



Consiglio Nazionale delle Ricerche

Cooperative development of the Healthcare Info-structure for Europe

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a step-wise evolution of health ICT

within and across organisations,
up to a regional and national scale,
the evolution goes through a set of ages:

- isolated applications
- communication between applications
- ad hoc integration
- systemic integration
for very large jurisdictions
- global impact

the paleoHITic period

the ancient era of Health Information Technology

- ***isolated applications***
 - local technical decisions
(for each point of service)
 - bilateral communication
with ad hoc interfaces
 - no standards

the mesoHTic period

2. communication between applications

- local decisions (within the same organization)
 - bilateral communication
 - communication with devices (signals, images)
 - profiles – mainly within the same organization – for the usage of a subset of messages
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- ✓ *international cooperation to develop standards*
 - ✓ *first generation of messaging standards*
1990-2000 (DICOM, EDI, CEN, HL7, ...)
 - ✓ *middleware to connect legacy systems*

the neoHTic period

3. *ad hoc integration*

- harmonized processes, also across organizations
- multi-lateral communication
- web services and integration platforms
- datawarehouses based on resources (**efficiency**)
(consumption of goods, prescriptions, ...)
- ✓ *a new generation of standards (HL7 version 3)*
 - cooperation between HL7 and CEN
 - Reference Information Model (RIM)
- ✓ *reference architectures, common components*
- ✓ *standard services (XML, SOAP)*

the prototaxic era

paleohitic, mesohitic, neohitic periods
**make the ERA of the
preliminary organization (*proto-taxon*)**

- many local decisions of increasing size
(from single applications to whole hospitals)
- many independent local decision-makers
with different histories and priorities
- structures at different evolutionary stages
coexist within the same region

the transition process

towards the end of the prototaxic era
many events announce the **Modern Era**:

- position papers and ad hoc meetings, showing an increasing **awareness** within the health ICT community
- **pilot projects** and lesson learned
- **White Books** to reach a **shared vision**
- **agencies for coordination** and for the production of basic reference material
- **strategies** and **Roadmaps**

the modern era

4. *systemic integration for very large jurisdictions*

- political decisions at the regional level
- networks for continuity of care
 - web-based EHR to share clinical information
- DWH feeded from care process (**effectiveness**)
- ✓ *regional health networks - infostructure*
 - *integration services*
 - *master files for citizens and professionals*
 - *metadata registries*

the utopian era

5. global impact:

the "perfect" Information Society

- decisions within national and international scenarios
 - European market, global market
 - integration of administrative, organizational and clinical information (**quality, appropriateness**)
 - integration with other sectors (e.g. social)
-
- ✓ *change management*
 - ✓ *support to the new organizational models*
 - ✓ ***international cooperation on the infostructure***

US National Health Information Infrastructure Act

Nancy Johnson

Chairman of the House Subcommittee on Health

"The lack of a health information infrastructure costs the quality of our health care system tremendously:

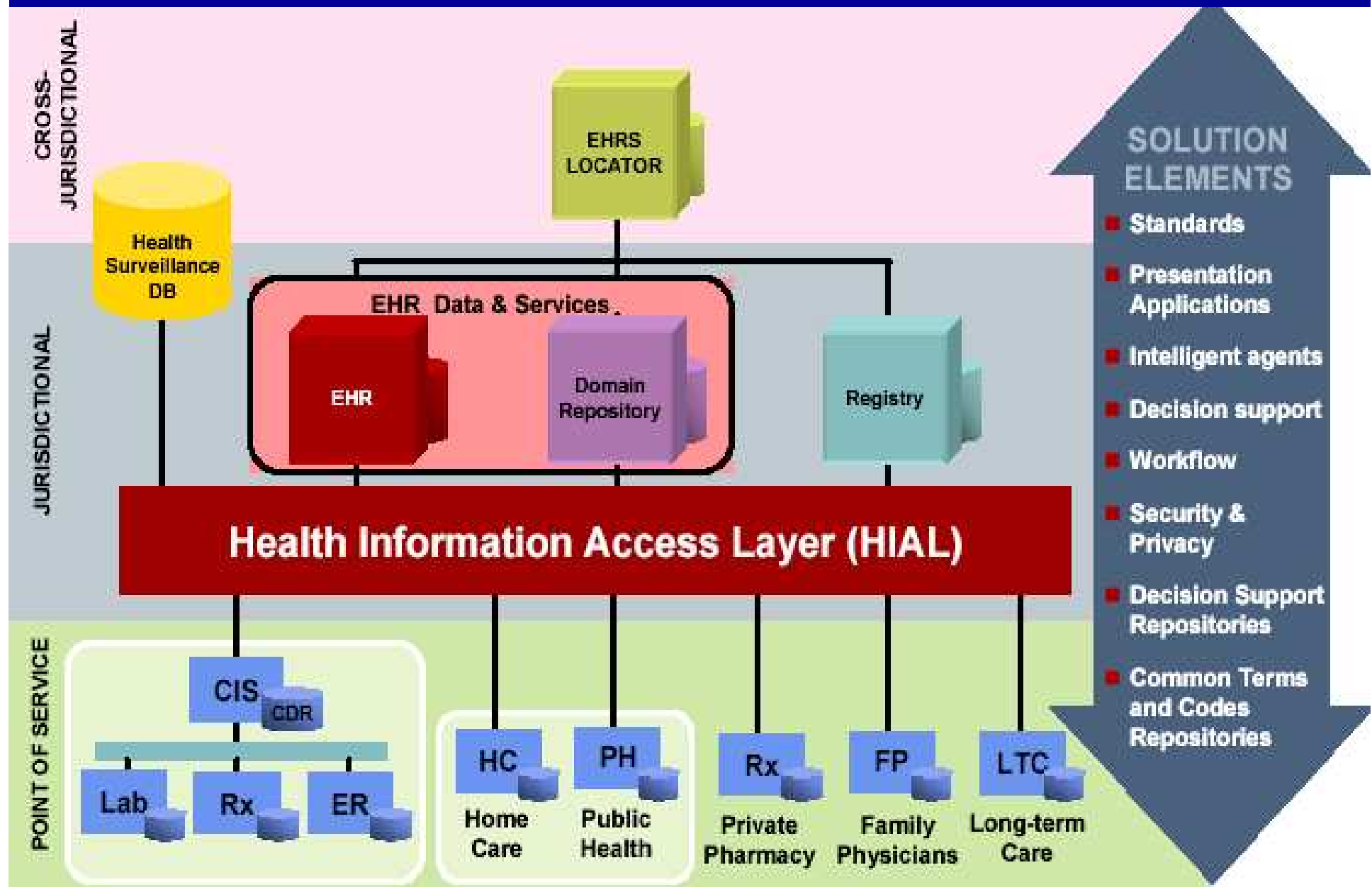
- It costs us \$5.4 billion a year because tests or second opinions cannot be located
- Known medical errors costs \$29.4 to \$35.4 billion a year
- It now takes 17 years for new knowledge generated by controlled clinical trials to be incorporated into practice !"

EHR in Canada Health Infoway

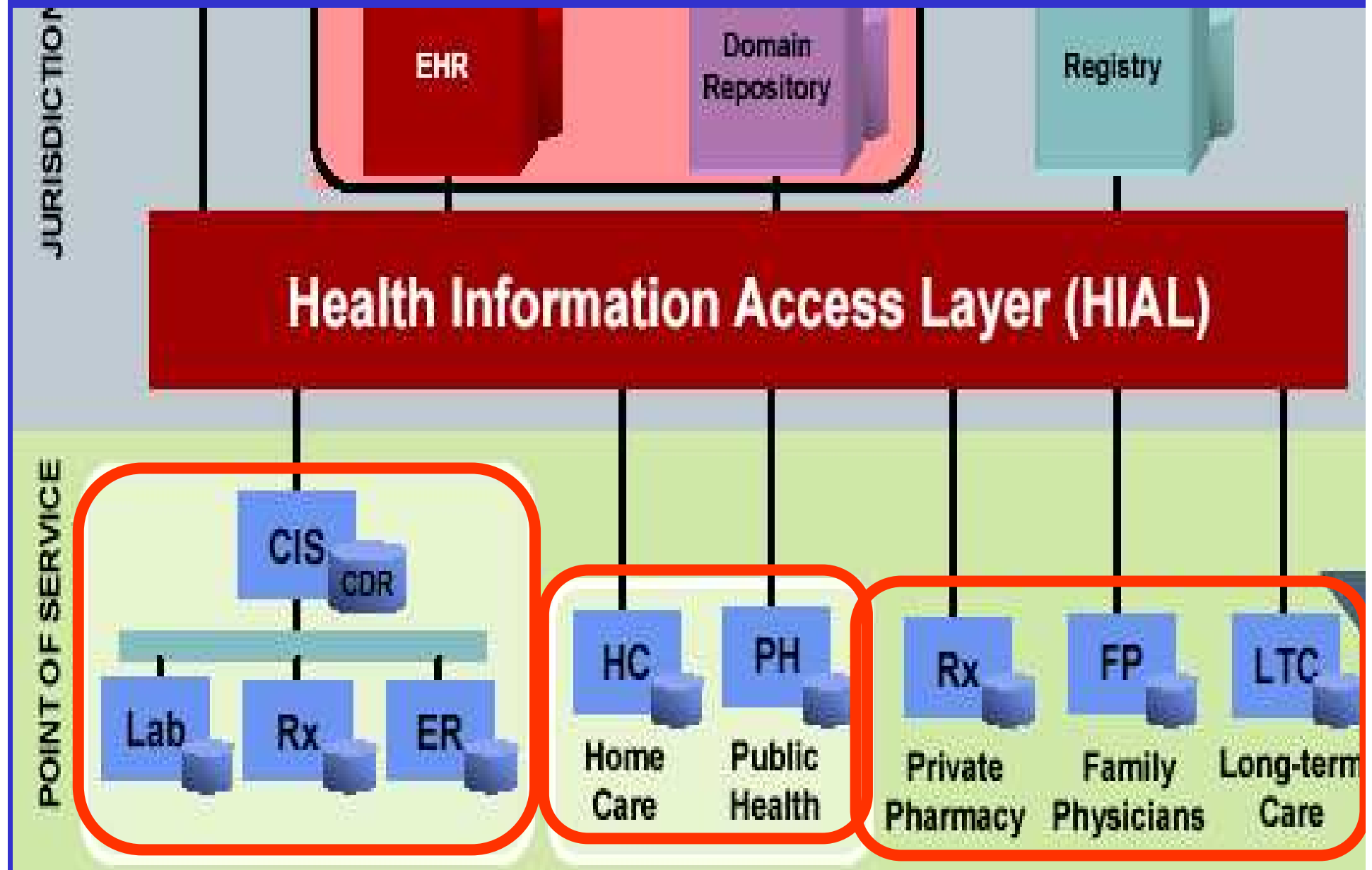
an independent non-profit corporation

- created by federal and provincial governments
- **1.1 billion \$ CAN**
- to foster and accelerate the development and adoption of pan-Canadian interoperable electronic health information systems
- first phase:
prescriptions, medical images, test lab results
(Pareto: 80% benefit with 20% of data)

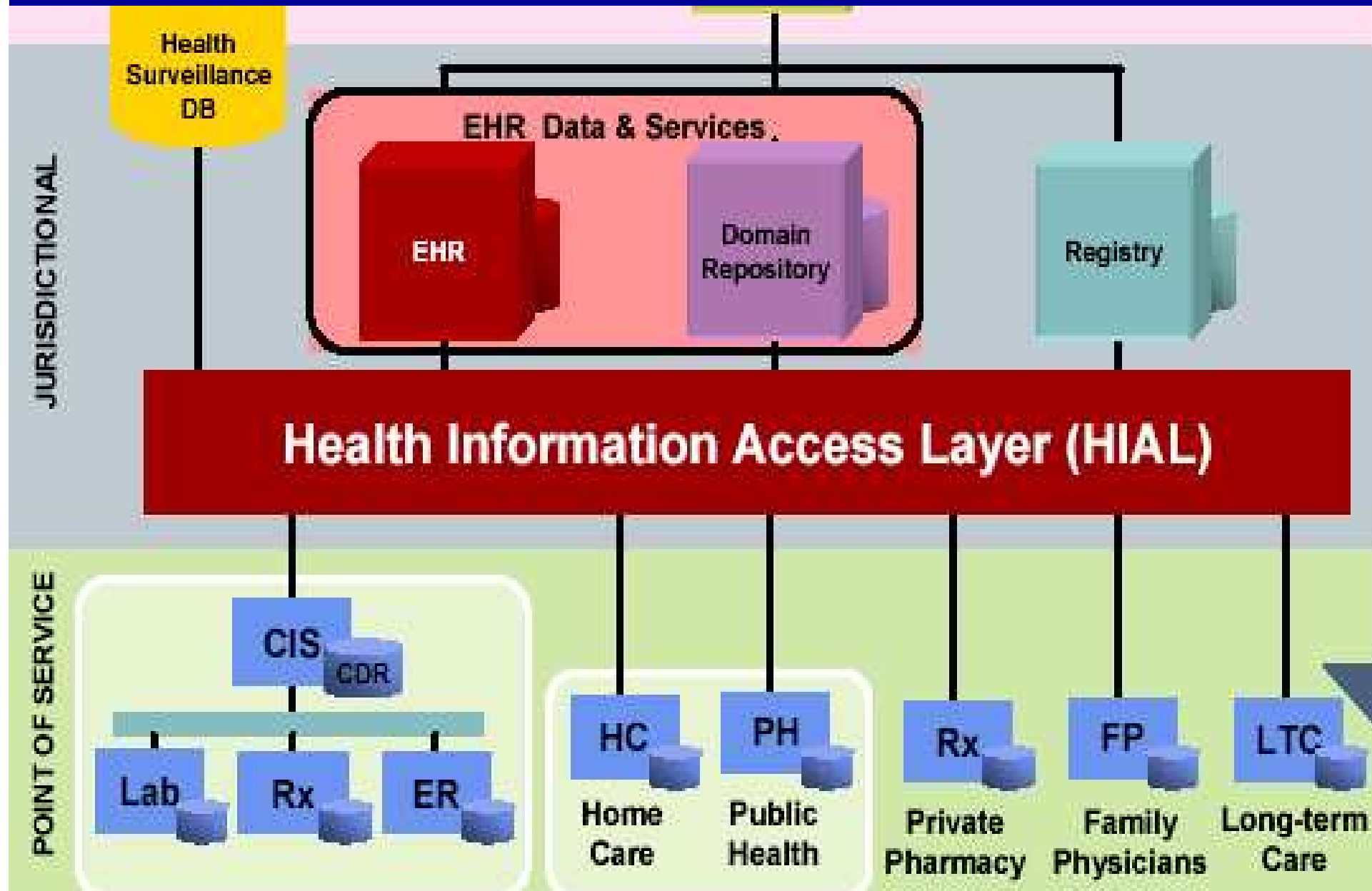
EHR blueprint – Infoway (Canada)



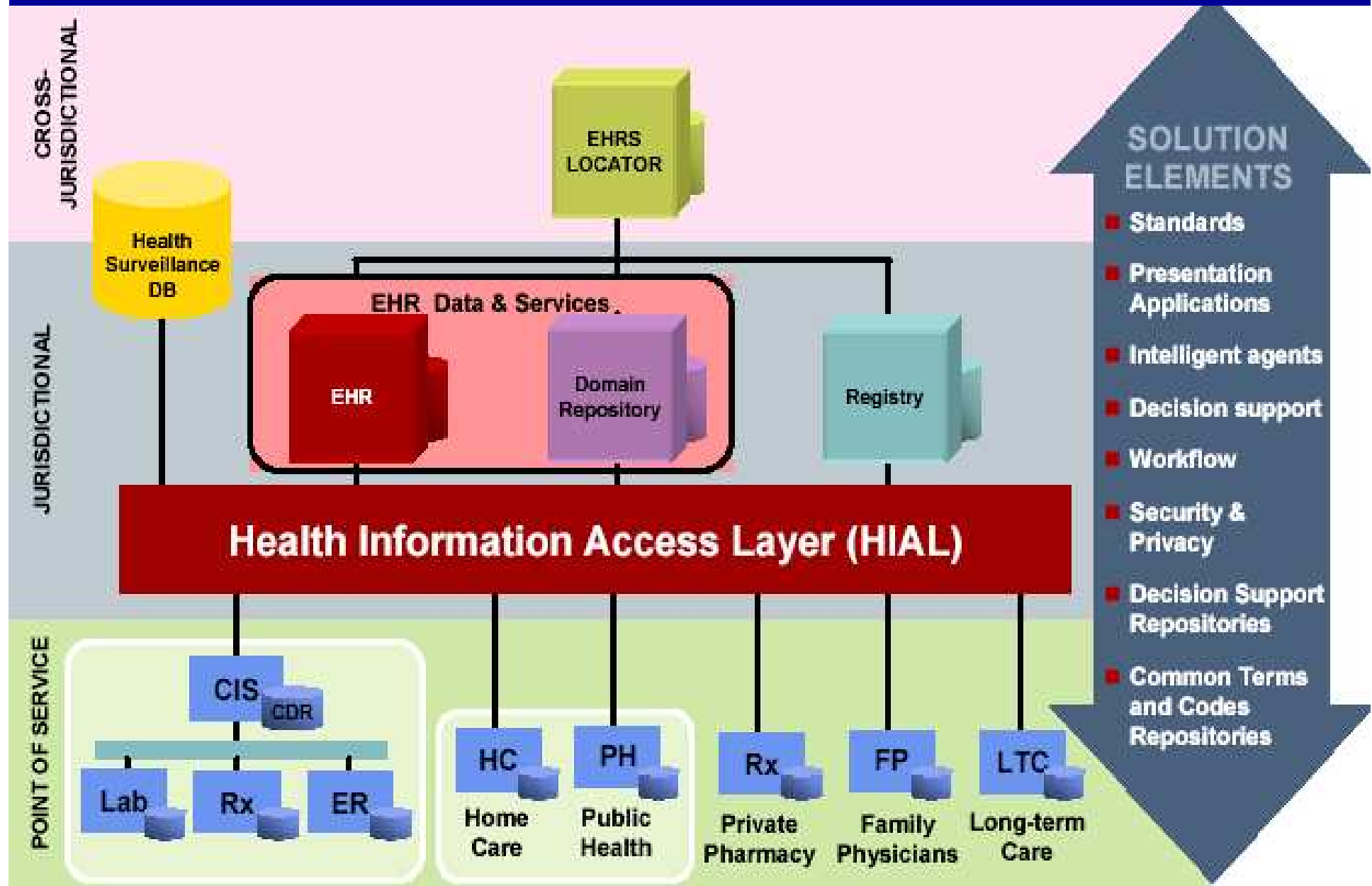
point of service



integration of EHR - jurisdictional



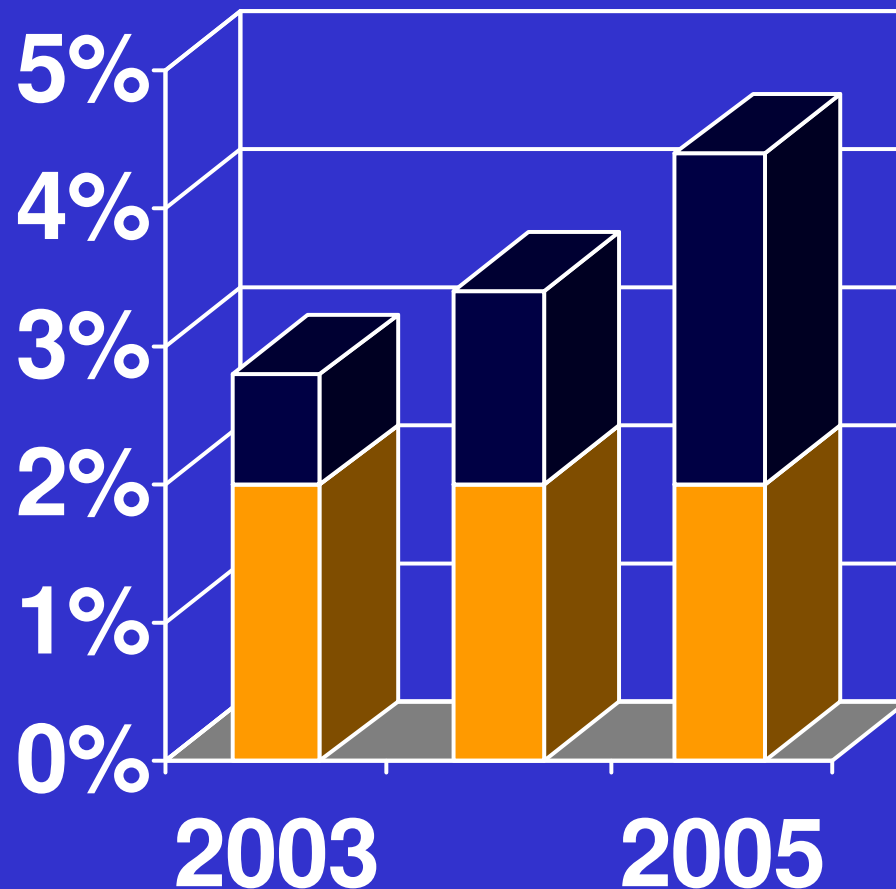
EHR blueprint – Infoway (Canada)



England – current status

- 50 million of citizens
- 1 million of health professionals
- 2% oh the health budget goes to ICT
- 20.000 ICT professionals in local NHS
- 1.000 ICT professionals at National level
to support deployment of ICT in NHS

England – Acceleration Program



***EHR
from birth
to death***

■ acceleration
■ current

EHR at Kaiser Permanente

Kaiser Permanente is the largest non-profit Health Maintenance Organization in US

- **8.4 million** members nationwide
- budget of \$19.7 billion
- ICT contract for **0.4 billion \$** in 1999

largest ever transition

to a paperless Health Record System:

- **\$1.8 billion** contract, 3-5 years
(9,14 % of their annual budget)

a process of change management

we should investigate the whole framework
to protect and stimulate investments
by producers and buyers :

- ***regulations***
- ***observatories***
- ***education***
- ***standards & infostructure***
- ***open source, open content***
- ***new organizational models***
- ***pilot implementations***

public infostructures

hospitals, local trusts, industries
should be facilitated by

a public information infrastructure

- reference architecture
- content to be exchanged or shared
 - which data entries
 - according to which coding schemes
- basic technical documentation
- an inter-regional observatory

opportunities for EU collaboration

- develop common methodologies to **support strategies** and to induce **cultural and organizational changes**
- support **e-communities** of regional and national experts on Health ICT
- encourage involvement of **professional societies** on Health ICT standards
- use lessons learned to assure that innovation faces **real problems** and is **adapted to the local contexts**

some technical topics

- tools for large metadata registries
- tools for a large collection of clinical protocols
- standards on architectures, transactions, data entries, coding schemes and documents
- planning web services to feed National, Regional and local health portals
- working out new organizational models, supported by advanced ICT solutions

AD-HOC

we need a **collaborative initiative**
at European level,
between **10 and 30 million euro a year**,
complementary to the deployment
of the technological infrastructure
within each jurisdiction, i.e.

an **AD-HOC EU Program**
Advanced Development
of Healthcare Open Content

e.g. 2-5 full-time "ambassadors" for each jurisdiction
2 ml euro/year on translations to and from English

thanks

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Italian web sites (with English pages) :

- **www.e-osiris.it**
- **www.hl7italia.it**
- **www.prorec.it**