The Diagnostic Imaging Repository Strategy in Canada

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The DI-r Strategy in Canada

Overview

- **Electronic health records for all.**
- **The Canadian DI landscape in 2003.**
- **The Canada Health Infoway vision and strategy for DI.**
- **2013: achievements, benefits and challenges.**
- **Conclusion.**
- **References.**
- **Contact info.**

Electronic Health Records for All: Canada Health Infoway

- **Created in 2001**
- **2.1 billion in federal funding to date**
- **Independent, not-for-profit corporation**
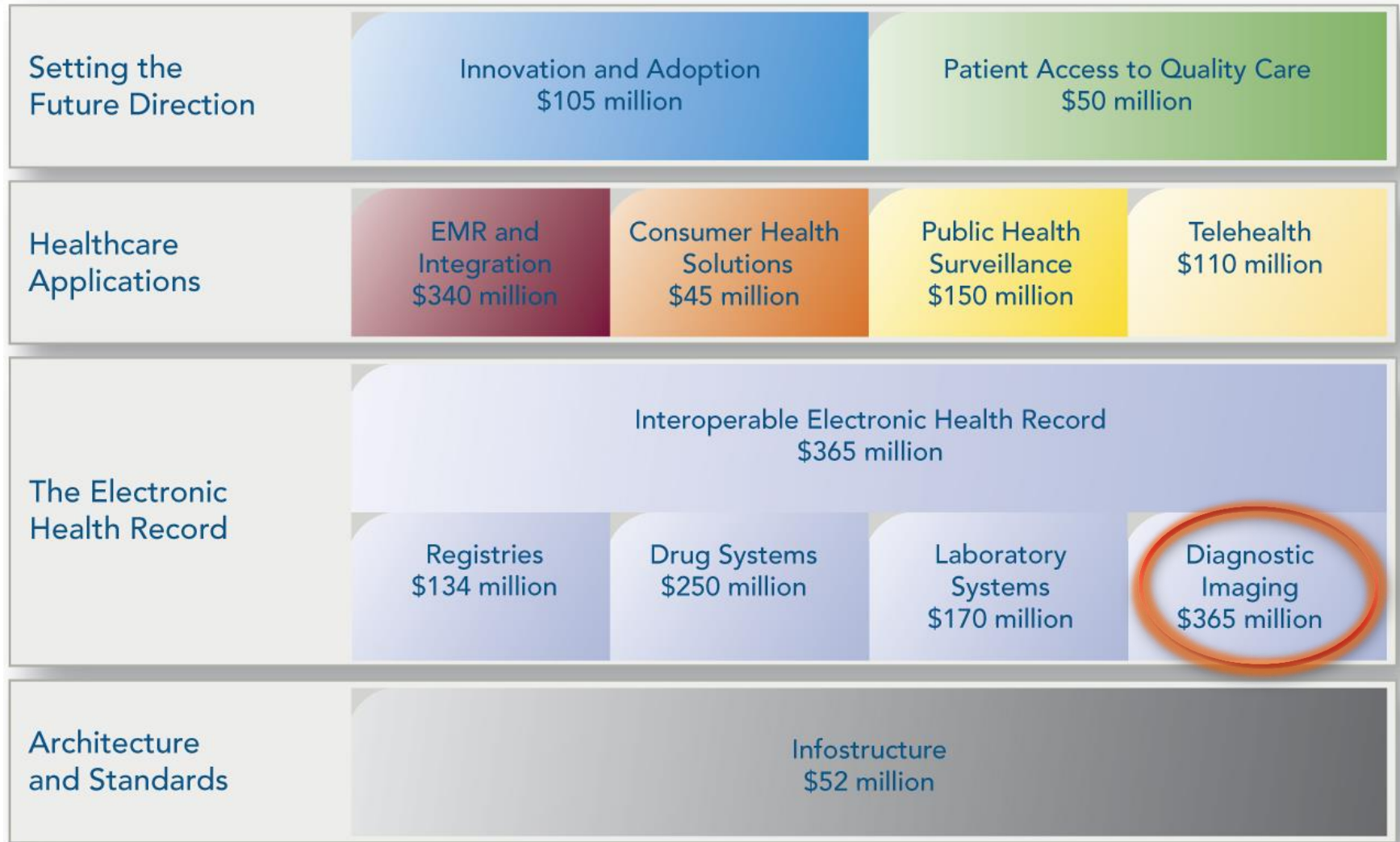- **Equally accountable to 14 federal/provincial/territorial governments**

Mission:

To foster and accelerate the development and adoption of electronic health information systems with compatible standards and communications technologies on a pan-Canadian basis with tangible benefits to Canadians.

Goal:

By 2010, every province and territory and the populations they serve will benefit form new health information systems that will help modernize their healthcare system. Further, 50 per cent of Canadians will have their electronic health record readily available to their authorized healthcare professionals.

Setting the Future Direction	Innovation and Adoption $105 million		Patient Access to Quality Care $50 million	
Healthcare Applications	EMR and Integration $340 million	Consumer Health Solutions $45 million	Public Health Surveillance $150 million	Telehealth $110 million
The Electronic Health Record	Interoperable Electronic Health Record $365 million			
	Registries $134 million	Drug Systems $250 million	Laboratory Systems $170 million	Diagnostic Imaging $365 million
Architecture and Standards	Infostructure $52 million			

The Digital Imaging Landscape in Canada in 2003

- **Use of Picture Archiving and Communication Systems (PACS): < 27%.**

- **Anticipated growth in annual procedure volume due to new CTs and MRIs: 15%**

- **Unnecessary duplications as pre-existing images are unavailable: 7 to 15%**

- **Limited exchange of images across facilities due to lack of technology.**

The Digital Imaging Landscape in Canada in 2003

- **Numerous healthcare facilities small and located in rural communities.**

- **Number of radiologists: 1,900 mainly located in urban centres and large regional hospitals.**

- **Radiologists workloads often exceed recommended levels.**

- **Estimated shortage of radiologists: 500.**

- **Report turn-around measured in days for facilities with no full-time radiologist resulting in delayed diagnosis and treatments.**

DI program vision

- **Filmless DI operations across Canada.**

- **Seamless sharing of DI data among authorized users within the EHR solution through consolidation of data in domain repositories (DI Repository = DI-r).**

- **Conformance to standards as a means to achieve cost effective interoperability.**

- **Adoption of pan-Canadian standards such as XDS-I and related IHE integration profiles to provide a solution for sharing (publishing, discovery and retrieval) of imaging documents across affiliated healthcare organizations.**

What is a Diagnostic Imaging Repository (DI-r)?

Centralized infrastructure serving as:

- **Storage repository for DI information**
- **Shared operational PACS for green field sites (not filmless)**

Purpose:

- **Reliably maintain, deliver and share DI information to consumers within the EHR**

Requirements:

- **Maintain a lifetime of 'relevant' DI data, including reports, images, key image notes, image processing results, overlay information, presentation states and other evidence documents**
- **Support 1.5 to 3 million exams per year (varies by jurisdiction)**
- **Provide high performance delivery of DI information over a network**
- **Provide reliable/uninterrupted access to DI information**
- **Maintain quality and integrity of data**
- **Comply with the EHRS Blueprint Architecture**
- **Conform to pan-Canadian Standards to achieve interoperability**

# 2 types of DI-r

Regionally deployed PACS:

1. Single database and vendor

2. Multiple patient index with some level of longitudinal view

3. Local image caches in some areas.

Independent DIR (hub and spoke):

1. Different databases for PACS and DIR

2. Each PACS needs to be interfaced to the DIR

3. DIR can typically play the role of long term archive

4. DIR is the sharing point

5. Multi-vendor setting.

2013: The regional Digital Images repositories

19 shared PACS/Archive Solutions (DI-r)

🟡 **Implementation**　🟢 **Completed**
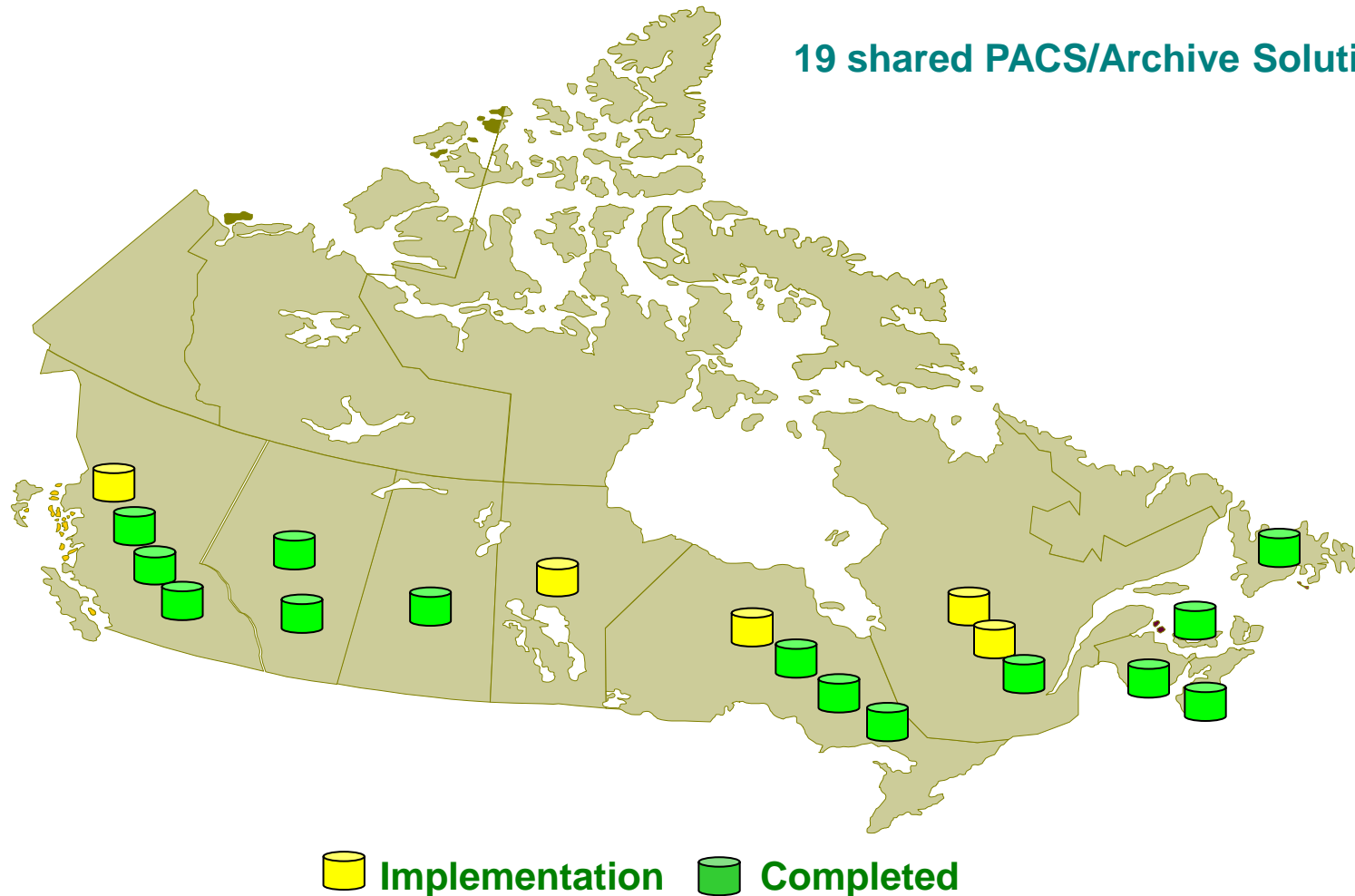
2013: Progress to Date

- **About 77% complete (filmless). Number of provinces and health regions are now 100% digital**

- **19 Diagnostic Imaging Repositories have been created. Northern territories are leveraging infrastructure from southern provincial partners**

- **Over $60M in savings via joint procurements and national pricing (major vendors include AGFA, GE, Philips, McKesson).**

- **Benefits evaluations have indicated $850M to $1B per year in savings via: reduced patient transfers, improved turnaround times, improved productivity & capacity creation, reduced film costs, reduced duplicate tests.**

# 2013: Improving access to care and boosting productivity

- **39% of radiologists now reporting for new remote sites; improved remote reporting enables radiologists to support care delivery and improve access for remote geographies and populations.**

- **On average, DI delivers 25-30% improvement in radiologists' productivity.**

- **More than half of referring physicians indicate DI improved efficiency of clinical decision-making by 30 to 90 minutes per week; capacity increase equivalent of up to 500 additional specialists across Canada.**

- **30-40% improvement in turnaround times (clinical decisions and subsequent treatment of patients now occurs 10-24 hours sooner).**

- **Clinicians in urban centres can review images of patients in rural areas instantly, reducing lag time for diagnosis, need for travel and lowering costs.**

- **Eliminates 10,000-17,000 patient transfers each year.**

Are all our DI-r's compliant with standards?

DICOM
Digital Imaging and Communications in Medicine

- **EMPI (Enterprise Master Patient Index) to create a unique identifier for each patient.**

- **XDS-I b: sharing of information across health enterprises:**
  - **Sets of DICOM instances (images, evidence documents, presentation states)**
  - **Reports**
  - **Significant images.**

GTA West Standards Based Solution

British Columbia
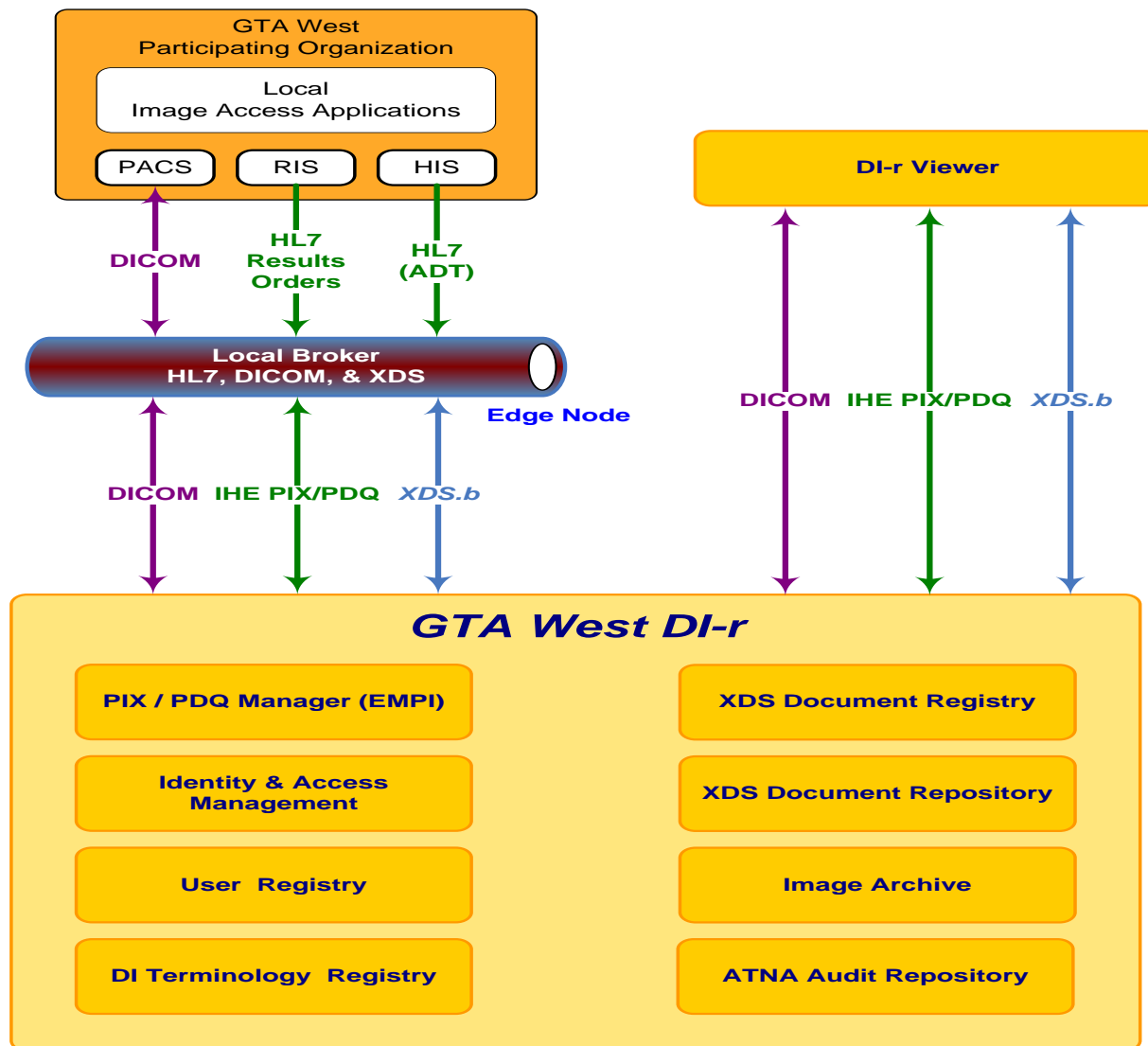
- **6 million exams/year**
- **Regional PACS: Agfa, GE, McKesson, Intelerad**
- **EMPI: in place but not fully implemented**
- **XDS-i: not in place.**

Alberta

- **5 million exams/year**
- **Independent DI-r: Agfa**
- **2 in Calgary and Edmonton**
- **EMPI: yes**
- **XDS-I.b: on trial.**

Saskatchewan

- **1.5 million exams/year**
- **Philips: one provincial PACS, single database**
- **XDS-i: no**

Manitoba

- **1.5 million exams/year**
- **Independent DI-r: Agfa**
- **EMPI: province-wide**
- **XDS-i: no, sharing via proprietary based solution.**

Ontario

- **16 million exams/year**
- **Independent DI-r's:**
  - **Agfa (HDIRS),**
  - **GE (NEODIN, SWODIN, GTA-W)**
- **EMPI: mix EMPI - OHIP**
- **XDS-i.b: yes for HDIRS and GTA-W**

Quebec

- **10.3 million exams/year**
- **3 Independent DI-r's: Agfa and McKesson/Dejarnette**
- **XDS-i: yes**

Newfoundland and Labrador

- **0.4 million exams/year**
- **Single database: GE**
- **EMPI: in process**
- **XDS-i.b: no, sharing by single PACS.**

New Brunswick

- **1.3 million exams/year**
- **Independent DI-r: Agfa**
- **EMPI: in process**
- **XDS-i.b: no**

Nova Scotia

- **1.4 million exams/year**
- **Independent DI-r: Agfa**
- **EMPI: in process**
- **XDS-i.b: no**

Prince Edward Island

- **0.2 million exams/year**
- **Independent DI-r: Agfa**
- **EMPI: in process**
- **XDS-i.b: no**

Territories

- **Cross jurisdictional sharing.**
- **Connected to regional PACS in adjacent provinces.**

Conclusion

- **Dl-r's deployment is very advanced in Canada.**

- **Medico-economic analysis already show its benefits.**

- **In an heterogeneous PACS environment, XDS-I allows the integration of different systems.**

- **And the journey is far from complete:**
  - ✓ **Ensure adoption of appropriate standards for DI integration into EHR: Interoperability, FEM, Terminology, XDS etc.**
  - ✓ **Integration of independent health facilities.**
  - ✓ **Expand to other diagnostic specialties (cardiology, pathology,…).**
  - ✓ **Integrate images seamlessly in hospital information systems (HIS) and electronic medical records (EMRs).**
  - ✓ **Make images accessible through consumer health portals.**

References

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Thank you for your attention !