



eHealth in Canada: Crossing the Chasm

2006 Branham eHealth in Canada Study

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In 2005 Branham conducted a comprehensive assessment of the state of eHealth in Canadian hospitals. Feedback from both clients and the healthcare IT community was so positive that Branham decided to conduct this assessment on an annual basis and to expand the scope of the study to include other elements of the continuum of care.

Scope

The 2006 eHealth in Canada study examines eHealth use and spending by publicly funded institutions. The 2006 Branham study specifically examined the following sectors:

- Acute Care / Hospital
- Primary Care
- Rehabilitation
- Long-Term / Continuing Care

eHealth applications cover a broad range of functionality. Unfortunately, there is no consensus on how to categorize this functionality. Various surveys examining use and adoption of eHealth / healthcare IT applications in Canada and the U.S. have each used a different taxonomy to attempt to categorize products from different vendors. For the purposes of the 2006 eHealth in Canada study, Branham divides eHealth applications into three broad categories:

- **Financial & Administrative Systems.** These systems support the operation of a healthcare organization including a broad range of activities associated with capturing and tracking non-clinical information and adhering to the legislation and regulations governing healthcare services delivery.
- **Clinical Systems.** These systems support and enhance the various clinical processes involved in delivering healthcare services. These systems include:
 - o Ancillary Systems. Often referred to as the “pillars” or “feeder systems” in an Electronic Health Record (EHR) architecture, these systems support the operation of ancillary services such as laboratory, pharmacy or diagnostic imaging.

- o Departmental Systems. These systems support the specific needs of particular departments or services such as the Emergency Department, Cardiology or Intensive Care (ICU).
 - o Electronic Health Record System. Once core services such as laboratory or pharmacy are digitized, healthcare organizations can begin to integrate data from these ancillary systems to create sophisticated applications such as closed loop computerized provider order entry with clinical decision support aids.
- eHealth Infrastructure. Consisting of the various components on which the systems in the other two categories operate and includes both hardware and software.

Approach & Methodology

In compiling data for the 2005 eHealth in Canada study, Branham learned several important lessons that had a significant impact on how Branham collected data for the 2006 study:

1. Interviews were a highly effective mechanism for engaging eHealth decision makers.
2. There is a wealth of information available in various on-line documents. This material can be used to establish initial data sets that can be confirmed and supplemented through interviews provides critical insight and context for asking questions.
3. Regionalization, joint procurements and centralization of eHealth programs are creating “eHealth regions”. Taking this trend into account reduces the number of interviews needed to compile a comprehensive data set.

Drawing on this experience, Branham opted to use interviews with decision makers from each eHealth region combined with interviews with representatives from each provincial Ministry of Health as the prime mechanism for gathering data. These interviews were supplemented with interviews with provincial medical associations and provincial associations representing long-term care providers.

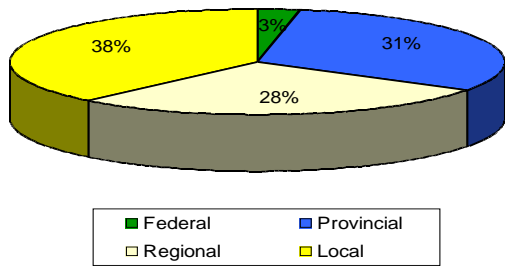


Figure 1 - Respondent Profiles by Level

Interviews took place primarily over the telephone, though a number were also conducted face-to-face. A total of 147 interviews were conducted, with respondent profiles by level and geography shown in Figure 1 and Figure 2 respectively.

Branham conducted the largest number of interviews in Ontario. This is due to the fact that Ontario is the only province that has not completed their regionalization efforts, and as such Branham had to interview large numbers of individual hospital corporations.

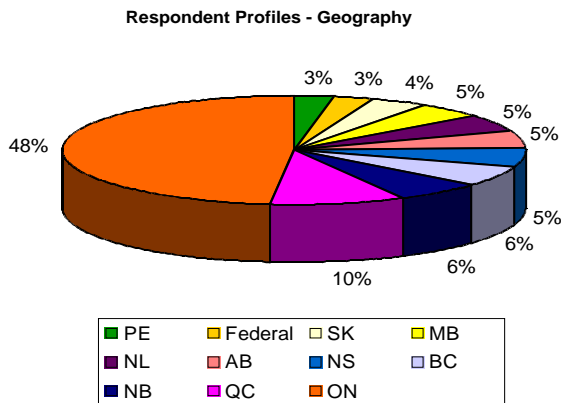


Figure 2 - Respondent Profiles by Geography

Buyers & Sellers

Although politicians often try to characterize the Canadian healthcare system as a single, publicly funded entity, it is in reality a complex web of hundreds of organizations with a mix of public and private funding, ownership and governance models. While every Canadian citizen has access to publicly funded healthcare, the manner in which the healthcare system is structured, funded and governed varies from Province to Province. These variations have a direct impact on eHealth deployments, with each Province setting its own agenda, strategies and timetables.

Starting in 1989 in Québec, provinces across Canada regionalized healthcare services delivery and, through this process, most of them have created Regional Health Authorities. There are 103 Regional Health Authorities or equivalent governance structures in Canada. Increasingly these entities are driving the eHealth agenda across many elements of the continuum of care including hospitals, long-term care and some aspects of primary care.

Given the federated nature of the responsibility for healthcare services delivery, any meaningful examination of the Canadian eHealth market must take provincial differences into consideration. For this reason Branham has chosen to organize the eHealth in Canada study along provincial lines. Indeed, Branham's data collection approach and subsequent analysis varied by Province and this report is organized along provincial lines. Table 1 summarizes key statistics related to healthcare services delivery in each province.

Through a review of advertising aimed at Canadian healthcare organizations, sponsorship of Canadian healthcare events, press releases and interviews with Canadian eHealth decision makers, Branham identified

Table 1 - Provincial Healthcare Services Delivery

Province	Population (thousands)	Health Budget (billions)	Regions	Hospitals	Acute Care Beds	LTC Facilities	LTC Beds	Primary Care Physicians
PE	139	\$0.3	1	8	574	18	1,004	140
NL	510	\$2.0*	4	37	1,607	41	2,842	455
NB	749	\$1.9	8	28	2,862	64	4,116	840
NS	934	\$2.8	9	37	3,194	73	5,800	1,200
SK	985	\$3.2	13	68	3,310	161	9,054	1,100
MB	1,178	\$3.6	11	80	5,380	125	9,447	1,200
AB	3,376	\$10.3	9	104	8,102	179	14,429	3,200
BC	4,310	\$11.9	6	94	8,869	275	26,600	5,000
QC	7,651	\$22.1*	18	123	21,314	214	46,200	8,200
ON	12,687	\$34.6	14	158	30,482	618	75,000	11,000

* - Budget includes health and social services

Table 2 - Vendors Selling into Canada

<i>Ownership</i>	<i># of Vendors</i>	<i>% Public Ownership</i>	<i>% Private Ownership</i>	<i>% of Total</i>
<i>Canadian owned</i>	149	19%	81%	49%
<i>Canadian subsidiary</i>	68	74%	26%	22%
<i>Foreign owned</i>	87	33%	67%	29%
TOTAL	304	35%	65%	100%

Table 3 - All Vendors - Sales Traction in Acute Care Facilities

<i>Primary business focus</i>	<i># of Vendors</i>	<i>% of Total Vendors</i>	<i># of Vendors with Sales Traction in Canada</i>	<i>% with Sales Traction in Canada</i>
<i>Software</i>	188	62%	119	63%
<i>Infrastructure (excludes Networking and Services)</i>	36	12%	33	92%
<i>Other (Services, Pharmaceutical, etc)</i>	80	26%	NA	NA
TOTAL	304	100%	152	

slightly more than 300 vendors who are actively selling to Canadian healthcare organizations. These vendors are a mix of Canadian-owned companies, Canadian subsidiaries of multi-national companies and foreign-owned companies as shown in Table 2. Branham has identified sales traction in Acute Care Facilities in Table 3.

Through interviews and background research, Branham determined that 50% of the 304 companies have market share in one or more of the categories tracked by Branham for the 2006 eHealth in Canada study.

Installed Base

Figure 3 and Figure 4 graphically depict the level of deployment of Finance & Administration and Clinical applications in Canada. It is important to note that application “deployment” is not the same as application “use” or “adoption”. Branham considered an application to be “deployed” when it has been installed and there is some form of operational use.

Branham chose to use “deployment” since it is a useful and relatively easy to measure indication of market penetration. Applications are considered as either “Present” (deployed) or “Not Present” (not deployed), with applications that have been purchased but not installed deemed to be “Not Present”.

Application deployment, as defined by Branham, does not distinguish between pilot, limited use and widespread enterprise-wide use. Hence, application deployment figures in some categories may be higher than actual use figures for the same category.

In some categories only basic functionality has been deployed. Hence, a high degree of deployment should not be interpreted as a lack of market opportunity, though in many cases the incumbent vendor will have a favourable position to supply products to implement additional functionality.

Plans & Priorities

While specific plans and priorities vary by jurisdiction and are discussed in detail in the main body of the study report, a number of common themes were identified, including:

- Canada Health Infoway’s Electronic Health Record agenda has had a significant impact on provincial eHealth plans and priorities. Every province has implemented, has plans to implement or is considering implementation of a laboratory information system, a drug information system, diagnostic imaging systems, public health surveillance and an interoperable Electronic Health Record.
- Within each province, regional plans and priorities generally include integration or alignment with provincial eHealth initiatives.
- Electronic Health Record (regional or provincial), Electronic Patient Record (hospital) and Electronic Medical Record (physician office) projects are either underway or planned in most jurisdictions.
- Nearly all hospital or regional health authorities interviewed by Branham have plans to implement advanced clinical applications such as CPOE and clinical documentation.

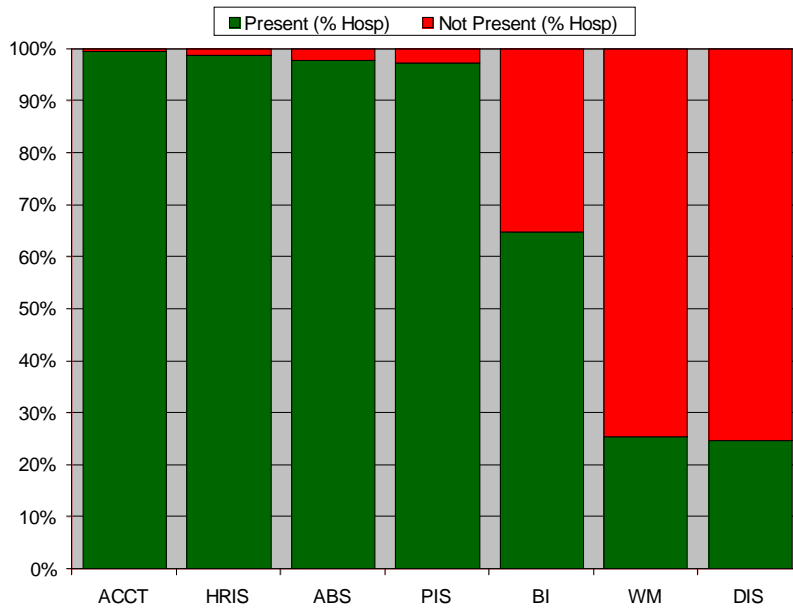


Figure 3 - Finance & Admin Application Deployment

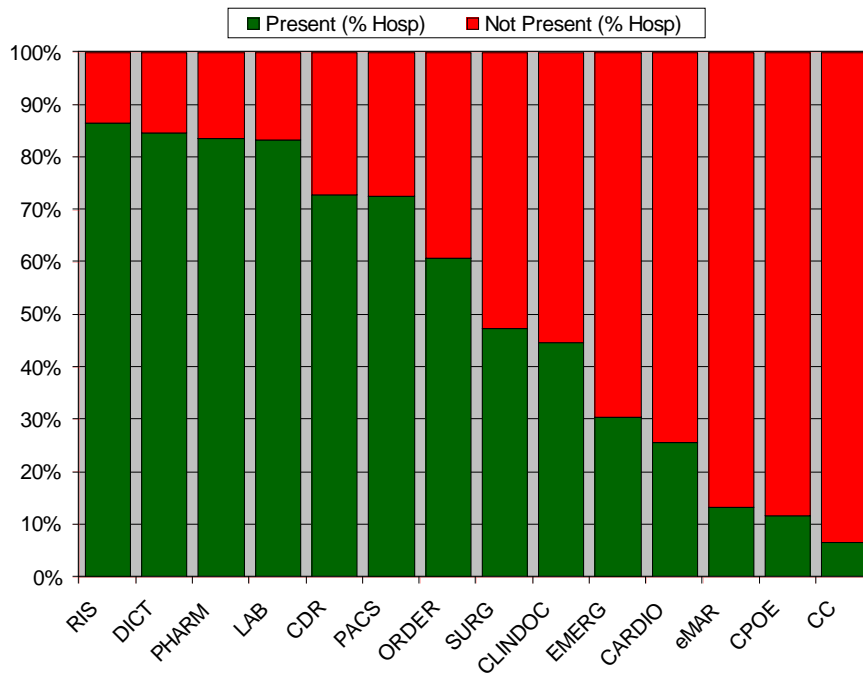


Figure 4 - Clinical Application Deployment

LEGEND:

Finance & Admin Systems		Clinical Systems			
ABS	Abstracting	CARDIO	Cardiology	EMERG	Emergency
ACCT	Accounting	CC	Critical Care / Intensive Care	LAB	Laboratory
BI	Business Intelligence	CDR	Clinical Data Repository	PACS	Picture Archiving & Communication Systems
DIS	Document Imaging & Scanning	CLINDOC	Clinical Documentation	ORDER	Order Communications
HRIS	Human Resource Systems	CPOE	Computerized Physician Order Entry	PHARM	Pharmacy
PIS	Patient Information System	DICT	Dictation & Transcription	RIS	Radiology Information Systems
WM	Workload Management	eMAR	Electronic Medication & Administration Record	SURG	Surgery

- Chronic Disease Management is emerging as a priority in many jurisdictions.
- Although there is moderate deployment of Business Intelligence (BI) tools across the country, many of these implementations offer only basic reporting capabilities. Many organizations interviewed by Branham expressed a strong interest in implementing more sophisticated BI tools, either as a new deployment or as enhancement of their existing BI deployment.
- Branham identified consolidation of eHealth infrastructure and applications as a trend in the 2005 eHealth in Canada study. This trend will continue based on the stated plans and priorities, particularly in jurisdictions such as Ontario and Newfoundland and Labrador that are in the midst of regional restructuring.
- There is increasing attention being paid to engaging primary care physicians whether they are working in provincial or regional clinics or independently in their own practices. While approaches vary across the country, Branham believes that there will be a considerable increase in the number of primary physicians using an EMR over the next 12 to 24 months.
- Although it is typically a longer term priority, many jurisdictions have identified patient access through tools such as patient portals and Personal Health Records as a key element of their eHealth plans. Based on activity in other parts of the world in this area and on general “customer self service” trends in various industries, Branham predicts that “consumer” eHealth will emerge as a growth area within 5 years.

Outsourcing

While healthcare organizations outsource a wide variety of functions, Branham focused on those functions that involved information technology. Specifically, Branham focused on two types of outsourcing: Infrastructure Outsourcing and Business Process Outsourcing.

Branham found that slightly less than half of the healthcare organizations delivering healthcare services had already outsourced or planned to outsource some or all of their IT operations while slightly more than one half had already outsourced or planned to outsource specific business processes.

Although there is a strong interest in outsourcing, there are a number of reasons why Canadian healthcare organizations have chosen not to outsource or are not planning to do so, including:

- Unionized Staff. Several healthcare organizations interviewed by Branham explained that they had been unable to consider any significant level of outsourcing due to union agreements.

- Size. Smaller Regional Health Authorities (<500 beds), particularly those in eastern Canada, stated that due to their small size outsourcing was not financially attractive.
- Remoteness. Regional Health Authorities in geographically remote areas such as northern British Columbia, northern New Brunswick and most of Newfoundland stated that they were unable to find qualified IT outsourcing companies who had staff located in reasonable proximity to their facilities.
- Not Ready to Outsource. Several larger organizations stated that although they were interested in outsourcing, they had not yet done so nor would they consider doing so until they had fully understood their outsourcing needs and had any operational problems resolved.

Emerging Technologies

The 2005 eHealth in Canada study explored what the future might hold for eHealth in Canada. One of the future visions mentioned by many of the eHealth thought leaders and decision makers interviewed by Branham was the degree to which wireless and other mobile technologies will be employed. Based on this insight and with input from Premier subscribers, Branham explored the impact of various technologies, including wireless, on healthcare services delivery in the 2006 study. Branham found that healthcare was aggressively employing some of the same technologies as other industries, like wireless, while holding off on others such as Open Source software and Service Oriented Architecture.

Wireless

More than one-half of healthcare organizations delivering healthcare services interviewed by Branham indicated that they allow both staff and the general public to use wireless devices, albeit with certain restrictions.

Not only do many Canadian healthcare organizations permit the use of wireless devices, they are aggressively deploying the infrastructure needed to support use of these devices by staff. A majority of the healthcare organizations interviewed by Branham stated that they already had deployed or planned to deploy a wireless infrastructure in at least a portion of their institution.

Radio Frequency Identification (RFID)

While there is considerable interest in RFID among Canadian healthcare organizations, nearly one-half of the organizations interviewed by Branham indicated they had no plans at this time to turn this interest into firm implementation plans. In addition, 22% stated that they had no interest in RFID at all.

Typical applications cited by those planning or even thinking about RFID implementations included asset tracking and patient tracking, with a small number expressing an interest in exploring RFID for

medication safety applications.

Biometrics

40% of the healthcare organizations that directly provide healthcare services interviewed by Branham indicated that while they were interested in biometrics, they have no firm implementation plans. In addition, a little over a third had no interest in biometrics at all, with many of them indicating a preference for using a security token over biometrics.

Voice Recognition

There is strong interest in voice recognition, with nearly three quarters of the organizations that deliver healthcare services interviewed by Branham indicating they have plans or have already implemented voice recognition technology in one or more departments. Only 12% of the respondents stated that they had no interest in using voice recognition technology.

Voice Over IP (VOIP)

Like organizations in many other industries, Canadian healthcare organizations are enthusiastically embracing VOIP technology. Slightly more than three-quarters of the healthcare organizations delivering healthcare services interviewed by Branham had either implemented VOIP or planned to do so within the next twelve months. A small minority stated that they had little or no interest in VOIP technology, with many of these organizations citing no pressing need to reduce long distance charges (typically single site or urban institutions).

Open Source Software

While other industries have embraced open source software, Canadian healthcare has shown a reticence to employ open source software, particularly in clinical applications. A large majority of the healthcare organizations that directly deliver healthcare services interviewed by Branham indicated that they had no interest in open source software. All of the organizations that did express an interest stated that they would only consider open source software for non-clinical applications. These organizations felt that clinical applications were simply too demanding to trust to open source software.

Service Oriented Architecture

Canada Health Infoway has embraced SOA in its Electronic Health Record (EHR) System reference architecture. Other organizations such as the Ontario government have adopted SOA as the best approach to defining complex, interoperable systems and to reducing the costs of implementing disparate applications.

Given Infoway's commitment to SOA, it was surprising to find that half of the healthcare organizations interviewed by Branham expressed little interest in SOA. Indeed, many of these organizations indicated that they were not familiar with SOA and perhaps had

not even heard the term before. Many respondents stated their enterprise architectures were largely defined by the vendors whose software they used, not by them.

CIO Feedback

At the end of each and every interview with an eHealth decision maker, Branham asked the interviewee what advice they had to offer the vendor community. Most respondents had one or two burning issues that they were more than willing to share.

- **Understand the Customer / Understand the Market.** By a wide margin the most common piece of advice offered by the interviewees was for vendors to take the time to understand the customer, whether that be from an individual customer perspective, a Canadian healthcare market perspective or a healthcare vertical market perspective.
- **Conform to Standards / Support Interoperability.** Another very frequently offered piece of advice was that vendors develop products that conform to Canadian and/or international standards. These decision makers stressed the need for systems from different vendors to interoperate.
- **Develop and Nurture Long-Term Client Relationships.** On par with the advice to conform to standards, many interviewees advised vendors to build lasting, long-term relationships. One interviewee commented that "When we buy a system we enter into a 15 to 20 year relationship with that vendor because we often keep systems for that long!"
- **Cooperate with Each Other.** Several senior CIOs who were interviewed commented that healthcare organizations are increasingly looking for solutions that no single vendor's product can address. They advised vendors to find ways to work together to meet customer needs rather than trying to simply beat the competition.
- **Help Make the Business Case.** Several interviewees pleaded for input from the vendors in making the business case for eHealth investments. They noted that vendors are often aware of what other customers are doing and could work with these customers to extract relevant metrics.

In the 2005 eHealth in Canada study Branham concluded, based on a review of provincial eHealth strategies and architectures, that Canada Health Infoway was having a significant impact on the Canadian eHealth agenda. Given Infoway's role and its obvious influence on eHealth decisions and architectures across Canada, Branham decided to explore how Canadian eHealth decision makers felt about Infoway's impact in the 2006 study. Since the main focus of the 2006 study was to explore current and future buying decisions, interviewees were only asked two questions about Infoway. While the answers to these questions reveal some concerns about specific aspects of Infoway's overall approach, the general

consensus among respondents can be best summed as “some tuning is required” but “don’t throw out the baby with the bathwater”.

When asked whether they felt that Canada Health Infoway has had a positive, neutral, or negative impact on the Canadian eHealth agenda, a large majority of respondents, as shown in Figure 5, stated that they felt that Infoway was having a positive influence. Although respondents felt that Infoway has had a positive impact on the Canadian eHealth agenda, many concerns and issues were raised and a number of respondents suggested that some changes were needed going forward.

There was a general consensus among interviewees that the \$1.2B given to Infoway by the federal government to date is insufficient to implement a Pan-Canadian, interoperable electronic health record. When asked whether they supported additional funding for Infoway, a large majority of respondents, as shown in Figure 6, support Infoway’s request for additional funding. However, this support does come with some caveats.

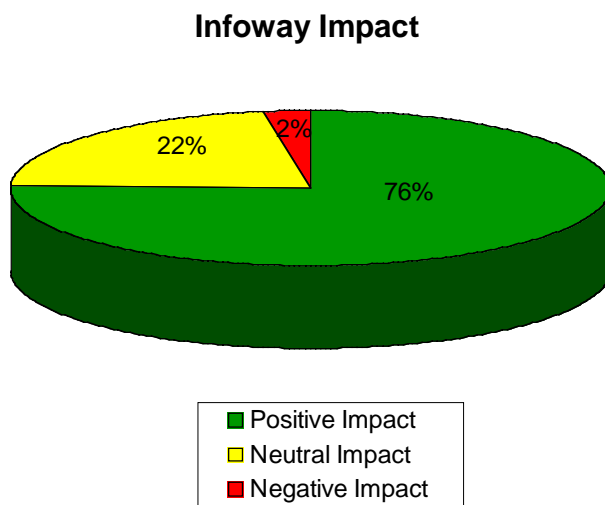


Figure 5 - Views on Infoway’s Impact on the Canadian eHealth Agenda

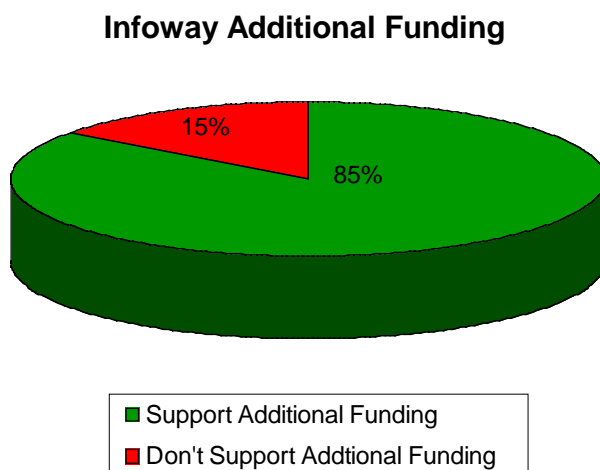


Figure 6 - Views on Infoway’s Request for Additional Funding

Acknowledgements

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Premier subscribers:

- Atlantic Canada Opportunities Agency
- Bell Canada
- Business New Brunswick
- GE Healthcare
- Industry Canada
- McKesson Canada
- Novell
- OCRI Global Marketing
- Xenos

Contributing subscribers:

- Dinmar
- Emergis
- HP Canada
- IBM Canada
- IQmedX
- Navantis
- New Zealand Trade & Enterprise
- Pfizer Canada
- Siemens
- Sun Microsystems of Canada

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- British Columbia Technology Industries Association
- CATA Alliance
- CHITTA - Canadian Healthcare IT Trade Association (the healthcare division of ITAC)
- Canadian Healthcare Association
- Canadian Medical Association
- Canadian Nurses Association
- Saskatchewan Advanced Technology Association ●

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