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Canada and the Information Society

Putting ICTs to work for citizens and communities

world summit on the information society
Geneva 2003 — Tunis 2005

Canada

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Putting ICTs to work for citizens and communities

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Foreword

At the United Nations Millennium Summit in September 2000, Canada set out access to the benefits of information and communications technologies (ICTs) as one of our aspirations for the world's people. Together, here in Geneva, and in two years' time in Tunis, we will define a vision for a global society where people everywhere will benefit from the potential that the information society brings to all areas of human life.

Canada can make a significant contribution to developing and deploying ICTs to create an equitable global society. Our history and geography have made us world leaders in ICTs and their applications. Our long-standing dedication to international development and harmony compels us to help developing countries harness the potential of ICTs, by supporting capacity building and sharing our experience and expertise.

Over the past 10 years, we have moved very far, very fast in building an information society within our own country — one that fosters innovation and spreads its benefits to people in every corner of our vast nation. We have seen how technology and its applications can transform economies, cultures and governance itself. We have taken important steps in sharing what we have learned with other nations.

This publication summarizes Canada's achievements and outlines our objectives for building a global information society. It describes specific policies and programs that have succeeded for us and the international partners with whom we have worked. It also reports on specific cases in which ICTs and their applications have made a difference to the lives of people in Canada and around the world.

Canada comes to the Geneva meeting of the World Summit on the Information Society eager to learn and to share. We are inspired by the Summit's vision of forging a shared political will and a concrete plan of action for fostering a global information society. Our shared goal is to transform a political vision into real benefits for people and communities. We believe that Canada's experience demonstrates how this can be accomplished.

Introduction

Nearly half a century ago, a Canadian, Marshall McLuhan, predicted that electronic media would bring the world closer together into one community. Today's technologies have made that vision a reality, creating a "global village" where distance is irrelevant.

Canada has been at the forefront of both the technology and its applications. We are a nation of 31 million people scattered across a very large country with some of the toughest terrain and climatic conditions on the planet. Communications have become our forte.

In 1876, Alexander Graham Bell made the world's first long-distance telephone call in Ontario. In 1901, Guglielmo Marconi received the world's first transatlantic wireless message in Newfoundland. In 1906, Canadian Reginald Fessenden broadcast the world's first voice and music program. Fast forward to:

- the world's first domestic digital microwave transmission network;
- the world's first geostationary domestic satellite communications;
- the world's longest fibre-optic communications network; and
- the world's fastest research and education network.

All are products of Canada's leadership in information and communications technologies (ICTs).

At the dawn of the 21st century, it is not enough to be at the leading edge of technological innovation. The challenge today is to apply these technologies to create an information society in which distance is irrelevant and all people have access to services, information and opportunities. Just as we have led the way in the development of many ICTs, Canada is also a world leader in finding ways to use the technology to create a more cohesive society.

Canada has pioneered many initiatives to create an information society within its own borders. Programs such as Computers for Schools, SchoolNet and the Community Access Program showed that it was possible to make Internet access available throughout the country. Programs such as Government On-Line and the Canada Health Infoway showed how information and services could be put on-line. And Canada's pioneering efforts in creating a policy framework for electronic business have provided a foundation for Internet access to a global marketplace. Section I, entitled Building Canada's Information Society, outlines many of the domestic policies and initiatives that have contributed to building an information society in Canada.

However, Canadians and their government feel very strongly that the true potential of the information society will not be realized until the technology can be used to bring the benefits of an information society to people everywhere. Canada has applied this philosophy within its own borders by

ensuring that residents of even the most remote regions in our country have access. ICTs are being used to support the global development agenda, and Canada believes the lessons learned and the programs created can contribute to reducing the global digital divide. Section II, Bridging the Global Digital Divide, outlines the many programs and initiatives that Canada has undertaken to build capacity within local communities in developing countries to use ICTs to meet their development needs.

This compendium is designed as a tool to help our global partners tap into the knowledge and expertise that Canada has gained in developing our own information society, and apply them to the challenges of bridging the digital divide worldwide, wherever it exists. In this way, Canada hopes to contribute further to achieving not only Marshall McLuhan's vision of the global village — but also a village where an enhanced quality of life is enjoyed by all.

I. Building Canada's Information Society

Legislation and Policy Frameworks

Canadians are among the world's keenest Internet users, and Canada is one of the most connected nations in the world. Part of this success is due to nearly a decade of sound public policy, based upon a remarkable degree of input and consensus from various parts of Canadian society.

Within Canada, telephone companies and cable television companies provide the most extensive wireline networks, reaching all Canadians. Their networks were built for different purposes, are configured differently and were subject to different regulatory frameworks and barriers. In the early 1990s, these factors prevented full interconnection and fair commercial competition. Given that new technologies were leading the two industries to compete, and that new service providers were emerging in areas of broadband wireless, advanced satellite services, digital broadcasting, Internet and multimedia services, the Government of Canada modernized its legislation governing telecommunications and broadcasting.

The legislation was updated to provide the basis for competition, while allowing government oversight where required, with the goal of encouraging the development of the telecommunications industry service. It was also updated to ensure that programs being broadcast to citizens provided a wide choice of Canadian programming and that the allocation and management of radio spectrum were fairly governed.

With our legislative frameworks in place, Canada began to develop policies and implement measures focussing on the interconnection and interoperability of network facilities; the support of Canadian cultural content services; and the transition to fair competition in the provision of all telecommunications and broadcasting services. Canadian public policy supports open, interoperable standards determined by market forces, with government acting as a facilitator, intervening only where necessary for security, safety, international commitments or consumer interests.

In the mid-1990s, the Canadian government determined that it would put the "Information Highway" at the centre of public policy. It commissioned an Information Highway Advisory Committee (IHAC), with members drawn from the telecommunications, broadcasting and information technology industries, consumer and labour organizations, and the artistic and educational communities. In September 1995, IHAC released a report with more than 300 recommendations on how Canada could best meet the challenge of creating an information society. The government acted on the overwhelming majority of the recommendations.

Broadband for Rural and Northern Development Pilot Program

Universal access has always been a key goal of Canada's Internet strategy. In the 1990s, the goal was to connect every school, library and community to the Internet. Today, the goal is to provide broadband access in every community so that all Canadians can partake in telehealth, distance education and e-commerce.

Since many regions lack advanced infrastructure, the $105-million Broadband for Rural and Northern Development Pilot Program was launched as a first step to provide broadband access to all Canadian communities.

Funding recipients are community-based, legally incorporated, not-for-profit organizations that commit themselves to act as the community champion on behalf of the eligible community.

www.broadband.gc.ca

For example, IHAC reported that access would be a key issue; the government made universal access a key goal. Building on that commitment, a new and ambitious program to bring broadband networks to rural and Northern communities was created to ensure that access also includes those living in Canada's remotest communities.

On IHAC's advice, the expansion of physical networks and infrastructure was left to the private sector. The government focussed primarily on creating the environment in which the private sector could get on with the job of building the Information Highway.

Through its extensive research, consultations and recommendations, IHAC helped build a national consensus on issues, helped focus the attention of both the general public and public policy makers on the changes that the technology would bring, and provided the foundation for a dynamic and forward-looking Connecting Canadians agenda.

Since IHAC, Canada has been moving aggressively to deal with challenges posed by the Internet, in keeping with its established pro-market philosophy. Regulation aims to ensure third-party access to carriers and current generation broadband networks, including both DSL and high-speed cable. For example, in 1999, the Government of Canada held its first spectrum auction. Unlike auctions in any other country, this auction was held in real time over the Internet, using Canadian public key infrastructure encryption and digital signatures for secure communication. Since that time, a second auction for additional spectrum has been held. Content and activities on the Internet are subject to laws of general application such as the *Criminal Code*, the *Copyright Act* and the *Competition Act*. In Canada, the Internet is highly competitive and is not subject to specific regulation.

Internet Use in Canada

- More than two-thirds of Canadians use the Internet on a regular basis.
- Half of all households have at least one member regularly using the Internet from home.
- Almost half of home users and the majority of business users have high-speed access.
- Seventy-six percent of all Canadian firms use the Internet; 92 percent of firms that employ 20 or more people use the Internet.
- Fifty-two percent of private sector employees have Internet access.
- On-line Internet sales reached $13.7 billion in 2002 — a one-third increase over the previous year.
- The Organisation for Economic Co-operation and Development (OECD) estimates that, as of 2003, there are 82 million broadband subscribers in the OECD member countries. Canada currently ranks second among OECD countries in terms of the number of broadband subscribers.

Communications Infrastructure

The successful transition to an information society requires an advanced ICT infrastructure. Building such an infrastructure cannot be accomplished by one sector alone. Rather, it requires the concerted effort of all sectors of society. Recognizing this, the Government of Canada focussed on what it could do best: establishing a modern domestic policy and regulatory framework that respond to the issues of the networked economy. Acting on IHAC's recommendations, the government modernized framework legislation, promoted competition, encouraged wireless and satellite services, and auctioned radio frequencies.

The private sector, in turn, built the infrastructure and created the software, and much of the content and services, that underpin the new economy. During this process, Canadian companies competed to be the best in the world. This competition drove prices down, increased consumer choice and sped up the introduction of new services. It stimulated productivity, innovation and investment. Today, Canada has one of the best communications infrastructures in the world, and is a leader in cable and telecommunications service, quality, market development and rates.

Ensuring Access in Rural and Remote Areas

New advanced applications such as telehealth, distance learning, the delivery of government services and e-business require broadband, or high-capacity, Internet access. These applications have the potential to greatly enhance the lives of citizens, whether through more learning opportunities, better access to health care or improved business opportunities. The Government of Canada believes it is important that all citizens have the opportunity to access these services and reap the benefits of the networked economy.

The Broadband for Rural and Northern Development Pilot Program was launched in September 2001 as the first step toward meeting the Government's commitment to ensuring broadband access for all Canadian communities, in partnership with local communities, the provinces, territories and the private sector.

Through a competitive process, applicants to the program receive funding to develop sustainable business plans outlining how they would deploy broadband to local communities. Additional funds are provided to implement the plans. Through this program, approximately $44 million has been invested in the development of broadband infrastructure to date.

TETRA — Technology Plus People

Memorial University of Newfoundland began working with telemedicine in 1975. Today, its Telehealth and Educational Technology Resource Agency (TETRA) is one of the most successful and mature telemedicine centres in the world.

With the Government of Canada's ambitious goal to bring broadband to remote and rural communities, TETRA is poised to provide telemedicine and distance education initiatives throughout Newfoundland and Labrador.

Communities will take advantage of global experts and resources. Citizens will access continuing education programs and information sessions. Local business will tap global markets. Health care professionals will communicate with specialists in the world's most advanced health care facilities.

After a quarter of a century of pioneering work in telehealth and distance education, TETRA has concluded that the simplest, least expensive technologies can often be used to meet the need — old technologies still have their place. Telemedicine and distance education is more than technology; a people network is just as important as a technology network.

www.med.mun.ca/telemed

The Broadband for Rural and Northern Development Pilot Program complements the National Satellite Initiative. This initiative will lower the cost of broadband for some 400 communities in the mid-North and Far North, as well as for other remote communities where satellite is the only practical means of providing broadband access.

Service providers will compete to gain access to the satellite connectivity, and in turn provide satellite service to their local communities. The broadband access will not be free for communities, but the rates are expected to be comparable to those charged to customers in other Canadian cities.

This unique satellite solution will help provide access to essential services in areas such as health care and education, using tools such as videoconferencing and tele-surgery. It will also bring economic opportunities. The National Satellite Initiative is another step toward meeting the Government of Canada's commitment to ensure that broadband access is available to all Canadian communities.

CA*net 4: Canada's National Research and Innovation Network

A supercomputer that is available to anyone linked to a network, CA*net 4 joins both high performance computers and personal computers across Canada into a vast network. Users can set up and manage their own private gigabyte networks using parts of the total capacity. Canada was the first country to adopt this networking methodology, and now the network's dedicated lightpaths are driving the evolution of grid computing.

The fourth generation of Canada's ultra high-bandwidth network, CA*net 4 has become an essential tool for collaboration in research and education. It is connected to virtually all research networks around the world.

www.canarie.ca

Cutting-Edge Research

The Government of Canada also supports research into advanced ICT applications through its own research facilities, including the Communications Research Centre Canada (CRC) (**www.crc.ca**) and the National Research Council Canada (NRC) (**www.nrc.ca**), which has a multi-site Institute of Information Technology.

As with the building of the Information Highway, much of the federal investment in ICT hardware, software and applications is made through partnerships and collaborations, such as CANARIE Inc. CANARIE's members include universities, businesses, industry associations and government research facilities, drawn from all regions of Canada. The organization funds many advanced Internet application projects. Since its inception in 1993, CANARIE has succeeded in increasing the speed of Canadian research and development (R&D) networks by a factor of almost one million. The most recent advances have come through the development of the broadband research network, CA*net 4.

Government Leadership in Using ICTs

Canada seeks to be a model in using the Internet to provide government services. To this end, the Government On-Line (GOL) initiative aims to use ICTs to enhance Canadians' access to improved and integrated services, anytime, anywhere and in the official language of their choice by 2005.

Although GOL is still in the middle of its mandate, proof of its success can be seen in the fact that, for the past three years, the international consulting organization Accenture (**www.accenture.ca**) has ranked Canada as the world leader in e-government.

Citizen Engagement

E-mail has changed the way Canadians communicate with one another, and has made an enormous difference in their ability to participate in the affairs of their community.

This is expected to grow: almost 50 percent of Canadians expect to use the Internet or e-mail as the chief means of interacting with the government in the future.

The result is a change in the way politicians and citizens interact. Political leaders are able to receive information and feedback from constituents faster and more easily. Citizens are able to organize and make their views known very efficiently.

With an e-literate citizenry, the result has been more input from the local level on political decisions, and less need for top-down government.

Access to information should be a basic right for every citizen. In the 21st century, universal access to the Information Highway will help ensure that societies are open, equitable and informed.

Reaching Government Through the Internet

- Seventy percent of Canadian Internet users have visited a Government of Canada Web site.
- Thirty-four percent of Canadians report that their most recent contact with the federal government was through the Internet.

E-Democracy at Work

The foundation of democracy is two-way education and communications between citizens and those who govern them. With the pilot Consultation Portal, Canadians can learn about and participate in public consultations on a variety of issues that affect them. The portal groups information on various consultation activities across federal departments and agencies. Where possible, it also provides direct links to on-line consultations.

The result is more public awareness of government consultation, more opportunity for Canadians to participate and a better ability to engage Canadians in the public policy process.

www.gol-ged.gc.ca

Government On-Line

From its inception in late 1999, the GOL initiative has been guided by the Government of Canada's service vision, which aims to improve service for citizens, and increase productivity and transparency.

Consulting Canadians is a critical part of the Government of Canada's approach to building e-government. Between April 1, 2002, and March 31, 2003, more than 10 000 Canadians participated in surveys and focus groups on e-government and service improvement.

Increasingly, Canadians are using on-line services. They are reporting high levels of satisfaction with the services provided. The result is better, more responsive government. Many Canadians already rely on government Web sites to search for jobs, find reliable health information, register a business and access many other services. But this is just the beginning. By 2005, Canadians will be able to access more than 130 of their most commonly used services on-line.

For more information on the GOL initiative, visit **www.gol-ged.gc.ca**

Services

Two factors motivate the Government of Canada's efforts to transform its services and service delivery network: the need to improve the service experience for citizens, and the need to increase productivity and transparency.

Canada's activities related to on-line service are conducted along the following five lines:

- service delivery;
- common secure infrastructure and architecture;
- policy;

Canada Site Portal

A student looking for government help to find a job; a woman who needs to change her address and basic information coordinates as listed in government databanks; a man contemplating how to proceed after losing his wallet — most scenarios would have these people trek to a wide range of individual organizations and government departments. The Government of Canada believed that there was a better, more user-friendly approach to solving life's problems. What if the services were organized according to the problems they solved?

The government's Canada Site does just that. Breaking down interdepartmental and intergovernmental "stove pipes," the site organizes information on the vast array of government services in a way that makes sense to users. For example, individuals can change all of their address and contact information in one on-line transaction.

Users can also create a page of bookmarks for their favourite links accessible through the Canada Site. Or they can register to be notified by e-mail whenever new links are added to their favourite sections on the site, and take advantage of on-line forms, and the government's Shop On-line sites.

www.canada.gc.ca

- organizational readiness and human resources; and
- communication.

Citizens' expectations for immediate, seamless access to integrated public services continue to rise as more Canadians experience the convenience. Taxpayers look to governments to improve productivity and achieve better results across all public services.

The Government of Canada has used the power of Internet technology to organize information on its policies, programs and services in ways that make it easy for people to find what they need quickly. The Canada Site portal is built around the recognition that people in Canada and around the world seek on-line help for different reasons. Users can choose key topics or the powerful search engines to quickly find the information they need. The portal presents as many ways to find the right information as possible. The goal is to make sure that there are no wrong doors to government information and services.

In the process of putting information and services on-line, the government has also strengthened its partnerships with stakeholders involved in important services and programs. The Aboriginal Canada Portal involves a partnership of six national Aboriginal organizations and 11 Government of Canada departments and agencies. The process of creating the portal has been a catalyst for other projects and initiatives, including a forum that brought together some 400 Aboriginal stakeholders from across Canada and around the world.

Aboriginal Canada Portal

The Aboriginal Canada Portal provides a single window to more than 16 000 different Aboriginal-related pages across governments, universities, communities and associations.

The site constantly evolves to include new technologies and tools, such as the Virtual Aboriginal Trade Show, created in partnership with the Aboriginal International Business Development Group.

The portal has won several awards, including a Public Service Award of Excellence in 2002, and the bronze medal for Management of Information and Technology at the 2001 Industry Distinction Awards of Excellence.

www.aboriginalcanada.gc.ca

Economic Development

Canada is establishing a networked economy and encouraging businesses and citizens to use it to their advantage.

Community Economic Development

The emerging knowledge-based economy brings new opportunities for local entrepreneurship — opportunities that help keep talented people at work in the community, as opposed to seeking careers in larger metropolitan centres.

To provide access to the Internet in all parts of Canada, the government has supported the creation of 8800 Community Access sites, where people can log on to the Internet. The sites receive more than 34 million visits a year, and many are becoming local economic development incubators.

Canada has been exploring how to achieve economic, social and cultural improvements through the use of ICTs under its Smart Communities program (**http://smartcommunities.ic.gc.ca**). A smart community is one with a vision of the future that involves the use of ICTs in new and innovative ways to empower its residents, institutions and region as a whole. In 2000, Canada chose 12 smart community pilot projects through a nationwide competition. The objective was to establish world-class smart communities across the country, and gather and disseminate the lessons learned in the pilot projects in order to apply them to communities elsewhere.

Smart Community: New Brunswick

In the Acadian Peninsula of New Brunswick, a rural Smart Community pilot project has explored ways to revitalize the local economy and provide opportunities close to home for people who used to have to leave to find a better way of life.

A network of 28 community access centres enables residents to exchange information and tourists to plan their visits to the region. The project also plans to set up several community information kiosks.

Through the project, the community has linked up with other Francophone communities across Canada and around the world. By delivering services and training in French, the project extends the benefits of the Internet to Francophones far beyond the Acadian Peninsula.

www.cipanb.ca

Canadian e-Business Initiative

The Canadian e-Business Initiative (CeBI) is a voluntary, private sector-led partnership that advocates the adoption and use of e-business by SMEs.

It advises on tax and investment rules that hamper economic growth, and is benchmarking Canada's performance in the digital economy. A key deliverable is the annual Net Impact Study. The 2002 study showed that firms adopting Internet Business Solutions have realized substantial financial benefits.

On average, revenues increased by 7 percent; the cost of goods sold decreased by 9.5 percent; and sales, general and administrative expenses decreased by 7.5 percent.

www.cebi.ca

E-Business

ICTs have revolutionized the way companies conduct business — in everything from buying and selling to advertising and managing. E-business applications and systems bring businesses into contact with global markets. They also lower transaction and distribution costs, and improve product support, as well as increase consumer choice.

Canada seeks to be a global centre of excellence for e-business as part of promoting the evolution of an economy driven by innovation. Our goal is to make Canada a location of choice for developing e-commerce products and services — to capitalize on the phenomenal growth of on-line business.

A business survey on e-commerce shows that, although 76 percent of Canadian businesses use the Internet, only 32 percent buy goods on-line, and only 8 percent sell goods on-line. The number of small and medium-sized enterprises (SMEs) using e-business is growing, and government and industry, through the Canadian e-Business Initiative (CeBI), are working together to increase the take-up rate through tools, focus groups, workshops and seminars.

In the 1990s, Canada moved quickly to put in place seven legislative and regulatory policies to support e-business. As these policies were at the forefront of marketplace framework initiatives in their day, they are known as the "Seven Firsts".

There are also Government of Canada initiatives to promote the adoption and use of e-business that involve the development and dissemination of intelligence on the best e-business practices of Canadian industry sectors. One example is SourceCAN (**www.sourcecan.ca**), an on-line marketplace that matches Canadian companies and their products and services with thousands of business opportunities posted daily by

both domestic and foreign companies and governments. Through SourceCAN's secure trading environment, Canadian companies can source bids, follow new business leads and post opportunities. As well, they can create a booth in the Virtual Trade Show, pursue strategic partnerships or browse through e-commerce tools. Similarly, the ebiz.enable Web site (**www.strategis.gc.ca/ebizenable**) helps SMEs determine the e-business benefits to their firms, and provides steps to effective commercial Internet use.

Seven Firsts

- **Cryptography:** Policy facilitating the development and use of strong encryption technology
- **Consumer Protection:** Voluntary business guidelines to protect consumers conducting on-line transactions
- **Privacy:** Framework legislation governing the protection of personal information
- **E-Signatures:** Legal framework for digital signatures in electronic records
- **Public Key Infrastructure:** Policy framework for the Government of Canada public key infrastructure
- **Standards:** Domestic and international e-commerce standards framework
- **Tax Neutrality:** Commitment to a technology-neutral taxation regime

ebiz.enable

How to convince busy small-business operators to invest the *time* — let alone the resources — to become e-businesses? Human nature being what it is, people tend to ignore or discard new products and services that demand more than a small amount of learning time.

One response in Canada is a Web site that helps SMEs explore whether or not e-business is right for them. The site features diagnostic tools to help entrepreneurs learn what is possible for their particular firm, and to assess the company's e-business potential. It also helps compare a particular business with others in the industry in which it competes.

Ebiz.enable provides case studies on ICT implementation, and ideas on ways to use the Internet to gather competitive intelligence, promote marketing and sales, manage customer relations and human resources, and streamline production and distribution. Using the Web, SMEs can start right away to make e-business work for them.

www.strategis.gc.ca/ebizenable

Human Development

ICTs offer the means to improve human development in areas such as education, health, and cultural expression.

Building Human Capacity

Establishing the right policies, infrastructure and networks has helped accelerate Canada's transition toward an information society. The efforts to build human capacity began with a focus on youth, communities and public service, and have led to a national vision for an inclusive and innovative digital society. The efforts to engage citizens and communities in implementing the national vision have helped create an information society.

For example, Canada's Computers for Schools program (**http://cfs-ope.ic.gc.ca**) has placed more than 400 000 refurbished computers donated by governments and corporations in schools, libraries and community centres across Canada. Subsequently, for each donated computer, schools have purchased three to four new computers. This initiative was an important early step in introducing e-learning across Canada.

In 1999, Canada became the first country in the world to connect every school and public library to the Internet. Canada also developed programs to digitize our cultural heritage and support local content development. The SchoolNet program (**www.schoolnet.ca**) has made 7000 e-learning resources available to teachers, free of charge through the SchoolNet portal. With access to these resources, thousands of young people have created their own Web sites, and have become e-literate in ways that far exceed the reach of traditional teaching methods.

Connecting the Last School to SchoolNet

On March 30, 1999, Canada achieved the Internet equivalent of winning the space race to the moon: it became the first country in the world to plug all of its public schools and libraries into the Internet.

The last school to be connected was in a community of 35 people on Pictou Island in Nova Scotia. The school has one room, one teacher and three students. But, through SchoolNet, it has gained access to an enormous wealth of teaching resources, and its students have acquired the tools to communicate with the rest of the world.

Canada has been very successful in helping other countries replicate the SchoolNet program. In the meantime, the Broadband for Rural and Northern Development Pilot Program will bring even more resources to communities like Pictou Island.

www.schoolnet.ca

Telemedicine

ICTs have been used to develop innovative applications, such as electronic health records, telehealth and Internet-based health information. These applications can significantly improve the accessibility and quality of health services for citizens, while increasing the efficiency of the health system overall.

E-health involves using ICTs to:

- connect health care providers and patients;
- educate and inform health care professionals;
- stimulate innovation in health care delivery and management; and
- improve the First Nations and Inuit health care system.

Health Canada's First Nations and Inuit Health Branch (**www.hc-sc.gc.ca/fnihb-dgspni**) develops and provides e-health tools that include electronic health records; telecare for physician–patient interaction; telehealth information, education and advice offered by distance using communications technology; and the management of health information, surveillance and research. Health Canada is installing the hardware and software for e-health applications, and providing training in communities for the users of these applications, as well as ongoing support. Health Canada is also part of the Government On-Line initiative to ensure that key government services are delivered electronically and in an integrated way.

Federal and provincial/territorial governments are also working together to use ICTs in innovative ways to improve health care services and cut costs. Canada Health Infoway is an independent, not-for-profit corporation whose members include deputy ministers of health from across Canada. Infoway is a strategic investor. It is investing in electronic health record solutions and related telehealth development. Through a coordinated, strategic approach to investment, Canada Health Infoway hopes to speed up implementation of electronic health information systems in Canada.

Checking a Pulse — Half a World Away

A doctor and patient meet. They shake hands. The doctor takes the patient's pulse, then feels the contours of the patient's body for surface anatomy. Nothing unusual — except that the doctor is in Ottawa, Canada, and the patient in Geneva, Switzerland. The doctor can virtually feel human tissue and receive feedback about the pressure being exerted.

The doctor, in this instance, uses two robotic arms, one in Ottawa and the other in Geneva. A video and audio link enable the doctor and patient to see and speak to each other. The ability to touch comes from hardware developed by MPB Technologies Inc. of Montréal, Quebec, and software developed by Handshake Interactive Technologies of Waterloo, Ontario.

In 2003, the technology was used by a surgeon in Hamilton, Ontario, to perform a stomach operation on a woman in a hospital 440 km away.

Centre for Minimal Access Surgery

Using telesurgical intervention and robotics, it is becoming possible for a surgeon to conduct an operation on a patient thousands of kilometres away. In 2003, the Centre for Minimal Access Surgery, in partnership with the University of Strasbourg, successfully tested the robot to perform remote surgery through the Internet.

The centre is a partnership between a Hamilton, Ontario, hospital and McMaster University, which conducts R&D into and provides education in specialized techniques of minimal access surgery.

Multimedia teleconference equipment allows the centre to broadcast and receive data from any operating room or classroom in Canada linked via ISDN (integrated services digital network) or ATM (asynchronous transfer mode) connection. This enables surgeons to gain access to expert and leading-edge instructors, and increase the standardization of high-quality laparoscopic techniques.

Using this technology, the St. Joseph's Health System of Hamilton has been providing support, training and mentorship with government officials and medical colleagues in Uganda, Yemen and Haiti.

www.cmas.ca

Canada Health Infoway

ICTs are changing Canada's health care system, increasing the potential for better care and improved cost management.

Traditionally, an individual's medical diagnostic and treatment files are scattered among the physicians, hospitals and pharmacies that have helped that individual. ICTs offer the potential for a system of electronic health records that can provide each individual with a secure and private lifetime record of his or her health history that can be used by authorized health practitioners.

One key objective is interoperability, to enable computer and software systems to communicate seamlessly with one another, making clinical data available across the continuum of care and across health delivery organizations and regions.

Canada Health Infoway will also permit the transmission of x-rays, ultrasounds, and other diagnostic imaging. This will enable radiologists and other specialists to examine images from distant locations.

www.canadahealthinfoway.ca

E-Content

In an age where global mass media have tended to homogenize cultures, the Internet provides a superb opportunity to express culture locally, in a variety of languages, and with the possibility of disseminating it globally. Putting Canadian content on-line in both of Canada's official languages was one of the first objectives of Canada's connectedness strategy.

Over the years, Canadians have developed many applications to help them tell their stories. For example, the Books of Remembrance (**http://collections.ic.gc.ca/books/remember.htm**), listing the names of those who died serving Canada in the wars of the 20th century, are now available on-line. SchoolNet (**www.schoolnet.ca**) has made a wealth of educational material available through its portal. Internet users can research archived broadcasts of the Canadian Broadcasting Corporation (**www.cbc.ca**) and Radio-Canada (**www.radiocanada.ca**). Canadian Heritage (**www.pch.gc.ca**) has made the contents of many of the nation's museums available on-line. In partnership with the government and the arts community, CANARIE Inc. (**www.canarie.ca**) is exploring cutting-edge broadband applications in fields such as 3-D collaborative environments for performance artists.

A Library as Big as the Net

A library of more than 2200 scholarly publications is now available to over 650 000 researchers. The Canadian National Site Licensing Project (CNSLP) is a groundbreaking initiative intended to expand the on-line information available to researchers. Through pioneering licensing agreements, the project has secured desktop access to electronic scholarly journals and research databases in science, engineering, health and environmental disciplines for more than 60 Canadian universities.

The CNSLP was selected as one of 10 world success stories featured by the International Federation of Library Associations and Institutions in November 2003 at the Pre-World Summit Conference, Libraries @ the Heart of the Information Society.

www.cnslp.ca

Virtual Museum of Canada

The Virtual Museum of Canada celebrates the stories and treasures held in trust by Canadian museums. On-line audiences can find virtual exhibits, interactive games, and educational resources. The site also encourages Canadians to visit museums and take advantage of the heritage attractions in their local communities. More than 240 000 visitors from Canada and around the world use this portal every month.

The Virtual Museum of Canada is part of Canadian Culture Online, a collection of programs to help creators and communities, cultural industries and institutions to develop and promote digital content.

Through the Government of Canada's Digital Collections Program and Youth Employment Strategy, young Canadians are offered an invaluable job experience in the development and promotion of Canadian digital content, much of which appears in the Virtual Museum of Canada.

www.virtualmuseum.ca

II. Bridging the Global Digital Divide

Canada has a long tradition of helping developing nations and, over the past years, it has applied its expertise in helping them harness the potential of ICTs for economic, social and political development. Several departments and agencies of the Government of Canada have played prominent roles.

Industry Canada (**www.ic.gc.ca**) has been very involved in sharing Canadian ICT policy and program expertise in connectivity. Canada's Connecting Canadians initiative has been internationally recognized, and has been adapted for use in developing countries. The Department has also played a key role in coordinating political commitments through the Summit of the Americas, the G8 Digital Opportunity Task Force (DOT Force), and the United Nations Information and Communication Technologies (ICT) Task Force.

The **International Development Research Centre** (IDRC) (**www.idrc.ca**) was one of the first development agencies to embrace ICTs as a key means for development and poverty alleviation. With established programs such as Acacia in Africa, Pan Asia Networking in Asia and Pan Americas in Latin America, IDRC has a breadth of experience on the impact of ICTs on the lives of people in the developing world. This experience is reflected in IDRC's leading role in international initiatives such as the Institute for Connectivity in the Americas, Connectivity Africa and the G8 DOT Force.

The **Canadian International Development Agency** (CIDA) (**www.acdi-cida.gc.ca/ict**) funds several ICT for development projects in developing countries. Recently, it launched the Strategy on Knowledge for Development through Information and Communication Technologies. Poverty reduction is a central component of this strategy. The Agency also participated in the G8 DOT Force and the UN ICT Task Force, and is part of the Working Group on Health of the UN ICT Task Force. CIDA also played an instrumental role in the early orientation of the World Summit on the Information Society toward development. CIDA supports the Government of Canada's commitment to the Africa Action Plan through the Canada Fund for Africa. Through this fund, $35 million will be allocated to bridging the digital divide in Africa.

Several other Canadian players have also been involved, representing federal, provincial/territorial and municipal governments, community groups, the private sector, and civil society.

Canada believes that community-based development should be a major focus of plans to build an information society, and that partnerships among governments, civil society and the private sector should provide the foundation for developmental activities and planning.

Canada's Presence in Global ICT Policy

The G8 DOT Force

At the G8 Summit in Japan (2000), leaders set out the *Okinawa Charter on the Global Information Society* which mandated the DOT Force to identify concrete ways to bridge the digital divide between industrialized and developing countries, and to ensure the full participation of developing countries in the global information society.

At the G8 Summit in Genoa (2001), leaders endorsed the DOT Force report, agreed to support the implementation of the Genoa Plan of Action and encouraged stakeholders to develop concrete initiatives to deliver on nine priority areas. The Plan of Action provides a basis for developing economies to achieve sustainable ICT-enabled development, both economic and social. As the lead on the G8 DOT Force, and in the context of Canada's presidency of the G8 in 2002, Industry Canada led the implementation of the Genoa Plan of Action and the release of its report card, entitled *Leadership for Change*. The report and accompanying team reports are available at the DOT Force Web site (**www.dotforce.org**).

The DOT Force membership, which submitted its final report to G8 leaders at the 2002 Summit in Kananaskis, represented both a unique model of international cooperation and a new way of responding to the challenges of development. It included stakeholders from G8 and developing country governments, private and not-for-profit sectors, and international organizations. The DOT Force initiative was acknowledged as a key element of global efforts to reduce poverty through the application of ICTs for broad-based economic and social development.

In less than one year, participation in the DOT Force reached well beyond its original membership to include almost 100 stakeholder organizations, spanning more than 30 countries. Implementation teams generated more than 20 major bilateral and multilateral initiatives, operating across a broad range of areas crucial to balanced development. These include access, governance, entrepreneurship, health and education. In designing and implementing these initiatives, DOT Force members also gave special attention to the needs of lesser-developed countries, particularly those in Africa.

United Nations ICT Task Force

In March 2001, the Economic and Social Council requested the UN Secretary-General, Kofi Annan, to establish the UN ICT Task Force. This initiative is intended to lend a truly global dimension and policy coherence to the multitude of efforts to bridge the global digital divide and foster digital opportunity, thus firmly putting ICTs at the service of development for all. It is the first body created by an intergovernmental decision of the

United Nations in which members, representing governments, civil society — including the private sector, not-for-profit foundations, non-governmental organizations (NGOs) and academia — and organizations of the United Nations system have equal decision-making power.

Canada is a lead financial contributor and bureau member of the Task Force. It has played a key role in harmonizing the priorities and overall work plan of the Task Force with that of the G8 DOT Force. Specifically, Canada has fostered joint work at the working-group level of both organizations, resulting in several collaborative initiatives by its members.

Under Canada's leadership, the UN ICT Task Force (**www.unicttaskforce.org**) is developing a comprehensive conceptual framework which underlines the role that ICTs play in the overall development agenda. The analysis uses as a starting point the eight Millennium Development Goals endorsed by heads of states at the UN Millennium Summit (2000) and maps ICTs against each one of these goals. The mapping process illustrates how, in each case, ICTs can help achieve the development goal. This analysis will be the subject of a major contribution to the World Summit on the Information Society.

Canada Making a Difference Globally

Global e-Policy Resource Network

In the DOT Force Genoa Plan of Action (2001), G8 leaders undertook to establish a Global e-Policy Resource Network (ePol-NET). Its objective is to marshal global efforts to support national e-strategies for development.

ePol-NET (**www.epol-net.org**) provides a focal point for bringing together providers of e-strategy information and expertise for the benefit of individuals, organizations and governments in developing countries.

Championed by the Government of Canada, ePol-NET will consist of national and regional centres of expertise from various national governments, including Ireland, Italy, Japan, the United Kingdom and France, as well as international organizations, such as the United Nations Development Programme (UNDP), the OECD, the United Nations Conference on Trade and Development (UNCTAD) and the International Telecommunication Union (ITU).

These centres will provide policy and regulatory experts from developing countries with a focal point for obtaining development assistance services and information products and services. They will also direct demand for more specific support to the appropriate individual or institution.

Bellanet

The Bellanet Secretariat (**www.bellanet.org**) promotes and facilitates collaboration within the international development community, especially through the use of ICTs. It delivers its program through the following three program lines:

- on-line communities;
- knowledge sharing; and
- open development.

Bellanet encourages the use of on-line dialogues to support development collaboration, and promotes better knowledge sharing to help organizations learn from one another's experience. Bellanet is also exploring the potential for free/libre and open source software, open standards for equitable and sustainable information sharing, and open content to encourage the wide distribution of information without compromising the intellectual property rights of its creators.

Bellanet has also established regional operations in Latin America and the Caribbean and in Asia through strategic partnerships with like-minded local organizations. These mark an important step toward using ICTs to promote development in the South.

Bellanet is governed by a steering committee representing its core funders: CIDA, the Royal Danish Ministry of Foreign Affairs, the Swedish International Development Cooperation Agency, the Swiss Agency for Development and Cooperation, and Canada's IDRC, which hosts its head office in Ottawa.

Bellanet: Dgroups — An On-line Meeting Place

Dialogue — it's one of the most important elements for collaboration, and one of the simplest. Dgroups allow for virtual dialogue through a common platform that is simple, non-commercial, respectful of privacy, and targeted to low-bandwidth users in the South. The interface is available in English, French, Spanish and Portuguese.

Established and supported by Bellanet and its partners, Dgroups is now the on-line home for the world's largest collection of development-oriented groups and communities. Members range from those discussing ICT policy in Jamaica to the Virtual Parliament of the Americas, an initiative to help parliamentarians communicate and work together on hemispheric issues.

Sharing Canada's Experience and Model Internationally

The Government of Canada's Connecting Canadians initiative has gained attention around the world for its success in accelerating the adoption of ICTs within Canada. Programs such as Computers for Schools, SchoolNet, the Community Access Program, Smart Communities and Government On-Line are recognized worldwide. As a result, the Government of Canada has won Stockholm Challenge Awards along with best practice accolades from consulting firms like Accenture and Booz Allen Hamilton.

To help share what Canada has learned, the government has organized several connectivity initiatives, including the following.

- With the aim of building local capacity, the NetCorps Canada International program has placed more than 1265 ICT-skilled youth in over 100 developing countries to help accelerate the adoption of ICTs. For example, a group of Canadian youth have helped establish SchoolNet programs in Africa, have built NGO capacity in South America and have put local Caribbean hotels on-line so they can compete with multinational chains.
- Programs have been adapted to suit other countries. For example, Canada's Computers for Schools recycling program, which refurbishes and distributes surplus computers to libraries and schools, is seen as a cost-effective way to introduce e-learning and, at the same time, to launch partnerships among stakeholders. The Computers for Schools model has been implemented successfully in Colombia, Jordan and Kenya, and will soon be introduced throughout the Americas. Similarly, Canada has received requests from Argentina, Bolivia, Uruguay, Costa Rica, Guatemala, Mauritius, South Africa and other African countries to establish a Computers for Schools program, similar to Canada's, in these countries.

NetCorps: Helping Farmers Maintain Their Rights

In the mountains of Costa Rica, the *Union de productores agropecuarios independientes de Perez Zeledon* (UPIAV) informs small-scale farmers of their rights and represents them.

A NetCorps consultant, Steeve Thériault, has built a database for the organization to keep track of the accounts of 8500 small-scale farmers who are its members. Steeve has also trained UPIAV's staff on using the Internet, which has become one of its most important tools to keep abreast of developments in international trade, such as fluctuations in coffee prices.

www.netcorps-cyberjeunes.org

- Advice has been provided on national e-strategies for countries such as Colombia, Guyana, Trinidad and Tobago, and Russia in the development of ICT applications.
- Study tours have been hosted, involving over 165 international delegations, including representatives of international financial institutions and the media from 47 countries.

Canada Making a Difference in Africa

Canada has a variety of initiatives to support ICTs for development in Africa. For many years, IDRC's Acacia program has helped communities in sub-Saharan Africa use ICTs to meet their development needs. More recently, the G8 Africa Action Plan focusses on three areas that are crucial to development through ICTs: national e-strategies and policy frameworks, including ePol-NET; connectivity and the use and development of local content; and assistance to African entrepreneurs.

At the G8 Summit in Kananaskis (2002), Prime Minister Chrétien announced a $500-million aid package, the Canada Fund for Africa, to support the G8 Africa Action Plan and the New Partnership for Africa's Development (NEPAD). Included in this package was $35 million for three related DOT Force initiatives. Industry Canada is overseeing the implementation of the following three initiatives: Canadian e-Policy Resource Centre, Connectivity Africa and Enablis.

Canadian e-Policy Resource Centre

As its specific contribution to ePol-NET, the Canada Fund for Africa is providing $10 million to establish the Canadian e-Policy Resource Centre (CePRC), as well as to support the development of an African-based centre of expertise at the United Nations Economic Commission for Africa (UNECA). It will serve as a focal point to identify and fund Canadian experts who will provide expertise and mentoring to support national policy makers in Africa. The initiative will cover a wide range of ICT policies and strategies, including the following:

- legal and policy frameworks for e-commerce;
- telecommunications policy and regulation;
- Internet governance;
- e-government strategies; and
- the sharing of program experience in e-health, distance learning and community access.

Connectivity Africa

The Canada Fund for Africa is providing $12 million for the implementation of Connectivity Africa (**http://connectivityafrica.org**) to apply Canadian expertise in applying ICTs to education, health and community development. Connectivity Africa has the following four components:

- innovation in the use of ICTs;
- African regional ICT futures;
- research and development in African ICTs; and
- partnership and convergence.

IDRC is implementing Connectivity Africa in partnership with the Economic Commission for Africa within the framework of the African Information Society Initiative (AISI). The initiative works closely with IDRC's Acacia program and other ICT initiatives focussed on Africa.

Connectivity Africa will also work with the Open Knowledge Network (OKN), a civil society initiative which is receiving $3 million from the Canada Fund for Africa. The OKN is being developed under the leadership of One World International to promote the creation and exchange of local content as widely as possible across the South.

Enablis

Enablis (**www.enablis.org**) is a not-for-profit organization formed in partnership with Telesystem Ltd. (Canada), Accenture (United Kingdom) and Hewlett-Packard (United States) to implement the DOT Force's Entrepreneurial Network. Its goal is to drive economic development in Africa and to build self-sustaining businesses by supporting SMEs in their application of ICTs.

Enablis will seek leveraging from governments and entrepreneur support organizations, as well as aid agencies and multilateral organizations to support developing country entrepreneurs in taking advantage of ICTs in their business practices.

Through a $10-million contribution from the Canada Fund for Africa, Enablis will focus initially on entrepreneurial users of ICTs in African and other developing countries. It will emphasize the transformational power of ICTs in such areas as the better functioning of a local market and better access to local and global markets. The projects will set an example of how best to use ICTs to improve the countries' internal efficiency and effectiveness.

Enablis will support projects through a combination of funding assistance and in-kind support. Its range of services will include the following:

- advice to governments and policy makers on effective policies for ICTs, small businesses, trade and so forth;
- loan financing for start-ups and SMEs;
- guidance, mentoring, and networking to facilitate strategic partnerships with global corporations and other SMEs; and
- a variety of hardware and software products donated by large corporations.

Acacia

Acacia (**www.idrc.ca/acacia**) is IDRC's ground-breaking program to demonstrate how sub-Saharan communities can benefit from ICTs for their social and economic development. It focusses on research and policy, in contrast to the emphasis on technology and innovation of the Connectivity Africa program.

Many Acacia projects demonstrate that communities in Africa with greater access to ICTs are able to generate and sustain economic growth. In Timbuktu, Mali, a community telecentre connects the town of 25 000 people to the rest of the world through the Internet, e-mail, telephone, fax and radio. In Angola, a new satellite connection is ensuring that vital information is exchanged among NGOs helping to rebuild the country after years of war. In another project, nomadic cattle herders track their wandering herds with cell phones and global positioning systems.

Launched in 1997, Acacia has invested more than $40 million in research, demonstration and evaluation projects on key ICT issues. These include how ICTs can be used to reduce poverty, policies to bridge the digital divide, and the development of local content and knowledge.

Acacia — Information to Get a Fair Market Price

In Senegal, Cheikh Ba can use his knowledge of world market prices to more than double the price he receives from middlemen for his grapefruit. With his cell phone, he checks the market prices for produce twice a week. Using wireless technology, he dials into a database of current prices compiled by Manobi, a mobile and Internet services operator.

"If I didn't have the Manobi service, I definitely would have agreed to a lower price, for fear that the buyer would go and I'd be left with a lot of produce [*translation*]," explains Mr. Ba.

Research shows that food producers using this service have seen their incomes increase by an average of 15 percent.

www.manobi.net

Acacia — One-Stop Business Shop

In Uganda, women make up more than 45 percent of small-scale entrepreneurs. They are using the Women's Information Resource and Electronic Service (WIRES) as a one-stop shop to find information on markets, prices, good agricultural practices, and support and advisory services.

Based in Kampala, and linked to two rural telecentres, WIRES provides information that has been gathered from electronic and print sources and then repackaged in easy-to-use databases in local languages. With this information, women in Uganda are able to hone their entrepreneurial skills, expand their enterprises, and boost their family's incomes.

Acacia — Student ICT Business

In Inhambane, Mozambique, Momed Cadir has set up a community access centre for ICTs within his school. Students use the centre for free, while walk-in users pay for services. The students and teachers have started small projects such as designing Web sites and recycling and repairing computers. In addition to developing ICT skills, the projects bring revenue to the centre. As a result, the centre is well on its way to sustainability.

Acacia — Go with the Global Flow

"Computer tools and access to the Internet are *not* superfluous to the poor," says Modou Diouf of ENDA Tiers Monde, a non-governmental organization in Senegal. He adds that, in an age of globalization, poor countries must go with the flow, by taking advantage of networks that interlink them with the rest of the world.

ENDA Tiers Monde has been working with Acacia, an IDRC program to empower sub-Saharan communities with the ability to apply ICTs to their own social and economic development. Today, a series of community resource sites provide training and Internet access to those living in the most challenged neighbourhoods in and around Dakar.

The project has helped transform a grass-roots economy to make the social and technological innovations of local groups more visible.

Canada Making a Difference in the Americas

At the Summit of the Americas in Québec City (2001), the leaders of the western hemisphere democracies issued a statement, *Connecting the Americas*. In addition to leading the discussion on ICTs and development in the Americas, Canada made a commitment to establish the Institute for Connectivity in the Americas (ICA) (**www.icamericas.net**).

Incubated at IDRC, the ICA has been given seed funding to build on the success and experience of the Connecting Canadians initiative and Canada's international and ICT programs. By promoting ICTs for development in Latin America and the Caribbean, the ICA strives to connect the Americas through knowledge creation and capacity building. The Institute helps forge partnerships and co-funds projects. By connecting the people of the Americas, the ICA hopes to strengthen democracy, create prosperity and help realize the region's human potential.

The Institute supports projects in three core areas:

- e-strategies — case studies, profiles of successful projects and policy studies;
- knowledge network — virtual collaboration networks, awards, and seminars and events; and
- innovation and demonstration — strategic regional projects and small grants.

The ICA is helping to open high-speed university networks and to provide wireless fidelity (WiFi) links to connect computer centres in the *favelas* (slums) near Rio de Janeiro, Brazil. E-Link Americas, an ambitious effort to give universal Internet access to remote and marginalized communities through wireless is now under development. ICA partners include the Government of Canada, IDRC, the Inter-American Development Bank, the Organization of American States and the World Bank.

The ICA works closely with IDRC's Pan Americas corporate project, which supports research on the social uses and impact of ICTs for development in Latin America and the Caribbean. The project strengthens the capacity of civil society organizations to understand the implications of ICTs for development, and to participate more effectively and influence policy making in the region. Pan Americas fosters collaborative approaches to research and learning, and promotes sensitivity to gender issues.

Canada has also spearheaded a process at the Organization of American States to help with implementation and to bring together the major funding agencies (**www.citel.oas.org/Connectivity%20Agenda.asp**).

Institute for Connectivity in the Americas — Laptop Warrior Against Human Rights Abuse

In Colombia, the Institute for Connectivity in the Americas (ICA) is supporting the work of Vilma Almendra, a 23-year-old Paez Indian, who uses ICTs as an antidote to violence against indigenous peoples. Almendra coordinates the community information service, or telecentre, in the town of Santander de Quilichao in southwest Colombia.

The telecentre lists and denounces human rights abuses, and brings them to national and international attention. Many Paez have used the Internet to circulate pictures of friends and relatives who have gone missing after armed attacks on towns and villages. "We have succeeded in reaching international audiences," says Ms. Almendra, "something we weren't able to do before we set up the telecentre. We can now communicate with the media, donor agencies, and human rights and environmental organizations."

ICTs are also helping Paez and other indigenous communities to push ahead with their own social and economic development, including education, health, land management, legal protection and monitoring legislation.

Pan Americas — An Internet Home for NGOs

In Brazil, the ICA is supporting *Rede de informaçãoes para o terceiro setor* (RITS) in its work to help civil society organizations use ICTs on such issues as human rights, education, the environment and health.

RITS disseminates a weekly e-zine of news from NGOs and its Web site hosts a virtual research centre on Brazilian civil society. RITS also provides Web site hosting, e-mail access and intranet services for hundreds of organizations.

RITS believes that, if NGOs invest in the Internet, they will be better equipped to address the needs of their clients, often among the poorest of the population.

Canada Making a Difference in Asia-Pacific

Pan Asia Networking

Established in 1994, Pan Asia Networking (PAN) (**www.idrc.ca/pan**) is the oldest of IDRC's current ICT programs. PAN's early support helped organizations use ICTs for communications and networking and in developing Web-based tools and applications. It also helped establish the first Internet services in Bhutan, Cambodia, Laos, Mongolia and Vietnam.

Today, the program places more emphasis on applied research related to community uses of ICTs, particularly those practices that lead to more equitable access, and policies that encourage public and private sector investment in ICTs. This includes such things as piloting village information centres, researching open source software and promoting local language content on the Internet.

Another priority is to look at innovative ICT applications for developing countries in areas such as e-commerce, distance learning and health.

PAN programming takes into account Asia's diverse mix of economies. It directs support at least-developed countries to build their capacity to participate in the new economy. At a broader level, PAN encourages networking and collaboration by the growing community of ICT pioneers in the region. In 2003, one such collaboration, involving IDRC, the UNDP's Asia-Pacific Development Program, Orbicom and Southbound, resulted in the publication of *Digital Review of Asia Pacific*, covering 27 economies.

PAN also helps its partners contribute their research results to the policy-making process of various Asia-Pacific economies.

Pan Asia — People Power Through WiFi

Dr. Onno Purbo regularly attracts hundreds of people to his seminars in Indonesia on how to build community-based ICT networks through wireless fidelity (WiFi). The author of more than 40 books, Dr. Purbo posts all his how-to technical information on the Web, free for anyone to download. "I don't believe in equipment power; I believe in people power," says the self-described ICT evangelist. The decade-old grass-roots technology movement has resulted in more than 4 million Indonesian Internet users, 2500 WiFi outdoor installations, 2000 cyber cafés, and over 1500 schools connected to the Internet. Dr. Purbo is currently a Research Fellow at IDRC.

Pan Asia — From the Net to the Loudspeaker to You

At a temple in Veerampattinam, India, loudspeakers have been erected among the statues. They are one innovative way that a project by the M.S. Swaminathan Research Foundation uses traditional and new technologies to provide information that empowers villagers.

The loudspeakers broadcast weather forecasts, downloaded from the Internet, that are potentially life-saving for local fishermen. Other information available includes agricultural techniques, market prices, government programs and local bus schedules.

This innovation shows how the delivery of relevant information contributes to rural development. "As a single intervention, information and knowledge empowerment can give a quantum leap in terms of improving the security of livelihoods," says Professor Swaminathan.

Conclusion

For wealthy economies like Canada's, ICTs have become more than just a key economic sector; they are vital tools for economic modernization and vehicles for social, cultural and civic enrichment. The broader challenge today is to spread these benefits throughout the "global village" by strengthening the social and economic fabric of the developing world. The international community has many instruments to apply ICTs to development objectives.

From Canada's experience, the most effective and productive way is to build partnerships among all stakeholders, and make sure that these partnerships include players at the community level. Canada believes that top-down policies are not enough to build an inclusive information society. Community-based, bottom-up initiatives, driven by the demand of people for services that suit their requirements, have played an important part in creating Canada's information society. In Canada, projects have been more successful when initiatives are targeted to social groups that are prepared to adopt new technology, and adapt the technology to their needs. These groups are often prepared to mentor other members of the community in how to make technology work for them. Young people often fill these mentor roles. The information society is their future — and they are the future of the information society.

This lesson learned in Canada's domestic strategy for the information society has a broader application in global initiatives to remove the barrier of a digital divide. Canada has appreciated the partnerships that have emerged with its international partners as, together, we address a global challenge. We understand and appreciate that, just as in our domestic programs, the strength of these collaborations comes from the input of the people who have the most at stake and the most to gain — wherever in the world they live.