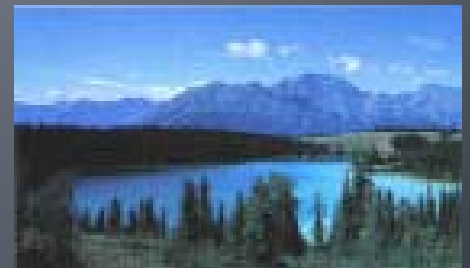


Evaluating Adoption of Health Information Technology in North America: Issues, Barriers and Trends

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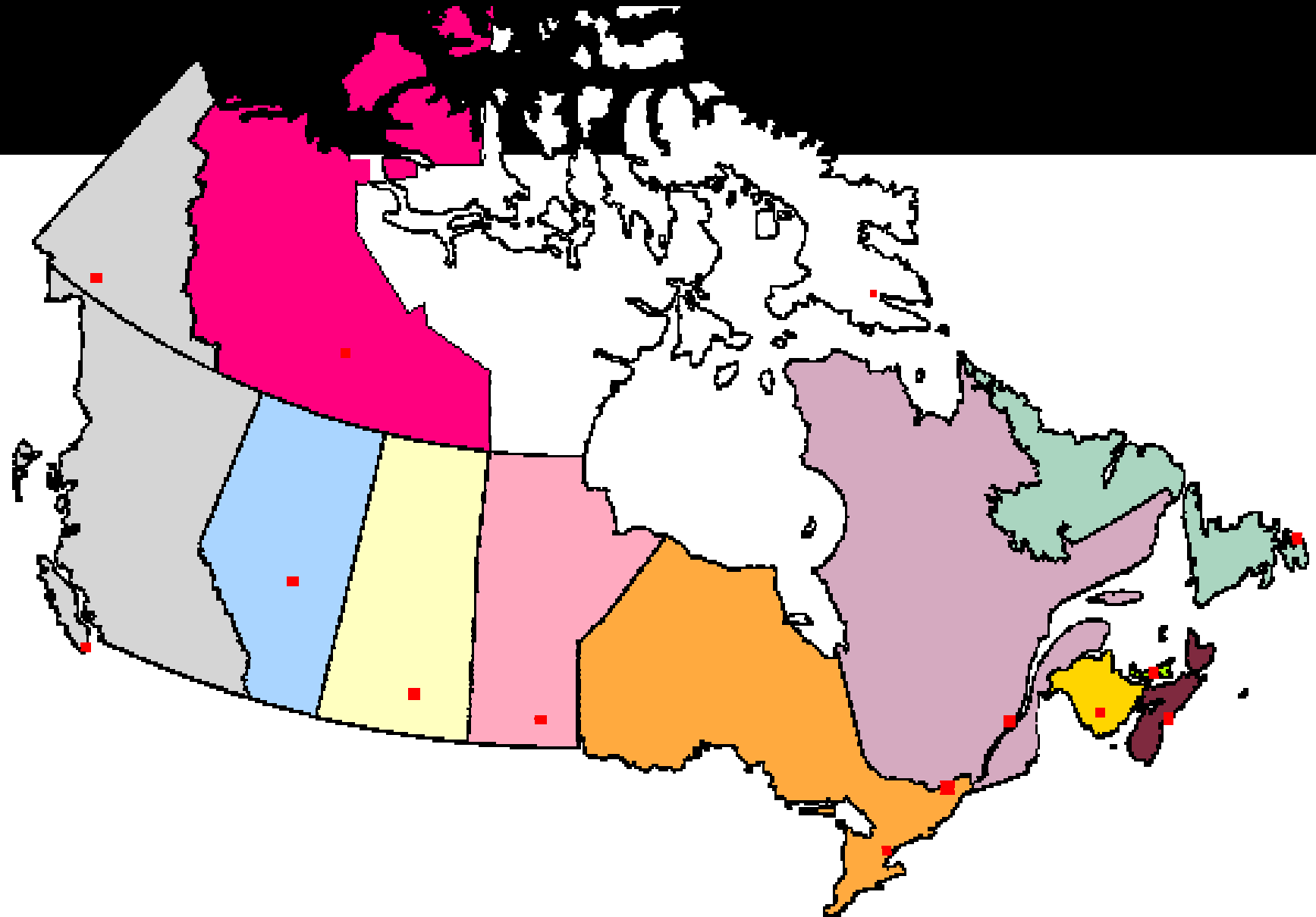
International Overview

- International trend to increasing adoption of healthcare information technology (IT)
- Central to this has been the concept of the electronic health record (EHR) and related technology
- Internationally the rates of adoption and uptake differ considerably



Canadian Healthcare Context

- Canada has approximately 35 million people
- It is geographically huge and the population is dispersed, with a few major cities (over 1 million population)
- The healthcare system is universal (all citizens are covered)
- Includes some privatization (primarily with specialized services – e.g. dental care)



Healthcare in Canada

- Canada's healthcare system has both public (70%) and some private, or "out of pocket" insurance
- National government collects tax dollars and transfer payments go to provinces for healthcare
- Much of the decision making is at provincial level
- 5 principles of the healthcare system
 - Not for profit, comprehensive, universal, portable, accessible

Definitional Issues – Health Information Technology

- **EMR**
 - the electronic record in a physician's office
- **EPR**
 - the electronic record in a hospital or facility
- **PHR**
 - personal health information entered and maintained by the patient or layperson
- **EHR**
 - the longitudinal electronic record of an individual that contains data from multiple EMRs, EPRs and PHRs
- *Concept of the EHR is the cornerstone of efforts provincially and nationally in Canada*

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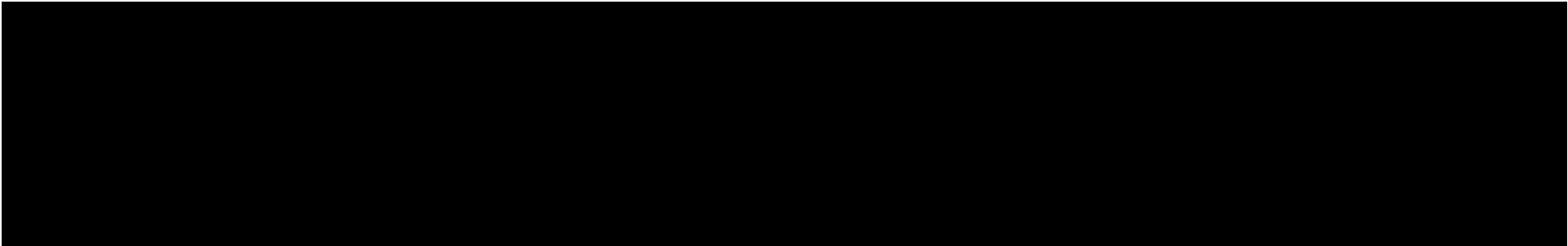
Canada's Approach

- Canada's strategy is aimed at increasing use of electronic health information systems in Canada
- Canada Health Infoway Inc., created in 2001, is a nonprofit organization
- Governed by Canada's 14 federal, provincial and territorial Deputy Ministers of Health

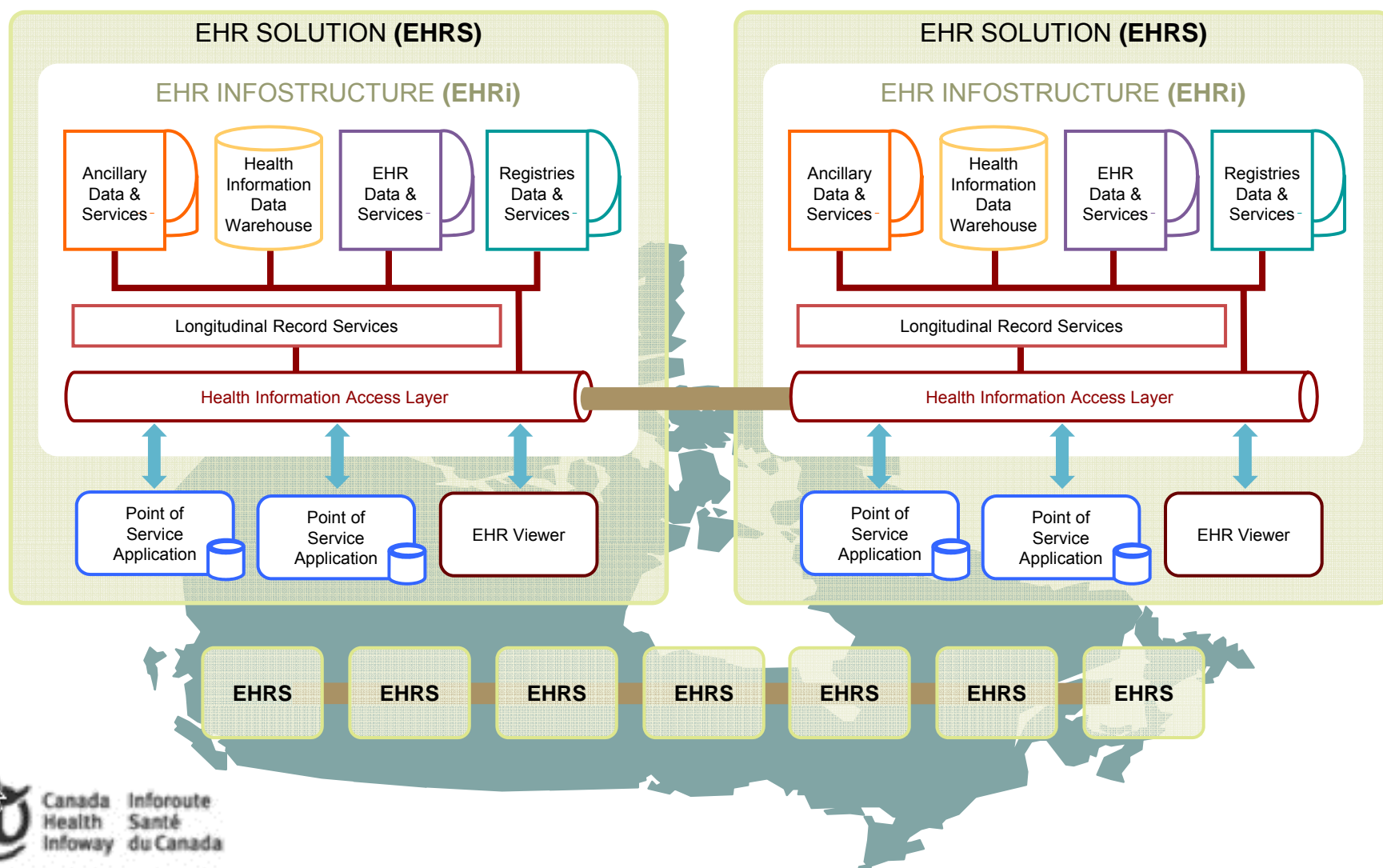
Canada Health Infoway

- 1.6 billion dollars
- Objective:
 - To foster and accelerate the development of secure, interoperable electronic health record systems Canada-wide
- Electronic health records (EHRs)
 - Allow for electronic entry of health data and facilitate electronic retrieval
 - Seen as the core to a strategy for nation-wide collection of health data from point of care
 - Also seen as “backbone” for sharing of health related data across Canada



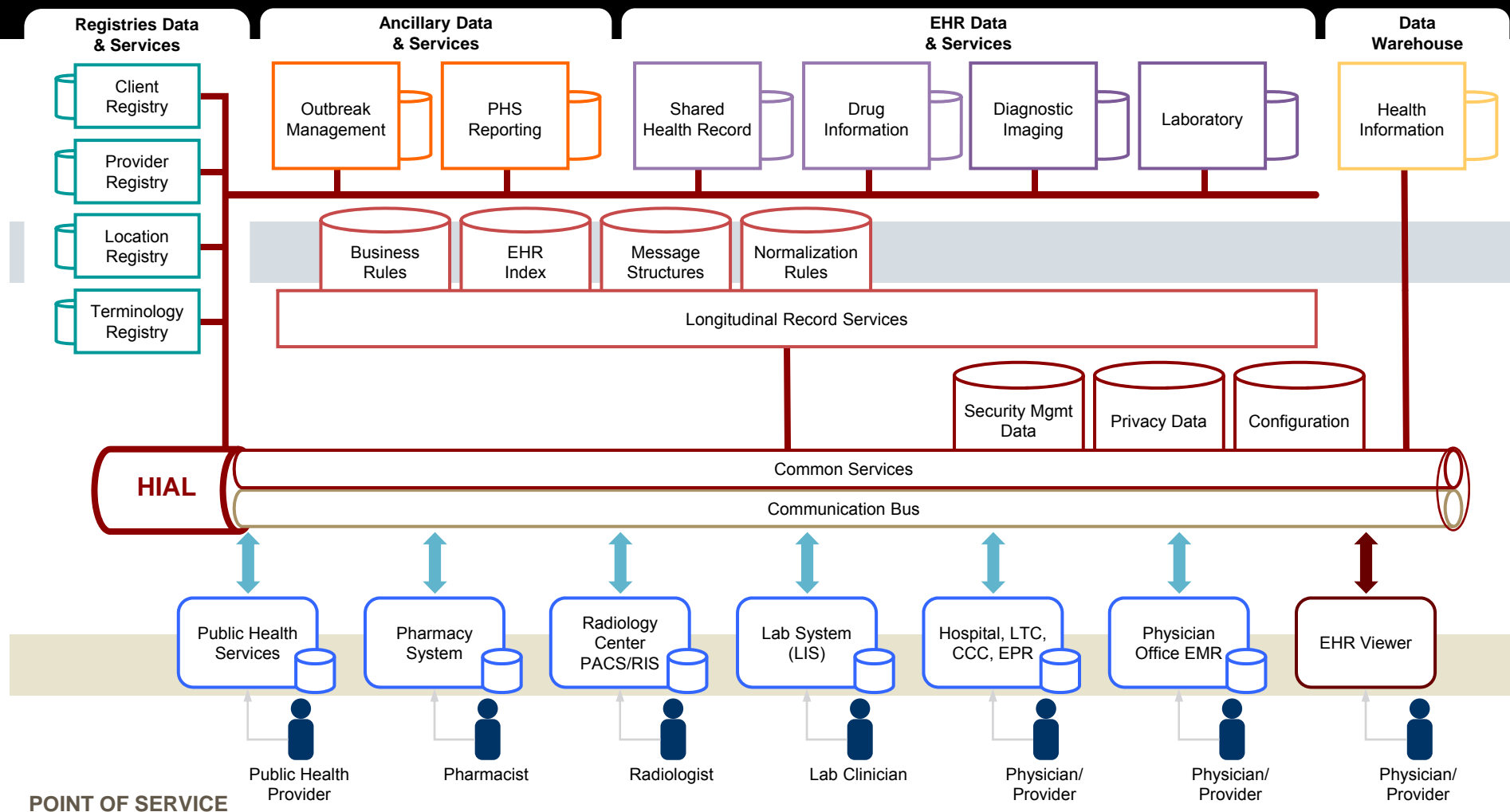
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- Infoway aims to provide leadership by establishing a strategic direction for EHR in Canada
 - Has released an updated Health record Solution “blueprint” for Canada
 - Designed to be a technical framework to define how health information is to be shared “between health services providers across settings and across geographic distances”
 - Implementation of the plan is still in progress

PAN-Canadian Service



EHR Infostructure: Functional Components

JURISDICTIONAL INFOSTRUCTURE



Objectives of Infoway

- To develop a network of interoperable electronic health record solutions across Canada, linking clinics, hospitals, pharmacies etc.
- Nine main areas of interest were identified to be funded by Infoway
 - Considered “priority activities” and Infoway acts as a “strategic investor” in these areas
- Aims to build on existing work in each province (as they each have their own strategies as well)

Canada Health Infoway

- Key stated principles
 - Interoperability
 - Facilitate standards for sharing and use of health information across the country and its application in emerging healthcare information systems
- Projects ongoing across Canada

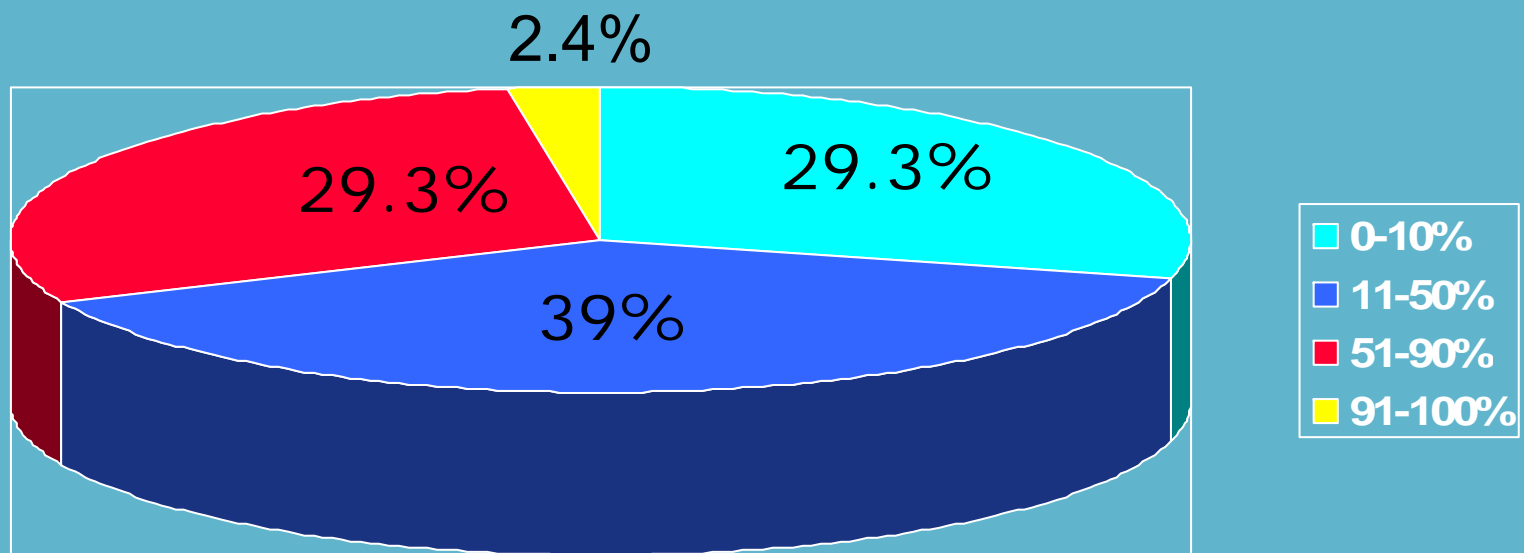
Areas Addressed by Canada Health Infoway

- Interoperable EHR
 - Standards for privacy, security and architecture
- Infostructure
 - Interoperability, reusable services and standards
- Registries
 - Electronic, searchable directories that uniquely identify patients, providers
- Drug information systems
- Telehealth diagnostic imaging systems
- Laboratory information systems
- Public health surveillance systems
- Telehealth
- Innovation/Adoption

Current Realities

- Despite objective of electronic health records available for 50% of the population by 2010, in Canada (like the United States) the adoption level is below that target
- Adoption and uptake statistics are similar for the United States

Adoption of Electronic Patient Records in Canada



Urowitz et al., 2008

7 Country Comparison of Healthcare IT

(from Jha, Doolan, Grandt, Scott & Bates, 2008)

	<u>Australia</u>	<u>Canada</u>	<u>Germany</u>	<u>Nether-lands</u>	<u>New Zealand</u>	<u>United Kingdom</u>	<u>United States</u>
<u>Primary Care</u>							
EHR (%)	70-90	20-30	42-90	95-98	92-98	89-99	24-28
CPOE (%)	75-81	5-11	59	85	90	> 90	9
<u>Hospital Care</u>							
EHR (%)	< 10	< 10	< 5	< 5	< 10	8	N/A
CPOE (%)	< 1	< 1	< 5	< 5	< 1	3	5-10

EHR = Electronic Health Record

CPOE = Computerized Physician Order Entry

Comments on Patterns

- Difficult to compare across countries
- However, some patterns become apparent (confirmed by other studies):
 - Hospital EHR and CPOE usage appears to be low across all 7 countries studied
 - Biggest differences are in primary care adoption rates across 7 countries studied

Issues in Canada

- Despite large-scale spending, adoption of systems has remained low
- Similar to situation in the United States
- Low adoption at level of primary care (below 50%)
- Lack of practical standards for: (a) clinical data content (b) interoperable data representations (c) data transfer across vendor products and organizations
- Canada's somewhat independent jurisdictional control of healthcare complicates these issues

Additional Issues

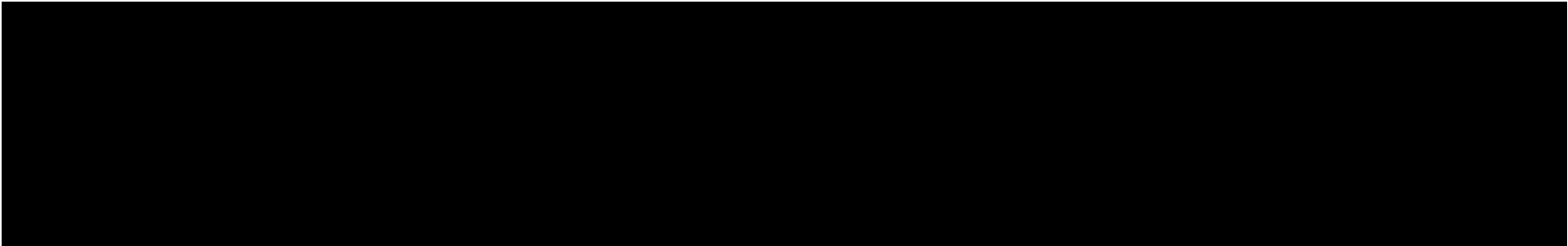
- Many feel that with the movement to electronic health records, health care is not just more accessible, it is being revisited, revised and totally changed
- Others feel that the movement will have less dramatic positive effects -- that it will complement rather than replace
- Others in Canada are worried about issues related to greater access to wide range of health related sources (e.g. by patients) and associated problems
 - Access
 - Privacy
 - Legal/ethical
 - Understanding/misunderstandings of health knowledge

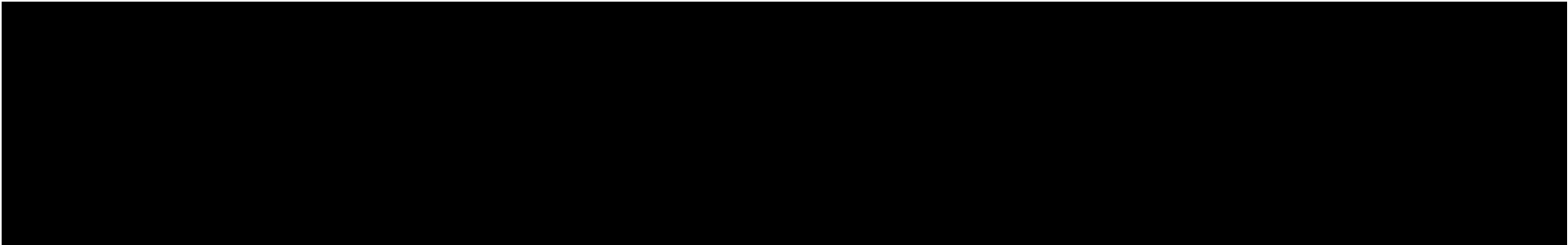
Current Challenges in Health Informatics in Canada

- Numerous large scale projects for implementation of systems such as health records, however a number of problems exist around:
 - Lack of system acceptance
 - Usability issues
 - Unclear financial benefits
 - User satisfaction issues
 - Complexity of interfacing diverse systems and technologies
 - Safety issues
 - Workflow integration
- NOTE – these issues do not appear to be unique to Canada

Other Issues

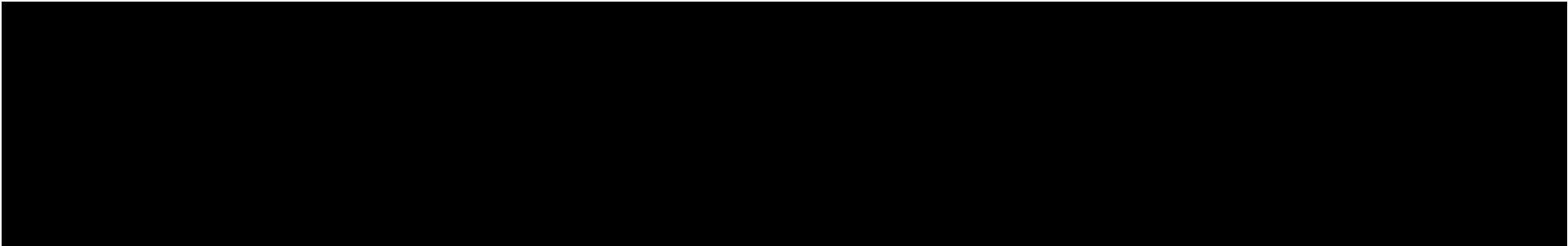
- Healthcare in Canada is largely a provincial responsibility
- moving the EHR agenda along requires provinces negotiating with their own doctors to install systems in their offices
- success here has varied across provinces
 - The province of Alberta has taken a lead with other provinces not as far along

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- Some have argued that despite potential for future advances in Canada the current process has danger of leading to fragmented systems
 - Furthermore, it has been argued by some (e.g. Pascal 2006) that reconsideration is now needed of
 - Investment priorities and timing
 - Support for front-line healthcare workers, in particular physicians

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- Some have argued what is the point of an “health information super highway” if there is limited or no access to “on-ramps” for physicians and front-line health workers
 - Argues for need a balance between global national strategy and meeting needs of local health practitioners
 - need for the right balance of both “top-down” and “bottom-up” planning

Situation in the United States

- In the United States success stories for healthcare IT include:
 - The Veteran's Health Administration system
 - Certain HMOs (health management organizations)
 - These projects and implementations have been examples for the world
- However, overall there is a low adoption rate of EHR in the U.S.
- This has led to a plan to spend 20 billion dollars to stimulate "Meaningful Use" of healthcare IT

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- The Health IT component of the U.S. stimulus package (HITECH)
 - considered essential component of improving the quality of healthcare in the U.S.
 - Developed the Office of the National Coordinator of Health Information Technology
 - Responsible for creating a strategic plan for nationwide interoperable health information systems

New Strategy: Reimbursement for “Meaningful Use” (Blumenthal, 2009)

- Meaningful use of EHR will earn hospitals a one-time bonus payment of \$2 million plus an “add on” to the standard fees
- Physicians will receive extra Medicare payments for meaningful use of a “certified” EHRs
- Physicians who demonstrate meaningful use starting in 2011 would be estimated to collect \$44,000 over five years

Trends in Health Informatics in Canada and North America

- Canadian and US expenditures and current adoption rates
 - Overall adoption rates by primary care physicians in Canada and the U.S. are similar
 - Large amount of money in the U.S. (\$ 20 billion) will be made available, in Canada it already has (over \$1.5 billion)
 - Program to reimburse physicians for “meaningful use” of systems, similar to several provincial programs in Canada
 - However, key problems remain around issue of interoperability and product certification

Challenges and Current Directions

- To address current challenges in Canada research is taking place in the following areas:
 - Usability and adoption issues/barriers
 - Interoperability
 - Evaluation
 - Privacy-legal implications
 - Education and adoption issues

Top Barriers to Adoption in North America

(based on systematic review – Vishwanath, 2007)

- Cost
- Logistics/regulatory issues – need for clear and strong mandate
- Return on investment (ROI) issues
- Integration and standards
- Concerns about adding new technology
- Reimbursement/Incentive issues
- Control issues
- Concerns over customization

Solving the Interoperability Problem

- Requires considerable inter and intra-organizational agreement
- Standards required at multiple levels
 - Need for specification of common representations for sharing health data across vendor products, organizations and regions
 - common description of shared clinical content (SFI) issue remains to be resolved
- Decentralized control and decision making in North America poses considerable challenge for standardization and interoperability

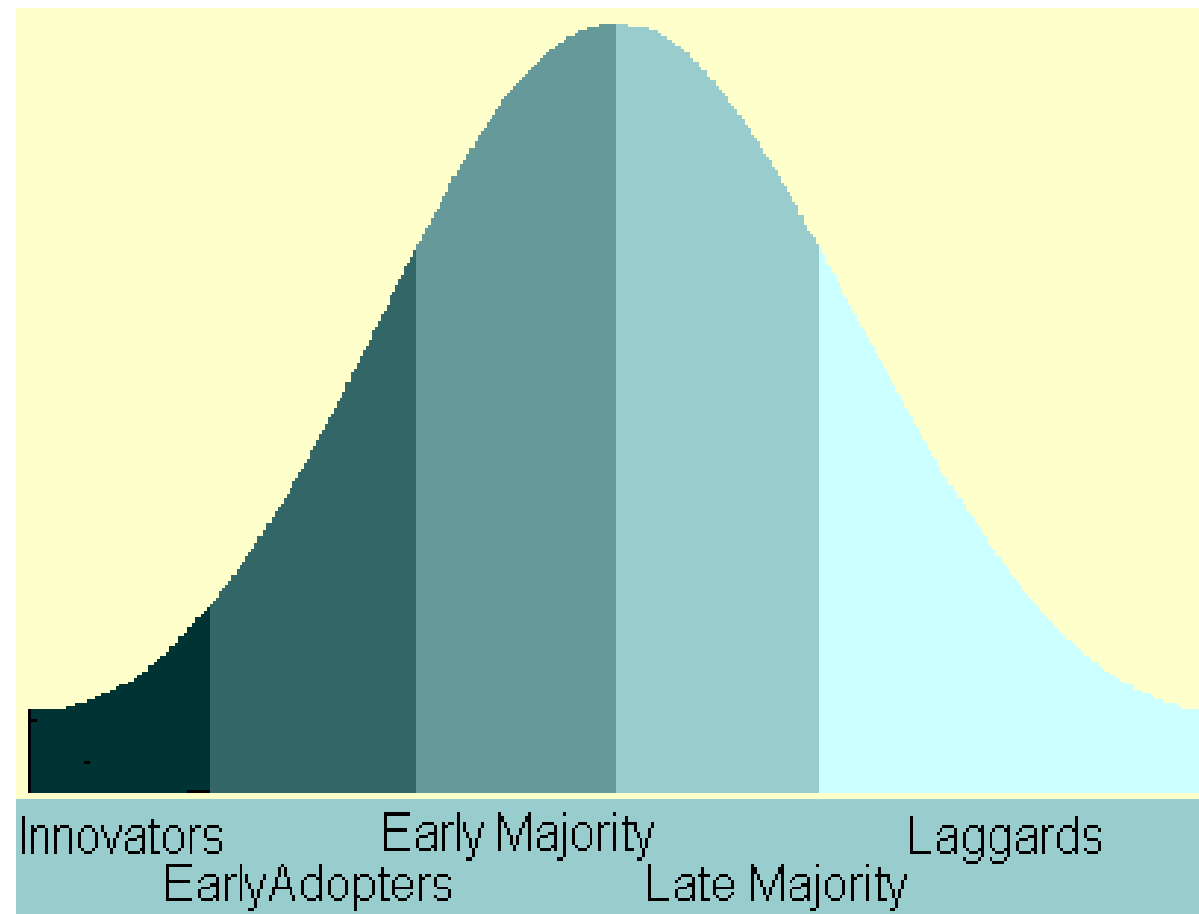
Issues in Collecting, Analyzing and Comparing Adoption Data

- Work begun on a Canadian project for development of an e-health observatory
- Monitoring by national agencies
- Consulting reports
- Current “best” data from independent peer-reviewed studies

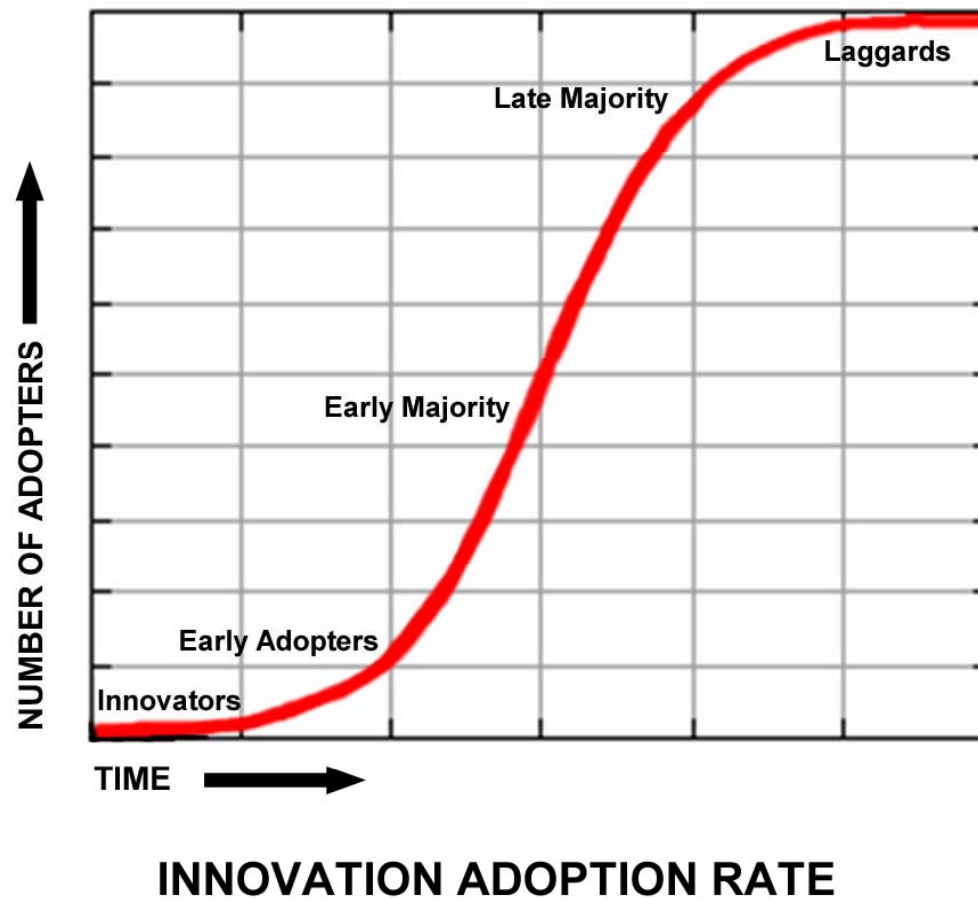
Issues in Monitoring Adoption

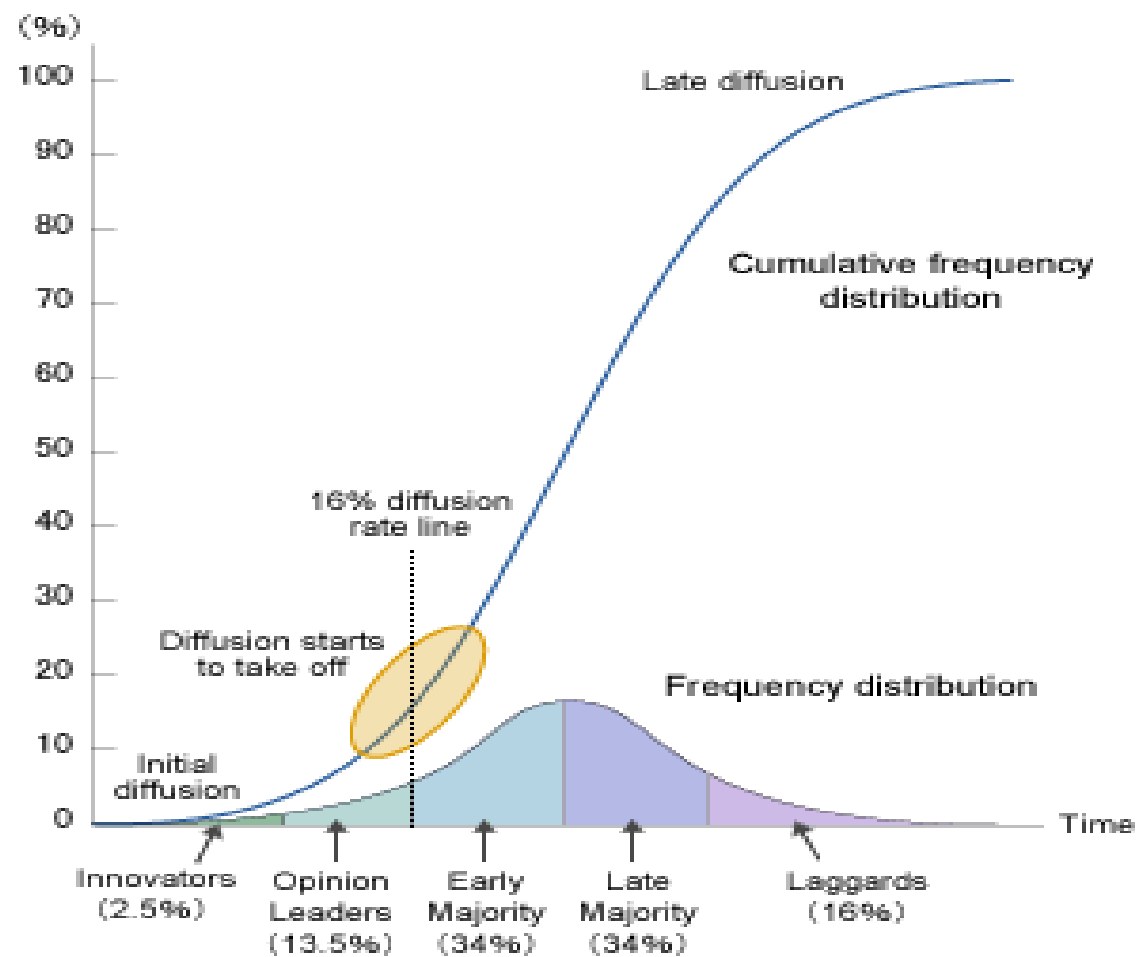
- Systematic reviews/meta-analyses needed
- Surveys and continuous monitoring
- National efforts needed
- Independent quantifiable data and reproducible statistics
- Ways of measuring “interoperability”
- Better methods for defining “adoption”
- Better methods for comparison across regions/countries

Adoption of Innovation - Rogers

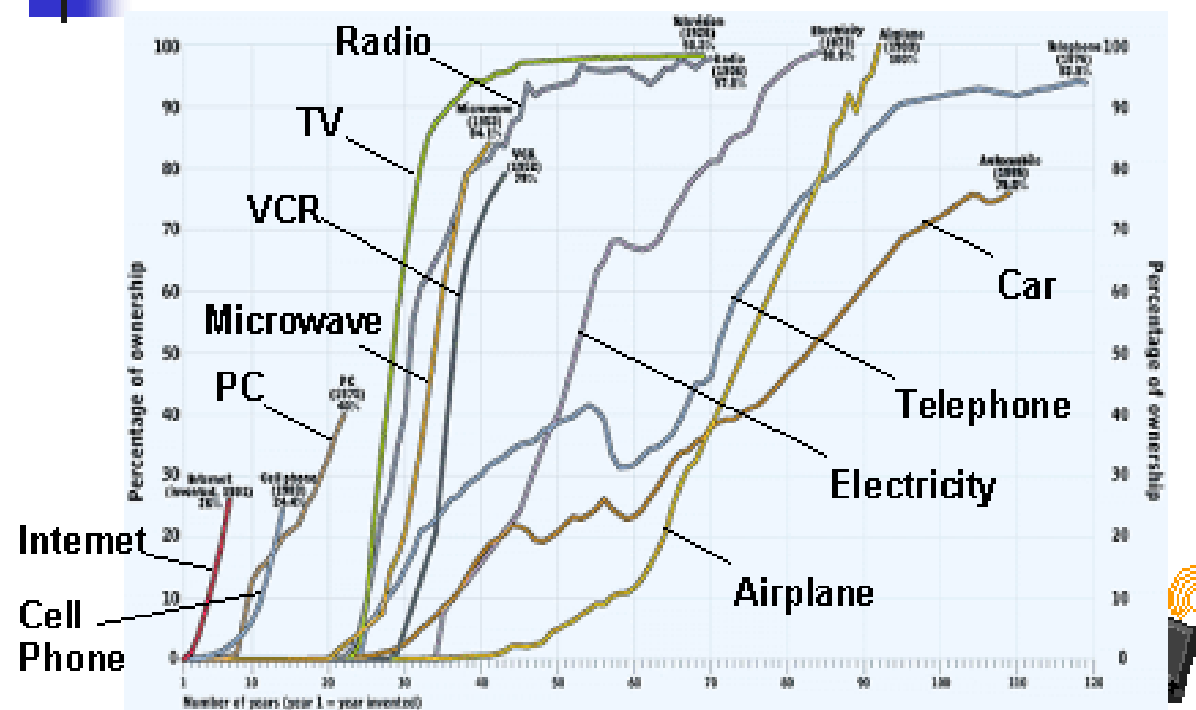


Innovation Diffusion Curve





Technology Adoption



Forbes Magazine July 7th, 1997

Concluding Thoughts from the North American Experience

■ “R & D”

- Many of the healthcare IT projects in North America could be considered “R” for research (i.e. with major components “never been done before”), rather than standard “D” for development projects (i.e. “done before”)
- Therefore need for different approaches to project planning, scheduling and management
 - to ensure success of projects lacking complete information up front – i.e. knowledge of “will it work?”

Additional Lessons Learned

- **Mega Projects and Risk**
 - Need to consider size of program/projects and chances of success
 - Need for increased risk management and tighter monitoring as strategies/projects grow larger
- **Need for concrete proof of concepts for key components of architectures**
 - leading to scalable architectures and projects
- **Need for an iterative approach**
 - with constant monitoring
 - especially given size and huge monetary investment

Final Thoughts

- Differences across regions and countries make comparison difficult
- However, it is clear there is need for greater global cooperation and interchange as challenges and issues are not completely unique to only one part of the world

Thank you!

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