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EMERGING DEVELOPMENTS AND KNOWLEDGE IN PUBLIC POLICY RESEARCH

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Welcome!

This issue features research findings on the emerging knowledge-based economy and society (KBES), including e-commerce, the digital divide and community informatics. At what point is the KBES said to exist? Anecdotal evidence is strong. For

many, e-mail has moved from being a novelty to being as important as the phone. Urls and e-mail addresses are commonplace (this issue alone contains more than 70 of them). While counterfactuals exist, it is hardly a stretch to conclude that the KBES is moving from prediction to reality.

Much of the work contained in this volume was undertaken as part of the Policy Research Initiative's Knowledge-Based Economy and Society project. For more information on the project, please contact Bob Kunimoto at (613) 943-2401 or b.kunimoto@prs-srp.gc.ca

Canada's KBES Crossroads

"In 2000, the greatest challenge lies in Canadian firms themselves. While they have made some progress on improving their operations and strategy with respect to our recommendations, their improvements are overshadowed by the remaining shortcomings. ... The 1999 Global Competitiveness Report rates Canadian company operations and strategy as 12th in the world, far below Canada's standing in the microeconomic environment for business.

Most notable among the Company Operations and Strategy questions (in the survey) is Canada's 21st ranking on the nature of competitive advantage. ... this question had the most profound relationship with GDP per

capita of any question. ... Canadian ratings for Capacity for Innovation (20th), Product Designs (19th), Value Chain Presence (17th), Control of International Distribution (15th) and Extent of Branding (14th) are all similarly disappointing. ... **The basic explanation of the apparent paradox between the impressive macroeconomic turnaround and the fall in relative prosperity is a weakness in strategy. On the whole Canada has pursued replication, not distinctiveness.**"

Porter, Michael and Roger Martin. *Canadian Competitiveness: Nine Years after the Crossroads*, presented at the CSLS Conference on the Canada – U.S. Manufacturing Productivity Gap. January 22, 2000, pgs.16, 18 and 20. <http://www.csls.ca/>

Policy Reflections

"One of the great myths of the Information Age is the idea that technology will create collaboration."

Brook Manville,
former Chief
Information Officer,
McKinsey & Co.

Next Up!!!

The 49th parallel is an act of the imagination, a tangible reality, and a semi-permeable, and possibly eroding, barrier. In the next issue of *Horizons*, we look at the public policy concerns "at", "behind" and "beyond" the Canada-U.S. border, i.e. transboundary, comparative, and common issues. Areas of interest include: trade flows, immigration, environment, culture, transnational crime, common defence, multinational enterprises, tourism, and labour policies. If you know of any research that might be of interest to readers, please contact a.sutherland@prs-srp.gc.ca or call 947-1956.



Executive Brief



e-Government – Something Old, Something New, Something Borrowed

At the closing plenary of the national policy research conference, *Analysing the Trends*, in November 1999, **Hugh Segal** (Institute for Research on Public Policy) argued that the transfer of ideas, concepts and frameworks from one discipline or sector to another was often an excellent source of new approaches and insight (See *Horizons – Sunset Issue*, Volume 2, Issue 5b). This cross-fertilization is a primary driver of progress. The history

to infrastructure development. The national railway and public education system are quintessential examples of society-building through infrastructure development. Subsequent infrastructure projects have drawn from and deepened this heritage, including the creation of the Canadian Broadcasting Corporation (1936), and the deployment of the world's first satellite for domestic communications, Alouette I (1962).

bones that, while not sufficient in itself, forward-looking infrastructure development enables Canadian society. The result, as described by the Canadian E-business Opportunities Roundtable in their report, *Fast Forward: Accelerating Canada's Leadership in the Internet Economy*, are hopeful signs that Canada is well-positioned to prosper in the emerging KBES.

But KBES policy development is not simply a case of going back to the future. Concepts, ideas and approaches from the ICT-world should also help us rethink approaches to public policy. Previous *Executive Briefs* have discussed the role of knowledge management (Volume I, Issue 2) and networks (Volume 2, Issue 6). ICTs are redefining business rules, strategies and niches just as they are rewriting the Fortune 500. Of course, not everything changes even during a time of change. That said, it would be amazing if e-business concepts, such as disintermediation, distributed learning, aggregators, portals and virtual venues, as well as entrepreneurial approaches to risk, innovation, customer service and knowledge workers, were without application to public policy. The challenge is to rethink established habits of thought and find solutions for which there are, as yet, no problems.

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of ideas is replete with examples where log jams, bottlenecks and barriers were overcome by inspired parallel thinking and even the rediscovery and application of long-established concepts and ideas in a new milieu.

What does this have to do with the knowledge-based economy and society (KBES)? To date, Canada has benefited from a long tradition of visionary approaches

To this list of public sector innovation should be added *Connecting Canadians*, a broad set of initiatives that includes the effort to wire every library and public school in the country – a world first completed in March 1999 (the next target is the wiring of all classrooms by March 2001). It seems that Canadian policy developers understand in their

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Bookmark

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Indeed, Industry Canada's *Community Access Program*, the government-wide branding Canada initiative, and the Treasury Board Secretariat's *Alternative Service Delivery* project offer clear evidence of the beneficial cross-fertilization of private sector models and concepts to public sector challenges. Much more cross-fertilization is needed. For instance, a recent survey conducted by Erin Research Inc. for the Canadian Centre for Management Development assessed changing expectations in customer service. It found that 87% of citizens believed that a reasonable duration between writing a letter to government and receiving a response was 2 weeks. Ninety percent expected e-mail responses to the same queries within 4 hours. Try meeting that deadline consistently over the speed bumps of government hierarchy.

From today's imperfect view, the e-world seems inherently horizontal, dynamic and idea-rich. Effective public policy must be equally so.

Laura A. Chapman
 Executive Director,
 Policy Research Secretariat

Arts Degrees: Still Worth More Than The Paper They Are Written On

"Instead of Techism (i.e., the *a priori* view that in today's high tech world educational resources should be re-directed to train more technologists), educational programs should be assessed in terms of their contribution to economic development. ... **The empirical evidence reviewed here shows that the demand for graduates in the social sciences and humanities is growing rapidly, that they earn high salaries, and that the rate of return to investing in their education is as high as that of sciences and engineering.** These findings mean that education in the humanities and social sciences is raising productivity in Canada.

Education in the humanities and social sciences is meeting the needs of the Canadian economy because the widespread utilization of computers and information technology has revolutionized the organization of businesses and government bureaucracies. **The new-style organizations put a premium on workers who can relate models to real situations, work well with other members of a management team or with clients, and who can speak and write effectively.** These skills are developed in humanities and social science programs. Techism, which concentrates on the production of new technologies and on the nuts and bolts of their operation, misses the organizational revolutions that accompany the adoption of new technologies."

Allen, Robert C.. *Education and the Technological Revolutions: The Role of the Social Sciences and Humanities in the Knowledge-Based Economy*. November 1999, No. 2, pp 1-2. Available at: <http://www.sshrc.ca/english/resnews/pressreleases/allen99.html> .

Cluster Envy

"While Canada has some nascent clusters, there is a shortage of early-stage venture capital to invest in Internet-based companies. **In Canada, the pool of venture capital is smaller than that in the U.S. because there are fewer institutional investors, smaller deals and a venture capital market dominated by "passive" government and government incented funds that are permitted only a limited ownership stake in the companies in which they invest.** Linkages among universities, business and the financial community are generally weaker and less frequent than in the U.S., and the linkages that do exist are often too sub-scale to drive rapid new business creation. While Canada has some strong anchor companies in the high tech sector, there is not enough critical mass in most geographies to spin off many satellite companies."

Report of the Canadian E-Business Opportunities Roundtable. *Fast Forward: Accelerating Canada's Leadership in the Internet Economy*. Boston Consulting Group (Canada). January 2000, p. 7.



Network Nuggets

Growth Nugget *The Productivity Puzzle*

"In the long run, our standard of living will be determined by our productivity performance. Currently, Canadian productivity trails that of the United States by 15 percent; this gap accounts for more than 80 percent of the difference between Canada and US per capita incomes. All G-7 countries have a productivity gap with the United States, but Canada is the only country that is not catching up. This is reflected in the fact that Canada's productivity standing has deteriorated from second, after the United States, among G-7 countries in 1976, to fifth place two decades later. ... **There is, however, widespread recognition that trade, investment and human capital formation are the main drivers of productivity growth, within an overall framework in which innovation creates the opportunities for growth.** ... Addressing the productivity challenge means understanding more than economic drivers and policies. Productivity needs to be viewed from a broad, multi-faceted perspective, encompassing economic, social and environmental drivers and policies."

Sulzenko, Andrei and James Kalwarowsky, "A Policy Challenge for a Higher Standard of Living". *Isuma*. Volume 1, No. 1 Spring 2000, p. 125 and 129.

KBES Nugget *The New Market for Brains*

"E-commerce is to the Information Revolution what the railroad was to the Industrial Revolution – a totally new, totally unprecedented, totally unexpected development. And like the railroad 170 years ago, e-commerce is creating a new and distinct boom, rapidly changing the economy, society and politics. ... In the new mental geography created by the railroad, humanity mastered distance. In the mental geography of e-commerce, distance has been eliminated. There is only one economy and only one market. ... **The fastest-growing e-commerce in the United States is in the area where there was no "commerce" until now – in jobs for professionals and managers. Almost half of the**

Human Development *The Time Squeeze*

"Those who have the most responsibilities were also those who tended to work the longest days. **The "struggle to juggle" in 1998 was most difficult for those aged 25 to 44 who were married parents and employed full time.** Overall, men in this group averaged 48.6 hours and women averaged 38.8 hours per week of paid work and work-related activities. This was an increase of 2.0 hours per week since 1992 for both men and women.

For many people in this group, an increase in paid work did not result in a reduction in unpaid work. These individuals spent approximately one half-hour more per week on unpaid work than in 1992. Men spent 22.8 hours each week at unpaid work and women spent 34.4 hours. Unpaid work includes household work, childcare, shopping, helping others, volunteering and civic activities."

Statistics Canada. *Overview of the Time Use of Canadians, 1998* (Cat. No. 12F0080XIE, free) at www.statcan.ca/cgi-bin/downpub/freepub.cgi/freepub.cgi

world's largest companies now recruit through Web sites, and some two and a half million managerial and professional people (two thirds of them not even engineers or computer professionals) have their resumes on the Internet and solicit job offers over it. This is a completely new labor market.

New knowledge-based industries will depend on attracting, holding and motivating knowledge workers. When this can no longer be done by satisfying knowledge workers' greed, it will have to be done by giving them social recognition and social power."

Peter F. Drucker. "Beyond the Information Revolution", *Atlantic Monthly*, October 1999, pp. 47 - 57.

Global

Training of Adult Workers in OECD countries

The on-going transition towards a knowledge-based economy underlies the importance of a highly skilled workforce. While a good initial education provides an essential foundation, learning needs to continue through working life and learning systems should be assessed in terms of how effectively they support the goal of lifelong learning. A chapter in the 1999 edition of the OECD *Employment Outlook* reviews the main types of policies used by developed countries to encourage continuous adult training, and assembles some evidence on the consequences of cross-country differences in training patterns.

Training patterns differ significantly across OECD countries, with the level of formal continuous training being relatively high in Sweden, the United Kingdom and the United States and relatively low in countries like Belgium and Germany. Based on the 1994/95 International Adult Literacy Survey, participation in job-related training in Canada is roughly equal to the OECD average. About

38% of Canadian adults took part in work-related training in 1994/95.

High-training countries tend to enjoy strong trade performance in “high-tech” industries as well as above average productivity and wages. **Within individual countries, those workers who already are the most skilled also tend to receive the most additional training (a trend described by some observers as “those who got get”). This pattern is problematic because it risks marginalizing some groups of workers.** The OECD concludes that policies enhancing the incentives and resources for the training of workers who typically receive few training opportunities is a priority.

Adapted from Newsletter 1999 of the OECD Employment and Social Affairs. For further information, see Chapter 3 of *Employment Outlook*, June 1999, OECD, Paris (OECD On-line Bookshop: www.oecd.org/bookshop).

Social Cohesion

The Paths Ahead

“Given the uncertainties surrounding new media, three potential evolutionary paths are suggested (for the information highway): the emergence of ‘**information suburbs**’ and ‘**information cities**’ in contrast to the idealistic connotations associated with information societies; **new media as adjuncts of ‘old media**’; or, a strategy that seeks to **expand the range of universal service and media freedoms** for the many rather than the few and which uses ISDN as the cornerstone of the fixed public telecommunications network.”

Winseck, Dwayne. “Abstract: The Quest for Information Highways and Media Reconciliation in Canada”. *Info*. volume 1, No. 6, December 1999.

Bookmark



Good Governance in the Age of Cyberspace

“**Different governmental approaches on a wide variety of regulatory issues concerned with e-commerce may lead to friction in the system and could be detrimental to both business and consumers.** ...a common framework is needed to help all stakeholders implement high quality governance in the emerging global information society. From a legal and mainly European perspective, ...the essentials for good governance, ...revolve around: sovereignty; regulation of markets and safeguarding access and competition; specific and general principles of governance; bottlenecks; and cooperative self-regulation.”

Grewlich, Klaus W. “Abstract: Good Governance in the Age of Cyberspace”. *Info*. Volume 1, No. 3, June 1999.



Primer

GLOSSARY FOR THE NEW ECONOMY:

Is your mindshare dazzled by radically morphing new economy terminology where Moore's law rules but supply and demand do not? Move higher on the information food chain by being the first in your virtual office to apply the latest in new economy jargon. Sponsored by Andersen Consulting, the site <http://hotwired.lycos.com/special/ene/> provides plain language definitions with attitude for new technology terms. Below are its definitions of "data mining" and "adhocracy":

DATA MINING – Extracting knowledge from information

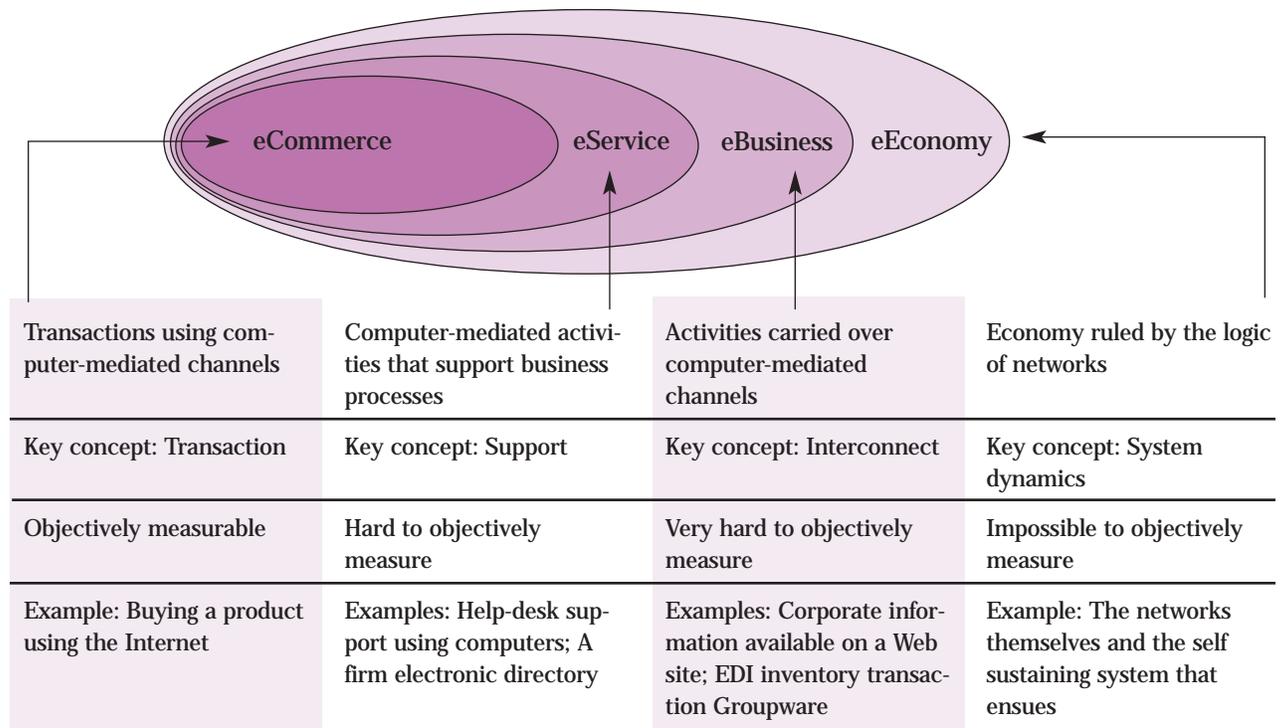
The combination of fast computers, cheap storage, and better communication makes it easier by the day to tease useful information out of everything from supermarket buying patterns to credit histories. For clever marketers, that knowledge can be worth as much as the stuff real miners dig from the ground.

More than 95% of U.S. companies now use some form of data mining – often nothing more than mailing lists, but increasingly the more sophisticated psychographic profiles of potential customers make privacy advocates shake. It's a perfect hot-button political issue: Whose data is it, anyway?

ADHOCRACY – Organization without structure

Adhocracies have long been used by creative enterprises – film studios and ad agencies, for instance – to produce a steady flow of differentiated products. They are a mirror image of the well-defined bureaucracies that built most industrial organizations. Instead of a strict rule book, there exists an evolving collection of shared goals. Start-up software companies are a classic example. Instead of fixed tasks and job descriptions, everyone does what needs to be done. Computer networks encourage adhocracy by enabling people to continuously share information and coordinate themselves informally.

E-World: the Business Side



Source: Statistics Canada. *A Reality Check to Defining eCommerce*, 1999. Cat. No. 88F0006XIB-99006.

Upcoming Events



DATE	EVENTS
SPRING 2000	<p><i>Call for Papers for National Policy Research Conference 2000</i> The 1999 Conference and Awards Dinner attracted close to 1000 participants and 130 speakers interested in policy research. The working theme for this year's conference is "Canada in a Global Society" and the Policy Research Secretariat invites you to submit your research to the Program Committee for consideration. Keep an eye on the PRI web site as details will be posted once they are confirmed. http://policyresearch.gc.ca</p>
MAY 4	<p><i>"Restorative Justice and Social Cohesion"</i> The 2nd quarterly workshop on social cohesion will take place on May 4 at Justice Canada, 284 Wellington St., Room 6015 West from 1:30 p.m. - 4:30 p.m. The session will address the concept and potential of restorative justice. What is the evidence? When is restorative justice appropriate? For further information, please contact Valerie Howe at Valerie.howe@justice.gc.ca or (613) 957-9597.</p>
MAY 18	<p><i>"Technology in a Global Society: Implications for Canada"</i> The Policy Research Secretariat is hosting a special session as part of the Congress of ACFAS (Congrès de l'Association canadienne-française pour l'avancement des sciences) on <i>Technology in a Global Society: the Implications for Canada</i>. The session will take place on May 18, 2:00 p.m. - 4:00 p.m., in Room 3240 of the Jean-Brillant Pavilion of the University of Montreal. The session will examine the following issues: the information highway and the repercussions for linguistic and cultural policy; privacy and the confidentiality of information transmitted on the Internet; and, accessibility to new information technologies and the participation of citizens. To register or to obtain more information, please contact Patrick Morin at (613) 943-3912 or p.morin@prs-srp.gc.ca.</p>
MAY 24-31	<p><i>Congress of the Social Sciences and Humanities</i> Over 70 scholarly societies and associations annually converge at the "Learneds", giving researchers the chance to share ideas and network with like-minded and not-so-like-minded people in small groups and interdisciplinary symposia. The Congress also features the largest annual book fair in the field with over 150 presses represented. The University of Alberta, Edmonton is this year's host. For more information, consult http://www.hssfc.ca/Cong/CongressInfoEng.html.</p>
JUNE 1-2	<p><i>"Families, Labour Markets, and the Well-Being of Children"</i> A conference jointly organized by the Canadian Employment Research Forum and Statistics Canada, and supported by the Policy Research Secretariat, Human Resources Development Canada, and Status of Women Canada will explore the links and interactions between families, labour markets, and government policy with emphasis on the well-being of children. This two day event will take place on the campus of the University of British Columbia in Vancouver, and is affiliated with the meetings of the Canadian Economics Association. For more information contact Miles Corak ((613) 951-9047 or miles.corak@statcan.ca) or Jane Friesen ((604)-291-3403 or friesen@sfu.ca), or visit http://cerf.mcmaster.ca. Registration materials are also available at http://economics.ca/2000.</p>
JUNE 26-28	<p><i>"Rethinking the Line: The Canada-U.S. Border"</i> Sponsored by the Government of Canada, this conference will examine the Canada-U.S. border from a variety of policy and disciplinary perspectives, including transboundary issues, e-commerce, trade, culture, environment and security issues. The conference will take place at the Four Seasons Hotel in Vancouver and will be preceded by a day of data workshops organized by Statistics Canada. For more information, please contact Roger Roberge at (613) 943-8412 or r.roberge@prs-srp.gc.ca or consult the PRI web site http://policyresearch.gc.ca.</p>



Network Columnist



Doing Business in a KBE: Areas for Action

What issues confront policy developers in an era of knowledge-based growth? Canada's evolution as a knowledge-based economy (KBE) is reflected in the growing knowledge intensity of occupations and industries, the growing use of information and communications technologies (ICTs), and the increased emphasis on product and process innovations. The increased role of knowledge in the production process is being driven by three interrelated developments: globalization, the information revolution, and the increase in intangible investments (R&D, software, and public spending on education).

Canadian firms face the formidable challenge of prospering in an environment in which competition among companies increasingly involves "competition to innovate first". While there are no direct measures of knowledge development and use, indicators such as relative R&D expenditures, patents, and rates of technology adaptation, point to significant weaknesses in the innovative capacity of Canadian firms. On a broad innovative index developed by Michael Porter, Canada only ranked 9th out of 17 OECD countries in 1995. At the same time, however, a study for the Mont Tremblant conference* on the KBE found that many small firms do rank high on some dimensions of technological prowess. While our understanding is incomplete, Canada's weak showing on a number of important indicators of

innovative capacity focuses attention on further policy actions that might be taken to support the key broad determinants of innovation and knowledge-based growth.

INNOVATION AND TECHNOLOGY POLICIES

The measures pointing to weaknesses in Canada's innovative capacity raise questions about the adequacy of government policies

suggest that the R&D support currently available to business through IP laws and Canada's regime of tax credits is inadequate. Together, the federal Scientific Research and Experimental Development (SR&ED) credit and provincial tax incentives, provide Canada with a degree of support for R&D that is substantially greater than that of all other OECD countries. Third, experi-

Canadian firms face the formidable challenge of prospering in an environment in which competition among companies increasingly involves "competition to innovate first". While there are no direct measures of knowledge development and use, indicators such as relative R&D expenditures, patents, and rates of technology adaptation, point to significant weaknesses in the innovative capacity of Canadian firms.

to (i) promote R&D; and, (ii) support the operation of the country's national innovation system.

In terms of supporting R&D, the Mont Tremblant conference papers and other studies point to three general conclusions. First, it is desirable for governments to utilize a range of tools, including intellectual property (IP) laws, tax credits and subsidies, to promote R&D. With a large toolkit, the government can better tailor its response to different sources of market failure and different industry conditions. Second, available evidence does not

ence shows the advantages of broad general programs to support private sector R&D and the need for government to exercise great caution in employing programs that target specific research areas or technologies. Instead, the OECD and the recent federal science and technology policy review suggest that the focus should be on improving national innovative systems, particularly information dissemination flows between university researchers and industry.

A key conclusion of the conference papers was that future

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policy initiatives should focus on promoting Canada's participation in international innovation networks and on helping firms transform themselves into "learning organizations".

FRAMEWORK POLICIES

How can governments help create a business climate that supports the growth of competitive knowledge-based enterprises? There is growing evidence that an economy's responsiveness to market signals and its ability to efficiently shift resources from less productive to more productive firms within an industry and from lower to higher-value uses overall are important determinants of economic performance.

The Mont Tremblant conference identified three key determinants of business innovation: namely, openness, capital investment and human capital development. While it is difficult to establish a coherent framework for all these factors, Canadian policy has been highly supportive in areas such as expanding opportunities for trade and investment. There are some issues that need further attention. First, government policies, especially the explosive growth in public debt over the 1980s and early 1990s, have contributed to Canada's low rate of machinery and equipment investment relative to the U.S. Although Canada has made great progress expanding access to post-secondary education, it has lagged behind other industrial countries in developing a training infrastructure. More also needs to be done to encourage worker training, including employer-sponsored training.

Second, the economy's ability to reallocate resources from less productive to more productive activities needs to be better understood. In recent decades, considerable progress has been achieved in eliminating government regulations and subsidies that impede and distort the allocation of resources. By eliminating regulations that no longer have a role or whose costs cannot be justified by their benefits to society, governments in major industrialized economies have expanded the role of competitive forces and the opportunity for dynamic change in the transportation, telecommunications, energy, electric power and finance sectors. Policy-related impediments to change have also been reduced as governments have moved away from the subsidization of firms and the "bail out" of losing enterprises. Firms can no longer delay needed adjustments in the expectation that government will come to their assistance. Because of the non-neutrality of Canada's corporate tax system, as the Mintz Committee pointed out, tax rates have a significant influence on business investment decisions. In addition, gaps in Canada's corporate governance laws and capital market regulations affect the operation of takeover and venture capital markets in Canada.

Third, the policy framework should help business firms exploit the opportunities created by ICTs and to participate in the growth of the "virtual economy". All industrial economies are striving to ensure their policies are adequate for the new age of virtual

enterprise. Significant Canadian initiatives include the Canadian Electronic Commerce Strategy, introduced in September 1998, which aims at clarifying marketplace rules and building trust in electronic transactions. One of the conference papers pointed out that there is still a need to adapt copyright law so that it applies sensibly to the world of computer technology. In addition, Canada must work with other countries to establish the mechanisms needed to effectively apply policies to global electronic commerce.

A stable macroeconomic environment and efficient financial, labour and product markets are crucial elements of the business climate. Other important, although difficult, factors in the business climate for innovation include: intellectual property rights that encourage innovation and diffusion of technology; and, a regulatory framework that promotes competition and innovation. As this survey of the KBE policy landscape is intended to show, an innovative and forward-looking policy agenda is a key component of an innovation-based economy.

Surendra Gera and Serge Nadeau,
Industry Canada

*This paper draws heavily from papers presented at the CIRANO/Industry Canada Conference on *Doing Business in the Knowledge-Based Economy (KBE)* held in September 1998 at Mont Tremblant, Quebec. For a more extensive coverage of the issues, the reader may wish to consult Gera, Hirshhorn and Ahmad, *Doing Business in a KBE: Recent Policy Initiatives and Future Directions* (presented at the "Analysing the Trends" Conference, Ottawa, November 25, 1999). The views expressed in the paper do not necessarily reflect those of Industry Canada.



A Look Ahead



Community Informatics

Canadians, preoccupied as we are with the vigour and accomplishments of our neighbours to the South, tend to overlook our own strengths and achievements.

Before the brouhaha about the “Digital Divide” in the United States or the “Wiring the Nation” ruckus in the United Kingdom, Canadians have been rather quietly, but persistently, and with an immense measure of imagination and institutional creativity, making huge advances in the area that is coming to be called “Community Informatics”.

Community Informatics is the application of information and communications technologies to enable community processes and the achievement of community objectives: overcoming “digital divides”, “wiring (and ensuring connectivity for) the farthest reaches of a far-flung nation”; but even more important, working to find ways of making the enormous opportunities of Internet connectivity of real value to local communities in achieving their economic, social and cultural objectives.

Without a great deal of public fanfare, Canada through a variety of initiatives and programs — Community Telecentres, as in rural Newfoundland; Freenets, such as those in Ottawa and Winnipeg; Community Networks, such as Chebucto Suite in Halifax; SchoolNet, the Community Access Program (CAP), and now Volnet and NetCorps; the Centre for Community and Enterprise Networking (C\CEN) in Cape Breton; Web Networks in Toronto — has

created world standards and models for how the opportunities and advantages of the new technologies (ICT's) can be made “universally” available. This availability extends not just to those with the advantage of an urban location,

a home computer, or the funds to support the Internet “habit”.

What has characterized the Canadian approach to public computing is what has characterized the best of Canadian public policy in other areas: a commitment to universality; a concern to understand and respond to the needs of the disadvantaged; the desire to be producers as well as consumers of culture; a quiet practicality and an absence of rhetoric; and public sector policy leadership, entrepreneurship and creativity. The dark-side as well is very typically Canadian: federal-provincial wrangling, intra-bureaucratic rivalries, and short-sighted inattention from the private sector.

But overall, in the area of Community Informatics, Canada has been and remains a world leader. Community Telecentres have been the model for public Internet access throughout Africa; CAP has been a model adopted in Australia and rural areas throughout South and Central America; Chebucto Suite is the software of choice for Community Networks world-wide; and C\CEN has been reproduced in Virginia, Australia and Egypt.

If anything, the overwhelming impact of the Internet has increased the challenges for both the theory and practise of Community Informatics,

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where Canadian practitioners and researchers are leading the way forward by:

- designing ways of using ICTs to enhance the quality and coverage of electronically enabled public services <http://cnbb.unb.ca>
- building and rebuilding the bridges across the Digital Divide as the multiple chasms of income, education, location, nationality widen between the sides <http://cap.ic.gc.ca/>
- developing sustainable models for a community public space on the Internet <http://vcn.bc.ca>
- developing the strategies and techniques so that local e-commerce can find ways to co-exist/collaborate/compete with global e-commerce <http://sencen.ednet.ns.ca>
<http://www.knet.on.ca/info.html>
- creating local, national, and global democratic practises in a world of electronic citizenship <http://www.web.net>
- using the Net to support development in the Third World <http://www.idrc.ca/acacia/>
- supporting communities as they find ways of using the Net to be contributors to as well as consumers of global culture and global <http://www.cbmusic.com>; and
- applying the principles of open source to the practise of governance <http://www.c4ld.org>

A theory and a practise of Community Informatics is gradually developing, partly out of experiences such as those in Canada, and, partly out of a need to develop systematic approaches to some of the challenges that are following in the wake of ICTs' astonishing speed:

- the need to enable and reinforce community processes using ICTs;
- the need for training and for technical usability;
- the need (but difficulty) of local sustainability;
- the recognition that access in itself is insufficient — it is what is and can be done with the access that is the objective; and,
- the extraordinary power at the interface of virtual and spatial communities.

And some questions still remain: What role can telecentres play in ensuring access for the marginal

and illiterate; How can the net be used to support minority languages and cultures at risk?; Can the net restore vigour to flagging processes of democratic participation?; Can there be a local economy in the midst of an Internet enabled global one? These issues emerge out of the reality of the transformation which is taking place and which underlie the glitz and the buzz about IPOs and “click through” rates.

There is also an important research agenda for Community Informatics including: linking the variety of advanced ICT tools GIS/GPS, CSCW (computer supported collaborative work) — and artificial intelligence software into community processes and applications (including designing interfaces which make them more broadly accessible and usable); understanding the interrelationships between virtual and spatially determined social processes; and, designing usable public e-services in such areas as health, lifelong learning, and public information. Finally, there is the need to establish a firmer link between the theory and research of Community Informatics and practise, policies and programming, so that these are mutually informative and supportive.

Overall, there is an opportunity to take the experience which is being gained in Canada in Community Informatics into the global “marketplace”, both by selling programs (software or bureaucratic) and by supporting those with knowledge in translating that experience into the kinds of e-products which can not only compete in, but create new markets and even new marketplaces. Equally, there is a role for Canada in ensuring that, just as a “public/community space” on the Internet has been encouraged and supported to develop within “Canadian cyberspace”, so too there should also be provision globally. It will require vision, financial support and policy development to ensure that a Community Informatics dimension can be nurtured in the “global cybersphere”.

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Eyewitness



Foreign Ownership in Canada: *A Cause for Concern?*

The pace of Americanization and concerns over Canadian sovereignty have led former Alberta Premier **Peter Lougheed** to speak out on the issue of foreign ownership in Canada. He made his latest foray into this complex and sensitive subject at a seminar organized by the Policy Research Secretariat to launch Canada's newest policy research journal, *Isuma*. The event was held at the Calgary Chamber of Commerce on January 27 and included a panel with **Roger Gibbins**, President and CEO of the Canada West Foundation, and **Oryssia Lennie**, Deputy Minister of Western Economic Diversification Canada.

The low Canadian dollar, according to Lougheed, has contributed to the vulnerability of Canadian companies to foreign takeovers — 90% of them by American corporations. He also expressed concern over the south-bound movement of corporate head offices and said he does not underestimate the significance of the brain drain. While admitting that he was not quite ready to prescribe policy solutions, Lougheed welcomed the opportunity to share his concerns with the audience of about 60 representatives from the private sector, academia and the public service.

Lougheed outlined his early efforts to promote a free trade agreement with the United States, confident in what he described as a uniquely Canadian approach to international business. In subse-

quent years, however, the performance of Canadian firms on the international stage has been disappointing, as Canada has concentrated more and more of its trade activity with the U.S. Increased Americanization, Lougheed argued, poses threats to Canadian sovereignty. For example, while Americans consider culture to be just another business, for Lougheed, culture means sovereignty.

So why speak out now? Lougheed explained that his concerns are rooted in Canadian nationalism and patriotism, and that federal interest in this issue seems to have abated. Several factors have converged to make foreign ownership in Canada a timely subject. First, the rapidity of the expansion to a global village had not been anticipated — the implications of Internet growth, for example, are immense. Second, the Canada/U.S. exchange rate has remained unexpectedly low, rendering Canadian companies “easy pickings.” Other factors include free trade, the unprecedented and extended success of the U.S. economy, and Canada's proximity to it. Increased prosperity for Canada over this period has contributed to the notion that “passivity works.”

So what to do? Lougheed was tentative about what the appropriate policy response might be. Nonetheless, he suggested that the problem was complex and multi-faceted, and would require a multi-faceted approach. Part of

the solution certainly lies in the area of fiscal policy — possibly an elimination of capital gains tax and measures to address an uneven exchange rate. Combating the movement of head offices could require moral suasion from business leaders. National symbols might be strengthened, including a Canadian Broadcasting Corporation that was more effective in carrying out its original mandate. Finally, Lougheed suggested, efforts in the area of education are imperative. He recommended that basic Canadian history become a core subject throughout the education system. Lougheed left his audience with the very Canadian metaphor of a toboggan ride: when you are heading down a steep hill, there's a period where you can still get off the toboggan; but eventually, you reach a point where you can no longer get off. Canada, he argued, was getting very close to that point.

Oryssia Lennie reiterated that globalization makes policy choices extremely complex and difficult. Using OECD data, she noted that Canadian investment abroad was actually growing faster than foreign investment in Canada, although the pattern was somewhat different vis-à-vis the United States. Technological change, privatization, deregulation, and the increased openness of stock markets have contributed to higher flows of cross-border investment. In industrialized countries, mergers and acquisi-

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tions have accounted for 60 to 80% of these flows.

Generically speaking, the benefits of foreign investment include local employment, improvements in labour productivity, as well as various spill-over effects (training, adoption of technologies and management practices, etc.) that are less easily measured. On the negative side, foreign investment can reduce the diversity of economic activity and lead the receiving economy to focus on production and marketing. It can also discourage domestic competition which, in turn, is needed to bring about international competitiveness. Finally, foreign direct investment may influence culture.

Lennie mused whether barriers to increased foreign direct investment were even possible in the globalized environment. She suggested that a balance must be struck between preserving our culture or roots and the need to



Sponsored by the Policy Research Secretariat, *Isuma* is Canada's newest policy research journal. True to its name, which is Inuktitut for "thought" or "idea", *Isuma* will focus on horizontal issues that cross disciplines, sectors, departments, and jurisdictions, as well as the link between policy research and decision-making. The first issue is available now and focuses on *North American Integration*. For more information, contact Alfred LeBlanc (613) 995-3655 or a.leblanc@prs-srp.gc.ca.

survive in the new global reality. Lennie closed by quoting Thomas Friedman's book, *The Lexus and the Olive Tree*: "If globalization were a sport, it would be a 100-metre dash that had to be run over, and over, and over again."

Roger Gibbins added that globalization in Canada's case is very much a continental phenomenon, as 88% of Canada's trade was with the U.S. He noted that Canadian corporations were leaders in building the Calgary and Alberta economy, and reinforced Lougheed's concerns that the potential loss associated with increased foreign ownership

and a corporate exodus to the U.S. is great.

What can be done to encourage regeneration in the face of global challenges? Gibbins warned against complacency. Instead, general economic issues would have to be addressed. Tax reform, for example, is paramount — not just the amount of tax, but also the manner in which taxation occurs. Second, Gibbins suggested that the vitality of local communities needed to be strengthened. We will have to nurture and harness a new generation of economic elites to lead Canada into the global economy.

Crossroads: *Canada Then and Now*

"Some progress has been made on the microeconomic conditions for prosperity in keeping with the recommendations of *Canada at the Crossroads* (1991). ... deregulation has improved key aspects of the competitive infrastructure such as telecom and transportation, which has spurred the creation of more responsive specialized factors. Governments have widely recognized the need to support clusters that build on regional strengths and have made that a priority instead of creating pockets of unsupported industry across Canada.

Porter and Stern's work on innovative capacity reveals that Canada has improved the context for innovative activity on several dimensions. Canada improved from 12th to 6th in adequacy of intellec-

tual property development between 1990 and 1997, and from 6th best to 4th best (with only Netherlands judged to be significantly superior) in exposure to foreign competition in manufactured goods. Finally, Canada exhibits great strength in educational spending. It moved into world leadership in public spending on tertiary education as a percentage of GDP between 1982 and 1995. As well, Canada maintained its lead in secondary education spending over the same period, though spending as a percentage of GDP declined."

Porter, Michael and Roger Martin. *Canadian Competitiveness: Nine Years after the Crossroads*, presented at the CSLs Conference on the Canada - U.S. Manufacturing Productivity Gap. January 22, 2000. <http://www.csls.ca/>



Network Columnist



The Knowledge-Based Economy and Society: *Challenges for Individuals and Policy Makers*

In the knowledge-based economy and society (KBES), the capacity to learn and accumulate skills and competencies is becoming an imperative for individuals to access employment and adapt to changing circumstances and, for an economy, to innovate and achieve growth. In this context, the policy challenge is to continue developing a highly skilled and adaptable workforce.

Overall, research undertaken in the context of KBES project shows that the Canadian economy is adjusting well to the requirements of the KBES. Unlike some other countries, such as the United States and the United Kingdom, Canada has not experienced a significant increase in income inequality and employment opportunities between high- and low-educated workers over the past 20 years. This fact suggests that Canada is not experiencing a broad-based shortage of skilled workers — increases in the supply of highly educated workers appears to have been sufficient to offset the growth in demand. Indeed, Canada has invested heavily in education over the past 50 years and compares very well internationally in terms of educational attainment and average literacy levels.

However some disadvantaged groups are increasingly facing exclusion from the labour market. For example, individuals in all age groups who have only primary schooling or who have poor literacy skills have seen their employment situation deteriorate substantially in recent years. These people face limited access to jobs. Many don't even possess the

basic literacy skills required for many low-skilled jobs. Low-skilled individuals who are displaced from their current job are less likely to be able to meet the entry-level requirements of new job openings and are, therefore, at risk of being excluded from the labour market. Research shows, as well, that low-skilled individuals are less likely to participate in education and training, which further increases the risk of long-term exclusion.

The combination of high educational attainment and poor literacy outcomes for a significant proportion of adults raises some concerns regarding the quality of initial education in Canada. Another area of growing concern is

the need to reduce high school drop-out rates to improve labour market outcomes over the long term.

Of course, not all the responsibility lies with the education system. There is some evidence that many low-skilled individuals do not work in "literacy rich" environments that provide them with opportunities to develop or even maintain their existing skills. Part of the solution may, therefore, lie in promoting the creation of jobs and workplaces demanding higher literacy skills.

Lifelong learning is fundamental to meeting both growth and equity objectives. Measures and incentives that will help people invest in their own human capital will be important as changes in working arrangements and in labour market participation patterns continue to alter training investment incentives for employers and place more responsibility

...the rise of self-employment implies that a growing number of workers must now rely on their own means and motivations to upgrade their skills. Possible measures include developing better financial vehicles and mechanisms, providing better information and decision tools, implementing systems to improve the recognition and portability of skills, and helping address constraints related to the lack of time available to undertake training.

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on individuals for training. For example, the rise of self-employment implies that a growing number of workers must now rely on their own means and motivations to upgrade their skills. Possible measures include: developing better financial vehicles and mechanisms, providing better information and decision tools, implementing systems to improve the recognition and portability of skills, and helping address constraints related to the lack of time available to undertake training.

There is still debate regarding whether or not there is under-investment in employer-based training in Canada. The lack of concrete evidence on rates of returns to investment in these activities still constitutes an important knowledge gap. Ensuring that clear signals are available to individuals and firms regarding the returns to investment in human

capital is an area where governments may have an important role to play.

Targeted policies aimed at the low-skilled population are a crucial element of a lifelong learning strategy. Participation in education and training is much lower among populations with low skills because they often lack the basic skills required for further learning. They are also less likely to identify themselves as requiring skills upgrading. Because policies aimed at the general population are more likely to benefit those who already have the skills and the motivation to learn on a continuing basis, targeted policies are required if equity concerns are to be adequately addressed.

Jean-Pierre Voyer

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 Human Resources Development Canada

Government Support for e-business: *Comparative Experiences*

The race is on! Governments in Europe, North America, and Asia are adopting new measures to promote the use of electronic business processes within the private sector of their respective domestic economies. Creating an effective domestic and international legal and regulatory framework is of paramount concern. It is a huge, multi-level task that ranges from privacy, security, and encryption affecting consumer trust, to ensuring that tax and R&D policy promote innovation. In addition, governments themselves have been adopting a host of new measures to speed the use of e-business techniques within their own administrative processes.

A key question posed by a number of observers is whether there is a single new economy emerging, based on the Internet and the e-business practices associated with it, or whether there

are several variants of this new economy. The dominant view in the U.S. is that the technology drivers themselves will force a convergence in both business models and government policy towards a predominantly American model. Others, however, suggest that the emergence of new forms of business networks and practises is forcing a wide array of new issues onto the policy agenda of governments. Differences in government policy and legislative frameworks in North America, Europe and Japan, they argue, will likely influence the development of new technology and the patterns of market behaviour associated with it.

So how are government policies being designed to influence the emerging Internet economy? A new report examines several of Canada's competitors (the United

States, the United Kingdom, Ireland, Australia and the European Union) and documents various initiatives aimed at stimulating the adoption of e-business practices in the private sector. For example, most of the countries surveyed have recently adopted new policy initiatives, policy frameworks, and organizational structures to guide the development of their respective e-business strategies. The report also examines what these countries are doing in the areas of expanding information infrastructure, taxation of e-business, building consumer trust, export development and promotion, and focused R&D initiatives.

Wolfe, David A. Government Support for E-business: Comparative Experiences. Prepared for the Canadian E-business Opportunities Roundtable and the Task Force on Electronic Commerce, Industry Canada, December 1999.



Guest Columnist

Making Canada a Global Centre of Excellence for Electronic Commerce

E-commerce has the potential to raise the quality of life of citizens through economic growth, job creation and more convenient access to information, goods and services. The question remains: how do we, as a nation, achieve this goal?

EARLY STEPS

Industry Canada established the Electronic Commerce Task Force in November 1997, and gave it the job of developing a strategy in response to this policy challenge. In the last two years, the Task Force has focused on creating a legal and policy regime in Canada, as well as developing the international arrangements necessary to ensure the rapid growth of electronic commerce. Accomplishments to date include: the announcement of Canada's national strategy for e-commerce by the Prime Minister in September 1998; hosting the first ever OECD Ministerial Conference on Electronic Commerce (October 1998); and, the introduction of legislation to protect personal information and recognize the validity of electronic signatures and records (Bill C-6).

FUTURE CHALLENGES

E-commerce, by its very nature, is a horizontal activity that cuts across a wide range of policy fields. For analytical purposes, the future agenda of the Task Force can be divided into three parts:

1. Continue to ensure Canada has a world leading e-com policy environment;
2. Accelerate the rapid adoption and use of e-commerce, and;
3. Strengthen e-commerce expertise and innovation.

Considerable effort is underway to establish an effective and forward-looking e-com framework (see Figure 1). With the basics in place, a number of "second generation" issues, such as self-accreditation and technical standards for secure transactions are coming to the fore. Furthermore, Canada continues to demonstrate strong leadership in international/multilateral forums, such as the World Trade Organization (WTO), the Organization for Economic Cooperation and Development (OECD), the Asia-Pacific Economic Community (APEC), and the Free Trade Agreement of the Americas (FTAA), to ensure consistency among global e-commerce policy approaches. E-commerce is inherently global and, as such, all electronic commerce policies and activities, whether international, domestic or regional, or from the public or private sector, will have a limited impact unless they facilitate a global approach.

As part of its international agenda, Canada has also been active bilaterally by striking Joint Statements on Electronic Commerce with the European Union and Australia. The aim of such

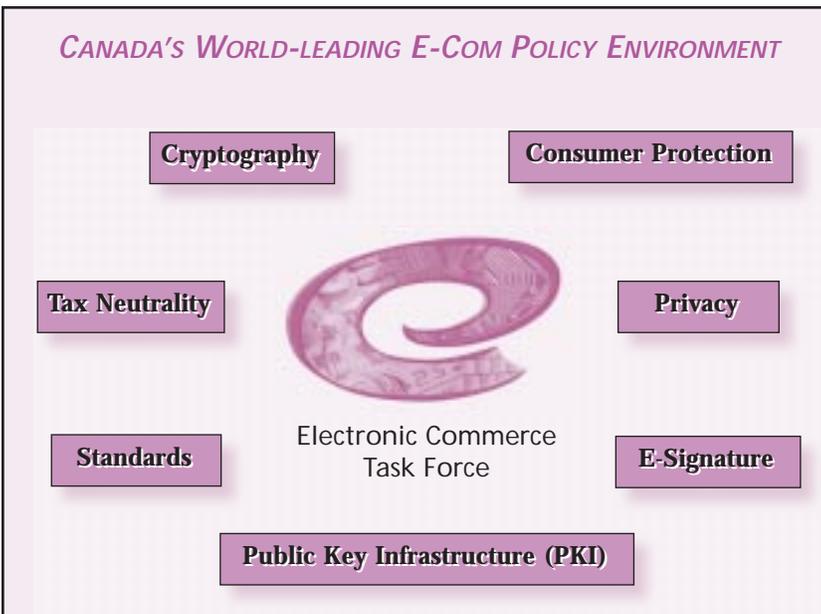
accords is to provide traction in developing a global approach to electronic commerce.

In *Fast Forward - Accelerating Canada's Leadership in the Internet Economy*, the Canadian E-Business Opportunities Roundtable noted that too many Canadian businesses are lacking a sense of urgency regarding the threats and opportunities presented by e-commerce. To eliminate this complacency, support for e-business sectoral adoption and deployment must be focused and coordinated across government and the private sector. A recent national conference for Canadian industry and business associations (*Building e-Business Capabilities in Canada*), hosted by Industry Canada, is an excellent example of such an initiative. Executives from over 70 associations were brought together for an intensive discussion on the importance of e-business to every sector in Canada.

Another key element in deploying e-commerce throughout the Canadian economy will be cultivating a critical mass of quality e-business solution providers to serve both domestic and international markets. This is an area where we are well positioned. For example, Canadian firms are world leaders in the development of Public Key Infrastructure (PKI) software, an essential element in the provision of secure on-line transactions and the very basis of

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electronic commerce. Government must, however, continue to aggressively encourage Canadian firms to become competitive suppliers of Internet-based commerce solutions, applications and services.

Finally to ensure rapid adoption and up-take of e-commerce, the government must continue to partner with and support various private sector initiatives aimed at accelerating Canadian e-commerce awareness, adoption and innovation. The visionary work of the Canadian E-Business Opportunities Roundtable (and supported by the Task Force) exemplifies this type of initiative.

Very quickly, it has become apparent that e-commerce is a dynamic force that has, and will continue to have, a profound impact on our social and economic lives. As a result, an important priority for governments, businesses, and the academic community is to engage in

research aimed at strengthening Canadian expertise and innovation in e-commerce. There are a number of exciting initiatives materializing in this area. For instance, Dalhousie University, through the Global Information Networking Institute (GINI), organized a workshop as part of an on-going effort to develop a Canadian research agenda in electronic commerce. The workshop brought together a diverse group of academics, researchers and business people from across the country, who agreed to formalize a national research agenda as part of a plan to make Canada a world leader in electronic commerce. Another important initiative, stemming from the Canadian E-Business Opportunities Roundtable, is a planned series of e-business workshops that will take place in centres across Canada this Spring. These events will elicit regional views on the Roundtable's priority areas and aim to stimulate dialogue on the

development of much-needed e-business "clusters" in Canada.

Partnerships of this nature are key to Canada successfully realizing the social and economic potential of e-commerce. In addition to research aimed at strengthening Canadian expertise and innovation, it will also be important to continue to develop metrics to measure the Internet economy and to study the on-going social and economic impacts of e-commerce. Industry Canada has worked in concert with the Conference Board of Canada and Statistics Canada to develop a sophisticated set of measures for benchmarking connectivity and e-commerce. This project will continue to provide the basis for a comprehensive analysis of the emerging digital economy in Canada.

The stated goal of making Canada a global centre of excellence in e-commerce can only be accomplished through a concerted plan of action by governments and the private sector. The priorities for this work will be keeping the policy environment 'evergreen', driving the deployment and use of e-commerce throughout the economy and aggressively pursuing a research agenda focused on cultivating e-commerce expertise and innovation.

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Canadian Connections



Living in the E-World

Surviving and thriving in the e-world begins by conducting some of the more mundane routines of life on-line. A “byte”-ful of activities include:

- Shopping for presents at Chapters (<http://www.chapters.ca>) or Indigo Books (<http://www.indigo.ca>)
- Trying on and purchasing clothes using a personalized, virtual mannequin developed by Public Technologies Multimédia Inc. in Quebec in partnership with retailers worldwide at <http://www.ptm.ca/mvm/>
- Sending and receiving certified mail and direct advertising as well as paying bills through Canada Post's Electronic Post Office at <http://www.epost.ca>
- Looking for a job using the [Workopolis.com](http://www.workopolis.com) site or pursuing a career in the federal public service at <http://jobs.gc.ca>
- Filing income taxes with Revenue Canada (now, Canada Customs and Revenue Agency) at <http://www.ccra-adrc.gc.ca/eservices/>
- Checking local weather conditions at Environment Canada at http://weather.ec.gc.ca/current_e.shtml
- Or, choosing to vote at a time and location of your convenience (which is being studied at Elections Canada at <http://www.elections.ca/>)

The corporate world and dot.com start-ups are also keen to gain insight on emerging trends. From a market research perspective, consulting companies

such as d-Code (<http://www.d-code.com>) and public opinion research firms have found a new niche. Angus Reid's Canadian Internet Advisory Panel (<http://www.panel.angusreid.com/>) invites connected Canadians to sign up and participate in surveys of their opinions on services, policies, products and ideas. In exchange for yielding some privacy with respect to on-line behaviour, panelists have the opportunity to win cash or gift prizes. As a policy researcher, questions regarding methodological rigour may arise. However, it may be worth investigating what inquiring corporations want to know.

As for governments, technology opens windows of opportunity for citizen-centred program and service delivery. The Service and Innovation Sector of the Treasury Board Secretariat (<http://www.tbs-sct.gc.ca/si-si/>) is leading the government-wide rethinking and redesign of past notions of serving the public and is guided by the objectives of responsiveness, results-oriented governance, improved cost-effectiveness, collaboration and citizen engagement. One example is Service Canada (<http://www.servicecanada.gc.ca>) whose goal is to provide a one-stop access point to government services — by phone, the web, and face-to-face.

The point is that the electronic mediation and the provision of goods and services in a knowledge-based economy and society carries implications for both public policy and government service delivery. Sometimes even the most mundane activities can have a revolutionary impact. Just ask [eBay.com](http://www.eBay.com) and [Amazon.com](http://www.amazon.com).

From the Cyberzone



Surfing with the Mega-byte Rich and Famous

At the policy wonk's dream conference — the World Economic Forum in Davos, Switzerland — technology once again took centre stage. For those whose platinum invite must have gotten lost in the mail, the World Economic Forum has created a web site with press releases and conference proceedings at www.weforum.org. Other sources of conference information include reports from Canadian journalists David Crane (Toronto Star), William Thorsell (Globe and Mail) and Christina Freidland (Globe and Mail).

At one workshop, panelists were asked to name “ten web sites that will change the world”. Below are some of the responses:

www.readworld.com (simultaneous translation): Like the elusive “babblefish” of Douglas Adams fame, this site purports to offer simultaneous translation of English into Chinese. It remains to be seen how Readworld will translate such Canadianisms as “Ottawa leaves me blue.” Requires an add-on program, e.g., the Chinese Text Support Display Program.

www.drudgereport.com (Internet journalism): From broadcasting to everyone a journalist. Courtesy of the Lewinsky-Clinton scandal, this site caught a march on the established media and created an Internet hero in Matt Drudge.

www.amazon.com (books and more), www.bluemountain.com (greeting cards) and www.webnoize.com (digital entertainment): Virtual retailers are threatening parts of the business supply chain with aggressive and innovative business plans.

<http://maps.vix.com> (black hole or spam fighter): This real time black hole list is available to Internet Mail Postmasters as a way of combating unsolicited e-mail. According to Jonathan Zittrain (Harvard University) blacklisted senders can expect that 60% of the e-mail they send will not be delivered. Moreover, it will not be returned to the sender. There is a potential dark side to this list. As Zittrain puts it “Vix (the designer of the site) is the sheriff, but you can't vote him out if you don't like what he does.”

<http://stanford-online.stanford.edu> (on-line distance learning): This site provides a demonstration of a virtual degree course, including lectures, illustrations, course notes, and assignments delivered on-line. The prospects of future applications, e.g., teleconferencing, may make this approach increasingly viable.

www.avu.org (African virtual university): Bringing distance education to the developing world.

www.refugjat.org (bringing the Kosovar diaspora together): This site, which was developed over a weekend, helps Kosovar refugees trace the whereabouts of family members. The database now contains 75,000 names and has reunited some 9,000 families.

www.icann.org (assigning Internet domain names and numbers): The Internet Corporation for Assigned Names and Numbers handles the distribution of Internet addresses.



Eyewitness



Canada-U.S. Manufacturing Productivity Gap

To gain a comprehensive understanding of the contributing factors to Canada's labour productivity problems, the Centre for the Study of Living Standards (CSLS) organized and hosted a major international conference in

to achieve the U.S. manufacturing productivity growth rate of 3% and is largely due to the superior productivity performance in the United States of two key industries: machinery and electrical and electronic products.

competitiveness of the Canadian manufacturing sector, measurement problems in the manufacturing sector, the contribution of trade specialization patterns, small businesses and insufficient innovation to the productivity gap, small business and the productivity gap, and case studies of Canada-U.S. productivity trends in the auto assembly and chemicals industries.

This growing gap reflects the failure of Canadian manufacturers to achieve the U.S. manufacturing productivity growth rate of 3% and is largely due to the superior productivity performance in the United States of two key industries: machinery and electrical and electronic products.

The policy session, focused on the policy levers to improve Canada's manufacturing productivity performance. Two key questions were highlighted: what are the key drivers of Canada's productivity performance; and, what are the policy levers to influence these drivers? Research indicates that the primary drivers for productivity performance are innovation, investment and human capital. Canada underperforms in the first two areas relative to the U.S. The policy challenge is to create the optimal business environment to help ensure that Canadian industries grow and compete among world leaders in the 21st century.

Ottawa on January 21-22, 2000 featuring fifteen research papers by well-known Canadian, American and European productivity experts.

Andrew Sharpe (CSLS) provided the stylized facts for the conference participants to set the context of the productivity challenge. The Canada-U.S. manufacturing labour productivity gap grew in the 1990s. Canada's manufacturing productivity level fell from 21% below the U.S. level of output per hour in 1989 to 27% in 1998. Equally disturbing, Canada's level also fell relative to all other G-7 countries. The growing Canada-U.S. gap reflects the failure of Canadian manufacturers

Roger Martin (Rotman School of Management, University of Toronto) provided a detailed examination of Canadian competitiveness. This enabled him as well as an assessment of how Canada has progressed over the decade. His key message is that it is imperative that Canadian firms and governments turn their backs resolutely on a culture of replication and instead embrace innovation, uniqueness and differentiation. Only by shifting from a replication economy to an innovation-driven economy will Canada prosper in the 21st century.

Other topics explored at this conference included: the size of the productivity gap, the

The policy debate focused on appropriate policy levers and their capacity to influence key policy drivers. Areas of discussion included: the reduction of corporate taxes, the reduction of personal income taxes, the

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development of organizational and management capacity, the reduction of the high cost of capital, the promotion of innovation, the modernization of business

framework laws, the development and use of critical enabling technologies and the training, attraction and retention of skilled workers.

Conference proceedings and papers can be found on the Centre for the Study of Living Standards web site at <http://www.csls.ca/> .

The New Online Intermediaries

Below are some examples of Internet businesses of the so-called new economy. Despite the spectacular successes of some on-line retailers, it is estimated that some 80% of e-commerce occurs below the surface, i.e., b-2-b (business to business), as opposed to business to final consumer.

Commodities exchanges, such as www.ariba.com and www.metalsite.com facilitate the buying and selling of goods among a vast number of companies by standardizing the process and making it more efficient.

Aggregators, such as www.mercata.com and www.accompany.com, pool small quantity orders placed by individuals and companies in order to negotiate bulk purchase rates from manufacturers.

Auction sites, such as www.bid.com and www.ebay.com, facilitate the purchase and sale of a huge range of products and services directly between individuals in the form of an on-line auction.

Clearing houses, such as www.priceline.com, enable consumers to access discount prices by bidding for unsold time sensitive inventory such as airline tickets and hotel rooms.

Adapted from the Report of the Canadian E-Business Opportunities Roundtable. *Fast Forward: Accelerating Canada's Leadership in the Internet Economy*. The Boston Consulting Group (Canada), January 2000, p. 14.

Internet Users in the Top 15 Countries

	On-line Population in Millions, 1999	Total Population in Millions, 1999	Percentage of Total Population On-line
United States	110.8	273	40.6%
Japan	18.2	126	14.4%
United Kingdom	13.9	59	23.6%
Canada	13.3	31	42.9%
Germany	12.3	82	15.0%
Australia	6.8	19	35.8%
Brazil	6.8	172	4.0%
China	6.3	1,247	0.5%
France	5.7	59	9.7%
South Korea	5.7	47	12.1%
Taiwan	4.8	22	21.8%
Italy	4.7	57	8.4%
Sweden	3.9	9	43.3%
Netherlands	2.9	16	18.1%
Spain	2.9	39	7.4%

Note: Total population data are July 1999 estimates.

Source: *Computer Industry Almanac*, Central Intelligence Agency



Research Brief

Families, Labour Markets, and the Well-Being of Children

The well-being of children has risen higher and higher on the public policy agenda, to the point that some observers are drawing direct links between the developmental health of children during the first years of life and Canada's longer-run economic potential. We should invest in children, the argument goes, because there will be a payback in terms of higher productivity, growth, and ultimately welfare.

But the balancing act for policy makers involves structuring such investments so that they complement and support both families and markets, while avoiding unintended consequences. If social policy really is an investment with long-term returns, then we need to know how families and labour markets interact to promote — or for that matter fail to promote — the well-being of children in the here and now.

Take, for example, the discussion of child "poverty." Leaving aside all the issues associated with the definition of that term, it is not enough to know that a given fraction of Canada's children fall below a particular level of income at some particular point in time. The longer-term consequences of living in low-income must surely be related to how long a child spends in straitened circumstances. How many children begin low-income spells in any given year? How long do they stay there? Just how secure

are the incomes families earn? Indeed, to fully appreciate how Canadian labour markets work and the prevalence of low-income among children it is important to cast these questions in an international light. How does the process determining low-income dynamics in Canada compare to other industrialized countries?

The Netherlands, for example, has in the span of a decade completely reversed a long established tradition discouraging, and at times actually forbidding, mothers to take jobs. Beginning in 1990, policy makers began encouraging labour supply, with the result that the participation rate of mothers with young chil-

But the balancing act for policy makers involves structuring such investments so that they complement and support both families and markets, while avoiding unintended consequences. If social policy really is an investment with long-term returns, then we need to know how families and labour markets interact to promote — or for that matter fail to promote — the well-being of children in the here and now.

Labour markets are only one side of the coin; the other is the family. Parents must juggle the needs of their children and the demands of their employers. The degree to which this act succeeds, and how best to support it, sets the stage for a host of policy issues. The most obvious concerns child care. There are remarkable differences in the way industrialized countries structure parental leave and child care policies. It is also remarkable how quickly a policy change can impact societal conditions.

dren more than doubled by the end of the decade. Child care capacity was substantially increased, but it was also designed to share the costs among governments, employers, and parents, as well as to redistribute paid and unpaid work between fathers and mothers. The involvement of employers in the child care market has increased substantially, to the point that the relative share of government expenditures has fallen from 70% to 40%.

In a period of increasingly turbulent labour markets, families

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also look to governments for income support. But at the same time, it is being argued that much more than money matters for successful child development, and policy makers are, therefore, drawn into areas far removed from income transfer programs.

On the one hand, there have been important changes in welfare policies in a number of provinces and U.S. states. South of the border these have been justified by claims that reliance on welfare has intergenerational consequences, affecting family formation and fertility decisions as well as leading children to rely on welfare in their turn as adults.

On the other hand, other researchers, like Janet Currie — a native of Ottawa now teaching at University of California at Los Angeles —, argue that the safety

net should be widened so that government policy focuses on in-kind transfers to families with young children, not simply income transfers. However, this presupposes a good deal of knowledge about which interventions are best, how they are taken up by those most in need, and how they are used for the benefit of children. This sort of knowledge is starting to be developed, and in some cases evaluation techniques employing control and treatment groups — not unlike experimental methods used in the medical sciences — are, if not common place, at least more frequently used than a decade ago.

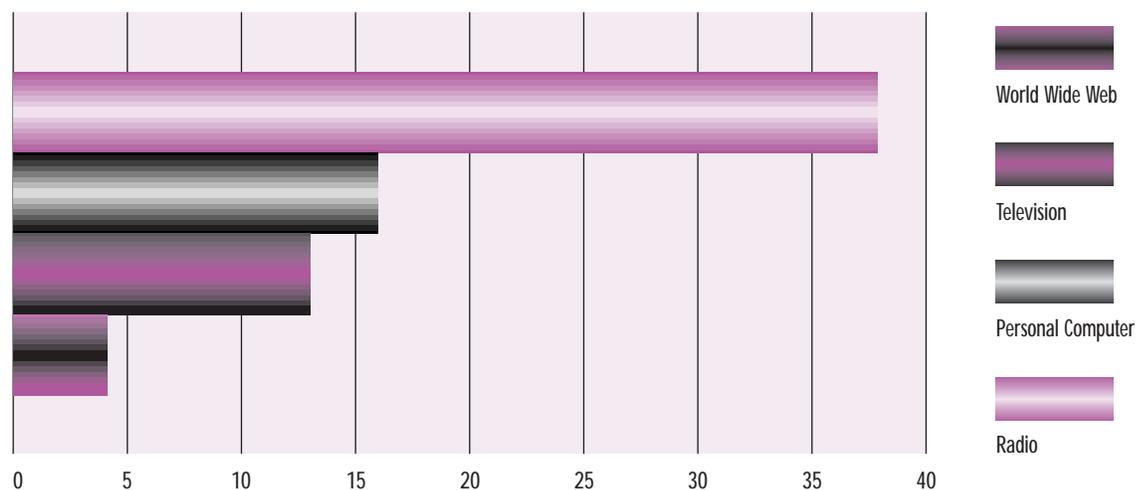
Making sound investments in Canada's children requires as much knowledge as possible of the return that society can expect from a host of different policy options: income support, labour

market interventions, and in-kind transfers among others. Choosing the right mix and balancing the trade-offs will be much more straight forward if the right questions are asked about how families interact with labour markets, and how children get ahead when confronted with both a favourable and not so advantaged start in life.

Miles Corak
 Manager,
 Family and Labour Studies,
 Statistics Canada

To learn more about the interaction between families and labour markets, and how policy can promote the development of children you may wish to attend the conference "Families, Labour Markets, and the Well-Being of Children" to be held on June 1st and 2nd, 2000 in Vancouver. Details are available at <http://cerf.mcmaster.ca> and registration materials at <http://economics.ca/2000>.

HOW LONG BEFORE NEW TECHNOLOGIES GAIN WIDESPREAD ACCEPTANCE?
 (YEARS FROM INCEPTION TO 50 MILLION USERS)



Source: United Nations. *Human Development Report 1999*, p. 58.



Looking Outward

The National Policy – For Kiwis

A healthy knowledge-based economy may be of particular benefit to New Zealand. Its remoteness from world markets has often been referred to as the “tyranny of distance.” For New Zealand, recent advances in information and communication technologies are the modern equivalent of the freezer ship that revolutionized its economy last century. New Zealand’s assessment of the knowledge-based economy and prescriptions for the future resonate with the Canadian experience.

BRIGHT FUTURE

Over the past two years, New Zealand has embarked on a number of initiatives to prepare for and support a knowledge-based economy and society. Recently, the government of New Zealand released *Bright Future — Five Steps Ahead*, a report and policy package setting out how the economy will be transformed into a knowledge-based one. The recommendations contained in *Bright Future* have informed the strategic planning and policy direction of the Ministry of Research, Science, and Technology, the Ministry of Tertiary Education, and the government as a whole. Many of the policy recommendations have already been acted upon. What follows is a brief report of its main elements.

A SHORTAGE OF SKILLS — BECOMING A LEARNING NATION

As in Canada, New Zealand firms have reported skill shortages in specialist areas essential for a knowledge-based economy. These include information technology, biotechnology, and software engineering. Firms have also reported a paucity of core skills, such as literacy, numeracy, motivation, and discipline. Individuals, employers, and government need to understand that lifelong learning is an integral part of the knowledge-based society. People will have to continually gain new skills as their careers develop. New Zealand, the report notes, needs to become a learning nation.

THE BRAIN DRAIN: KIWI-STYLE

The Canadian lament “we are losing our best and brightest” has resonance in New Zealand. It is widely recognized that New Zealand is experiencing a ‘brain

drain,’ especially in those fields where the country is already experiencing significant skill shortages. New Zealand, however, has constraints that limit its ability to plug the drain; the country has small firms that do not always have the capacity to provide the same rewards delivered by larger firms in other countries.

The government wants to encourage successful New Zealanders living overseas to maintain links with New Zealand and share their knowledge of international markets, latest innovations, and business opportunities. To this end, the government has developed a web site and a newsletter informing citizens living abroad of the latest market opportunities and business developments.

DEVELOPING CAPACITY AND COMPETENCY

The government, in its 1998 report on *Information and Communication Technology Strategy for Schools*, committed itself to address the skills shortage. The government has agreed to boost the number of teachers and has committed to fund annual teaching awards. These awards will enable teachers to spend time working in research institutions and industry, or undertake enterprise training. The government is also encouraging students to study science, math, and technology subjects at the post-secondary level by offering bursary incentives.

FUNDING THE IDEA

In a knowledge-based economy, many wealth-creating ideas come from focused R&D. New Zealand’s level of private sector investment in research and development lags behind other OECD countries, including Canada. Small firms in New Zealand simply do not have the capacity to undertake formal R&D on their own.

The government of New Zealand currently invests the equivalent of CD\$482.4 million in R&D, but it wants to improve upon translating this investment into commercially viable products and technology. The government’s *Blueprint for Change* describes the steps that the government should take to align its investments in R&D so that they support the ongoing development of New Zealand’s knowledge-based economy.

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The need to fund innovative ideas has also encouraged a shift in New Zealand's investment capital market. To help small businesses get investors for their ideas, the New Zealand Stock Exchange is developing a new capital market. This capital market will list small companies that do not meet the \$5 million (NZD) threshold required to list on the current stock exchange.

FREEDOM TO INNOVATE

As in Canada, voices have been raised in New Zealand advocating for a change in the country's legal and regulatory framework. The outcome of the *Bright Future* consultations suggests that the current set of laws do not set out clearly understood business and tax requirements, thereby increasing unnecessarily firms' transaction costs and encouraging noncompliance. To provide government with better information on a firm's transaction costs arising from the country's legal and regulatory framework, New Zealand intends to establish Small Business Test Panels. These Test Panels, consisting of a cross-section of businesses, will be asked directly about how proposed new laws will affect them. Through these test panels, a new regulatory framework will be developed.

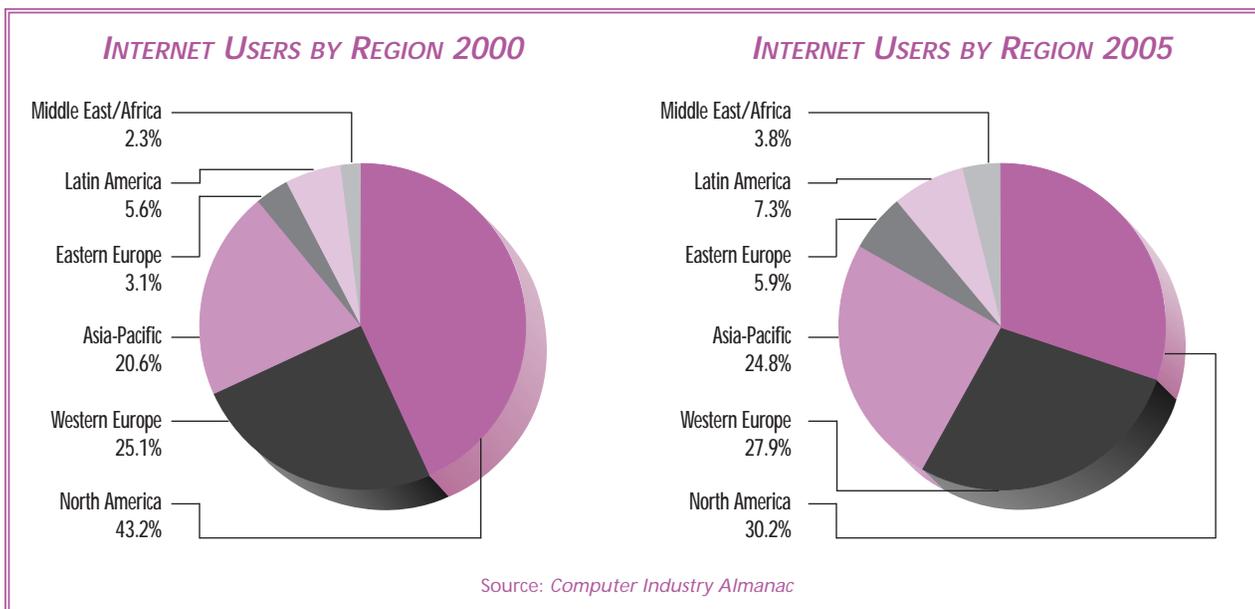
BUILDING AN INNOVATIVE NATION

Finally, the *Bright Future* report noted that New Zealand needs a culture of success that encourages

creativity and innovation. A culture of success is not just about feeling good about accomplishments. It is about taking risks, innovating, and being competitive by constantly striving to achieve. So, in addition to becoming a learning nation, New Zealand needs to become an innovative and entrepreneurial nation. As a step toward this goal, the government is establishing the annual Prime Minister's Awards. These awards recognize excellence in achievement in science, technology, innovation, and enterprise. They will also include an award for the most enterprising Maori business.

In sum, *Bright Future* recognizes that while people as individuals may hold knowledge, knowledge is also incorporated in the very fabric of society through its institutions. New Zealand, like Canada, has considerable challenges ahead if it is to build a knowledge-based economy. The most successful knowledge-based economies of the future are likely to be those that are best at building "knowledge capital" in individuals and in the structures and networks of society. The *Bright Future* policy package helps New Zealand move towards this goal.

For more information, please see New Zealand's *Bright Future* web site and its related links: www.stepsahead.org.nz.



Toolkit



Bridging Knowledge and Practise at Human Resource Development Canada (HRDC)

In an effort to improve effectiveness, organizations everywhere are exploring innovative ways to develop new knowledge bases and knowledge sharing. Much of this effort is predicated on the belief that evaluation information, specifically on what works, what does not and why, can be made more relevant and useful to a broader audience. This information can be used constructively to build a strong culture of learning and to influence future policy and programming decisions. In principle this makes perfect sense; in reality, however, the challenge is creating an environment that facilitates sharing and understanding.

In 1996, management at HRDC's Evaluation and Data Development Branch (EDD) consulted its clients about making evaluation information more relevant and useful. While program managers knew the value of EDD evaluations, many felt the information reported was too technical and narrowly focused on individual programs to be widely applicable. They suggested three possible improvements: simplify, broaden, and make the information more easily accessible, not only to policy makers but also to those working in regional and local offices.

With these goals in mind, EDD took steps to improve the communication of its evaluation findings. In addition to its web site (<http://www.hrdc-drhc.gc.ca/edd>), two innovative ways of making evaluation materials more accessible were developed: the *Lessons Learned* series and the *Focus on What Works* initiative.

The first initiative, the *Lessons Learned* series, provides information about the effectiveness of program or policy interventions on a particular policy issue.

The studies review and analyze both Canadian and international experiences in a given policy area and then present the key findings as a series of lessons. Rather than addressing the particulars of

specific programs, each study attempts to identify patterns in the evaluation literature. Consultations involving selected experts and stakeholders are built into the research process both to validate and enhance study results.

By capturing the state of knowledge and by identifying key areas that would benefit from further study, the *Lessons Learned* series inform and stimulate discussion on policy and program issues among managers, policy analysts, public policy researchers, academics and other stakeholders. Rather than having the final word on a subject, a *Lessons Learned* series should be seen as leading to an informed next step.

Below are two examples of lessons learned, as described in a recent study on *Older Worker Adjustment*:

Lesson 1 There is no systematic difference between the productivity of older and younger workers.

A large number of gerontological and psychological studies present direct measures of job performance

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WANTED

Ideas

The policy research and ideas environment is in constant change. Despite what you may have heard, no single organization, discipline, or source has all of the answers or even all of the questions. **We are on the look-out for cutting edge research, ideas and knowledge in public policy to profile in *Horizons*.** If you know of some noteworthy horizontal policy research, please contact Allen Sutherland at a.sutherland@prs-srp.gc.ca or call (613) 943-2490.

Thanks.



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and analyze their relationship to age. The literature review concludes that there is no significant overall difference between the job performance of older and younger workers. In almost every case, variations within an age group far exceed the average differences between age groups.

Lesson 2 Income support measures designed to facilitate the early withdrawal or retirement of older workers do not necessarily improve the overall labour market adjustment process.

A 1995 International Labour Organisation report found that the early withdrawal of older workers did not necessarily benefit younger workers. Referring to early retirement programs in countries such as Belgium, France, Spain and the United Kingdom, the report concluded that the total impact of such measures on the youth unemployment problem was negligible. The reason was that new entrants to the labour market often lacked the experience and know-how necessary for the jobs vacated by older workers. More often, the jobs just disappeared.

The second initiative, *Focus on What Works* builds on the *Lessons Learned* series by sharing 'what works' knowledge in three ways:

First, through the Lessons Learned Knowledge Bank, it incorporates the *Lessons Learned* series and additional evaluation research information. This provides a central access point for lessons learned and 'what works' information.

Second, through 'building awareness events' on specific topics, such as children or older workers, it brings together diverse discussion groups ranging from experts to practitioners, policy makers, decision makers and partners, such as provincial governments and non-governmental organizations. These events offer a unique occasion to bridge theory

with practise by sharing and critiquing lessons learned, exploring what works and discovering new ways of applying the knowledge in the field. They also represent a unique opportunity to blend validated evaluation knowledge with anecdotal information gathered by practitioners and evaluators in all regions of the country.

Third, an on-line research service, a documentation service to capture 'good or best practise' case studies, and an electronic clearinghouse for evaluation information, contacts, research and guides is made available via HRDC's What Works Centre. The Centre is specifically designed to take evaluation information and make it relevant to a local HRDC setting.

Lessons Learned and *Focus on What Works* are instrumental in bridging knowledge with practise and making evaluation more participatory and relevant throughout the department. In undertaking these activities, EDD hopes not only to increase awareness of what works in social and labour market policy and programs, but also to raise HRDC's capacity as a learning organization.

For more information about the *Focus on What Works* initiative, please contact Barbara Lawless at (819) 953-7787. If you would like to find out more about the *Lessons Learned* series, please contact Catherine Massé at (819) 953-8094.

*** *Lessons Learned* studies currently available include *Effectiveness of Employment Related Program for Youth, Own-Account Self-Employment, Disability Policies and Programs, Program for Aboriginal Peoples*. Future ones include *Innovative Workplaces, Student Financial Assistance, Adult Literacy, Gender Equality in the Labour Market, and Reconnecting Social Assistance Recipients to the Labour Market*. Most *Lessons Learned* "packages" include a series of communication tools — a Final Report summarizing the research results, a synopsis highlighting the lessons and a video showing the human faces behind the complex policy issues.



Did you know?



e-World by the Numbers

A study conducted by Nortel Networks and the International Data Corporation (IDC) and presented at the World Economic Forum in Davos, Switzerland projects that:

- The global Internet economy will grow at a rate of 56% per annum and will be worth or valued at \$2.8 trillion by 2003.
- E-business will grow at a rate of 86% per annum, representing \$1.3 trillion of the \$2.8 trillion value of the global internet economy.
- Internet infrastructure will grow at 42% to representing and will be worth 1.5 trillion by 2003.
- E-business will grow fastest in Europe with 118% CAGR compared to US 76% CAGR.
- 87% of e-business will be conducted in the business-to-business market.
- 87% of home Internet connections will still narrow band in 2002.”

Source: Craig, Ian. "The Promise of the High Performance Internet". *Nortel Networks*. January 2000.

"With 99 percent of homes equipped with a least one telephone and a cable system which passes through 90 percent of all households, with 81 percent accessing it, Canada has a strong base of affordable quality communications infrastructure upon which to build a knowledge-based economy."

Source: The Canadian Electronic Commerce Task Force. International Trade Centre, Executive Forum on National Export Strategies Re-Defining Trade Promotion, UNCTAD/WTO, 1999, p. 1.

"This year North America will represent only 43% of the on-line population and that will fall to 30% by 2005, according to projections by the Computer Industry Almanac. Western and Eastern Europe meanwhile, will account for about a third of all Internet users in 2005, up from about 28 percent this year. And almost a quarter of the worldwide online population in 2005 will reside in the Asia-Pacific region. ...About 43% of users in 1999 were non-English speakers, according to Global Reach. Japanese, Spanish and German were the most prevalent non-English languages."

Source: Lawrence, Stacy. "The Net World in Numbers", *The Industry Standard: The Newsmagazine of the Internet Economy*. February 8, 2000, p. 3.

"Information-poor schools and hospitals are often poorly connected. In South Africa, the best-connected African country, many hospitals and about 75% of schools have no telephone line. Even at the university level, where there is connection, up to 1000 people can depend on just one terminal."

Source: United Nations Human Development Report. 1999, p.59.

"The past two decades have seen a huge rise in patent claims... The number of applications made annually soared from less than 3000 in 1979 to more than 54000 in 1997."

"Industrial countries hold 97% of all patents worldwide...Indeed, in 1993 just 10 countries accounted for 84% of

global research and development, controlled 95% of the US patents of the past two decades and captured more than 90% of cross-border royalties and licensing fees... By contrast, the use of intellectual property rights is alien to many developing countries. More than 80% of the patents that have been granted in developing countries belong to residents of industrial countries."

Source: United Nations Human Development Report 1999, p.67-68.

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