

E-Governance and Smart Communities: A Social Learning Challenge

Abstract:

A period of great change has been brought forth by globalization and the new information and communications technologies (NICT). On the one hand, globalization has triggered more intense economic and political interdependencies, and has challenged fundamental assumptions about sovereignty and the role of the nation-state. “News, currency, and economic and political intelligence no longer can be contained within national borders, but flow often instantaneously, to all corners of the globe, making it difficult or even impossible for national governments to influence political or economic conditions over which, not long ago, they held unquestioned control” (Eger, 1997).

As networks increasingly take hold and reshape the way people live, communicate and work, such forces have raised the question of what kind of governance people will need in the next millennium. Some elements of answers have been put forward under the general rubric of e-governance. It suggests “a widespread adoption of a more community-based model of governance” with greater connectivity being facilitated by new technology (Tapscott and Agnew 1999). Aided by proximity, the application of NICT locally leads to economic, social and political transformations encapsulated by the new smart community movement. Yet, this transformation is more fundamental than it sounds, and there is a risk that current claims of digital interdependence remain too vague to command the adherence of many skeptics who are not satisfied with a simple request for a redefinition of the rules of engagement according to the promise of technology. For those skeptics, the devil is in the details, and the details, they claim, are missing. To respond to this sort of demand for details, one needs to specify more fully how the collective intelligence of the communities would operate, how the new governance structures would work. Our purpose in this paper is to provide some preliminary mapping of this terrain.

Key Words: Smart Community, Governance, Collective Intelligence, Networks, Learning, NICT

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The technology of telecommunications and information and the economics of a global economy are rapidly converging, ushering in a post-industrial age of information. In the wake of this convergence, all institutions, both private and public, are being forced to reinvent themselves. Power is being realigned and wealth redefined. Old forms of governance are being replaced with the emergence of the City-State and the establishment of local and regional “smart communities” that aggressively embrace the tools of this new age.”

~ Second World Forum on Smart Communities, 1999.

Introduction

A period of great change has been brought forth by globalization and the new information and communications technologies (NICT).

On the one hand, globalization has triggered more intense economic and political interdependencies, and has challenged fundamental assumptions about sovereignty and the role of the nation-state. “News, currency, and economic and political intelligence no longer can be contained within national borders, but flow often instantaneously, to all corners of the globe, making it difficult or even impossible for national governments to influence political or economic conditions over which, not long ago, they held unquestioned control” (Eger, 1997).

On the other hand, the Internet, with the development of the World Wide Web and browser technology, is among the major driving forces of this change. In the last five years, the Internet has blossomed from an arcane tool used by academics and government researchers into a worldwide mass of communications medium, now poised to become the leading carrier of all communications and financial transactions affecting life and

work in the 21st Century. As networks increasingly take hold and reshape the way people live, communicate and work, such forces have raised the question of what kind of governance people will need in the next millennium. Some elements of answers have been put forward under the general rubric of e-governance. It suggests “a widespread adoption of a more community-based model of governance” with greater connectivity being facilitated by new technology (Tapscott and Agnew 1999). Aided by proximity, the application of NICT locally leads to economic, social and political transformations encapsulated by the new smart community movement.

Yet, this transformation is more fundamental than it sounds, and there is a risk that current claims of digital interdependence remain too vague to command the adherence of many skeptics who are not satisfied with a simple request for a redefinition of the rules of engagement according to the promise of technology. For those skeptics, the devil is in the details, and the details, they claim, are missing. To respond to this sort of demand for details, one needs to specify more fully how the collective intelligence of the communities would operate, how the new governance structures would work. Our purpose in this paper is to provide some preliminary mapping of this terrain.

In section one, we identify the twin set of geographic governance dimensions at work in explaining the emergence of smart communities: the rise of city-regions and the new prominence of citizen engagement. Section two puts forward the proposition that community-based models of governance must be built on what we call “collective intelligence” (CI). While CI is obviously omnipresent in e-governance and smart

communities, it should be clear that there is more to it than geographical proximity and connectedness through the NICT. In section three, we review the current Canadian strategy to promote Smart Communities and its rhetorical acceptance of at least some of the logics ascribed by our analysis. In section four, we highlight the existence of some important blockages to social learning – using them as a starting point of the action necessary to ensure the epiphany of e-governance in our digital age.

City-regions and the connected citizenry

In a knowledge-based socio-economy driven by technological change and innovation, new challenges are emerging. Two sets of forces have tended to bring forth the present explosion of interest in smart communities and e-governance: the new importance of city-regions as a result of globalization, and the new potentialities of citizen engagement made possible by NICT.

With respect to the rise of city-regions, globalization and the rapid development and diffusion of information and communication technologies are said to be eliminating borders. Moreover, this process of international integration is paralleled by one of national disintegration: sub-national units are forced to adapt to “their” specific environments and have demonstrated the greatest adaptive capacities in this turbulent environment. Naisbitt has characterized these forces as the “global paradox” (1994) and they help explain why interest has grown around the smart communities movement.

Internationally, there is a flourishing of literature on systems of innovation from a local perspective. Terms such as industrial and technology clusters, local industrial systems, or local systems of innovation have been used to denote sub-national entities, their patterns of coordination and learning, and their main determinants of socio-economic development. This growing body of literature has informed much of the recent thinking on digital or smart communities.

Saxenian (1994) identifies the key determinants of regional competitiveness, ascribing the success of Silicon Valley to the establishment of a “network system”. A network system, according to Saxenian (1994), is a decentralized industrial system in which production is organized by networks of specialized firms that compete intensely while also collaborating in both formal and informal ways with each other and with local institutions like universities. What matters in this network system are relationships within communities of both competition and collaboration. In Silicon Valley, the rich social, technical and productive relationships foster entrepreneurship, experimentation, and collective learning. Thus, the region's social, technical and productive infrastructure is as critical to the successes of local firms as their own individual activities.

The network system, by linking public, private and academic organizations, facilitates collective learning, providing a regional advantage to Silicon Valley firms in today's very turbulent, competitive environment. The fluidity of the system enables people with innovative ideas to develop them and bring them to market more quickly. Saxenian identifies a number of factors that are key to innovation such as the density of

communication networks, group affiliations, cooperation between competing companies, fluid organization structuring, mobility of the workforce, local discussion forums, venture capital leadership, collaboration with world-class universities, and international connections. Silicon Valley has excelled in each of these, and as result, has been able to spawn start-ups much faster and successfully than anywhere else.

Therefore, the success of a locality is determined, in large part, by their effectiveness in gathering and using knowledge and technology. The ability to innovate and enhance technological performance depends on obtaining access to learning-intensive relations. Innovation stems from the interplay among the different institutions and individuals – firms, laboratories, universities and consumers. The result is a society composed of more network-based governance patterns (Stoker 1996).

While the lure of electronic networks may be at the heart of the smart communities movement, the localization of governance is dependent on more complex sets of social ties. The dynamics of learning and adaptation, central to the complexities of ecological systems, are increasingly used as an analogy to the collaborative relations between sectors in local systems of governance. Our economies are developing a far richer ecology of institutions to co-ordinate economic activity, to generate ideas and translate them into products. In this new ecology a range of corporate, regional and personal networks will organize the most critical process: generating new knowledge that can be translated into products and services. Durable and dynamic networks are underpinned by

reciprocity and mutual trust, which allow members to share information, risks and opportunities with greater ease (Leadbeater 1999: 148).

According to many commentators today, competitive advantage lies in the concentrated diversity that is the defining characteristic of city-regions – the diversity, for example, of intellectual capital, business and infrastructure. City-regions are also uniquely able to achieve the critical mass required to attract and support high degrees of specialization – specialized labour, knowledge, business services, media, etc. Through these special qualities, city-regions contribute in a unique and significant way to an enterprise’s flexibility, responsiveness and innovation (Capello 1999). In response to the growing pressures of globalization and NICT, communities around the world have begun to sketch out the first drafts of “networked” communities – networks of individuals and firms linked electronically. These are the “smart” communities of the future.

The global – local context can be summarized along the following lines:

	<u>Local Systems</u>	<u>Global Trends</u>
	- localization	- globalization
	- learning	- knowledge
	- collaboration	- innovation
	- community	- competition
	- proximity	- clusters
	- social capital	- human capital
<i>In sum **</i>	<i>- local conditions matter more than ever before</i>	<i>- capital and people more mobile than ever before (blurring national borders)</i>

The missing link – or the middle space, may perhaps be filled by technology. Thus, smart communities may be viewed as a template of how NICT can allow local systems to effectively harness these global forces and deploy the results in a positive generation of new opportunities – socially, politically and economically.

City-regions have a comparative advantage both because of their lower communication costs (including the human interface of inter-personal ties and trustability), and also due to the minimalist character of their coordination and control structures. But the requisite governance structure may not necessarily be emerging simply because of the desirability and attractiveness of such conditions. Local patriotisms and broader national and regional designs often prevent the coalescence of effective city-region governance structures, or only bring it forth in an oblique way through the work of civic entrepreneurs.

NICT plays an important role in the emergence of the requisite governance structures. The Internet is a particularly good example of successful decentralization based on both local proximity and extensive connectivity. This success has proved to depend on taking advantage of extensive and affordable connections through a loose arrangement within a framework that establishes how members interact: models such as the Visa card system exemplify such an approach. Yet, many city-regions have found such adaptation elusive. This difficulty is ascribable to both their embeddedness in larger socio-political and economic units that stunt their independent development, also due to a poor understanding of the sort of levers required to provide effective governance at this level. Barnett (1997) has outlined these challenges in a usefully simplistic fashion:

- i) what size, level and structure of government is best suited to perform an enabling role;
- ii) how can government facilitate activity by the private and voluntary sectors in order to bring about pluralistic governance; and
- iii) how can higher levels of government facilitate the task of governance of lower levels government in the discharge of their duties?

First, on the size, level and structure of government, there is a quandary at the local level. A wide body of knowledge points to local determinants of industrial competitiveness, technological innovation and collaborative capacities [Porter 1991; Saxenian 1994; Moss Kanter 1995; Paquet 1997]. What is far less clear, however, are the specific governance patterns that join organizations and sectors and contribute to socio-economic performance, and the changing role of government that results. Many commentators suggest that local government often lacks the policy tools and jurisdictional authority to effectively manage the new governance [Hudson 1995; Roy 1998]. It is important to explore what brokerage is needed and the extent to which local government may play a role and what other sorts of private or civic-based partnerships can elicit the necessary collaborative compacts to match the technological networks with social bonds.

Pertaining to the rise of pluralistic governance, it is locally where such dynamics may be said to be undergoing an empowerment due to arguments in favour of both proximity and the enhanced degrees of flexibility for innovation through a growing array of networks and partnerships emerging forms of distributed governance [Paquet 1997]. Industrial

clusters and innovation networks provided some sense of the interdependencies rooted in the geographic proximity provided by a regional environment [Best 1990]. Others, such as Putnam [1993] and Moss Kanter [1995], stress the importance of collaborative practises, community ties, and civic engagement in adding a collective dimension of the region. Saxenian's portrayal of Silicon Valley is multi-sector, and Henton's emphasis on civic entrepreneurship recognizes both the multiplicity of actors building new forms of synergistic ties and the growing place of civic creativity in this mix [Henton and al. 1997].

The result is an environment in which even those most interested in the managerial consequences for firms point to new ecologies, fluid boundaries, and multi-stakeholder ties as necessary elements of both competitive and collaborative advantages [Moore 1996; Capello 1999]. The consequence for smart communities is the necessity of fostering dynamic processes of learning that are, by definition, multi-stakeholder. In the context of an aspiring smart community, the extension of Barnett's analysis is to examine whether or not the forum, or sets of forums responsible for its evolution enjoys dispersed, yet significant degrees of support and participation. Also, the extent to which NICT is a variable in shaping such processes, and facilitating them must also be addressed.

In terms of Barnett's third question, the term governance is “now widely deployed to capture some of the meaning of efforts at social and economic coordination in a world where all tiers of government must increasingly collaborate with one another as well as with non-governmental organizations of various kinds (private and civic) in order to

pursue their goals” [Scott, Soja and Storper 1999]. This fluid interface of local governance and economic development and transnational integration creates a new division of labour amongst local, provincial (in the Canadian context) and national stakeholders. Yet, unlike the past the starting point for any such renaissance must be that of local action – or such is the claim of the federal initiative designed to foster local action. This claim is also worthy of further investigation.

In terms of the citizenry of city-regions and broader political units, a shift to more direct forms of democratic engagement, facilitated by NICT, reflects the human response to these new governance dynamics, and the possibility that local forums of economic and civic activities can also give rise to political innovation – and larger spaces for public input and social conversations than representational models typically allow. In this light, information technology is said to carry the potential to fundamentally affect our ability as citizens to have a voice in shaping our future. New technologies, and in particular the Internet, represent new ways of engaging the public in government decision-making, changing the very practice of politics in substantial ways. The Internet makes electronic democracy – a means of improving the responsiveness and accountability of political institutions and enhancing citizen participation in the political process – possible. The extent to which it is feasible, however, is a more complicated set of issues.

While the Internet may not entice all citizens to become actively engaged in local governance, it nonetheless provides an opportunity for more direct participation in and influence over government decision-making. At the very least, it offers additional

channels for the flow of political information. Electronic democracy also poses new social segregation challenges between those that are information rich and those who are poor. While the cost of technology is declining rapidly, the question of access remains. Access and usage not only require financial resources, but also technical skills, cultural familiarity, literacy and language. For communities to really make the technologies and applications work to aid the development of healthy and sustainable communities requires much more than building bandwidth.

Collective intelligence and smart community

On the governance front, the main features of the new global and digital age have been a drift toward a more demanding citizenry at a time when the collective institutions (market, state, civic fixtures) would appear to become less able to satisfy these demands.

This has led to both an increase in the degree of discontent of the citizenry vis-à-vis its institutions, and to a groping for new ways to cope with the challenge of adapting ever faster to the evolving environment. These new ways have built first and foremost on the coalescence of teams, clans and networks woven by empathy and trust, and on their capacity to ensure that partners would be able to do better together than in isolation. Such networking has emerged naturally among persons sharing some sort of proximity, and has had to materialize rather quickly in the form of fruitful results from such cooperation in order to ensure that it would survive. This dual constraint (proximity and collaboration bearing fruits) has led to the rise of community as the locus of such creative interaction and to the emergence of an effective mobilization of skills and competencies in real time

as the sine qua non of the resilience of the network. The notion of collective intelligence (Levy 1994) is a way to capture this mobilization effect and the nurturing of continuous learning that it generates.

The notion of smart community refers to the locus in which such networked intelligence is embedded. A smart community is defined as a geographical area ranging in size from a neighbourhood to a multi-county region within which citizens, organizations and governing institutions deploy embrace and NICT to transform their region in significant and fundamental ways (Eger 1997). In an information age, smart communities are intended to promote job growth, economic development and improve quality of life within the community.

At the 1997 World Forum on Smart Communities, it was estimated that some 50,000 cities and towns around the world would embrace “smart” initiatives by the year 2000. Cities and regions such as Singapore, Hong Kong, Yokohama and San Diego (California) are developing partnerships among industry, government, the private sector, health and educational institutions, and community groups. While the emphasis is very much on economic growth and competitiveness in the global knowledge-based economy, smart communities, by linking government, business and citizens, are said to provide an opportunity for enhancing citizen participation in and influence over local decision-making.

Yet, the conceptual dynamics of collective intelligence/smart community remain very poorly understood. While the geographical and technological coordinates of this

networked reality are much easier to fathom, understand and work with – and this explains why they are played up significantly – the hidden portion of the iceberg is collective intelligence and social learning. Consequently, it is not sufficient to underline the importance of proximity and information technologies – which are indeed as necessary in this context as water in the preparation of a cup of tea but are clearly not sufficient to generate the desired outcome i.e., a cup of restorative tea or a truly smart community.

The literature on this new movement is replete with references to proximity and NIC, often celebrating the emergence of collaboration in those locales. Indeed these collaborations are regarded as “becoming the new model for successful urban organization in the global age, and the only local political arrangement likely to make it possible for besieged municipalities to survive in the increasingly intense global competition that lies ahead” (Eger, 1997). A smart community initiative becomes an integrated approach to helping entire communities go on-line to connect local governments, schools, businesses, citizens, and health and social services in order to create specific services to address local objectives and to help advance collective skills and capacities. In the same spirit, the optimum use of NICT is presented rightly as an essential element of smart communities but has a tendency to become the *deus ex machina* from which collective intelligence and social learning stem.

The core transformational challenge may lie elsewhere. It lies squarely in the capacity to ignite and sustain social learning through an effective use of collective intelligence. This in turn requires governance structures that ensure effective coordination among the different stakeholders in this world where knowledge and power are distributed. And

there is no way to do this job without a distributed governance structure, the only sort of governance capable of such cognitive mobilization. To correct the biases injected in the current debates by the overemphasis on proximity and IT and to ensure that collective intelligence and social learning are given appropriate valence, it is crucial to uncover the impediments that may exist to a good functioning collective intelligence and effective social learning.

A template for ecological governance:

As has already been suggested, there is a need to recast the Smart Communities concept away from a near-technical focus on NICT – toward a more governance-based approach to learning and change. As a starting point, proximity can aid in this reframing exercise, to some degree, since it is locally, within the city-region context already described, where new forms of governance are best understood. Locally, it is the ecology of socio-economic activity that best reveals the growth dynamics of the so-called “new economy”, although for some commentators this emphasis is hardly novel. Jacobs, in particular, argues for a relational view of economic development by which it is the diversity of socio-economic activities, and the inter-connectedness of these activities in urban-based localities that explains local growth and ongoing socio-economic resilience.

Bahrami and Evans (1996) underscore that in much the same vein as a natural ecosystem, Silicon Valley’s growth and success can be attributed to the incessant formation of a multitude of specialized, diverse entities, which feed off, support, and interact with one another. You can compare these two economies, or industrial systems, like ecosystems:

“Silicon Valley is like the rainforest: it's a decentralized system with complex and a continually diversifying mix of species, flora and fauna that spontaneously and repeatedly cross-pollinate” (Bahrami and Evans, 1996: 257). The case of Silicon Valley illustrates the complex connection between innovation, competition, collaboration, relationships and social capital. Indeed, connections between social networks and knowledge sharing are the source of much innovation and explain why knowledge-creating networks are not threaded across the world but clustered in regions and cities. “Knowledge-creating networks depend upon the transmission of ideas and tacit knowledge. This is best done through regular face-to-face contact” (Leadbeater 1999: 144).

In the explaining the socio-economic ecology of a city-region, and by extension in providing a cognitive mapping of the networks of collective intelligence that must be viewed as the drivers of a Smart Community, we propose a dynamic set of six sub-processes, each with an important role to play in any adaptation of NICT. These sub-processes include three sectorally-based forms of organizational activity, and three more contextually-based systems of life that shape the socio-economic infrastructure embedding individuals in their different organizational pursuits.

The three sectoral sub-processes include: a) the marketplace – and the composition of private enterprise within a locality; b) the state – and its public sector components and mechanisms for democratic accountability; c) social movements and civic associations – the networks of civic engagement, to borrow Putnam’s phrase, that define community life. The three sets of contextual forces, permeating these sectoral realities, include: d)

financial mechanisms – the injection of capital flows into new and existing ventures (private, public or civic-based); e) demographics – the composition of local populations by such factors as age and ethnicity; and f) distribution of wealth – and the sharing of prosperity, as it is produced among the various segments of the population.

What explains social learning is the dynamic co-evolution of these forces in an environment where positive attributes fuel their expansion and growth. For Jacobs, for example, it is the necessity of diversity that adds strength to the ecosystem by making it more resilient to socio-economic change (an important notion in tying global forces with local systems). What may explain the capacity for social learning in a Smart Community is the utilization of NICT across this dynamic ecology, and how new technologies strengthen its performance. By contrast, blockages will arise if the technology impacts only selected sub-processes at the expense of others.

In terms of the three sectoral sub-processes, for example, the capacity for NICT to strengthen actors is most apparent in the marketplace – where the digital economy drives governance innovation across firms and clusters, both globally and locally. In the state sector, part of the response by local governments has been responsive to such forces – as localities attempt to provide the necessary infrastructure for knowledge-based industry. Yet, NICT must go further in transforming state processes, particularly locally where new forms of more direct democracy and relational governance drive citizen engagement and its consequences. The third partner in this collective pursuit is civic-based organizations who, in many cases, create non-economic pressures for NICT-adaptation in the public

and social realms of the local ecology. Thus, at one level the challenge for a smart community is to foster a collective forum (or a set of such forums inter-linked) where the private, public and civic interests may be addressed in an integrative fashion.

Both the composition and effectiveness of these new governance forums are also shaped by three contextual sub-processes, each partially determining the vibrancy and texture of the local ecology, and its adaptation and deployment of NICT. The local set of financial mechanisms, locally rooted but globally connected, will determine what sorts of private and public investments are made into NICT, and they also provide the lifeblood for innovation and entrepreneurship of both private and civic natures. Demographically, the advent of NICT at different speeds, across different population segments (i.e. differentiations by age, education and ethnic origin) will extend or limit the ecology, redefining the governance boundaries of the Smart Community (to be either inclusive or selective). In a related sense, the distribution of wealth carries a similar capacity in determining both the sharing of risk and rewards within the ecological system and the local capacities to re-channel the production of wealth into local pursuits (as well as the nature of local pursuits). The distributional dimensions of collective intelligence are key, since social learning implies a collective dynamic of shared improvements and benefits.

As opposed to being viewed primarily as a new technical infrastructure for connectedness, this ecological view of governance implies that NICT be interpreted as a new form of relational infrastructure too. Thus, leadership is also required for political and social innovation to strengthen the specific elements of the local ecology, and also

generate the possibility that actors within the ecology can deploy technology in new ways. Most importantly, collective capacities for dialogue and the generation of trust around and through NICT may then transform the relational aspects of the ecosystem and strengthen it in new ways.

Smart Communities in Canada – a cautionary beginning

The smart communities concept is growing in essentiality and importance in the U.S. and indeed worldwide. More recently, Canada developed its national strategy modeled after California, appropriately entitled, *Smart Communities*. In the 1997 Speech from the Throne, the Government of Canada made a pledge:

We will make the information and knowledge infrastructure accessible to all Canadians by the year 2000, thereby making Canada the most connected nation in the world. This will provide individuals, schools, libraries, small and large businesses, rural and Aboriginal communities, public institutions, and all levels of government with new opportunities for learning, interacting, transacting business and developing their social and economic potential.

The Smart Communities Program is a three-year federal program created and administered by Industry Canada to help Canada become a world leader in the development and use of IT for economic, social and cultural development. The program's goal is to help establish world-class Smart Communities across the country so that Canadians can fully realize the benefits that information and communication technologies have to offer. The program sets out the following objectives:

- assist communities in developing and implementing sustainable Smart Communities strategies;

- create opportunities for learning through the sharing among communities of Smart activities, experiences and lessons learned;
- provide new business opportunities, domestically and internationally, for Canadian companies developing and delivering information and communication technology applications and services.

Although no such admission is forthcoming by the federal government, an important rationale for this initiative lies in the implicit recognition that it is locally where the necessary degree of collaboration between all stakeholders must take place. This federal experiment reflects a much more European flavor in asking cities and regions to plan collaboratively in order to qualify for federal resources, rather than more direct forms of federal intervention that have been common in the post-war policy context. As a response to Barnett, the implication is that one cannot choose a single layer of government but rather learn to innovate and create new forms of multi-level processes – made much more feasible in a world of e-governance.

As Ontario's selection, the Ottawa-based local initiative (denoted Smart Capital) receives several millions of dollars in public funds to be matched, in turn, by private contributions in a collective effort to deploy IT across economic, social and political realms. The leading organization responsible for Ottawa's bid, itself a private-public collaborative, is a non-profit organization that has been termed a civic entrepreneur for its promotion of collaborative processes locally. Indeed, an important determinant of the success or failure of the Smart Communities bid is the degree of collaboration locally (meaning that in the absence of federal funding, many of the ideas may well proceed through alternative

forums - arguably a point of strength of the program from the federal perspective as well).

In parallel to the new Smart Communities initiative, Ottawa's own strategy for local economic development is coordinated by an associational body of local stakeholders with a mandate to foster collective action across government, industry and education. The focus on knowledge and research, in particular, is clearly demonstrated by the expanding array of industry-education partnerships, many of which incorporate IT-related learning and deployment in some capacity. The Ottawa experience locally appears to be indicative of the broader movement of smart Cities, and the primary focus on economic development and (to the extent that the public sector changes at all in such a context) a streamlined government. In an optimistic light, such a view might be regarded as less a criticism and more the present state of affairs in an evolution that may well be progressing. In terms of localized governance processes, it has been cluster-driven arguments for economic development, and locally-based systems of innovation that have influenced collaborative thinking; municipal governmental structures are, with few exceptions in North America, only beginning to shed their traditional role as service delivery agents of higher-order (i.e. provincial) governments and insert themselves strategically as an agent of change in the new local scene.

In terms of which level of government is most likely to serve as the engine of experimentation with new models of both digital and democratic governance, the federal government's list of anticipated outcomes from the Smart Communities Demonstration

Projects lacks any mention of direct democracy. The lack of emphasis in Canada's federal initiative on the potential use of IT applications for citizen engagement means that the emancipatory potential of the Internet will depend on local initiative and leadership. In a "smart community" all agents will potentially be connected. Such an observation is not necessarily surprising in light of the fact that it is nationally where the Westminster-based parliamentary model of government is most at odds with dispersed and more democratic forms of e-governance and citizen engagement.

Yet, the Internet and other IT applications, for example, could enable citizens to vote electronically in elections, referendums and plebiscites. They could facilitate opinion polling, "electronic town halls", and electronic forums that promote dialogue between elected politicians and citizens, bypassing the traditional intermediaries. Making policy information available over the Internet to citizens and educating them on how to use information technology to access the information are also important elements of electronic democracy in a "smart community".

In terms of distributional concerns and a broader inclusion of socio-economic segments into the Smart Communities fold, the growing concern about a digital divide is a good example of an emerging challenge dependent on new compacts of concerted action – both locally and across levels of government. A federal strategy, for instance, designed to provide access through infrastructure cannot itself ensure broader participation (particularly when it is not even clear if the federal government is willing to promote it). Alternatively, a federal strategy to provide improved points of access through a

broadened and more advanced infrastructure, coupled with locally-rooted strategies for education, civic engagement and inclusiveness, may well be required to counter the more ominous socio-economic trends of places such as Silicon Valley - leading the way, albeit in reactive fashion, in demonstrating the need for broad economic, political and social participation in a true smart community in order to foster sustainable forms of development.

It is interesting, and perhaps not misguided that the federal government does not attempt to define what forms of sustainable (in a social and economic sense) development should be pursued by the localities themselves. Indeed, laying out such goals and plans to achieve them are at the heart of the submissions that competed for federal funds. The consequence here, explored more fully in the subsequent section, is that the workings of federalism, and the new division of power and tasks among governments, presents an important variable in the Smart Community mix.

Social learning blockages

While it remains early days for the Canadian entry into the movement of Smart Communities, we can attempt to sketch out what are likely to be the most important issues, and the most important sources of blockages in efforts to achieve a bottom-up, ecological-based process of local renewal – assisted by the deployment of NICT. There are three categories in need of attention: a) the requirement for new social technologies; b) stronger approaches to education, awareness and leadership, and iii) an understanding of the omni-present dangers of the centralized mindset.

New social technologies:

There is a real danger in the present Smart Communities movement that social innovation is secondary to an emphasis on new technologies – for the sake of both invention and commercialization. While NICT will continue to serve as a critical catalyst for economic development and market-based innovation, the philosophy of smart communities implies a more profound transformation in every day life – across a wide spectrum of communities. Are these communities rooted by place, and is it a physical place? Does the composition of these communities differ than the sorts of groups that have been formed in the past?

The unanswered quandary of becoming a smart community is to better understand the social processes of engagement that will redefine governance – perhaps beginning locally where proximity can encourage action through already existing pools of trust (of more traditional forms). In terms of the local ecology, an important emphasis must be placed on civic innovations (within the social ecology) in contributing to a widened discussion of not only the basis for more connections – but rather an exploration of new types of connectedness and collaborative communities.

The Smart Communities program in Canada strongly encourages innovative forms of collaborations. It recognizes that only local political, civic, business, and education leaders, working in cooperation, can bring people and technology together in time to capture the competitive and civic advantages that the telecommunications revolution makes possible. While optimum use of information and communication technologies is

an essential element of Smart Communities, community partnerships - not wires - are the fibers that bind. The extent to which the underlying social capacities can be fostered to facilitate such partnering is an open challenge that must be met with local innovation.

Awareness, education and leadership:

A fundamental question, however, is whether information technology and the electronic marketplace will improve the social and economic circumstances of the whole community, or further widen the distance between the haves and have-nots.

For communities to really make the technologies and applications work to aid the development of healthy and sustainable communities requires much more than *building bandwidth*. A truly smart community will need to develop comprehensive plans to address, in more depth, the issues surrounding access and education to ensure that all citizens have the opportunity to benefit from the knowledge-based “networked” economy. In an attempt to address the issues surrounding access, under the federal Smart Communities program, a community must demonstrate that it will offer services that are accessible to all of its citizens (i.e. it will address barriers related to language, culture, income, education and skills development, and disabilities).

Digital divide between have and have-not communities is also a concern. The intent of the federal program is to provide a powerful impetus to create Smart Communities across Canada. However, the government will only be providing financial support for 12 communities. Further, the criteria for selecting these 12 demonstration projects require

communities to already be sophisticated in their use of NICT. Only those communities that are well on their way to becoming “smart” are likely to be selected. The reality is that government cannot afford to provide funding to every community in Canada, raising important policy questions about the nature and impacts of this program and subsequent initiatives designed to foster local connectivity. For most cities and regions not included in the new federal framework, local resilience may be even more central - underscoring the importance of a collective approach rooted in the local ecology, but sensitive to global processes and the need to partner outwardly in an open world.

The challenges are evident across all three sectoral sub-processes in our ecological template. In the marketplace, new enterprise will require a global outlook by necessity, and NICT is a liberating force that unleashes greater potential for smaller companies, and individuals to co-exist with larger forms of multi-national structures. The ecology of social groups and civic associations must be open in a similar vein, particularly when NICT is again a powerful vehicle to allow for exchange and learning across localities, a process that the growing mobility of human capital is likely to intensify. In terms of the state, although a good deal of emphasis has been placed for strategic action locally, this bottom-up emphasis must be complemented by an equally-important discussion of the consequences of this shift for other levels of government – and their interactions. This latter point requires further elaboration.

The centralized mindset:

As the local level becomes the crucible where innovation occurs, what role, if any, does the federal government play in economic development? Clearly, top-down federal approaches to economic development are no longer feasible in an ever changing, dynamic global world, which requires a substantial degree of flexibility in order to constantly adapt.

The nature of competitiveness in the new economy has forced national governments around the world to rethink their roles in economic development. According to Stevens (1996) governments are responsible for providing the framework conditions for innovative collaborations, technology dissemination and development of information infrastructures – all crucial to performance in knowledge-based economies. The Canadian government's approach to growth and competitiveness has been to create the very framework conditions outlined here. The government, through partnerships with other levels of government, private and third sector organizations is engaged in the development of a national infrastructure of connectedness under the Connecting Canadians agenda.

The federal approach also claims to recognize the centrality of local, bottom-up strategies of economic development by fostering a national framework while promoting the design of local NICT strategies that address the particular needs of individual communities. The program is based on the concept that local leaders know far better than national officials how next-generation technologies can best be marshaled to a community's benefit.

Success is believed to occur when communities take the initiative – that is, they build the necessary partnerships, develop a vision and take control of the effort.

Yet, the federal government’s track record in this regard is not promising. The legacy of a strong central government runs deep in post-war Canada, and it is evident in the most recent regional development strategies deployed in Atlantic Canada – where many of the Smart Communities principles have been repackaged into an expanded initiative, differentiated by a wider and more explicit reach of the federal government into local processes. Specific examples may be justified as necessary in areas deemed less developed, but the countervailing danger is that the federal government will go beyond infrastructure and move into disguised, albeit digitally-based forms of industrial strategy.

Thus, a national dialogue must be forged on the premise that social learning is inherently a localized process that requires endogenous strategies for both competitiveness and cohesion. A useful role for the federal government is a limited one – providing the framework for connectedness and a wider deployment of NICT is a source of merit in the Smart Communities initiative that can quickly be quashed by over-arching federal, federal-provincial, and provincial mechanisms that add rigidities to the local ecology, reducing its resilience rather than improving it.

Conclusion

In the broadest sense, the main challenge facing Ottawa is to recognize the need for an expanded notion of convergence. In the marketplace, the term convergence has

been deployed to refer to the blurring lines between previously distinct forms of technology (such as telephone and cable). In the smart community context, however, convergence must be viewed as the need to rethink governance in view of a technological permeation of all forms of economic, political and social institutions – as well as their interdependence. Convergence can also be viewed as the need to foster local strategies that recognize the interdependency of Barnett’s questions. E-governance brings with it not only a convergence of technologies, but also a convergence of economic, social and political interests that may be better managed and deployed in an IT-enabled setting (seemingly the point of a smart community).

Government, in particular, must operate in a world of heightened complexity. Governments, companies and citizens will be able to meet the challenges of a global economy alone. Collaboration between all sectors and members of society will be the key to success. For truly effective local governance, today and in the future, it is essential that government and politicians not only govern effectively, efficiently and economically, but that they also engage citizens in open and participative information sharing and decision-making. Engaging citizens contributes not only to better decisions but also to the greater vitality of both municipal governments and communities. Clusters and communities must become inter-linked, and they must be viewed and nurtured as interdependent components of a local ecology where interest converge as communities grow, Such is the hope provided by the vision of a *Smart Community*.

Thus, a truly smart community will need to develop comprehensive plans to address, in more depth, the issues surrounding access and education to ensure that all citizens and all organizations converge on the opportunities to benefit from the knowledge-based economy. Smart communities will need to move beyond the focus on economic development and develop a coherent and compelling vision that makes it clear how the new information networks are going to promote deeper engagement across local governance.

The reality, at least presently is more cautious. While there is little doubt about the growing importance of the local nexus of governance and proximity, technology alone cannot transform how individuals and organizations behave, interact and promote their collective interests – in processes that are fundamentally different than what takes place presently. The social challenges presented by NICT are in some respects similar to the impacts of technology in the economic sphere. In the latter case, technologies improved efficiency as existing processes were handled with greater speed and less resources, but the spectacular creations and success stories have taken place when entrepreneurs blend apply technologies to fundamental reinventions of how we live. On the social side, the same crest has presented itself – as connectivity alone will not suffice. New mixes of technical connections and social creations will truly define the smart communities of tomorrow.

References:

Amin, A. and Thrift, N. eds, [1994] Globalization, Institutions, and Regional Development in Europe (London: Oxford University Press).

Bahrami and Evans [1996], "Flexible Re-cycling and High-Technology Entrepreneurship" in Engineering Management Review V.24 No.2 (summer issue) pp. 243-368.

Barnet, R. [1997] "Subsidiarity, Enabling Government and Local Governance" in Hobson, H.R. and St-Hilaire, F. eds. urban governance and finance: a question of who does what (Montreal: IRPP) pp.62-79.

Best, M. [1990] The New Competition - Institutions of Industrial Restructuring (Boston: Harvard University Press).

Capello, R. [1999] "Spatial Transfer of Knowledge in High-Technology Milieux: Learning Versus Collective Learning Processes" Regional Studies, V.33, No.4 pp. 353-366.

Castells, M. and Hall, P. [1993] Technopoles of the World: The Making of 21st Century Industrial Complexes (New York: Routledge).

Caves, R.W., and Walshok, M.G. [1999] "Adopting innovations in information technology - The California municipal experience" CITIES (Special Issue: Cities and Telecommunications in The Global Information Age) V.16 No.1 pp.3-12.

Cohen, J. and Rogers, J. eds. [1995] Associations and Democracy, Real Utopias Project V.1 (New York: Verso).

de la Mothe, J. and Paquet, G. [1998] Local and Regional Systems of Innovation (London: Kluwer Academic Publishers).

Florida, R.[1995] "Toward The Learning Region" Futures 27,5 (pp.527-536).

Fukuyama, F.[1995] Trust: The Social Virtues and The Creation of Prosperity (New York: The Free Press).

Heeks, R. ed. [1997] Reinventing Government in the Information Age. (Routledge).

Henton, D., Melville, J. and Walesh, K. [1997] Grassroots Leaders for A New Economy (San Francisco: Jossey-Bass Publishers).

Hudson, C. [1995] "Does the Local Context Matter? The Extent of Local Government Involvement in Economic Development in Sweden and Britain" in Urban Policy Challenges (Boulder: Westview Press).

Jacobs, J. [1961] The Death and Life of Great American Cities (New York: Vintage).

Jacobs, J. [2000] Nature of Economies (New York: Modern Library).

Jessop, B. [1993] "Toward A Schumpeterian Workforce State? Preliminary Remarks on Post-Fordist Political Economy", Studies in Political Economy 40 pp. 7-39 (Ottawa: Carleton University).

Keeble, D. and Wilkinson, F. [1999] "Collective Learning and Knowledge Development in the Evolution of Regional Clusters of High-Technology SMEs in Europe" Regional Studies, V.33, No.4 pp. 295-304.

Lawson, C. and Lorenz, E. [1999] "Collective Learning, Tacit Knowledge and Regional Innovation Capacity" Regional Studies, V.33, No.4 pp. 305-318.

Leadbeater, C. [1999] Living on Thin Air: The New Economy. (London: Viking).

Levy, P. [1994] L'intelligence collective (Paris: La Découverte).

Moore, J.F. [1996] The Death of Competition - Leadership and Strategy in The Age of Business Ecosystems (New York: HarperCollins).

Moss Kanter, R. [1995] World Class - Thriving Locally in The Global Economy (New York: Simon and Schuster, 1995).

Naisbitt, J. [1994] Global Paradox (New York: William Morrow and Company).

Newman, P. and Verpraet, G. [1999] "The Impacts of Partnerships on Urban Governance" Regional Studies, V.33, No.5 pp. 487-492.

Paquet, G.[1997] "States, Communities and Markets: The Distributed Governance Scenario" in Courchene, T. J. ed., The Nation-State in a Global Information Era: Policy Challenges The Bell Canada Papers in Economics and Public Policy, 5, (Kingston: John Deutsch Institute for the Study of Economic Policy) pp.25-46.

Roy, J. [1998] "Canada's Technology Triangle" in de la Mothe, J. and Paquet, G. [1998] Local and Regional Systems of Innovation (London: Kluwer Academic Publishers) pp.239-256.

Saxenian, A. [1994] Regional Advantage: Culture and Competition in Silicon Valley and Route 128, (Cambridge: Harvard University Press).

Scott, A.J. [1994] Technopolis (Los Angeles: University of California Press).

Scott, A.J., Agnew, J., Soja, E., and Storper, M. [1999] "Global City-Regions"(Conference theme paper, *Global City-Regions Conference*, UCLA School of Public Policy, www.spsr.ucla.edu/globalcityregions).

Stoker, G. [1996] "Redefining Local Democracy" in Pratchett, L. and Wilson, D. eds., Local Democracy and Local Government (London: MacMillan Press).

Stoker, G. [1998] "Private-Public Partnerships and Urban Governance" in Pierre, J. [1998] ed. Partnerships in Urban Governance - European and American Perspectives (London: MacMillan Press Ltd.) pp.34-51.

Storper, M. [1997] The Regional World: Territorial Development in a Global Economy (New York: Guilford Press).

Sveiby, K.E. [1997] The New Organizational Wealth (Managing and Measuring Knowledge-Based Assets) (San Francisco: Berrandt-Koehler Publishers Inc.).

Tapscott, D. and Agnew, D. [1999] "Governance in the Digital Economy" Finance and Development December 1999, pp. 84-87.

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