



- JANE CURRY -

Sustaining a Canadian Health Information Infrastructure

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Designing, developing and sustaining the Pan-Canadian Health Infostructure requires a new way of thinking about the role of Information Management and Information Technology in the health system. Information Technology is not simply a tool to be used by various organizations to support their local processes; it must be considered an enabling infrastructure that evolves as the health system evolves. The ACHI Blueprint and tactical plan answered some of those questions of why, what, how, who and when for a Pan-Canadian Health Infostructure. The Canada Health Infoway Blueprint identified the essential design elements of the Electronic Health Record interoperability mechanisms. We must now answer the sustainability question.

Just what does “sustainability of the health infostructure” mean? What is the difference between **building** a health infostructure and **sustaining** a health infostructure?

An intention to build anything collectively must begin with a shared understanding of the “why, what, who, how and when” of the thing to be built. A national health infostructure is no different. The ACHI Blueprint and tactical plan answered some of those questions. To briefly paraphrase:

Why - why would we want a health infostructure?

- A health infostructure is needed to ensure that information is effectively captured, stored, transformed, shared and ultimately used to support evidence based decision making and accountability throughout the health system.

What - what is a health infostructure?

- The health infostructure is made up of five components: people across Canada, within various overlapping jurisdictions, in roles including funders, service providers, service recipients, and resource managers who engage in processes that capture, transform, manage and use various types of data and information using technology in the form of applications, the hardware platforms they run on and the networks that connect them. All of these components are integrated using standards that ensure the various components fit together neatly.

Who - who funds, builds, implements and ultimately uses the health infostructure?

- Clearly the **funding** is a shared responsibility across the jurisdictions responsible for the operation of the health system. Whether the funding mechanisms are public or private, the ultimate funders are Canadians who use the health system. All funders expect to see value for the

money paid either directly out-of-pocket or indirectly through taxes or premiums.

- **Building** the health infostructure requires specialized skills of many kinds - a range of skills that might be compared to the range of skills required to deliver health services (particularly if measured in the time and effort it takes to acquire the skills and be able to apply them effectively). Indeed, many of the most proficient practitioners of the highly specialized field of applying automated technology to health information are proficient in both health services and health information. This very specialized skill set is often referred to as **health informatics**. Along with these specialized skills are the skills required to identify information requirements, define the governance constraints applicable in all expected use situations, and to identify the processes necessary to capture, transform and present the right information to the right people at the right time and place. And of course, the various skills necessary to build the technology applications, hardware and networks to make it all work together.
- **Implementing** the components of the health infostructure and ensuring they are effectively tied together is also a shared responsibility across the full spectrum of service recipients, resource managers and service providers. Implementation is also the responsibility of the management of all groups that need to align their existing processes and business rules to take advantage of the health infostructure.
- **Using** the health infostructure effectively is the responsibility of everyone in the health system that makes decisions. The benefit of the health infostructure is in the effectiveness and efficiency that is gained when people collectively make more informed decisions. Merely having excellent information available at the point of decision does not guarantee the quality of the decision made. However, the health infostructure will enable recording of what decisions are made and what information is available to make each decision, which can result in the expected benefit of an increased transparency of accountability.

How - How will the health infostructure be realized?

- The health infostructure is being built collaboratively by all levels of the health system (local, regional, provincial and national) working to leverage existing infrastructure, aligning their processes to increase interoperability, building new components that can be leveraged into other jurisdictions, and agreeing to standards that make the pieces fit together.

When - when will the health infostructure be built, how long will that take and how long will it need to be in place?

- The health infostructure is an urgent requirement and needs to be built as soon as possible.
- Building the health infostructure will take years and must be an evolutionary process because there is an essential health system operating concurrently.
- As an essential underpinning of the health system in Canada, it needs to endure as long as the health system and adapt to the changing conditions within the environment. The health infostructure must be responsive to changes in regulation and policy, population demographics, resource availability and to changes in the capability of technology used in the infostructure itself and the health service modalities.

In examining the requirements for sustainability of the health infostructure, it is useful to consider what components make up the health infostructure and how change affects these components. Ensuring sustainability requires several considerations right during the 'design and build' stage.

Building for Sustainability

- **Build for Change:** The health infostructure *must* be designed to *change (evolve, grow and expand)* continuously without disrupting the health system it enables. The ability to continuously change is an essential ingredient of sustaining the health infostructure. A health infostructure designed and built according to a single static blueprint only satisfies requirements at the time it was designed. A long history of mega-projects has demonstrated that these types of structures cannot even be finished before the original requirements have changed. In an environment where the structure of the health system itself is changing, this approach to building a health infostructure is guaranteed to fail.
- **Build for flexibility:** Sustainability requires the flexibility to continuously adjust all the components that make up the health infostructure to meet changing requirements without disrupting the health system that it supports. The shift from a "build once and expect the product to remain stable for the foreseeable future" to "build with an expectation that the product will continuously change for the foreseeable future" requires a whole new way of thinking about what is being built and how it is built.
- **Build to support decision making:** The health infostructure achieves benefits by helping to manage the dynamic complexity of an inter-dependent health system. Therefore, the problems that the health infostructure must resolve have less to do with automating manual processes, although that is part of the solution, and more to do with helping to manage information used by the many people in different roles to make effective decisions. Someone other than the decision maker usually must create the information required to support the decision. Designing an effective health infostructure is all about optimizing the processes of capturing data at the most effective time and place, storing, sharing and transforming data into information for varying purposes and making the resulting information available in the right form and at the right time and place for people to make effective decisions.

- **Build to adapt to many contexts:** Building automated functionality in a single context takes time, skill and effort. This is the traditional custom solution environment. Building the same automated functionality to support multiple contexts takes from three to five times the effort. Commercial software falls into this category. Building automated functionality made up of many different components also takes from three to five times the effort of custom development. This is the situation faced by many health services delivery organizations required to rationalize applications as service integration occurs. Building an automated functionality designed to operate in multiple contexts may take more effort to design but is offset by the reduced effort to change as the health system changes.

Migrating from the existing situation where systems were built with specific contexts to one where systems are built to be changed to adapt to multiple contexts, is the environment facing the task of sustaining a health infostructure and supporting the Canadian health system. Achieving this goal will require the cooperation and collaboration of people at all levels of the health system across Canada, and indeed, around the world.

