



INFORMATION TECHNOLOGY
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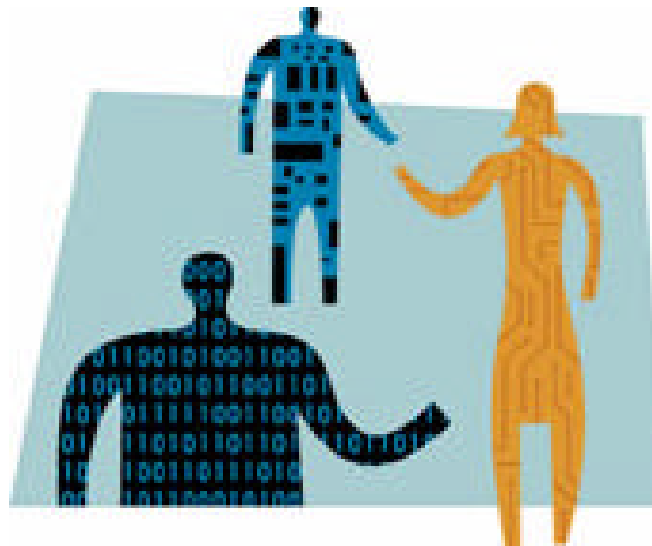


ASSOCIATION CANADIENNE DE LA
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Toward the Transformation of Health Care Delivery in Canada: *Information and Communications Technology in the Service of Health Care Innovation*

**Information Technology Association of Canada
Discussion Paper**



ITAC is the voice of the Canadian information technology industry. Together with its partner organizations across the country, the association represents 1300 companies in the computing and telecommunications hardware, software, services, and electronic content sectors. This network of companies accounts for more than 70% of the 542,000 jobs, \$132.6 billion in revenue, \$5.3 billion in R&D expenditure and \$44 billion in exports that IT contributes annually to the Canadian economy.

Foreword

As a doctor in New Brunswick performs surgery, her actions are transmitted in real-time to a professor watching in another province. A nurse in Prince Edward Island “visits” terminally ill patients using an innovative videoconferencing system. A physician in British Columbia uses his Personal Digital Assistant to instantly access on-line medical information, right at his patient’s bedside.

These people are not imaginary; neither is the technology. E-health, the application of information and communications technology in health care delivery, is a reality. Online databases allow authorized health care professionals to look at patients’ medical histories, to make sure they get the best treatment. The public has access to current health information. Individuals linked to a broadband network receive test results and confirm their next appointment. Residents of remote communities benefit from “televisits” from specialists who would otherwise have to fly in. Homecare nurses use videoconferencing to care for their patients, saving time and costs and helping them cope with an increasing workload.

The federal government’s commitment to expanding Canada's capacity for innovation is vitally important and long overdue. Aligning the Innovation Agenda with modernization of health care will deliver tangible benefits to which all Canadians can relate. Minister Rock reinforced this direction in his address to the November 2002 National Summit on Innovation and Learning. He said, “We too often look at health care in this country as a burden to be borne, rather than an opportunity to be seized.” He noted that Canadians will be spending \$1 trillion on health care by the end of the decade and proposed that we set a goal that 10% of our health care spending each year should come back to us as a dividend in the form of economic activity to the advantage of all Canadians.

ITAC believes that the tools the ICT industry produces can solve some of humanity's most difficult problems. Today, the largest problem confronting Canadian citizens and policy makers alike is what to do to sustain and improve our national health care system. Our health care system is rich in examples of excellence in innovation and the potential for the use of ICT in the service of health care, many of them world-class. This paper reflects on the opportunities and challenges and recommends some priorities for action.

Dr. Gaylen A. Duncan
President and CEO

Introduction

Health care is a key underpinning of Canadian society. The health care sector is also an engine of economic growth, a \$105 billion enterprise in Canada - one of our society's largest expenditures. Health care is also the last vertical market poised for ICT transformation. The health sector is still based primarily on bricks and mortar and paper, a system where lab tests must be repeated, because medical professionals do not have access to electronic records, or where patients routinely travel long distances to access medical services that could be made available electronically.

Across Canada, only \$2 to \$3 billion is spent annually on ICT in health care. This represents about 2.5% of operating budgets, compared to more than double that percentage in the US. The gap is even wider when we compare health care with other information-intensive sectors, like banking and government, where ICT spending ranges from 9% to 13%. The 2002 Canadian Healthcare Technology report found that hospital funding of ICT is \$560 million, much less than the \$880 to \$1470 million that hospital technology executives estimate they need to operate effectively.

Commissioner Romanow noted that globalization offers tremendous potential for Canada, not only to learn from other countries and take advantage of the newest treatments developed elsewhere, but also to export and market Canada's considerable expertise in the health sector. The global market for health products and services is estimated at more than \$2 trillion annually and Canadian suppliers currently have just over a 2% share.

Gartner Dataquest expects ICT spending in health care to grow steadily. North America and Western Europe represent more than 80% of the entire market. Demand is expected to grow rapidly through 2005, with global health care ICT spending growing from US\$61 billion in 2000 to US\$97 billion in 2005.

Canadian expertise in a wide range of health fields could benefit significantly from increased global opportunities. Canadian research institutes, hospitals and universities, combined with highly skilled research and medical professionals, have an opportunity to play a significant role in breakthrough discoveries and to share their achievements with others around the world.

Minister Rock emphasized this opportunity at the National Summit on Innovation and Learning, when he spoke about developing Canadian health expertise and exporting it to Canada's advantage, whether it is managing health information through electronic patient records, aggregating and using public health information for research purposes, telemedicine to deliver services to remote regions, or robotics where Canada is developing technology that will overcome the challenge of distance for surgery.

The Role of ICT in Health Care Innovation

General

Health Canada wrote about using ICT in health care to allow for greater communication and information sharing among patients, caregivers and policymakers, noting the potential to significantly improve the accessibility and quality of health services for all Canadians while increasing the health system's efficiency. Two examples of the use of ICT in health care are:

- record keeping and information sharing through online databases of electronic health records (EHRs) that allow authorized health care professionals to look at a patient's medical history to provide the best treatment; online order entry for prescriptions and to check drug interactions; and lab and diagnostic applications over broadband.
- telehealth, the use of ICT to deliver health education, information and services over large and small distances, allowing virtual home visits by nurses, or specialist treatment of people in remote communities

Patients will benefit from the strategic use of ICT in health care through reductions in rates of mortality and morbidity due to misdiagnosis and improper treatment and in medication errors, through access to online drug reference databases and the virtual elimination of handwritten prescriptions. Front-line health care professionals will benefit. A June 2002 report by First Consulting Group concluded, "Empowering nurses with the tools they need and reducing their frustration with paperwork can help to improve nursing retention and lessen the nursing shortage." ICT will permit better access to diagnostic services and online databases, such as clinical practice guidelines. Health promotion and disease prevention will be enhanced through superior monitoring and patient education (e.g. e-libraries), as will decision-making by providers and patients. Multimedia applications can enable professional and patient education and research. Health information networks enable institutions and individuals to exchange electronic health records and share information systems and databases to collect or deliver health information at a distance.

The Role of the Internet

A variety of health-related processes stand to be reshaped by the Internet. In clinical settings, the Internet enables care providers to gain rapid access to information that can aid in the diagnosis of health conditions, or the development of suitable treatment plans. It can make patient records, test results and practice guidelines accessible from the examination room. It can also allow care providers to consult with each other electronically. The Internet also offers the added benefit of supporting a shift toward more patient-centred care, enabling consumers to gather health-related information themselves, communicate with

care providers, health plan administrators and other consumers electronically and receive care in their homes.

The Internet can be used to modify home medical devices remotely. For example, after a remote consultation or review of home-monitoring data, a care provider might use the Internet to change a setting on a patient's pacemaker, alter the parameters for a programmable insulin pump, or increase the dose delivered by an infusion pump for an oncology patient.

The Internet can streamline the administrative overhead associated with health care. Providers can use the Internet to submit claims for payment and individuals can use it to update their coverage. By accelerating these transactions, the Internet could reduce misunderstandings and disputes, accelerate payments and reduce administrative costs that can constitute 30 percent of all health care expenditures in the US. By one estimate, paper claims cost between \$2 and \$18 each to process, whereas electronic claims have costs measured in cents.

Public health monitoring would benefit from application of the Internet, to:

- help in collecting data about the health of individuals;
- help identify personal risk factors and medical treatments;
- provide data about sources of disease and injury in the environment; and
- suggest possible effective action.

The Internet facilitates research by helping integrate databases for improved analysis, allowing linked simulations and enabling remote control of biomedical research apparatus.

Electronic Health Records

The EHR is a collection of an individual's relevant interactions with the health care system – whether with a physician, a pharmacist, a hospital, a lab, a community health centre, or a home care agency – that would be available to authorized health care professionals anywhere in the country on a need-to-know basis. EHRs would empower individuals by giving them access to their own personal health records. EHRs can also enhance confidentiality of personal information by putting in place safeguards that don't exist with paper-based records. For example, individuals could exercise greater control over who has access to their personal records, on what basis and for what purpose, than they can with our current, paper-based system.

The EHR has been identified as the central tool to enable e-health and strengthen and integrate our existing health care system. The Canadian Medical Association observes that an e-health system would contribute to a health care environment where we would have:

- improved quality of care
- fewer errors (improved patient safety)
- increased efficiencies through better access to health care, particularly for those living in rural and remote locations and those with limited mobility
- greater focus on competencies, giving providers the opportunity to maximize the time devoted to providing direct patient care (less time consumed by administrative and management tasks)
- better overall patient satisfaction in terms of access and outcomes.

EHR benefits are tangible – more time spent with patients, increased utility of patient files, less superfluous paperwork, better and faster diagnosis and treatment plans, greater opportunities for consultation among providers. Access to information on previous medical or lab tests would reduce the number of redundant procedures and result in cost savings and efficiencies. It would also avoid procedures that might pose a health risk to patients if they were repeated. A national EHR system will help reduce fiscal pressure from rising health care expenditures, while making it possible for all Canadians to obtain access to the right care, at the right time and place – whether they live in major metropolitan areas, rural communities, or remote settlements. As well, the information that a national EHR system could provide to researchers would improve the quality of care for individuals and the ability of health care administrators to develop policies for the future, determine trends and analyse the health of various sectors of the population.

Issues and Challenges

Successful ICT initiatives are not technology-driven, but patient-driven, that is, they seek to meet an identified, legitimate patient need. The Senate Standing Committee on Social Affairs, Science and Technology noted that technological advances could improve health outcomes and enable a more effective deployment of scarce financial and human resources. However, the report says that simply putting more money into the health care system will not make the system more efficient or more responsive to patients. New federal money given to the provinces and territories must “buy change”, by being used exclusively for expanding public health care coverage and restructuring and renewal of the publicly funded hospital and doctor system.

Similarly, the report of the Commission on the Future of Health Care in Canada calls for a new funding arrangement that is stable, predictable, long-term and targeted. Commissioner Romanow noted that there are many hundreds of innovative approaches to the delivery of health care across Canada, including telehealth, regionalization, integrated community programs, public-private partnerships, population health approaches and a myriad of initiatives to improve waiting list management. In fact there is no shortage of creative new initiatives, pilot projects and best practices that deserve attention and wider application.

The problem is that, too often, worthy pilot projects are not broadly implemented because of a lack of sustained funding, wrangling between governments, or the absence of effective mechanisms for sharing best practices.

ITAC does not believe that ICT is the silver bullet for health care transformation, but that wise, strategic investment in ICT can play a valuable role in reducing costs, while increasing the efficiency of health care delivery. However, as for every opportunity, there are challenges that must be overcome to use ICT to the best advantage in the service of health care. A discussion of these system, technological and people challenges follows.

System challenges include:

- demonstrating the effectiveness and cost efficiency of ICT initiatives; and
- lack of adequate funding to support health provider participation in the development and use of ICT, including reimbursement mechanisms for virtual visits and e-mail interactions.

Health care must be a client-centred system where patient safety and privacy are paramount. Issues include lack of commonly agreed standards and regulations for the collection, storage, use and transfer of electronic patient information, cost and difficulties with the integration of patient information system into office practice.

The best way to encourage adoption by providers is to give them solutions that help them provide better care for their patients, improve efficiency, or reduce practice costs. Therefore, health care providers must be consulted early in the design phase and receive ongoing training and support in their use of the technology. For health care to receive the benefits of ICT applications, companies with a wide variety of interests must work together to develop integrated solutions.

Technological challenges include:

- lack of access to ICT infrastructure and bandwidth (Some remote northern communities are still without the narrowband system and currently 80% of rural, remote and northern communities in Canada do not have access to broadband.);
- cost
- lack of decision support tools and reliable, functional clinical support systems
- lack of interoperability and standards

People challenges include:

- the digital divide between Canadians who do and those who do not have computer skills (Health related Internet sites are among the busiest, but Internet access is far from universal and poorer, less educated Canadians are often unable to take advantage of these important innovations.);

- lack of health informatics expertise to support providers using ICT, especially in remote areas;
- a health care culture that is typically conservative, risk averse and slower to seize new ideas;
- scarce resources, with providers having to take on increased workloads;
- fear of how EHRs will be used and of interference with the patient-provider relationship;
- concerns over the business case for ICT investment (will ICT improve care, lower costs, free up time, safeguard privacy and safety?); and
- lack of confidence in the appropriateness of applications and whether they can be smoothly integrated into the practice.

Priorities for Action

By Government

The Prime Minister, in his address to the National Summit on Innovation and Learning, said, “We will also apply learning and knowledge to enhance another Canadian advantage: health care. Our commitment to the number one priority of Canadians is unshakable. We will work with the provinces to respond to Roy Romanow. We will develop a plan. And we will make the necessary investments to sustain medicare for the long term.”

If there is one thing the Federal Government can do to advance Canada’s capacity for innovation, it should be to foster the widespread and rapid adoption of productivity-enhancing technology. ITAC believes this goal is so fundamental that it deserves a specifically stated set of targets of its own. One possible target would be: by 2010, raise the rate of investment in ICT throughout the economy to prevailing US levels.

Commissioner Romanow called for the federal government to make additional, substantial, ongoing, national investments in ICT, with the objective of improving the health of Canadians, as well as improving the efficiency and effectiveness of the health care system. The Senate Committee report notes that Canada needs to invest more in health care technology and health information systems and estimates that between \$6 billion and \$10 billion is needed over a 6 to 8 year period, to achieve full implementation of a Canada health info structure, or between \$1 billion and \$1.25 billion annually. Therefore, ITAC recommends that the government earmark \$1 billion for investment in ICT in general.

The committee also said, “It is very clear that Canadians want the provinces, the territories and the federal government to work collaboratively in partnership to facilitate health care renewal.” ITAC supports the recommendation that the Federal Government implement the recommendation of the Kirby Report that calls for an additional allocation of \$400 million a year for 5 years to Canada Health Infoway Inc., to develop, in collaboration with the provinces and territories,

a national system of EHRs. ITAC also supports the recommendation for greater coordination across jurisdictions on the security and protection of personal health information and calls for urgent attention action that addresses concerns associated with privacy protection, security and common standards for health information.

The pre-budget report of the Commons Standing Committee on Finance says that money alone is not the solution. ITAC agrees with the committee's recommendation for the reallocation of funds to new information technologies to improve the accountability, efficiency and effectiveness of the health care system.

Community readiness is the extent to which communities demonstrate the capacity to implement, manage and sustain e-health activities. Rural and remote communities will need special assistance in developing and improving community readiness. As well, governments must work with communities and other stakeholders to develop a national rural and remote health strategy for Canada. Government must assign funding to address the network and computing infrastructure, for health applications, as well as for the general social and economic benefit of Canada.

Lastly, governments must recognize the need for ongoing funding, beyond initial investments, to support transition and effective change management and education.

By the Private Sector

The Canadian Medical Association recommends that work begin immediately to engage the public in meaningful discussion on the implications of EHRs and the practical solutions that patients and physicians will require, including the development of a manageable consent process. The CMA also calls for a business case for EHRs be developed and communicated to physicians, as a critical element of the buy-in and change management process. As well, comprehensive educational and change management programs are needed to support the transition to EHRs in practice. ITAC will participate with the CMA, Canada Health Infoway and other stakeholders to facilitate these discussions.

ITAC recognizes that no single vendor has the total solution to meet all an organization's needs and that strategic alliances among vendors will be critical, to develop integrated offerings to help health care organizations derive greater value from ICT investments. Therefore, ITAC members will adopt this integrated approach with health care organizations.

By Government and the Private Sector Jointly

The Federal Government must take the necessary steps to ensure that the pan-Canadian implementation of EHRs is supported by the necessary security infrastructure and national, interoperable standards. Organized medicine must play a lead role in developing the necessary authentication and authorization mechanisms to ensure proper security. ITAC proposes to partner with government and continue its longstanding work on privacy protection, information security and standards.

Government and the ICT sector must collaborate to build a critical mass of qualified health informaticians, online health informatics content and flexible programs that can be easily accessed from multiple institutions by health professionals across the country. In addition, there is a need to support Canadian clinical training programs to enhance their curricula with health informatics knowledge so clinicians understand the application of informatics to support evidence-based care.