Sustainability, Social Capital and the Canadian ICT Sector*

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The Sustainability of Canadian Business in the New Economy: 'Sustainable Canada'

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Abstract

In this paper we explore the possibilities of information and communication technology (ICT) companies[1] creating economic, social and ecological value – primarily with reference to two theoretical constructs: sustainability and social capital. We take a global overview and provide commentary on private and public sector applications of digital technologies around the world. We develop a Canadian perspective on sustainability, social capital and the ICT sector and we report on preliminary research with the sector undertaken for the *Sustainable Canada* project. We observe that at the present time Canadian ICT companies do not see the issue of sustainability as a defining characteristic of their identities or of their business strategies. However, there is a good understanding of the importance of practical commitments to environmental and social good practice and there is potential for ICT companies based in Canada to enter into strategic partnerships with government and civil society organizations in order to help address a range of social and ecological issues in Canada and internationally. We suggest that pursuit of 'made in Canada' initiatives in sustainable development may enhance social capital in the ICT sector which may in turn improve the reputation and competitiveness of Canadian ICT firms.

Introduction

In his somewhat whimsical assessment of the way the 'new economy[2]' is emerging, former US labour secretary Robert Reich observes: "It's as if all sellers of all products and services have suddenly been placed next to one another in a global bazaar in which all prices, and all information about quality, was immediately apparent to all buyers" (Reich, 2001). Like Adams (1997), Hardy (1998), Putnam (2000) and numerous other popular commentators on the nature of life, work and society in the new economy, Reich is unconvinced that the human values guiding economic globalization are wholly benevolent. Indeed, he suggests a number of public policy interventions that might ameliorate the negative social impacts of the new economy.

These socio-economic and spiritual musings have been accompanied by a growing amount of commentary examining specific societal and ecological implications of new economy phenomena such as biotechnology, e-commerce and the use of the internet by businesses, governments, and communities. The one clear conclusion from all of this commentary is that the advent of the 'new economy' represents a paradigm shift - with all of the potential for positive and negative phenomena, contrasts and paradoxes such dramatic change entails. At the heart of the change is the digital technology revolution and the growing importance of the ICT sector.

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[1] In 1998, the OECD countries developed an industry-based definition of the Information and Communications Technologies (ICT) sector using the International Standard Industrial Classification (ISIC). According to this standard, the ICT sector has been defined as a combination of manufacturing and services industries, which capture, transmit and display, by electronic means, data and information. As a result of the OECD definition, the Canadian information and communications technologies sector (ICT) is defined as comprised of ICT manufacturing firms such as computer equipment, communications, wire and cable producers, and ICT intangible and goods related services including software and computer and telecommunications programs.

[2] In this paper we define the 'new economy' in the broadest sense, to reflect the importance of leveraging new competencies, knowledge and technology (including information and communication technologies), in order to sustain competitiveness and business success in the global economy. In this context we assert the links between concepts of sustainability, corporate social responsibility, business strategy and the abilities of digitally-based firms to create economic, social and environmental value for stakeholders in the long term. Part of this value creation may enable the bridging of the so-called 'digital divide'.

Clearly, the information and communication technology sector (ICT) has the *potential* to play a central role in creating a global new economy that is more ecologically sustainable and socially inclusive than the former 'industrial economy' (Post, 2000; Park & Roome, 2002; Smith, 2002).

The industry's proponents argue that their technology and services can help improve economic efficiency and social inclusion across a range of other economic sectors (European Information Technology Observatory, 2002). The ICT sector can help decouple economic development and progress from resource use, thereby improving living standards, quality of life and reducing environmental impacts e.g. climate change, simultaneously. ICT companies can also facilitate the inclusion of a far broader spectrum of the world's population in directing and enjoying the benefits of these possibilities (Sheats, 2000 & 2001).

In the environmental domain, ICT companies can foster sustainable development by enabling better resource and energy use and by dematerializing business transactions. It is argued that through miniaturization ICTs create the same or better technologies with fewer resources. And as technologies move toward wireless infrastructure, environmental impacts of ICTs could be reduced even further (World Resources Institute *et al*, 2002). Because of their demands for ultra-reliable electricity, they may help usher in a revolution in the need for and possibilities of distributed energy generation and 'micro power' (Dunn, 2000). Industries will adopt these technologies not only because they are more eco-efficient but because they will be necessary for creating and maintaining competitive advantage. Thus, it is asserted that the advent of ICTs may be a significant contributor to the arrest of climate change. It has been estimated that the potential in-built contribution to reducing the energy intensity of the US economy as a direct result of the greater efficiencies of e-commerce may be as high as 2% per annum (Romm *et al*, 1999). Finally, the industry itself is becoming more energy efficient. According to a recent report of the Global e-Sustainability Initiative (GESI, 2002), signatories to the Environment Charter of the European Telecommunications Network Operators Association (ETNO) decreased energy consumption by 21% and fuel consumption by 26% between 1997 and 1999.

In the social domain, the new information and communication technologies can improve social and economic conditions by facilitating coordination and cohesion in communities; by reducing the impact of geography on access information and services related to health, education and therefore competitiveness in the knowledge-based new economy; and finally, by enabling business, government and other interest groups to more easily include their stakeholders in decision-making, regardless of location. The new technologies are generally cheaper and more decentralized than prior technologies and in theory, therefore, more people have the potential to access them and to do so locally. This could have significant benefits for democratic and civil society. Wheeler and Elkington (2001) have described the potential benefits of real-time communication of environmental and social information by business. And the World Resources Institute (2002) has drawn attention to the implications for corporate accountability of technologies such as real time video streaming of corporate abuse over the internet. Kevin Hill and John Hughes (1998) have described the use of the internet by radical activist groups opposed to consumerism and economic globalization. The potential for maximizing the positive social and political impact of grass roots movements is very broad: ranging from humanitarian campaigns such as the banning of land mines, to the growth in influence of the Zapatistas in Mexico. According to the University of Texas (2002) "The international circulation through the

Net of the struggles of the Zapatistas in Chiapas, Mexico has become one of the most successful examples of the use of computer communications by grassroots social movements." In contrast, the fears of early 1990s commentators (e.g. Reich, 1992 and Rifkin, 1995) about the possibilities for massive social exclusion and dislocation or redundancy of entire workforces caused by the advent of the digital revolution have not materialized.

However, adoption of new technologies does not come without some risks and dilemmas – both for business and for society. Canadian commentator Don Tapscott has described the "promise and perils" of the digital revolution for business and the profound catalytic effect of information and communications technologies in helping establish and develop 'business webs' – inter-dependent networks of companies which leverage knowledge and creativity for commercial purposes (Tapscott *et al*, 1999). These developments significantly increase both the strategic opportunities and the competitive pressures on business. Gerry McGovern (1999) has laid out a blueprint for business in helping humanize the digital age. McGovern stressed the importance of basic principles such as customer care and ethical behaviour in business. However, like Robert Reich (2001), McGovern notes the failure of the emergence of information and communication technologies to create a better work-life balance for ordinary workers

The creation of these technologies themselves consumes resources and produces waste, some of it hazardous to human health. The problems of industrial clean up in Silicon Valley have been well documented (Silicon Valley Environmental Partnership, 1999; USEPA, 2002). There is an equally important and well documented concern about the potential for creating a "digital divide", i.e. fostering productivity growth in the developed world which is so dramatic that the gap between developed and less developed countries widens substantially and potentially becomes so wide that it becomes virtually impossible to bridge (International Labour Organisation, 2001; Smith, 2002). Anti-globalization groups have flagged concerns regarding cultural imperialism and homogenization as technologies spread culture from developed (and digitally advantaged) countries to less developed countries. Finally, some social capital theorists such as Putnam (1995; 2000) raise the concern that increased digital interaction may result in reduced face to face contact in local communities eroding existing "real" social capital for less sustainable digitally-based social capital.

In order to explore these contrasting possibilities in greater depth and to help us develop a theoretical basis for discussing the future potential for ICTs creating ecological and social value internationally and in Canada, we will now discuss in greater detail some of the phenomena associated with ICTs and their role in society.

Cases from the Present and Visions for the Future

Two leading think tanks have released reports on the potential and the limitations of digital technologies for promoting sustainability in the global economy: the World Resources Institute (2001) and the UK Forum for the Future (Wilsdon, 2001a & 2001b). More recently, Craig Warren Smith has published his research on Digital Corporate Citizenship, tracking how approximately sixty companies responsible for 70 per cent of global market share in ICTs are addressing their societal responsibilities (Smith, 2002).

On the more optimistic side of the equation, the World Resources Institute helped co-ordinate a special supplement for *BusinessWeek* (18th December 2000) describing the outcomes of a landmark conference on the *Digital Dividend* held in Seattle in October 2000. The conference was attended by 300 leaders of the digital industries and included contributions from Hewlett-Packard Chair and Chief Executive Officer Carly Fiorina and Bill Gates of Microsoft. The supplement, like the conference, was packed with good news stories and rousing rhetoric from leading business people, academics and political figures.

Accentuating the Positive

The positive potential for the digital industries was captured in Carly Fiorina's speech to the *Digital Dividend* conference: "We are now at the beginning of a second renaissance, the digital renaissance. Invention is once again the prime virtue. But this time the tools for invention can be extended to every corner of the earth". These sentiments were echoed and given an environmentally positive spin by Amazon.com founder Jeff Bezos and Stephan Schmidheiny – founder of the Business Council for Sustainable Development. Schmidheiny said: "The Internet is the best tool we have had for creating wealth and redistributing the opportunities to create it since the steam engine – wealth created not from our diminishing supplies of raw materials and natural resources but from our limitless resources of creativity, intelligence and information" (World Resources Institute, 2001).

Companies like HP (through their multi-million dollar *World e-Inclusion* project), AT and T (with their schools *Learning Network* – an internal 'joint venture' between their marketing and philanthropy departments), and Real Networks (with 5% of pre-tax profit committed to "progressive social impacts of digital technologies") seem very serious about backing strategic leadership rhetoric with real implementation. Whilst noting that the scale of some of these initiatives may be adjusted subject to business conditions, Smith (2002) refers to these big ticket programs as "signature initiatives", describing them as transcending both conventional philanthropy *and* conventional business practice.

According to Smith approximately half of the world's leading ICT companies have such initiatives which are typically multi-year, multi-million dollar programs. The initiatives often serve to unite employee interests and commitment with strategic corporate objectives despite the rapidly changing nature and structure of the ICT sector. At the heart of the strategic value proposition to ICT businesses is the shift from direct marketing to relationship and 'affinity' marketing in order to secure customer loyalty (Hegel & Armstrong, 1997; Reichheld & Schefter 2000). In the case of HP this extends both to the developed and the developing world, for example with their Lincos project aimed at digitally empowering Little Intelligent Communities. They are not alone. The WRI Digital Dividend web-site (www.digitaldividend.org) describes numerous initiatives relating to the potential for digital technologies to empower communities and businesses in developing countries.

For example, since 1997 Grameen Phone has provided a cellular service in rural Bangladesh through local entrepreneurs generating revenues of $1200 per annum per cell phone and maintaining average customer bases of 70 persons. These customers use cell phones to optimize prices for their goods by selecting the best local markets for their produce before they travel to

them. In India, TARAhaat seeks to create an on-line bazaar for communities which embrace needs as diverse as farm technology, refrigeration and bicycles while creating potential export outlets for artisans and handicraft workers. Viatru is a 'fair trade' exchange with similar ambitions with respect to providing access to international retail markets for artisans in the developing world. Leading US business academics C K Prahalad and Stuart Hart (Prahalad & Hart, 2002; Prahalad and Hammond, 2002) have developed interesting theories about the potential for marketing sustainable technologies to the world's poor based on an analysis of the unmet needs of the 4 billion people on the globe who live on less than $1000 per annum (the 'base of the pyramid'). Prahalad challenged the Digital Dividend conference in Seattle thus: "Don't look at the poor and say there is no hope. Selling to the poor may be more profitable than selling to you and me. This is where the future is. Opportunities are everywhere. The [digital divide] is not about lack of opportunity: it is about lack of imagination".

In our own research for this paper, we have uncovered a number of especially interesting examples of what we might describe as cases demonstrating simultaneous economic, social and ecological gain or 'triple bottom line' thinking. In some cases they represent novel applications of the digital technologies to generate economic, social and ecological value and in others they represent particular initiatives by ICT companies. One example of the former is GreaterGood.com which is described in the following case by way of illustration (Case 1).

Case 1: Cause-related e-commerce from GreaterGood.com

GreaterGood.com is based in Seattle, Washington and is a privately held, for-profit company, which owns and operates several 'click-to-donate' sites, including:

> The Hunger Site - the world's first "click-to-donate" site where over 95 million visitors donated nearly 10,000 metric tons of free food to help feed the hungry during 2000.
>
> The Rainforest Site - founded May 1, 2000 to help protect our environment. 15 million donations preserved over 1,900 acres of the world's rainforest in 2000.
>
> The Kids AIDS Site - founded 18 September 2000 to help provide HIV care, education and counselling to pregnant women and mothers with newborns. During 2000, there were nearly 6 million donations leading to the provision of 827 care days.
>
> The Child Survival Site - where 3.5 million donations during 2000 provided 270,000 capsules to support global supplement programs providing vitamin A to children every four to six months through preschool age.
>
> The Breast Cancer Site - where 4.7 million donations facilitated 440 mammography screenings for underprivileged women who otherwise wouldn't receive the gift of early breast cancer detection during 2000.

These sites allow visitors to participate in worldwide efforts to end hunger, preserve endangered habitat, prevent and treat paediatric AIDS, increase the life expectancy of impoverished mothers and children, promote early detection of breast cancer and assist landmine victims to recover, heal and reclaim their lives - at no extra cost to them. Advertising sponsors pay for the donations generated by clicking on the sites' "donate" buttons. Additionally, GreaterGood.com operates the leading cause-related shopping portal (www.greatergood.com), where up to 15% of each purchase automatically benefits the charity, K-12 school or university scholarship fund of the shopper's choice. GreaterGood.com works with more than 3,500 not-for-profit organizations including: The Humane Society, The Nature Conservancy, Save The Children, the Special Olympics and over 100 brand-name retailers, including: Amazon.com, L.L. Bean, Lands' End, Nordstrom, Dell, and Office Max.

Another example of ICTs facilitating social, environmental and economic gain through pure application of the technology is the potential for on-line filings of government-required information over the internet. In some cases this has been further facilitated by governments and software companies helping bridge the digital divide for low income families and in others banks have used software for on-line filing as a marketing incentive. Well designed e-Government initiatives can reduce resource use (paper, postage and travel to government offices), increase social inclusion, and save money – both for users and government (see Case 2 below).

Case 2: Governments Going On-Line

In March 2001 the US Internal Revenue Service (IRS) claimed that 35.4 million Americans filed their federal income tax returns over the Internet in 2000. The figure for 2001 was 40.25 million of whom more than 6 million filed on-line from their home PCs (www.irs.gov). In support of this, and in an effort to help bridge the digital divide, software manufacturers and financial services companies have introduced low cost or free options for online filing for low income families. Intuit's Quicken Tax Freedom Program allows families with adjusted gross incomes of under $US 25,000 to file their tax returns by computer for free. Companies such as WingSpanBank.com offer their customers free online access to tax filing software as a bonus for depositing money with the bank. The IRS itself sponsors a free online-filing service for low-to-moderate income families, non-English speakers, and the elderly. The benefits to the IRS and the users of the systems include faster processing and significantly lower rates of error. From an environmental perspective, less paper is expended (Nandotimes, 2001).

According to Cathilea Robinett, executive director of the California based Center for Digital Government: "The cost and time savings that online transactions offer make it a win-win situation for government agencies and citizens" (Atlantic Canada On Line, 2001). According to the same article "the state of Georgia estimates that it has saved in excess of $1 million by putting nearly 30 forms online, including those for corporation filing fees, state college tuition payments, and hunting and fishing licenses". Analysts in Canada have estimated annual savings of up to 20% to the Canadian Government of adopting a similar strategy (Tuck, 2001).

A number of 'triple bottom line' signature initiatives by mainstream ICT companies were listed in the *BusinessWeek* supplement noted above and described at the World Resources Institute Digital Dividend conference (WRI, 2001). As described above, they included significant initiatives by Hewlett-Packard, Real Networks and others. We have selected just one example of a mainstream ICT business to profile – 3Com, a company which has exhibited triple bottom line thinking both in its mainstream business and in its signature initiatives.

Case 3: Stakeholder engagement and triple bottom line thinking at 3Com

In the early 1990s, 3Com found themselves with decreasing availability of chlorinated solvents for cleaning their printed circuit boards. With President Bush accelerating the Clean Air Act Amendments of 1990, like many of their competitors, 3Com began looking for alternative cleaning processes. 3Com pioneered the implementation of a chlorofluorocarbon (CFC)-free semi-aqueous cleaning process. As a result, in 1992 CEO Eric Benhamou won the President's Environment and Conservation Challenge. Thus began 3Com's leadership in matters of corporate social responsibility with many innovative initiatives that became the cornerstone of their growth that led them to report revenues of $1.5 billion in 1999.

There is no doubt that 3Com is a company with a proven track record of being innovative in addressing social, economic and environmental issues. In 2000, 3Com announced a Digital Divide initiative: a one million-dollar grant to 10 major cities in the United States to help low-income families gain access to the Internet. By 2002, the Urban Challenge Grants totaled $4 million with $100,000 available in 3Com systems and services across 40 US cities. Even more innovatively, in late 2000, 3Com launched Planet Project - a web-based global poll to gather information on "what it is like to be human at the beginning of the century". One of the most interesting parts of the poll was that 3Com took full account of the digital divide and addressed social and cultural diversity issues by dispersing thousands of people across the globe to gather results even in areas not served by Internet access. 1.2 million people from more than 250 countries took the poll. The political section of the poll received nearly 25,000 responses - 19,000 from the United States. The largest number of responses from outside the US were: Canada, Australia, Mexico, the United Kingdom, Norway, Germany, Brazil, Chile, Spain, Argentina, Colombia, Denmark, France and Italy (www.3com.com).

What the 'digital dividend' commentary and the above three cases allow us to observe is:

i) There are new possibilities to create social, ecological and economic gain through application of ICTs that simply would not have been possible prior to the advent of the technologies; we might describe examples such as GreaterGood.com and e-government initiatives as 'pure play' triple bottom line propositions. And:

ii) There are ways in which mainstream ICT firms can create social, ecological and economic gain through ***both*** business practices and 'digital divide' signature initiatives. We might describe examples such as 3Com as 'walking the talk' business propositions – uniting technical innovation and good compliance practices to improve social and environmental performance of the business itself (internally) whilst also embracing triple bottom line signature initiatives (externally).

We will now explore the shadow side of ICTs for social, ecological ad economic value propositions.

Reflecting on the Negative

Notwithstanding the positive possibilities described above, there are no guarantees that companies employing digital technologies will *a priori* fully bridge the digital divide and create sustainable value for all stakeholders. Hardware companies had a difficult time in 2001 and 2002. Software firms and those totally dependent on digitally-based products e.g. in entertainment and 'business to consumer' (b to c) e-commerce often do not make profits. And on the evidence of the NASDAQ high technology stock price index during 2001 and 2002, and the swinging job cuts announced by many of the industry's best names during those two years, few wholly digitally-based companies added either economic value for their investors or social value for their (ex) employees in that period. If this situation continues, there must be some doubt whether even the most socially and environmentally benevolent digital industries can be sustained. So the question remains: just what is (or what might be) a sustainable ICT enterprise?

The case described below illustrates that even the best funded companies in the e-commerce world may struggle to achieve economic sustainability. Moreover they may also fail the test of environmental and social gain hitherto assumed by some commentators.

Case 4: Home deliveries or a trip to the local grocer?

Webvan is one high profile business-to-consumer enterprise that has been examined with respect to its environmental, social and economic performance (Walton & Galea, 2002). Webvan is an on-line Californian grocery operation supplying home deliveries to 9 cities and more than half a million customers with an average transaction value of more than $US 100. Webvan received more than $ 1 billion in venture capital funding. The conclusions of the Webvan study were not encouraging from a sustainability perspective. Despite obtaining record-breaking levels of venture capital funding, by March 2001 Webvan's losses were running at an annualized rate of $US 284 million and the company's share price was just 12.5 cents – down from $ 25 at IPO in November 1999. The company needed to increase daily orders by almost 50% to break even.

In contrast to the cited assertions of organizations like the World Resources Institute, Walton and Galea are skeptical that the home delivery of groceries will generate significant social or environmental value. They point to negative environmental impacts such as excess packaging, land use, and significantly lower transportation efficiency (based on a notional 10,000 home customer base and round-trip radii of 5 and 60 miles for conventional versus Webvan deliveries). Social impacts might be more mixed with enhanced free time for the wealthy being counter-balanced by negative community impacts and other social exclusion factors. The authors of the study noted that Webvan would be out of business before the end of 2001, a prediction which sadly proved to be true.

Similarly, in equally pessimistic vein, UK think tank Forum for the Future released a report in January 2001 entitled *Digital Futures: dot-com ethics, business and sustainability* which concluded that in general "e-business has failed to grapple with sustainability" (Wilsdon, 2001a). The Forum for the Future report related the apocryphal tale of the negative environmental impacts of the launch of the third Harry Potter novel by Amazon.com in the US and bemoaned the apparent lack of understanding of sustainability concepts by many in the ICT sector who appear to be unaware of the environmental and social impacts of their industry.

Ironically, perhaps the most controversial social phenomenon associated with the internet is probably its most reliable 'b to c' commercial product: pornography. Whether this phenomenon is a social good or ill is not the point at issue here. However, there is a shadow side to the phenomenon (and the technology itself) that even the most liberal commentator would not seek to defend: illegal pornography, most specifically the trade in child pornography. Our fifth case explores the issue and the legal and voluntary options which are available to governments, judicial authorities and industry with respect to this troubling issue (see Case 5, below).

Case 5: Successful e-commerce with a social cost

Given the undoubted potential of the internet to provide social benefit it is a major disappointment that the most successful commercial activity on the medium to date is pornography. Legal online pornography is the first consistently successful e-commerce product with earnings estimated at $US 1 billion a year (C-net, 1999). But of significantly more concern to the majority of citizens than soft porn is that part of the industry which is beyond the law in most jurisdictions and which carries a distressing social cost: the manufacture and internet trade in child pornography.

In March 2001, the Canadian Government announced that it planned to introduce some of the world's toughest legislation to combat child pornography on the Internet. The new bill, which received royal assent in June 2002, makes it a crime not only to produce or transmit indecent images of children, but also to access them (http://canada.gc.ca). It was already illegal in Canada, as well as in the United States and many other countries, to possess child pornography by downloading it off the internet but the Canadian legislation is believed to go further than any other by outlawing the very act of viewing child pornography. Prosecutions for transmitting and accessing child pornography will incur prison terms of up to ten years. The bill also allows prosecutions in Canada for offences committed abroad.

A complementary approach to the problem is that advocated by the UK industry-funded body, The Internet Watch Foundation (IWF) which was launched in 1996 by PIPEX founder Peter Dawe to address the problem of illegal material on the Internet, with particular reference to child pornography. The IWF receives funding from the European Union and organisations represented on the IWF Funding Council include, AoL, BT, Cable & Wireless, Energis, Microsoft, NTL, 02 and Yahoo! (www.iwf.org.uk).

These cases allow us to observe the following:

i) 'Pure play' value propositions i.e. those wholly enabled by ICTs (e.g. business to consumer e-commerce) may fail to realise promised social, ecological or economic gains; indeed may actually cause significant damage in one or more dimensions, child pornography being one of the starkest examples. And:

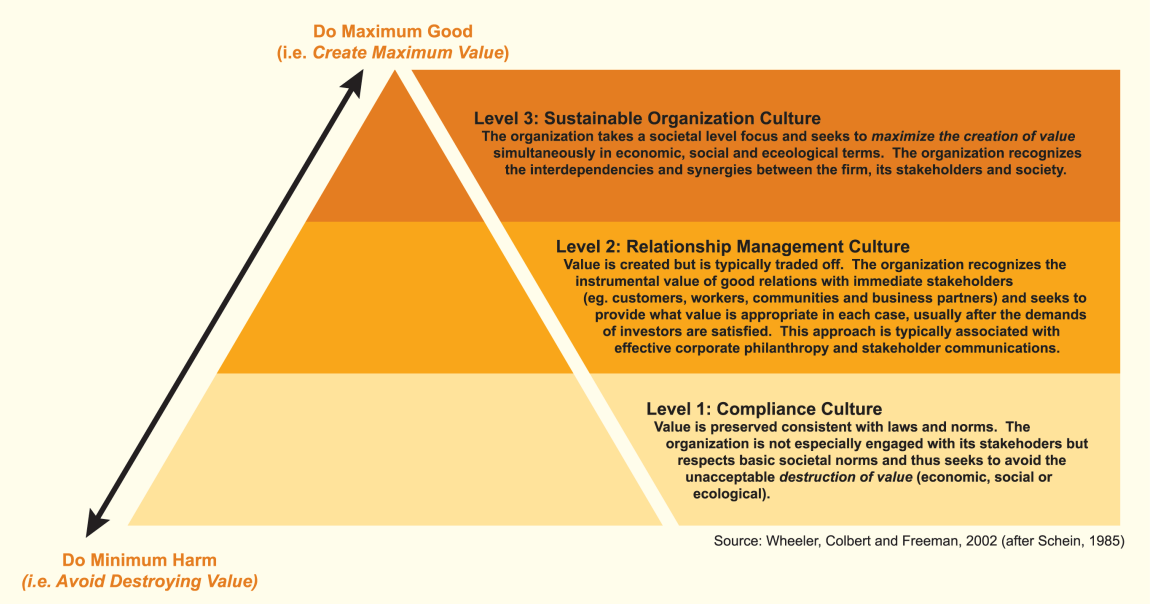
ii) Based on the commentary of some critics, 'walking the talk' business propositions i.e. those embracing both internal and external 'triple bottom line' practices may not be the universal norm in the ICT industry.

Sustainability, Social Capital and the ICT Sector

There is a consensus among large firms who are members of the World Business Council on Sustainable Development that 'corporate responsibility' should be defined in three dimensions: the financial, the social and the environmental (WBCSD, 2001). This is consistent with Elkington's (1998) thinking on the 'triple bottom line' which calls for firms to achieve balanced progress on economic development, environmental quality and social justice (or equity). Of these, it is probably the social dimension that is the least developed in terms of corporate strategy and practice (Watts and Holme, 1998). And it is principally in the social dimension that problems of the digital divide reside. If we unwrap the social dimension a little, we discover that it is possible to construct models and frameworks that may help categorize and explore companies' attitudes towards society and the broader concept of sustainability.

Wheeler *et al* offer a model for categorizing corporate culture with respect to orientation to stakeholders in service of economic, social and ecological value. The three cultures described are: i) compliance; ii) relationship management; and iii) sustainable organization. This model may be helpful in our exploration of the role of ICTs in society in that it spans the breadth of philosophical debate around the purpose of business and reflects the two most oft-posited assertions for corporate responsibility: 'do no harm' and 'do maximum good'. The model simply restates these two assertions in the three dimensions of sustainability and places them in Level 1 and Level 3 respectively, with an intermediate level (Level 2) as an interface.

Figure 1: Framework for classifying organizational cultures with respect to the creation and distribution of value: economic, social (stakeholder) and ecological



The model implies that highest order sustainability transcends compliance and or 'relationship management'- phenomena typically associated with conventional approaches to business and corporate citizenship. It also describes organizational culture (beliefs, mindsets and behaviours) and the creation of value for stakeholders (economic, social and ecological). It therefore overlaps significantly with the associated construct of social capital – a term that also deals with stakeholder value linked to structures, relationships and beliefs.

The concept of social capital has gained significant attention from theorists and practitioners across the social sciences. Social capital as defined in this paper refers to the contributions that aspects of social structures and relationships can make to the creation of valued outcomes. Putnam (1993; 1995; & 2000), one of the modern founders of the term, refers to social capital as "networks, norms and social trust that facilitate coordination and cooperation for mutual gain". This paper expands on that definition by including individual gains in addition to mutual gain, but highlighting that *sustainable* individual gains are created through win-win strategies that meet the needs of all stakeholders in the long term.

Networks or interaction patterns that develop among people over time allow connections to be made and bridges to be built among previously unconnected people. These bridges or connections can enable access to and mobilization of resources for individual or mutual benefit. In addition to structural properties of interaction, relational and affective qualities such as trust and reciprocity can facilitate the creation of value by improving willingness to undertake transactions and mutual action. Social capital also refers to the shared mindsets or acquisition of mutual understanding that exists among people and helps to produce value by enabling people to act and reducing time spent on clarifying interests or preferences. Nahapiet and Ghoshal (1998) proposed three dimensions of social capital: structural, relational and cognitive that capture each of these forms of social capital.

Economic approaches to production focus on use of physical resources, labour and value creation that emphasize short term gains for individuals. This paper argues that sustainable development is an inclusive concept that draws on multiple forms of resources, including social and human capital, and emphasizes broad-based value creation in the long term.

Economic theories focus on efficiency and productivity. Social capital theory draws attention to the role that social structures and relations play as facilitators of both. Physical resources are transformed into outputs through labour, i.e. people, and therefore social capital plays a role in all economic activities. Social structures and the quality of relations or culture can either facilitate or undermine the production process. Economic activity is inherently social, therefore, creating a social context that facilitates production is a core activity for all successful managers.

Burt (1997), an influential social capital theorist in the organizational context, has defined social capital in terms of creating bridges across the structural holes in networks. In other words, individuals can connect one person who needs a resource to another who can supply it. In this way production is facilitated in obvious ways by eliminating impediments to production or by facilitating entrepreneurial activity.

Many other social capital theorists Adler and Kwon, 2002 for a valuable review) have demonstrated how qualitative aspects of social relations, e.g. levels of trust or friendship, help to motivate people and mobilize resources. A social structure with well-developed networks may have little impact if participants are not willing to engage or share their information, knowledge and resources in the production process.

More broadly speaking, at the level of communities and nations, social capital is a competitive advantage or disadvantage. As Putnam, (2000), Fukuyama (1995) and Woolcock (2000) have argued, economic development is significantly affected by extent of interaction among citizens and levels of societal trust that exist. Therefore, effective social and international development spending should be viewed as investments in sustainable economic development rather than costs that detract from economic profits.

Social capital therefore, is potentially a critical component to both explaining *and achieving* sustainable development. Social capital theories require us to include social resources and impacts in our conceptions of production drawing attention to the need to create broad-based value for both the focal organization as well as its stakeholders. Inevitably, social capital propels us to view economic growth as integrally connected to the social context of the people that participate in and are affected by it. And because of the highly networked and relationship-dependent nature of the sector, there can be few industries of greater interest to social capital and thus sustainable development theorists than those that are reliant on ICTs.

We now turn to our preliminary research on Canadian ICT organizations ad their attitudes to sustainability and social capital.

Sustainability, Social Capital and the Canadian ICT Sector

The ICT Sector

Despite the dramatic downturn of 2001 and 2002, the Canadian Information and Communication Technologies sector still represents approximately 6% of the Canadian economy. Until recently the sector was one of the fastest growing sectors in the economy. However, between its peak in the third quarter of 2000 and the end of 2002, the ICT manufacturing industries lost more than 40% of their output. Nevertheless, ICT service industries continued to grow - albeit less quickly. The sector is made up of a diverse range or organizations in the telecommunications, cable and information technology manufacturing and service firms (ITAC, 2002; Industry Canada, 2002a).

Globally, the ICT sector is dominated by large international firms with many international subsidiaries and a few high profile firms focusing on domestic markets. This structure poses special challenges for a smaller and more dependent economy such as Canada which has traditionally been dominated by the US in technology-based industries. The pace of change in the last ten years has also meant that large incumbent US companies have tended to dominate developments more effectively through their ability to drive mergers, acquisitions and divestments.

Notwithstanding the dominance of US firms, the Government of Canada has recognised the importance of this sector to the overall competitiveness of the domestic economy and since the early 1990s has been investing in proliferation of information technologies both directly through research grants and tax credits, and indirectly through provision of necessary infrastructure to facilitate the emergence of and innovation among ICT companies (Industry Canada, 2002a).

Judging by recent performance statistics on growth, foreign direct investment and research and development, efforts aimed facilitating growth of the ICT sector have resulted in improved economic performance by the sector. In 2000, the sector generated $57.5 billion (6.1% to Canada's GDP, up from 3% in early 1990s). The sector has also been successful in terms of generating foreign direct investment: since the mid-1990s, ICT products have accounted, on average, for about 30 percent a year of total investment spending in Canada, raising the share of ICT in the capital stock to 4.5%. In 2001, R&D expenditures in the ICT sector were expected to reach $5.3 million, representing 45.8% of total Canadian private sector R&D. From 1990 to 1997, R&D expenditures in the ICT sector grew at a compound annual growth rate of 9.1 per cent, compared to 7.5 per cent in the total Canadian private sector, representing almost 42 per cent of total Canadian private sector R&D (ITAC, 2002).

These statistics, together with commentaries by Industry Canada (2002a), might be interpreted to mean that Canada's ICT sector is thriving. However, while in comparison with Canada's other knowledge-based and traditional manufacturing industries, the sector appears to be positioned strongly, its performance vis-à-vis US and European technology industries does not appear so robust.

Concerns about possible underperformance in the sector are not new (Himmelsbach, 1999). A comparative overview the Canadian ICT sector with respect to its international counterparts in the developed world, for example on the innovative capacity of ICT firms, their investments in R&D, and their overall trade position, reveals that Canada lags behind most G7 nations in almost all key measures (OECD, 2000). According to the OECD Information and Technology Outlook, Canada has historically bœn outperformed by other industrialized nations. In the period 1980-1997, Canada's value added to GDP averaged 2.9 compared with the US ICT sector's contribution of 4.4%. As a result, Canada has maintained a negative trade balance in ICT manufacturing and services trade, reaching 18% deficit in 1997 despite the fact that it exports more than three-quarters of its overall production. Canada's trade deficit in ICT products and services increased 67.7% from 1993 to 2000, currently standing at more than $20 billion.

The performance of the Canadian ICT sector is largely attributable to its small size when compared to other industrialized countries, its relative slowness in adopting new technologies, as well as its lower investment in innovation. These trends are also reflected in the positioning of individual firms within the Canadian ICT sector. There are now no Canadian firms among world's top 50 ICT companies

Sectoral Interviews

As part of the Sustainable Canada initiative (www.SustainableCanada.org) and in order to explore Canadian ICT sector attitudes to sustainability and questions of social capital, eight in-depth interviews were conducted. Interviewees for this exploratory study were drawn from a range of Canadian based ICT firms and organizations as well as independent consultants with substantial experience in the industry. The firms contacted to participate in the study comprised a mix of Canadian and non-Canadian companies: Bell Canada, Gennum, IBM, ITAC, Lucent Canada, Microsoft Canada, Nortel Networks and Telus. In addition, the industry association (ITAC) and two industry consultants were also contacted. The majority of interviewees were senior managers with extensive corporate experience in sustainability issues.

Results of Interviews: Possibilities For Sustainability-Focused Collaboration

Based on our interviews, sustainability is seen as a somewhat marginal rather than core issue for the sector. Responses to whether sustainability is a frame of reference in day-to-day operations were quite varied and on average suggested that it was not (with only small disagreement). On the other hand, most interviewees felt that it is important for their organization to be recognized as a leader in sustainability.

The ICT sector sees sustainability in two ways: internal to the industry and external. The Global e-Sustainability Initiative (GeSI, 2002) has released a report clarifying the role of ICTs in sustainability. Internally, issues focus on how the sector needs to deal with its own sustainability through reduction of waste and improved human development. On the other hand, the ICT sector views itself as an "enabler" of greater sustainability in other industries through the supply of technology that improves the efficiency of resource use, reduces the demand for travel and is helping to "de-materialize" the economy. On the social side, technology makes knowledge more widely available than it was. Overall, most insiders see ICT as a positive force for encouraging sustainability rather than as a contributor to environmental and social problems.

The Canadian ICT industry is divided between manufacturers and service/software providers. As a result, sustainability is viewed quite differently from these vantage points. Manufacturers need to be more concerned about environmental impact such as waste disposal and efficient use of resources, while the non-manufacturing side tends to view sustainability in terms of social issues.

Many organizations involved with manufacturing in the industry are beginning to recognize that there are environmental concerns related to hazardous waste and disposal of products. ITAC has identified waste and recycling as one of their three priorities for the immediate future. The association has convened a working group examining the issues with a view to developing a national voluntary program that would see the industry take responsibility for disposal of its products and preferably engage in recycling. The issue is extremely complex with a broad range of equipment involved and differing regulatory regimes in different provinces and municipalities

as well as potential issues regarding cross-border disposal. This effort is partially driven by proposed "product take back" legislation that has been tabled in Ontario and Manitoba and is being considered in British Columbia.

The Digital Divide was also identified as a sustainability issue but is not as broadly recognized. The Digital Divide is seen as a philanthropic issue to a large extent although, as the National Broadband Task Force notes (Industry Canada, 2002b), this issue could translate into increased demand in the industry.

With the downturn in the industry, it is widely agreed that organizations must focus on issues that will contribute to the economic bottom line in some way, e.g. reduce costs or increase demand. However, most interviewees felt the profile of sustainability is increasing in the industry and although legislation is not preferred, the sustainability-inspired proposals are putting pressure on the industry to examine the issue. Another potential driver of change comes internally, from employees, who for the most part are well educated, highly skilled and concerned about the ethical stance of the organizations they work for. A final incentive to move forward is the fact that Europe is perceived as being significantly ahead of Canada in making progress on these issues. Canada is seen as a leader in North America while the U.S. is behind in recognizing and dealing with sustainability issues.

While sustainability may not be top of priority lists, the industry has some potential advantages that could help them move forward on issues of sustainability. One is their core identity as innovative problem-solvers. This "can-do" attitude could be a significant asset. In addition, despite recent disruptions in the social structure of the industry, most still indicate that the industry works well together on matters of mutual interest.

The industry has substantial social capital. Members of the industry indicate that they interact frequently at associations, conferences and industry task forces. Many others report strong informal ties, particularly among those in similar functions. While responses regarding levels of trust were quite varied, most agreed that there was positive trust among members of the industry, particularly long-standing members. While there is quite a bit of variation in attitudes, many feel that the industry is a "tightly" knit community and report well-developed networks among organizations for coordinating activities. As a "networked" industry, agreeing on standards and coordinating activities is a core competence.

Some of the larger, more visible companies see license to operate (tier one in Figure 1) as an increasingly important issue and being seen as a leader on sustainability issues may be beneficial on this front. Despite these advantages, there is concern that an immediate "need for survival" may overshadow issues that cannot be linked directly to the bottom line in the short term. In addition, Canada is not seen as a leader internationally in the ICT sector where some European companies such as Ericcson as seen as far ahead of North American firms. On the other hand, Canada is recognized by many internationally for spearheading global efforts to reduce CFC's, although awareness of this accomplishment is not as widespread in Canada. Another concern is the absence of pressure from customers. This may be changing as the downturn in the industry has put customers' (including European customers') interests to the forefront and 'design for the environment' (DfE) is increasingly seen as important.

The approach that most interviewees felt was necessary for progress on any strategic Canadian initiative on sustainability for the ICT sector was one that was quite formal, included strong leadership from dominant players in the industry and partnered with governments, especially the federal government. The ICT sector has a strong relationship with government and feels the Federal Government of Canada's innovation agenda is quite compatible with their industry objectives. Members of the industry thought that it was very important not to over-state Canada's position with respect to sustainability as many European countries are seen as ahead of Canada on this agenda. In addition, many respondents expressed a reticence to "stick your neck out" as some stakeholders might be willing to "chop it off". These comments suggest a desire for a balanced and genuine approach that will withstand the scrutiny of potentially critical stakeholders.

Members of the ICT industry strongly identify with the industry and see themselves as innovative problem-solvers. They also identify with technology, change and dedication to their customers. Most felt that the identity was quite homogeneous. While few identified sustainability as an aspect of their core identity, most agreed that being seen as leaders on sustainability was important for their organizations.

The sector's identity has shifted in the past 10 years toward a more dynamic, customer-driven one reflecting the industry's shift from monopoly to competition. Relations with stakeholders were seen as very important with a broad range of external stakeholders mentioned. Organizations viewed the communities they served, governments, shareholders and customers as stakeholders. Few non-governmental or pressure groups were mentioned and the industry experiences little concerted pressure toward sustainability from pressure groups or other external stakeholders. Employees were seen as important internal stakeholders, particularly given the importance of hiring and retaining highly skilled staff across the industry. In fact, one respondent identified access to skilled employees as the core sustainability issue for the industry. Employees were also seen as valuing sustainability and working for an organization that was "doing the right things".

In summary, the innovative, problem-solving identity of members of the sector and the high value placed on sustainability by employees are key sources of leverage for strategic sustainability initiatives in the sector. The absence of significant pressure from external stakeholders however, was viewed as one reason the sector had not moved forward more quickly on sustainability issues to date. Thus, our research allows us to observe that:

i) opinion formers in the Canadian ICT sector believe in the inherent potential for the ecological and social sustainability of the sector; they also recognize the internal *versus* external dimensions of the sustainable development agenda for the sector (i.e. employee perspectives and other business issues plus the need to help bridge the digital divide);

ii) opinion formers in the Canadian ICT sector recognize the national competitiveness issues involved in the sustainability agenda but also feel that there is greater

leadership in Europe and that in Canada there is a need for stronger leadership both from government and major sector players in the sector; and thus

iii) opinion formers in the Canadian ICT sector feel there is potential for concerted action on sustainability in the sector based on the high level of trust already evident and that this might best be galvanized by an approach linking sustainability to innovation, which in turn links Canadian government policy with industry identity.

Conclusions and Implications for the Canadian ICT Sector

Our exploration of cases, our theoretical analysis and our preliminary research have led us to advance seven observations:

i) there are new possibilities to create social, ecological and economic gain through application of ICTs that simply would not have been possible prior to the advent of the technologies; we have described theses as 'pure play' triple bottom line propositions;

ii) there are ways in which mainstream ICT firms can create social, ecological and economic gain through ***both*** business practices and 'digital divide' signature initiatives; we have described these as 'walking the talk' business propositions – uniting technical innovation and good compliance practices to improve social and environmental performance of the business itself (internally) whilst also embracing triple bottom line signature initiatives (externally);

iii) 'pure play' value propositions i.e. those wholly enabled by ICTs (e.g. business to consumer e-commerce) may fail to realise promised social, ecological or economic gains; indeed may actually cause significant damage in one or more dimensions;

iv) 'walking the talk' business propositions i.e. those embracing both internal and external 'triple bottom line' practices may not be the universal norm in the ICT industry;

v) opinion formers in the Canadian ICT sector believe in the inherent potential for the ecological and social sustainability of the sector; they also recognize the internal *versus* external dimensions of the sustainable development agenda for the sector (i.e. employee and other business issues plus the need to help bridge the digital divide);

vi) opinion formers in the Canadian ICT sector recognize the national competitiveness issues involved in the sustainability agenda but also feel that there is greater leadership in Europe and that in Canada there is a need for stronger leadership both from government and major sector players;

vii) opinion formers in the Canadian ICT sector feel there is potential for concerted action on sustainability in the sector based on the high level of trust already evident and that

this might best be galvanized by an approach linking sustainability to innovation, which in turn links Canadian government policy with industry identity.

Earlier in the paper we described the cognitive, relational and structural dimensions of social capital and noted the convergence of social capital theory and 'sustainability' as a construct requiring cultural (cognitive values and beliefs) and stakeholder-inclusive (structurally and relationally) corporate cultures.

Applying our theoretical frames to our seven observations, it appears that cognitively (and culturally), there are no intrinsic barriers to ICT firms pursuing sustainability as a sector and/or as individual firms committed to creating economic, social and ecological value for stakeholders. Of course there are no guarantees that the sector in Canada will deliver such value, but there seem to be no philosophical barriers.

In terms of the relational dimension of social capital, despite competitive pressures and structural rearrangements, there seems to be a high level of trust within the sector in Canada. This may further assist in the development of strategically valuable initiatives in sustainability and innovation, led by the sector.

However, in terms of structures and networks, it appears that many of the companies comprising the Canadian ICT sector are strategically oriented to ensure a stable domestic position, rather than pursuing international expansion. Moreover, due to competitive dynamics evident among firms in the sector (principally the domination of the sector by large US companies), it may not be typical for Canadian ICT firms to form strong international networks or long-term alliances of their own, and therefore social capital formation and significant efforts on sustainability are more limited than they might be.

So we might conclude that optimizing social capital within *and beyond* the Canadian ICT sector may require initiatives focused particularly on improving *structural* i.e. network-related social capital. Furthermore, such initiatives may be a pre-requisite both for greater international competitiveness *and* enhanced sustainability.

As Adler and Kwon's (2002) review of the social capital literature suggests, despite the existence of over 20 different definitions of social capital, most include both structure (i.e. networks) and content (e.g. trust, shared norms or understandings) of social relations. New technologies have the potential to foster expansion of networks and enable people to develop trust and mutual understanding that will facilitate sustainable economic development. These new technologies help to overcome barriers of time or geography that previously confined the development of social capital to a local context allowing certain people or geographic locations to be excluded. There is no industry that understands this better than the ICT sector itself.

As many social capital theorists argue, social capital can be fostered through increased interactions that enable people to know, trust and understand one another. While the link between interaction and creation of social capital has not been shown to be causal, theoretically high levels of *voluntary* interaction should be indicative of higher levels of social capital. While

actors in a particular context may be forced into regular interaction, voluntary interaction should signal the existence of a positive quality to the interaction.

Some social capital theorists (Burt, 1997; Rowley, Behrens, & Krackhardt, 2000) have viewed the existence of dense connections as constraining and therefore, a liability rather than an advantage. This paper argues that sustainable development *requires* the focal actor to engage and resolve potential conflicts of interest with stakeholders in order to create sustainable economic profits. The increased opportunity for interaction and dialogue that the new technologies offer should enable organizations to engage those both favourably and unfavourably disposed to their enterprise in constructive discussions that can produce greater shared understanding, trust, and support. Alignment among the interests of stakeholders thus enables the focal actor e.g. a Canadian ICT firm to create value across its 'value-based networks' (Wheeler *et al*, 2002).

Not only can individuals interact more often, new technologies offer broader access to different forms of interaction that can enable dialogue rather than a simple information exchange. The opportunity to discuss issues more fully, potentially including visual displays such through webcams or videoconferences that allows for more comprehensive communication should result in improved understanding among stakeholders and the focal actor. Frequent and more personalized interactions should aid in the development of trust, shared norms and mindsets that will remove obstacles and encourage constructive participation. Again, the ICT sector knows this better than any other sector and indeed depends on it for its economic success.

Thus we argue that in terms of i) the establishment of social license to operate through effective compliance with laws and societal norms (level 1 in Figure 1); ii) effective management of stakeholder relationships (level 2 in Figure 1); and iii) the generation of 'triple bottom line' value for all stakeholders (level 3 in Figure 1), Canadian ICT companies should be in an excellent position to leverage their technological expertise to generate stakeholder support both in home markets and more internationally. Arguably, this is precisely what the 'signature initiatives' of large US ICT firms are designed to do: aligning external stakeholders through inclusion in value-based networks or communities of interest that maximize loyalty and market advantage. The question remains, can Canadian-based ICTs generate similar advantages? Our belief is that they can – partly because of existing levels of cognitive and relational social capital within the sector, partly because of the natural tendency of Canadian institutions to operate in a stakeholder-inclusive manner, and partly because the nature of the industry and its products are intrinsically beneficial for the creation of powerful networks.

With the inclusion of more and more diverse stakeholders in market-based economic processes, the external, structural social capital of the Canadian ICT sector has the capacity to grow exponentially. Social capital, like other forms of capital, is often created as a byproduct of successful transactions. Capital tends to beget more capital; hence, those with social capital may end up with more while those without may again, fall further behind. This phenomenon is central to the competitiveness dilemma for Canadian ICT firms.

Happily, it seems that social capital is often an unintended by-product of interactions conducted for another purpose. Therefore, communities that interact a lot tend to maintain the social capital

they have and to create more as a byproduct of their frequent mutual engagement in activities. Social capital theorists have called this the virtuous cycle (Putnam, 2000). Social capital theory has tended to regard social capital as an endowment and has not explored the ultimate sources of social capital. Proximate sources such as homogeneity or high levels of interaction have been suggested as sources of social capital, but these are clearly not 'created' but 'givens'. So if Canadian ICT firms are by their nature dependent on (primarily) US networks, US sources of innovation and US social capital, they could choose to find new ways of building social capital *of their own* in service of greater competitive advantage. Joint initiatives in sustainability and innovation where there are less competitive pressures to act as barriers may be one example of how to stimulate a virtuous cycle of social capital creation both domestically and internationally.

We argue that social capital can be created by gradual inclusion of a broader array of participants in interactions. In other words, the social capital created as a byproduct of a 'sustainability interaction' e.g. with domestic and international partners, may be 'seeded' in virgin soil, potentially creating a foothold that enables a once disenfranchised and disconnected small Canadian ICT firm to become a member of a more powerful network and therefore, gain the right to appropriate and leverage that broader network's social capital. Further, this firm may be able to use this network affiliation to begin to engage others in that community gradually expanding the 'Canadian ICT social capital' created via a ripple effect. The virtuous cycle, therefore, should gradually be engaged once some threshold is reached.

One final potentially important factor in the creation of social capital and capacity for sustainability is the transparency that new technologies allow. This is especially important in the current (early 2003) context of corporate governance and lack of confidence in capital markets. Controlling the flow of information has become much more difficult as technologies enable fast and cheap dissemination of information. Transparency is of great importance to building trust and understanding and therefore social capital. With the right strategies in corporate disclosure in place, as more people become aware of processes of decision-making distrust should decline. In the future, organizations that may have been tempted to make a less than ethical decision may hesitate given the real potential for widespread dissemination of this information. Again, Canadian ICT firms can choose to play a leadership role here.

In order to increase the social capital and thus the international competitiveness and sustainability of the Canadian ICT sector some practical proposals arising from this analysis may be proposed. They focus especially on creating internal and external synergies and the need to build the structural component of social capital in service of economic, social and ecological gain. For example:

The Canadian ICT industry could lead in more actively disseminating best practices on the internal dimension of 'walking the talk' sustainability initiatives in ICT companies.

We have already noted the reluctance of some Canadian-based ICTs to be too bold in advancing an image when there may be disconnects between external 'signature'-type gestures and internal practices. However, ITAC has created an infrastructure for addressing internal sustainability management issues that is national in scope and thus allows for the development of a broad-based governance structure for broader issues too. This effort might include proactiveness on

reporting and environmental management, and may be positioned as building on the previous successes of the CFC elimination success. Should the solution include any technical advances, these may be used to broker international relationships with others seeking to solve similar problems, as the CFC campaign did. Partnership with Industry Canada through their innovation strategy may create the necessary link to government – identified in our interviews as an important structural dimension.

Partnering between hardware and software/services firms, civil society organizations and governments on domestic and international i.e. external 'walking the talk' signature initiatives led by individual Canadian-based ICT businesses

Sociological literature suggests that a proactive move by a dominant industry player can create a bandwagon effect among less dominant players. Thus there is a real opportunity for a dominant Canadian player to take a leadership role e.g. in bridging the digital divide reaping reputational advantages as well as potentially creating demand for content and other applications among the expanded user base over the long term. The software side of ICT companies has not been as hard hit by the industry downturn on digital divide issues. But there is no reason why, for example hardware providers such as Nortel Networks or RIM should not identify leading Canadian-based software suppliers – including those with US parents - with whom to partner in ambitious signature initiatives. If such initiatives are made more strategic through partnerships with governments, economic development agencies and civil society organizations, so much the better for external advantage. For example:

The Canadian Government (e.g. Industry Canada and CIDA) could lead brokering of partnership arrangements between the Canadian ICT sector and specific geographies in both developed and developing countries, involving civil society organizations and local governments.

It is unlikely that the Canadian ICT sector can establish strategic partnerships aimed at bridging the digital divide globally (as has been HP's intention). However, a more selective approach based on geographies where Canada and Canadians have historic ties i.e. pre-existing social capital, may be appropriate in forging collaborative and mutually beneficial partnerships. Twinning the sustainable development and innovation agendas may provide particularly appropriate in harnessing the power of commercial foreign direct investment, overseas development assistance and direct commercial e.g. supply chain arrangements designed to deliver social, ecological and economic value.

In each case, the net impact of these recommendations would be to build economic, social and ecological value for Canadian ICT firms and their stakeholders. But there would be an assumption of radically broadening the horizon and breadth of stakeholders in a more broadly-based dimension of structural social capital in order to augment the existing cognitive and relational strength of Canadian ICT firms with respect to internal and external sustainability.

Dedication

This paper is dedicated to the memory of Mike Perkin (1957-2002) whose enthusiasm for the potential societal benefits of ICTs was boundless.

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