to improve civic intelligence led to the development of the pattern language, which in turn, has driven and inspired technological development to further improve civic intelligence.

2.3 Models / Frameworks

As we've seen above, identifying examples of activities that exhibit civic intelligence is not difficult. To complement

anecdotal histories and case studies, we need to develop frameworks and models that can help orient research and promote civic intelligence within the communities that use them. Ideally these frameworks can help us understand how civic intelligence projects are developed but also the context in which they were developed and how successful they were. To this end I've developed two preliminary models [34] that capture complementary perspectives: (1) a descriptive model which can be used to characterize organizations and other collectivities that develop, implement, and evaluate activities that manifest civic intelligence, and (2) a functional model which can be used to map and trace civic intelligence processes and activities.

The descriptive model highlights a set of dimensions, namely (1) orientation, (2) organization, (3) engagement, (4) intelligence, (5) products and projects, and (6) resources, for describing relevant cases. The hope is to use those dimensions not only to characterize and understand civic intelligence but to collect data from projects around the world to assist in comparative studies.

The second model, a functional one (Figure 1) is closer to a theory since there is a claim that the basic roles, informational entities, processes, and their relationships are represented. It is presented graphically using the modeling methodology SeeMe [16] and is intended to capture the major aspects of a collectivity operating within their particular "ecologies of agents" [18]. It attempts to show the major elements that could have an effect on civic intelligence projects throughout their lifecycle. The SeeMe semantics are clear and the models can be relatively simple or arbitrarily complex. The components of the model have been gathered from theories and analytical components of social change, media, and human learning. The functional model, as with the descriptive model, is intended to be used as a common framework for people who are thinking about social learning, social change, civic intelligence, and the like.

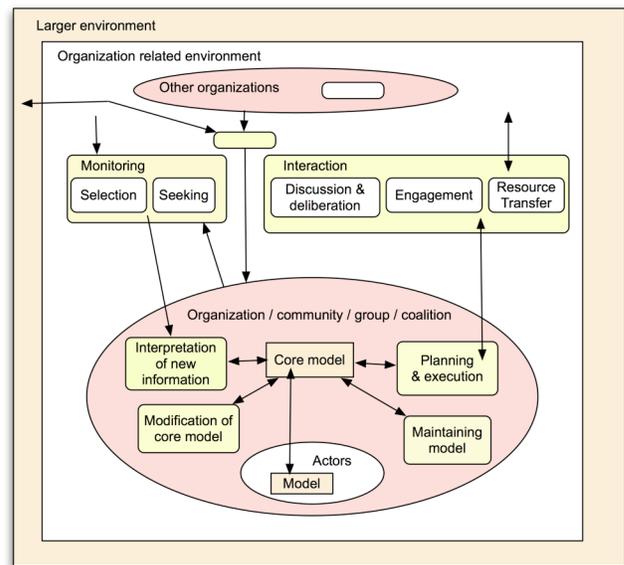


Figure 1. Functional Model of Civic Intelligence

One of the most significant aspects of the functional model is its systems or "ecological" orientation. This asserts that all human knowledge, whether it's accurate or inaccurate, formal or informal, implicit or explicit, is contained within collectivities (and the artifacts they use), and these collectivities engage with

each other in an informational ecosystem. The other important aspect of this is that the "minds" of the collectivities (called "mental models" [24] in the functional model) develop and change (and resist change) over time and, indeed, employ cognitive and perceptual operations to learn, interpret, hypothesize, decide, evaluate, deliberate, collaborate, plan, and assert, that have analogues in individual human beings that may or may not function similarly.

At a basic level, the civic intelligence models can be used in several ways that are of particular interest to communities and technology research and practice. The first step is simply capturing pertinent information. Presumably the data provided by one person for one case (a project or process) will be internally consistent. If the data collection is consistent across cases then there are opportunities for identifying important relationships between them. It might emerge, for example, that human rights advocacy groups interpret new information quite differently than environmental groups do. Moreover, each relationship in the functional model gives rise to several questions. How, for example, do organizations decide what information is relevant to their enterprise? The descriptive model framework is designed to capture salient aspects of the collectivity under scrutiny and can be used in comparative studies, with or without the functional model data. One of the most important things to keep in mind when using one of the models is to articulate precisely what is being modeled. This will help improve the usefulness of the model for the modeler by increasing the validity of any correspondence between data entered within a single model or across the two models. It also increases the opportunities for meaningful correspondence between model data entries from heterogeneous projects.

Frameworks invite interdisciplinarity in situations where disciplinary islands currently exist. Increasingly many issues we face in the social sphere and the environment cross boundaries and require consideration from multiple perspectives. The frameworks presented here are not intended to replace other analytic frameworks. Indeed, other frameworks, theories, methodologies, and perspectives generally can be mapped onto the civic intelligence models I've proposed. Ideally, the framework would encourage the development of research questions, case studies and other information, and lead to institutional, policy, and technological innovation.

A model can be evaluated on a variety of criteria. Three important ones are: (1) its purpose; (2) how well it functions in relation to the purpose; and (3) other effects (including "side-effects"). Thus, the audience for the model must be taken into consideration; how well does the model work for the people who are using it, as well as the secondary "users" of the model who may not be even aware of its existence? Thus any model of civic intelligence should be evaluated according to the value afforded to researchers, specific communities and society at large. Finally, Wartofsky [47] suggests several intriguing functions of a model. Models can be used for analysis or presenting a theory. At the same time they can also serve as an engine for generating thought and action that sets us off in new directions:

3. Implications

Explicitly acknowledging civic intelligence as an orienting framework and as an object of study in its own right would be useful to the communities and technology community and to society at large. For one thing, while communities and

technology, the topic of this conference, reflects an intriguing and important relationship, civic intelligence places a focus on civic goals. While both topics are abstract, civic intelligence aligns the work within the important perspectives of governance, social inclusion, collaborative problem-solving, and environmental mediation. Communities and technology studies and civic intelligence both focus on information and communication and are interdisciplinary. Both strive to integrate theory and practice. They are both contextual; they vary from time to time, place to place, community to community. I maintain that civic intelligence could help focus our work through conference topics, research questions, data for comparative studies, data for policy work and collective action. It could provide an orientation that could help provide evaluation criteria, encourage technology development, and inform policy development. Civic intelligence presents a non-partisan and non-dogmatic perspective and suggests the direct acknowledgement of challenges that are simple and complex, expected and unexpected, life-threatening and merely bothersome. Since civic intelligence directly connects with problems of today it brings up urgency and hence, legitimacy and importance of our work. It has an active and purposeful engagement aspect that is missing or submerged from other, more objective sounding disciplinary areas. In other words it helps us answer the question *Why are we exploring the relationship between communities and technology?*

Civic intelligence acknowledges that humans are social actors capable of perceiving their world, modifying their behavior based on their perception, and, in turn, changing both the physical world and the knowledge world through which we perceive everything else [46]. A dynamism exists that sets up the *possibility* of ushering in paradigm shifts that could improve the environment and reduce violence among people. This point of view sets up the possibility that the people engaged in a civic intelligence project could actually become more *intelligent* throughout the process. This increased intelligence could be acquired through the addition of more content knowledge and process knowledge. It could also increase the civic intelligence that placed them in closer touch with the knowledge that society has (including that which is "known" that is inaccurate or even delusional) and how to play a role in relation to that knowledge. Note that playing an "individual" role isn't equivalent to being overwhelmed or subsumed by the collective; sometimes over time the marginalized voice becomes the dominant one. So, although there is definitely room for individuals, the study and development of civic intelligence reminds us of the fact that no person is truly independent of others.

A goal of developing and supporting civic intelligence seems to argue against the additive collective intelligence [14] approach where a large number of people contribute a small amount of data (a guess about weight, a vote, etc.) and intelligence is elicited algorithmically. Although there is some validity in that argument, there are two important caveats. The first is that civic intelligence (or social learning or other social problem solving) can be developed and encouraged within this framework. The second is that algorithmic approaches such as "straw polls" (informal polls to get a rough sense of where members of a group stand in relation to an issue) could be used in conjunction with more complex, content-rich processes. In other words, the relatively simple approaches aren't necessarily antithetical to civic intelligence, but civic intelligence couldn't be defined solely using those perspectives.

3.1 Social and Institutional Context

The important ingredients for civic (and uncivic) intelligence — what O'Reilly [29] has called the "rules of success" — will likely become more well-known and sought-after over time. While this process unfolds, the "natural" (i.e. unintentional and uncoerced) by-products of the Internet and other information technology use, as well as the more directed and engineered consequences, are being established and selected (in the evolutionary sense). Now is the time to be asking who or what is influencing the development of and control over these technological features, whether in the service of research or social engagement (or both). Understanding the nature of these influences is a natural focus of technology and community studies. It's also an important area to understand in some detail while broadly defining what constitutes the field. Our knowledge of where we (individually and as communities) stand in relation to other institutions of research and action will help us see where we are and help us decide where we'd like to go and what we should do to get there.

The question of influence (or drivers) is a key issue in the consideration of communities and technology since the interactions and relationships among the players help steer our work — whether we acknowledge it or not — and are likely to change over time. Studying these drivers and how they play out over time is interesting in its own right and central to this enterprise. I'd also argue that looking at the communities and technology enterprise itself with this perspective is important. Doing so, at the least, will help us acknowledge the potential of this community to be a driver itself — if only to reject that role as out of our purview. If, however, we are to consciously determine to become an influential player in the communities and technology enterprise that extends beyond this conference and to help determine values and norms of our community we need to understand two things: (1) the forces (including expectations) that impinge on us and (2) how we intend to engage with them, in opposition or in accordance, or through some mixture of the two. Some of the questions that we could pose about influence in relation to an enterprise oriented around civic intelligence include:

- Who has interests (or stakes) in communication systems technology and policy and its future?
- What are the various actors seeking?
- How do various actors exert influence (through policy, norms, research findings, and funding, for example) and what are the potential consequences?
- Whom is being influenced? That is, whose future behavior will be diverted from where it seemed to be going?
- Who and what sectors would be interested in civic intelligence work?

Addressing these questions involves working with a variety of researchers and others, and exploring educational, government, media, and civil society organizations and institutions around the world. At least part of the reason for considering drivers is to consider how we might ourselves intervene in how the course of the future unfolds. Groups form as a way to leverage their assets and have an influence on the world. Looking at our community as it currently exists and how a smaller group within it that explicitly focuses on civic intelligence might function are two good test cases of the descriptive and functional model of civic intelligence described above.

3.2 Research Questions

This section introduces research questions that would be particularly relevant within a civic intelligence perspective. These are presented thematically although it's certainly plausible that one project could address a variety of research issues at the same time. Also because this work is so disciplinarily broad only a portion of the research questions that could be posed are mentioned.

One key question, of course, is *What is civic intelligence?* Because of the examples we've looked at, we see that civic intelligence exists and can be recognized in a general way. On the other hand, would it ever be possible to obtain a single *measurement* of civic intelligence? Probably not, not least because civic intelligence is contextual, dynamic, and multifaceted: it takes different forms in different situations. Also, as Howard Gardner [13] has pointed out, there are many types of intelligences within individuals. On a larger scale it would be useful if we could gain some feeling of whether or not civic intelligence is increasing in a given community, country, or worldwide. We need to establish useful proxy measures; the number of news reports on television about educational policy, for example, in Seattle, or elsewhere, and how many people viewed them. So while it should prove useful to strive for more precision, the difficulty of doing so absolutely should serve as the important reminder that civic intelligence in its most meaningful sense is unlikely to ever be reduced to a problem of engineering.

The civic intelligence perspective is inherently interdisciplinary; it integrates ideas from disciplines such as cognitive science and neuroscience to historical and world systems sociology. The question is how best to leverage the interdisciplinary nature and make it productive for the largest number of people. In addition to setting up collaborative situations such as interdisciplinary workshops and conferences, how do we make the process more orderly, and at the same time, easy to understand and learn and encouraging of diverse participation? Clearly, relevant theory, concepts, and constructs from other disciplines as well as empirical data should be introduced. Ideally points of articulation can be found and used to integrate ideas and data from multiple disciplines. New research questions can be identified based on the new cross-cutting effort and mappings between concepts (perhaps using semantic web constructs) could be useful. And as previously mentioned, the relationship between social capital and civic intelligence should be explored early on. Is, for example, a community with high social capital likely to have a high degree of civic intelligence as well?

The nature of collective intelligence is still, of course, not fully understood. Can we identify mechanisms that are activated when collective (and civic) intelligence occurs? Dutton [11] worked with 15 researchers in a distributed collective intelligence undertaking to look deeper into some of the recent approaches to collective intelligence on the Web. Specifically they examined a variety of "collaborative network organizations" to help "identify the locus of value in these networks" and to uncover "who gains the benefits." Both of these objectives are critical for an investigation of civic intelligence. Dutton also makes the point that careful management is key to setting up the particular circumstances where "intelligence" is likely to emerge (what could one call the infrastructure of intelligence). This important insight is not only important as a way to examine claims of collective intelligence but as a reminder that management is likely to be a prime consideration for encouraging

civic intelligence whether in the "real" or virtual world, or in the hybrid reality that encompasses both.

The information and communication infrastructure gives rise to a variety of research questions. What protocols and other technological approaches are more likely to promote the development of civic intelligence? What technology and applications can be developed to share civic intelligence "best practices." Is there an "ideal platform" for civic intelligence? What features and capabilities would it have? ICT development is of course not standing still. What new developments in ICT, including increased computational capabilities, access to data (and simulations) and more and increased use of social applications will become available and how will these affect civic intelligence?

How are commercial applications (Facebook and the like) being used in civic intelligence contexts? In what ways are these successful — or not successful — for civic intelligent enterprises and why? Perhaps mixing business and pleasure is an effective strategy for the development of civic intelligence? What problems currently exist or could arise with commercial systems? Could policy issues arise that would impede civic intelligence work? What studies on collaboration and cross-cultural communication need to be done in relation to civic intelligence?

Research questions can arise at the organizational, policy, and societal levels also. How would a socio-technological infrastructure (including policy) that explicitly supported civic intelligence differ from others? What elements would be borrowed from other forms of collective intelligence? How can we formalize / analyze forms of collective intelligence (such as civic intelligence) that extend or modify the models described above? How can we promote and possibly institutionalize metacognition [24] to make it more effective? Can we set up situations that would allow or promote evolution of socio-technological systems (like collaboration, deliberation, etc.) To what extent can civic intelligence be institutionalized? (Or should the *conditions* for encouraging civic intelligence be institutionalized?) How could existing institutions be changed to better support civic intelligence? What features might new institutions need to have to support civic intelligence?

What forms does civic intelligence take in societies or communities that aren't democratic? Under what circumstances do marginalized communities engage in collective action or other civic intelligence approaches with ICT versus other types of communicative strategies? Are there ways to establish effective partnerships between marginalized and non-marginalized groups? What cultural characteristics influence the ability to develop civic intelligence? How are economic, political and other forms of power projected and manifested in communication systems? How can people organize under oppressive regimes? In what ways does access to communication systems relate to economic and other forms of power, and, in general, how does communication in various arenas travel to others?

Even with a stronger focus on civic intelligence, researchers would still conduct research. One difference would be that the research would be conducted less exclusively for other researchers or for academic consideration and generally have a stronger action orientation (see, e.g. [15]). As discussed in the subsection above, the research that emerged from civic intelligence would be intended for a larger audience including community members and policy-makers. From a civic intelligence perspective, promoting and improving civic intelligence is as important as exploring it or

understanding it, although in practice the two approaches should be mutually reinforcing. Research findings should help in the improvement of knowledge, process, technological development or policy development that was not produced solely for elites, whether those elites were academic, economic, or political. Research projects should also explicitly be designed with the intent of contributing to civic intelligence. This could include ensuring that preprints of scholarly papers (including summaries of the papers in clear, accessible language) as well as research datasets, etc are publicly available on the web. Researchers who develop technologies could make their source code available as open source. They could help promote the idea of building on existing projects and leaving material in a state that encouraged further development.

3.3 Projects

Research projects that support the understanding and development of civic intelligence will help answer research questions (such as those proposed above) while providing direct or indirect benefit to the communities within the relevant social and institutional context (also discussed above). Many of the projects that we would be undertaking would be of indirect benefit from a civic intelligence perspective. These would include developing applications that supported civic capabilities including problem solving, negotiation, planning, social capital formulation, and deliberation. Another indirect approach would be to support academic, security, non-profits, government, and other organizations with technologies, information, and policies that engender civic intelligence. A project of direct benefit would involve working with a community using existing tools and methodologies to help them solve a specific problem. Projects that provide direct and indirect benefits explore probably the richest, most fertile, and most challenging research arena.

There are several general areas of importance to cultivating civic intelligence. These include:

- Improving access and quality of access to information and communication systems and resources;
- Improving access to deliberation, and collaboration, i.e. to political spaces — physical and virtual and hybrids;
- Improving translation — including technical-ese into natural languages;
- Creating institutions with civic intelligence at their core — science shops and community networks, for example;
- Improving and expanding collaboration among diverse people and communities including laymen and scientists;
- Developing models and other frameworks, paradigms, and narratives;
- Exploring policy implications and developing recommendations; and
- Surfacing research questions in different focal areas.

One ambitious "grand challenge" that is currently little more than a thought experiment is to develop a World Citizen Parliament [38]. This project (which admits its Quixotic orientation) is based on the assumption that people worldwide will ultimately be connected via communication technology, and that by identifying barriers to communications and by envisioning approaches to

overcome these even if the "ultimate" information and communication environment turns out to be entirely unlike what was originally envisioned. A broad-based initiative along these lines could provide a "big tent" for research and action and raise consciousness in general without being overly restrictive.

Finally, we have launched an open project to collect information about efforts that seem to manifest civic intelligence. We are striving for a broad range of examples so as not to focus solely on those efforts that seem to support the work on the conceptualization of civic intelligence accomplished so far. We will use this data to debug the current models and to begin the construction of "social objects" and other resources.

4. FUTURE DIRECTIONS

Obviously defining civic intelligence and putting resources (time, thought, people, programs, and money) into the study and cultivation of civic intelligence will not, by themselves, bring about social sanity and environmental remediation. Undoing damage that has been centuries in the making won't be easy. On the other hand, are there dangers in explicitly focusing on the development of civic intelligence? I note several issues — and others surely exist. The first objection is that civic intelligence is not "objective" or "scientific" enough and consequently won't garner the desired prestige, recognition, or funding. This could be because any hint of advocacy could be construed as being not academic or because the work deviates from dominant paradigms too dramatically. These concerns have some validity, although to my mind, they're far from fatal. We need to think creatively about how to position the work to serve several objectives. It also is plausible, however, that the people doing this line of work will ultimately be rewarded with more work, responsibility, and support as the value becomes more widely acknowledged.

Another objection is that it's better not to pursue social objectives directly. While it's true that side effects work in mysterious ways, this observation shouldn't preclude the idea of actually working towards the directions where society needs to be going. While we don't want to preclude interesting research just because it's not directly germane for social and environmental amelioration, we don't want to err in the other direction and let the marketplace and other anonymous and abstract forces sort things out without citizen consultation.

Another possible objection is that this approach, as a "modernist" approach, *necessarily* leads to totalitarianism. Although the determinism, and hyperbole of the objection somewhat undermines it, it does raise some important issues. The most important one is that an approach like this could lead to dogmatic programs or other restrictive ways of thinking. Problems like this, if they arose, would undoubtedly be traceable to false certainty where one approach was seen an infallible arbiter of truth. An overly abstract, academic approach to civic intelligence could theoretically lead to "rational" projects that lack the contextual and cultural moorings that are needed to be successful. For that reason, smaller projects deploying diverse approaches should generally be preferred over large, monolithic projects. In any case civic intelligence project should always promote incremental learning and incremental progress towards goals.

The idea of civic intelligence also introduces conflict intrinsically through the use of the uncivic intelligence concept. If this work is done thoughtlessly it could result in a crude partitioning of knowledge into good or bad categorizations when in fact there are

ample gray areas over which people will disagree. Nevertheless, as with other uncomfortable issues that this line of thinking brings up, the answer is not to ignore difficult issues because they're difficult.

A community will be needed to prevent these observations and issues from paralyzing the effort. We all have to work together to help develop opportunities that support civic intelligence. We need to keep asking rigorous questions and performing rigorous intellectual work. Today's realities call for new types of inquiry that defy some of the "ivory tower" habits and that actively and directly engage with real people and real issues. The idea of bringing communities and technology closer together at least in a thought experiment forces theoreticians and practitioners to extend their view of what is worthy of study and what their role in that enterprise is. Biologists and other scientists in the life sciences to a large degree are re-orienting their perspective to acknowledge that protecting the environment is part of their professional responsibility. We can likewise acknowledge that the information and communication environment is also critical. It's clear that the form that this environment takes in the future may fall far short of where it could — or should be — in terms of supporting meaningful, intelligent, and healthy interactions.

Civic intelligence as a particular perspective (or working hypothesis) of the communities and technology community could help serve as an intellectual springboard for research and technological and policy development, in addition to contributing to the advance of much-needed social and environmental amelioration. Its role simply as a frame could spur valuable applications and collaborative efforts that never would have been developed without it. By encouraging a more contextual, dynamic, purposive, and urgent approach, the development of a civic intelligence perspective represents a substantial detour from the inertia of prior power and knowledge systems. Will humankind be able to summon the necessary civic intelligence to overcome its problems? Given the potential for innovative new relationships that integrate communities and technology, there are innumerable ways to help address this question. On the other hand, in the absence of strong voices from this community and others we may unfortunately arrive at the destinations that humankind seems to be hurtling towards.

5. REFERENCES

- [1] Barber, B. 1984. *Strong Democracy*. Univ. of CA. Press.
- [2] Bishop, A. and Bruce, B. 2008. *Community Inquiry In Liberating Voices*, D. Schuler. MIT Press, 478-480.
- [3] Boyte, H. 2005. *Reframing Democracy: Governance, Civic Agency, and Politics*. *Public Administration Review*. 65,5, 536-546
- [4] Briggs, X. 2008. *Democracy as Problem Solving*. MIT Press.
- [5] Caidi, N. 2006. Building "Civilizational Competence": a new role for libraries? *Journal of Documentation*. 62,2, 194-212.
- [6] *Community as Intellectual Space*, <http://www.lis.uiuc.edu/programs/cpd/CIS2008/>
- [7] Davies, T. and Noveck, B. eds. In press. *Online Deliberation: Design, Research, and Practice*. CSLI Publications / University of Chicago Press.

- [8] De Cindio, F. and Schuler, D. In Proceedings of CIRN Conference 2007 "Communities and Action", Prato, Italy, November 5-7, 2007
- [9] Dewey, J. 1927. *The Public and Its Problem*. H. Holt and Company.
- [10] Diamond, J. *Collapse*. Penguin.
- [11] Dutton, W. May 2008 *The Wisdom of Collaborative Network Organizations*. Working Paper. Oxford Internet Institute.
- [12] Galton, F. *Vox Populi*, *Nature*, v75, 450-451.
- [13] Gardner, H. 1999. *Frames of Mind*. Basic.
- [14] *Handbook of Collective Intelligence*. 2008. MIT Center for Collective Intelligence.
http://scripts.mit.edu/~cci/HCI/index.php?title=Main_Page
- [15] Hearn, G., Tacchi, J., Foth M, and Lennie, J. 2009. *Action Research and New Media*. Hampton Press.
- [16] Herrman, T. 2002. *SeeMe in a Nutshell*. <https://web-imtm.iaw.ruhr-uni-bochum.de/pub/bsew.cgi/0/208299/30621/30621.pdf>
- [17] Juris, J. Caruso, C. and Mosca, L 2008. *Freeing Software and Opening Space: Social Forums and the Cultural Politics of Technology*. *Societies Without Borders*, 3,1, 96-117
- [18] Keck, M. 2002. "Water, Water, Everywhere, Nor Any Drop to Drink." In *Livable Cities?* Evans, P. Ed. Univ. of CA. Press.
- [19] Keck, M. and Sikkink, K 1998 *Activists Beyond Borders*. Cornell Univ. Press.
- [20] Landemore, H. 2008. *Democratic Reason: the Mechanisms of Collective Intelligence in Politics*. *Collective Wisdom: Principles and Mechanisms Conference*, Collège de France, Paris, May 22-23.
- [21] Mathews, D. 1985. *Civic Intelligence*. *Social Education*, November-December.
- [22] Matic, V. 2004. *Civil Networking in a Hostile Environment*. In D. Schuler and P. Day eds. 2004 *Shaping the Network Society: The New Role of Civil Society in Cyberspace*, MIT Press.
- [23] Meyer-Knapp, H. 2008. *Truth and Reconciliation Commissions*. In *Liberating Voices*, D. Schuler. MIT Press, 259-261.
- [24] National Research Council. 2002. *How People Learn*. National Academy Press.
- [25] *Neighborhood Networks*, <http://www.neighborhood-networks.net/>
- [26] *Networked Politics*. <http://www.networked-politics.info/>.
- [27] *The New Face of Hunger*. April 17, 2008. *Economist*.
http://www.economist.com/world/international/displaystory.cfm?story_id=11049284 <http://www.newtactics.org/>
- [28] *New Tactics in Human Rights*.
- [29] O'Reilly, T. 2006. *Web 2.0 Compact Definition*.
<http://radar.oreilly.com/archives/2006/12/web-20-compact-definition-tryi.html>
- [30] Putnam, R. 2001. *Bowling Alone*. Simon & Schuster.
- [31] Robert McConnell Productions. 2001. *Robert's Rules of Order*. Wiley.
- [32] Sartori, G. ed. 1984. *Social Science Concepts*. Sage
- [33] Schuler, D. 1996. *New Community Networks*. Addison Wesley.
- [34] Schuler, D. 2001. *Cultivating Society's Civic Intelligence*. *Information, Communication & Society* 4,2, 157-181
- [35] Schuler, D. 2002 *A Pattern Language for Living Communication*. *Participatory Design Conference*, Malmo, ACM Press.
- [36] Schuler, D. 2008 *Liberating Voices*. MIT Press.
- [37] Schuler, D. 2008 *Towards Liberating Voices 2.0*. *Participatory Design Conference*, Bloomington, IN. ACM Press.
- [38] Schuler, D. 2008. *World Citizen Parliament In Liberating Voices*, D. Schuler. MIT Press
- [39] Schuler, D. in press. *Online Civic Deliberation Using E-Liberate* In T. Davies and B. Noveck eds. CSLI Publications. University of Chicago Press.
- [40] Sen, J., Anand, A., Escobar, E., and Waterman, P. eds. 2004. *Challenging Empires*. The Viveka Foundation.
- [41] Shirky, C. 2008. *Here Comes Everybody*. 2008. Penguin.
- [42] *Social Learning Group 2001. Learning to Manage Global Environmental Risks*. MIT Press.
- [43] Tainter, J. 1990. *The Collapse of Complex Societies*. Cambridge Univ. Press.
- [44] Tarrow, S. 1994. *Social Movements, Collective Action, and Mass Politics in the Modern State*. Cambridge Univ. Press.
- [45] von Hippel, E. 2005 *Democratizing Innovation*. MIT Press.
- [46] Wallerstein, I. 1999. *The End of the World as We Know It*. Univ. of MN. Press.
- [47] Wartofsky, M. 1968. *Telos and Technique: Models as Modes of Action in Models: Representation of the Scientific Understanding*, 1978. R. Cohen and M. Wartofsky. *Boston Studies in the Philosophy of Science XLVIII*. D. Reidel. 140-53.