

# National and Regional experiences in eHealth deployment

Federica Sandri  
Vedran Boskic

# General Introduction

- This presentations focuses on 4 deployments (national, regional and cross border)
- There are many more around the world at the regional, national and international level:
  - regional: Netherlands, Belgium, Canada, Germany, Russia, Italy, USA
  - national: France, Japan, Luxembourg, Slovenia, Australia, USA
  - cross- border: EU-US Trillium Bridge

# Austria eHealth Program

- 2005:
  - new Health Care Act
  - eHealth strategy (EHR and identification)
- 2006:
  - Preliminary organization ELGA
- 2007:
  - Federal Health Commission has recommended IHE as the standard
- 2008:
  - “Bundes-Zielsteuerungsvertrag” (9 Austrian regions + National relationship)
- 2009:
  - ELGA GmbH registration
  - IHE European Connectathon - Vienna
- 2014:
  - IHE European Connectathon – Vienna
- 2016:
  - National ELGA live production

# Austria

- December 2015 - Go live of the first two affinity domains in Styria and Vienna
- Implemented IHE profiles:
  - XDS, XCA, PDQ, ATNA, CT, XUA, BPPC, XDS-I, XD\*-Lab, XDS-MS, PRE, PADV, DIS
- At the same time, the ELGA-Portal offers more features:
  - Access to medical documents
  - Patients will be able to exercise their rights such as access to their own data and blocking HCP from access as well as deleting links to data within the ELGA system (not the data as such)
  - Enhanced access to the protocol
- In the first half of 2016 the affinity domains of Lower Austria, Carinthia and Social Security will go live
- e-Medication test phase in the 2nd half of 2016 in the district Deutschlandsberg, Styria
- Go-live of further affinity domains in the course of 2016
- ELGA-Verordnung (ordinance by the minister, based on the ELGA Act) will provide for security standards and dates of duty to use ELGA for HPCs.

# Austria

- IT-Architecture national level:
  - Unambiguous patient identification
  - Consent Management
- IT-Architecture regional level:
  - Document registry and repositories
- Benefits:
  - Vendors' choice flexibility
  - Optimized therapy by improved collaboration
  - More quality through better knowledge
  - Patient empowerment
  - Easier workflows

# Switzerland

- 2009:
  - Kick-of meeting
- 2010:
  - Registered organization
- 2012:
  - IHE European Connetathon – Bern
- 2017/2018:
  - National deployment

# Switzerland

- Maximal level of decentralization at the level of each Canton
- National level is mainly responsible to set standards and certify Canton's ability to interconnect (certification testing platform provided by IHE Europe)
- Leverage IHE profiles:
  - National: XCA, XCPD
  - Canton: XDS, PDQ
  - Content profiles serve both national and Canton level

# Switzerland

- eHealth Connector:
  - Document Source and Consumer actors for IHE XDS.b, XDR and XDM
  - Master Patient Index Client (IHE PIXv3 and IHE PDQv3)
  - Serialization and deserialization of:
    - IHE Immunization Content (based on IHE IC)
    - IHE Sharing Laboratory Reports (based IHE XD-LAB)
    - IHE Emergency Department Encounter Summary (based on IHE EDES)
  - Validation of CDA documents





## Veneto's Research Centre for eHealth Innovation

### Health Information Exchange in Veneto Region

Federica Sandri, Project Manager Arsenà.IT



*e-Health Forum, Gdànsk/Sopot, 15-16 September*

## Veneto Region & Arsenà.IT

- 4,9 M inhabitants (2013 data)
- 18.391 km<sup>2</sup> of land surface



Source: Veneto Regional Government

### 21 Local Health Authorities

- Healthcare assistance (Hospitals)
- Territorial assistance and social issues (GPs, outpatients' clinics, elderly care, in-home assistance, mental health, disability, drug addiction, ecc...)
- Prevention department

### 2 Hospital Trusts

- University education and research
- High-specialty services

## The Consortium Arsenà.IT: Veneto's Research Center for eHealth Innovation



Founded in 2005 as “Telemedicine Consortium”, currently groups all the 23 Local Health Authorities afferent to the Veneto Region.

Has succeeded in highlighting the critical issues of interoperability, standardization and organizational impact as key factors for driving Telemedicine applications to the mainstream of the care delivery process.

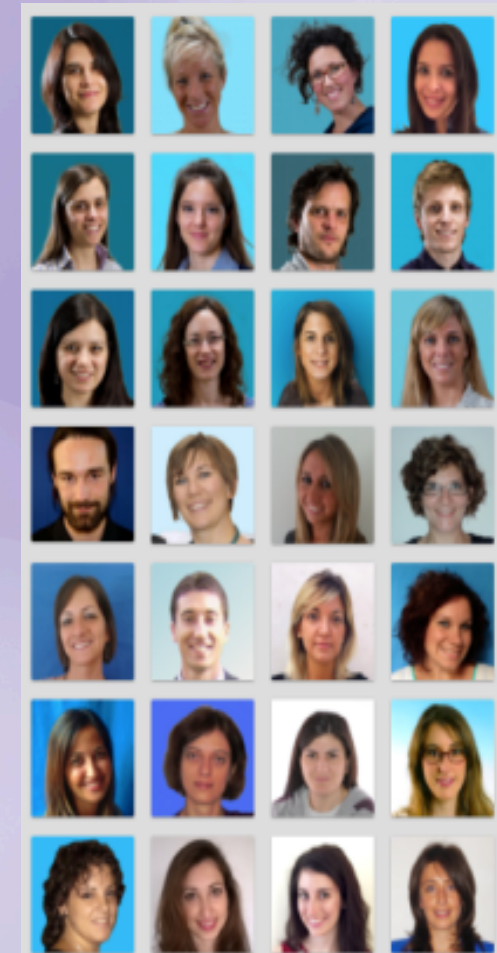
- Timely and coordinated investments in innovation
- Sustainable and clear e-health objectives
- Direct collaboration between Government and Innovation resources



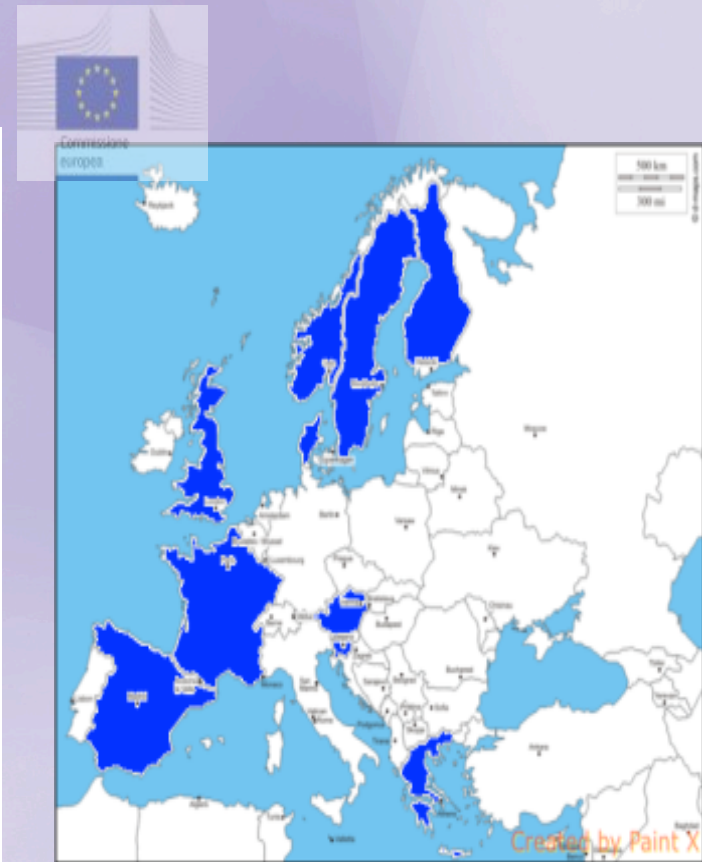
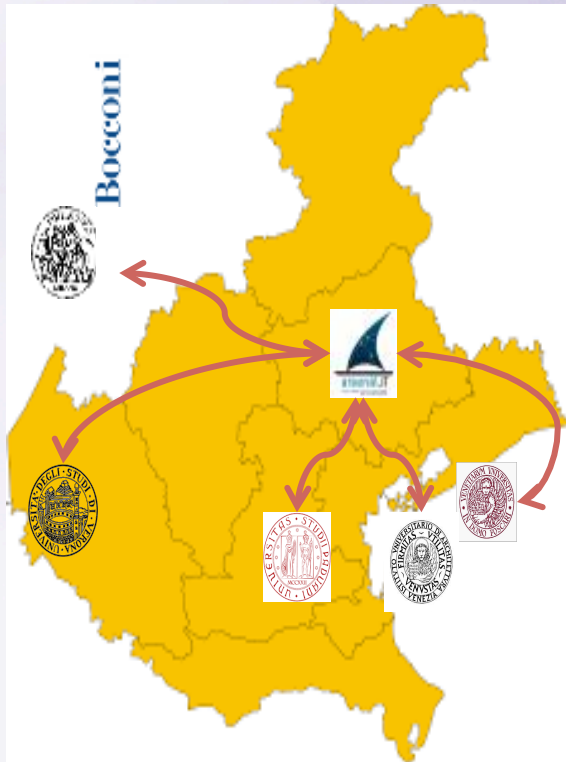
- Coordination between Region and LHAs
- 8340 professionals involved in the 23 LHAs and Hospital Trust
- IT and organizational solutions as answer to local needs

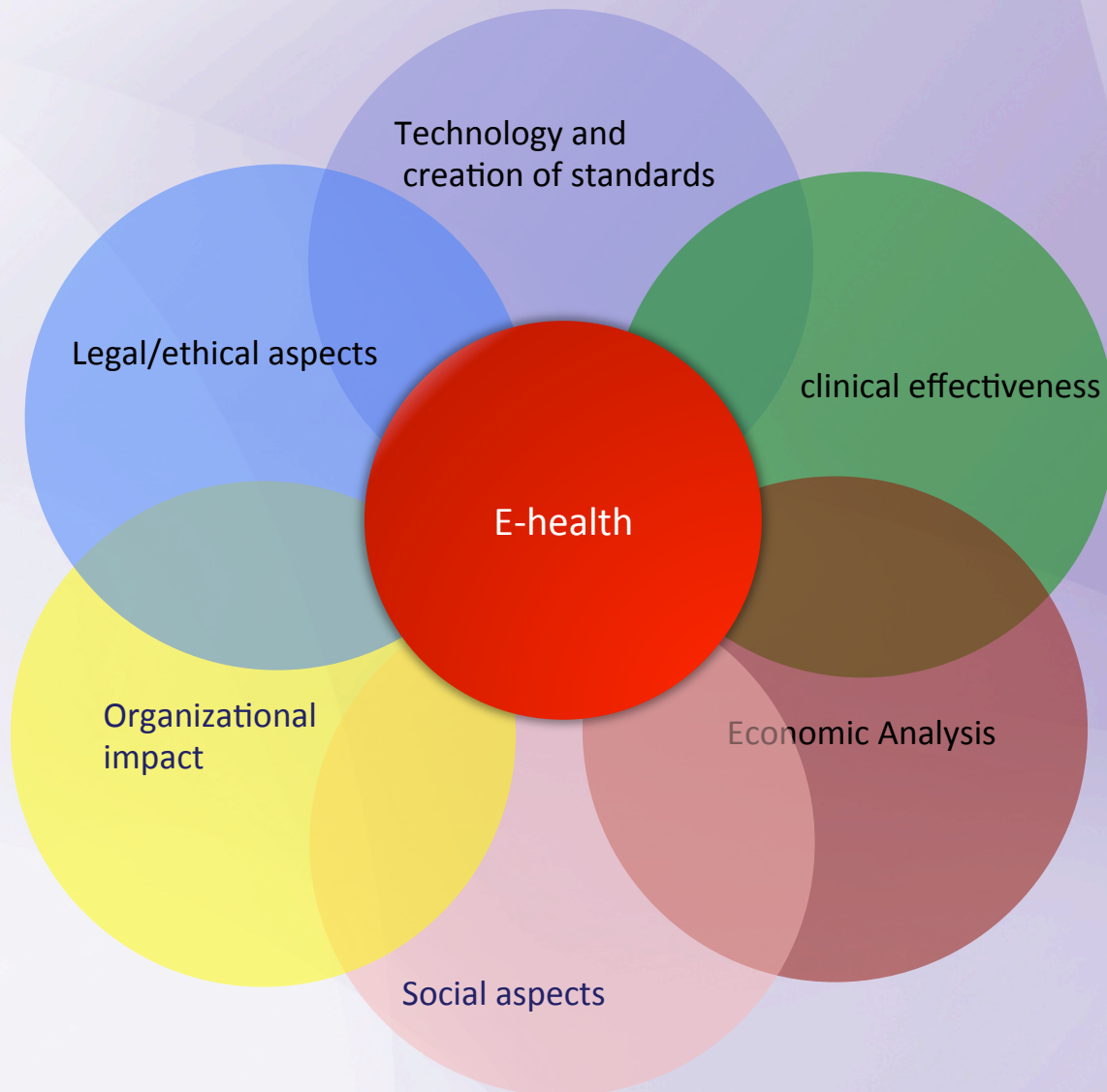


- 60 Collaborators
- Multidisciplinary skills
- Focused to results
- Strong ability to find solutions “out of the box”

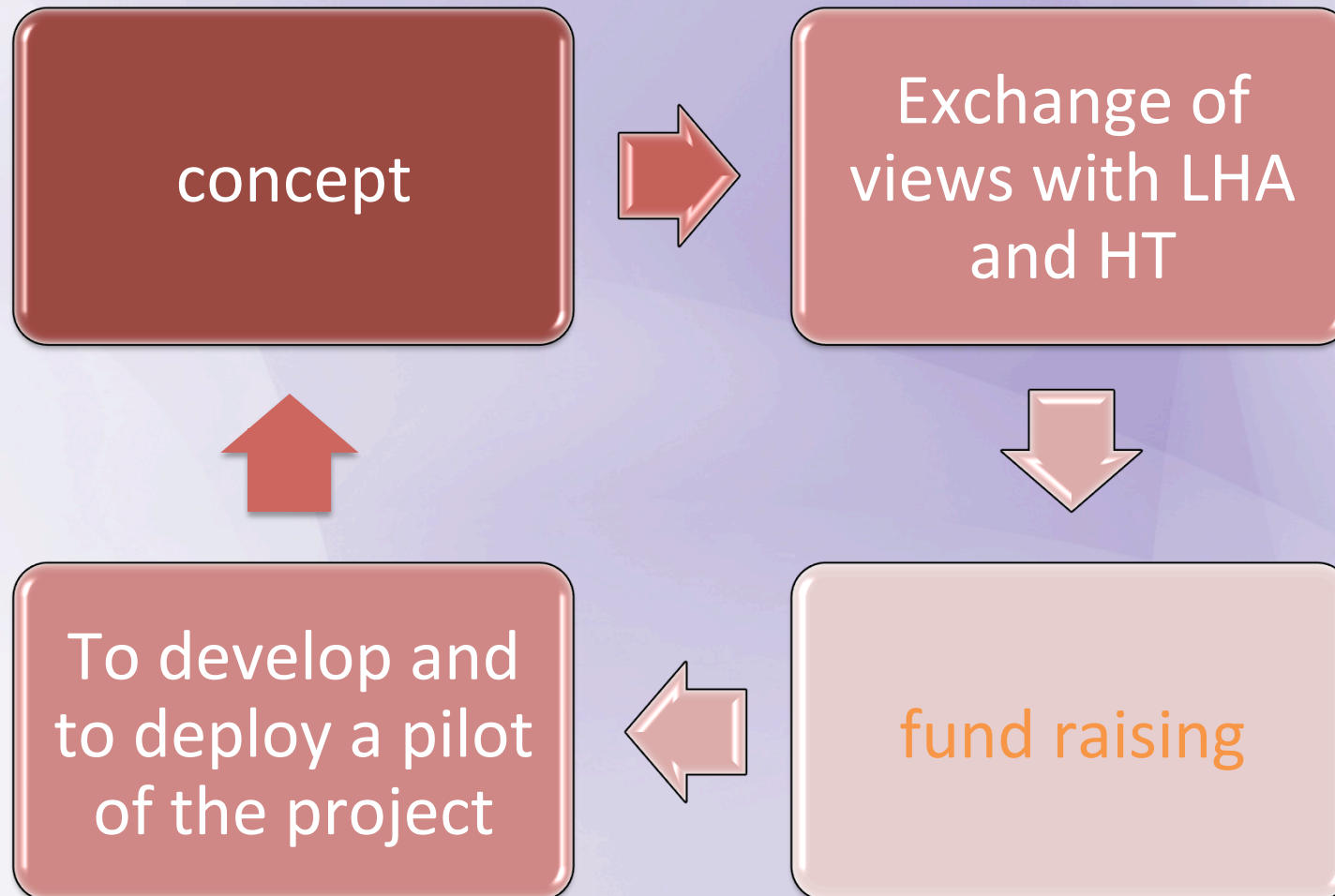


## 4 – The network of the expertise of Arsenà.IT

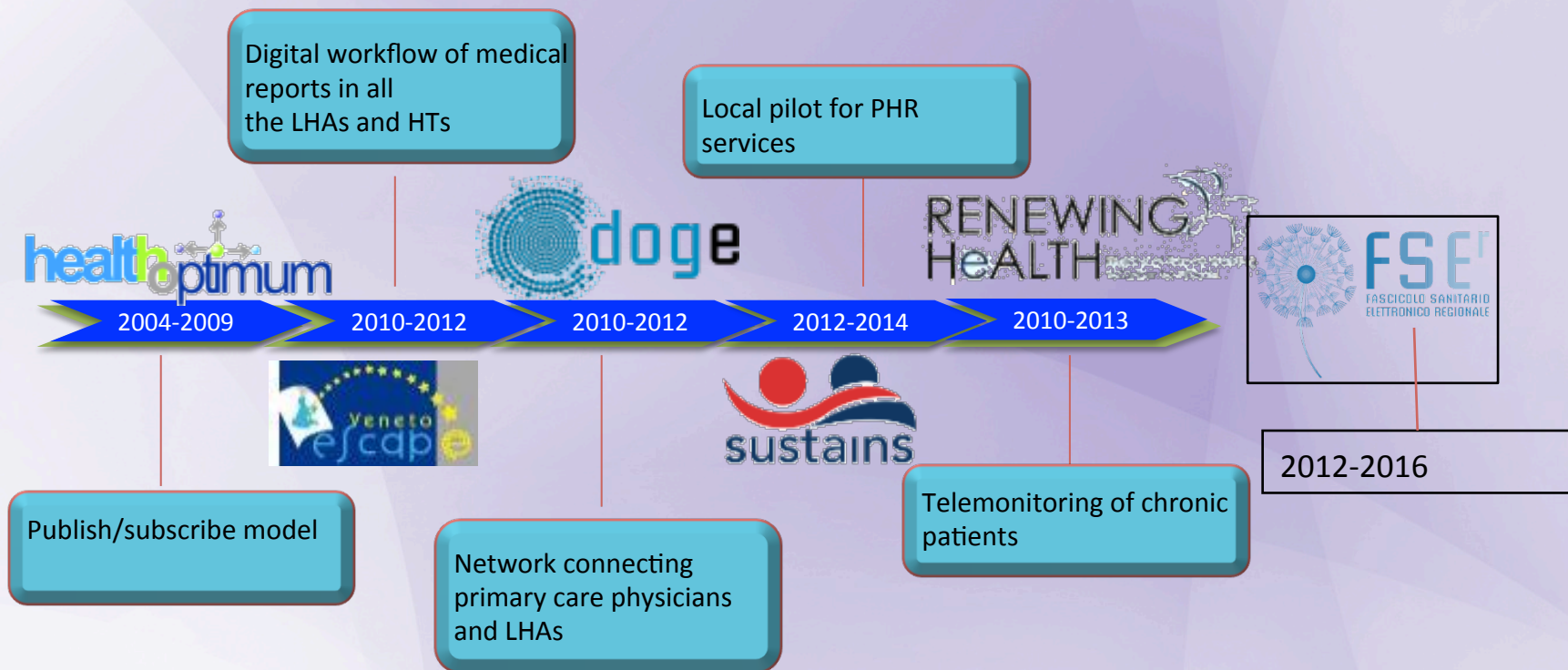








## 7- the history of the projects



## The regional Health and Social Care Plan

“The concept and the use of the regional EHR are meant to be referred to the following areas:

- **hospital**
- **territory**
- **social care**
- **prevention and health promotion.**



The means must be **unique**, at regional level, regardless of the areas the information come from.”\*

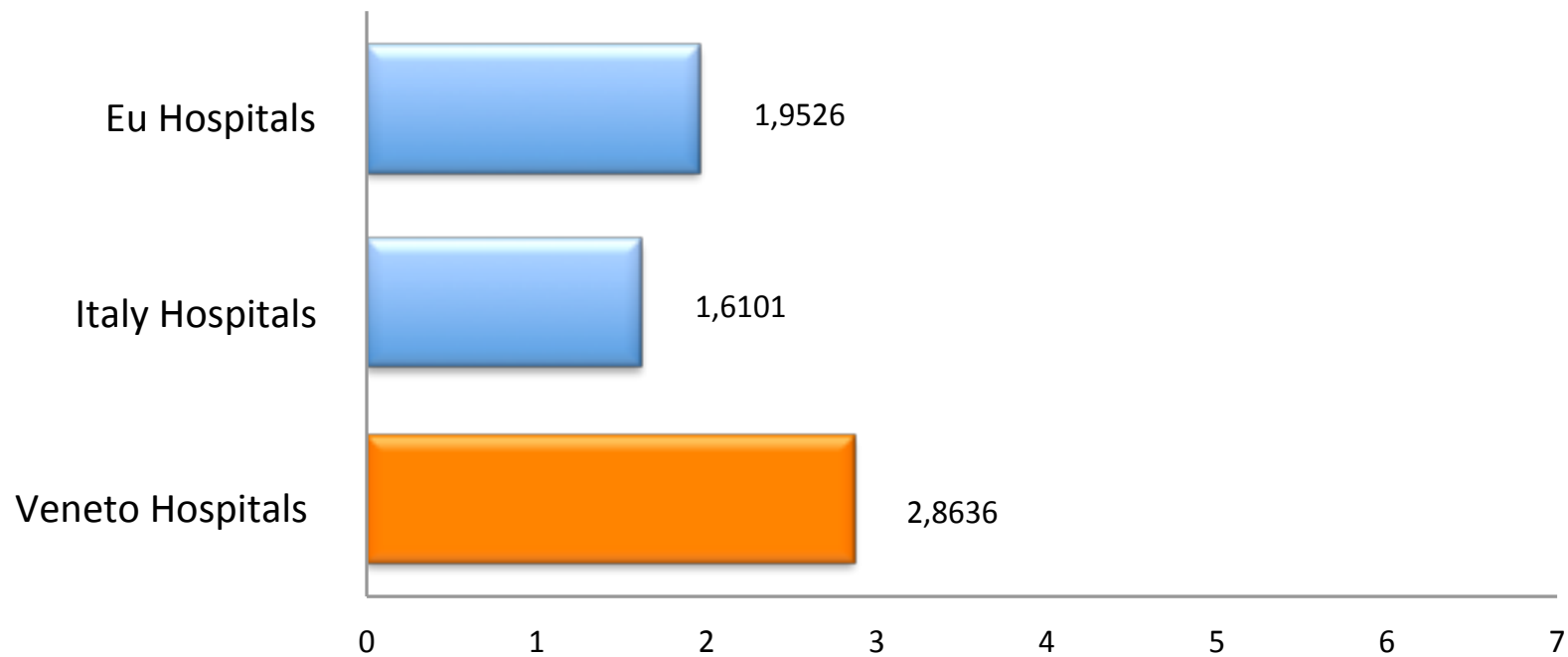
*\*Regional Health and Social Care Plan*

The **EMRAM** (Electronic **M**edical **R**ecord **A**doption **M**odel) is an eight-step process that allows you to analyze your organization's level of EMR adoption, chart your accomplishments, and track your progress against other healthcare organizations across the country. View and compare your scores in the HIMSS Analytics® Database.

United States EMR Adoption Model™	
Stage	Cumulative Capabilities
<b>Stage 7</b>	Complete EMR; CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP
<b>Stage 6</b>	Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS
<b>Stage 5</b>	Closed loop medication administration
<b>Stage 4</b>	CPOE, Clinical Decision Support (clinical protocols)
<b>Stage 3</b>	Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology
<b>Stage 2</b>	CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable
<b>Stage 1</b>	Ancillaries - Lab, Rad, Pharmacy - All Installed
<b>Stage 0</b>	All Three Ancillaries Not Installed

## Veneto Region Hospital EMRAM in 2013 and in 2016...

### EMRAM Score Regione Veneto vs strutture ospedaliere italiane ed europee



**From 2.8 to 3.4..**

- **National ePrescription project** started 02.11.2011
- **“National Digital Agenda for Country Development”** - Decreto Legge n. 179 del 18.10.2012
- **FSE Act 26.11.2015** (Regional HIEs creation and national federation)

**National  
Level**



- **Project: Fascicolo Sanitario Elettronico regionale (FSER) (Regional HIE)**  
*Deliberazione della Giunta Regionale n. 1671 del 07.08.2012*

**Regional  
Level**



## FASCICOLO SANITARIO ELETTRONICO REGIONALE VENETO

*The regional EHR get to the re-organisation of health and social care processes thanks to the digitalisation and share of data and processes among a plurality of stakeholders.*

*All the already-existing local EHRs will be transformed in a regional Health Information Exchange network based on an interoperability platform.*

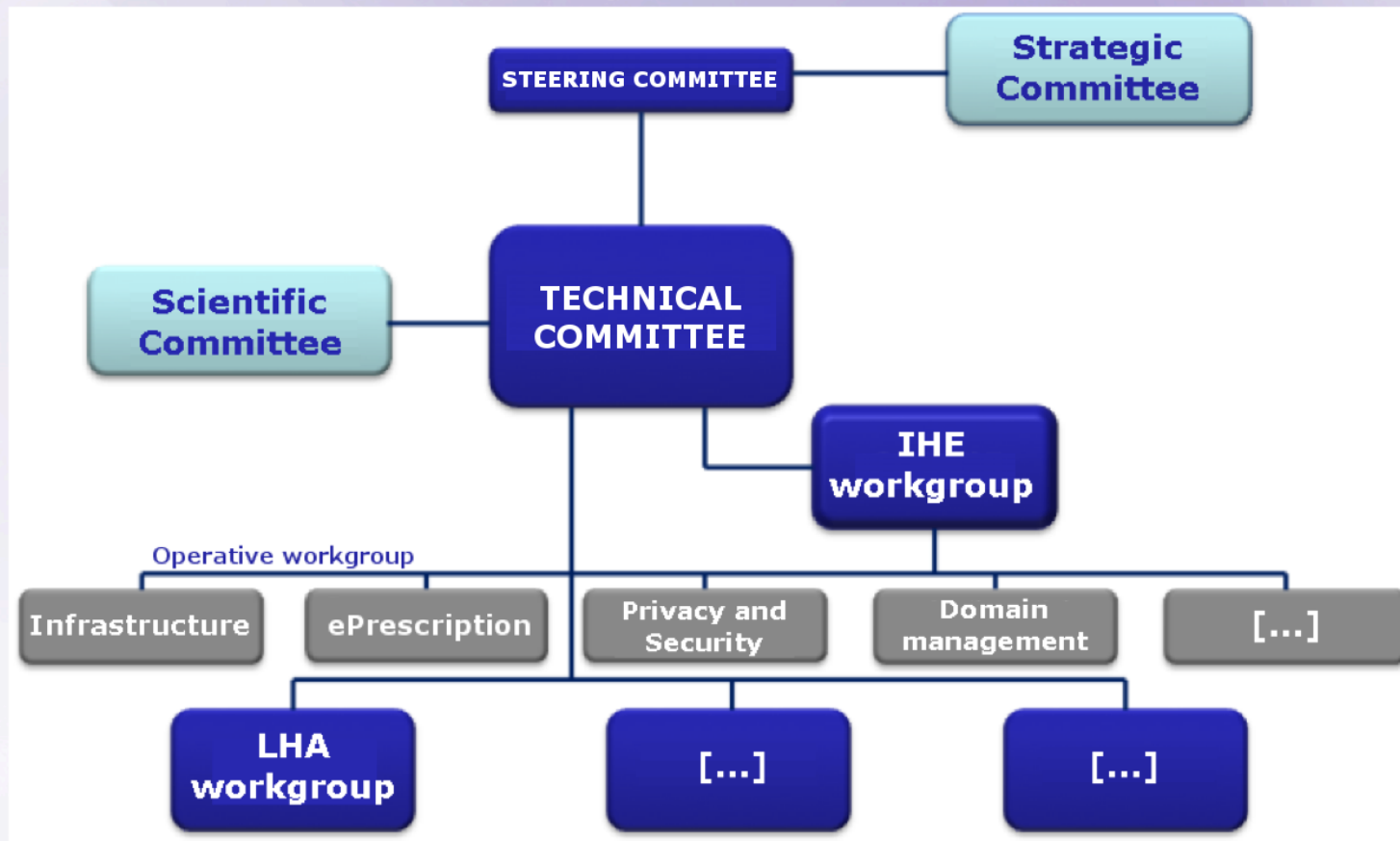
*A modular approach allows the development and scale-up of different EHR components starting from pre-existing infrastructures derived from previous initiatives.*



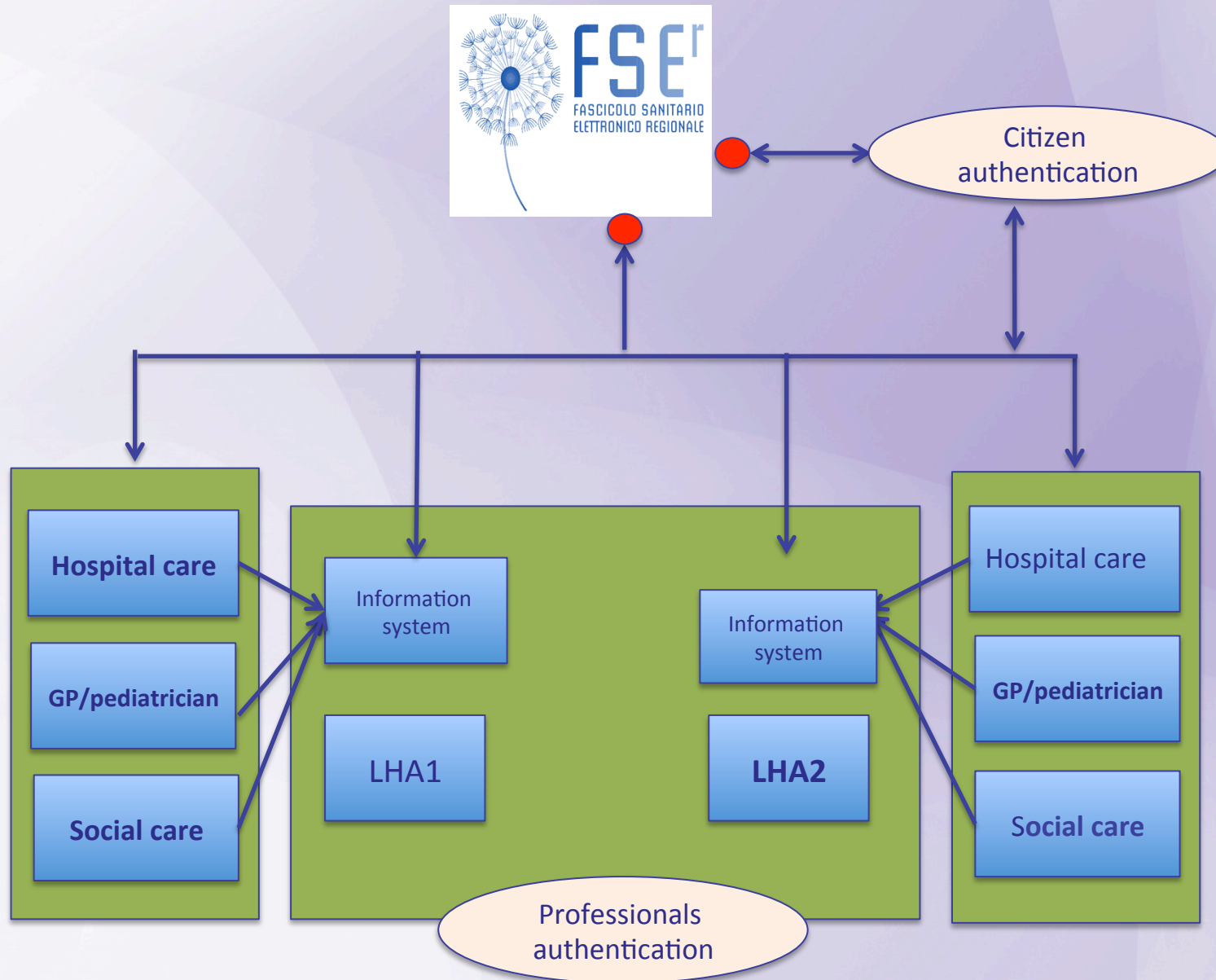


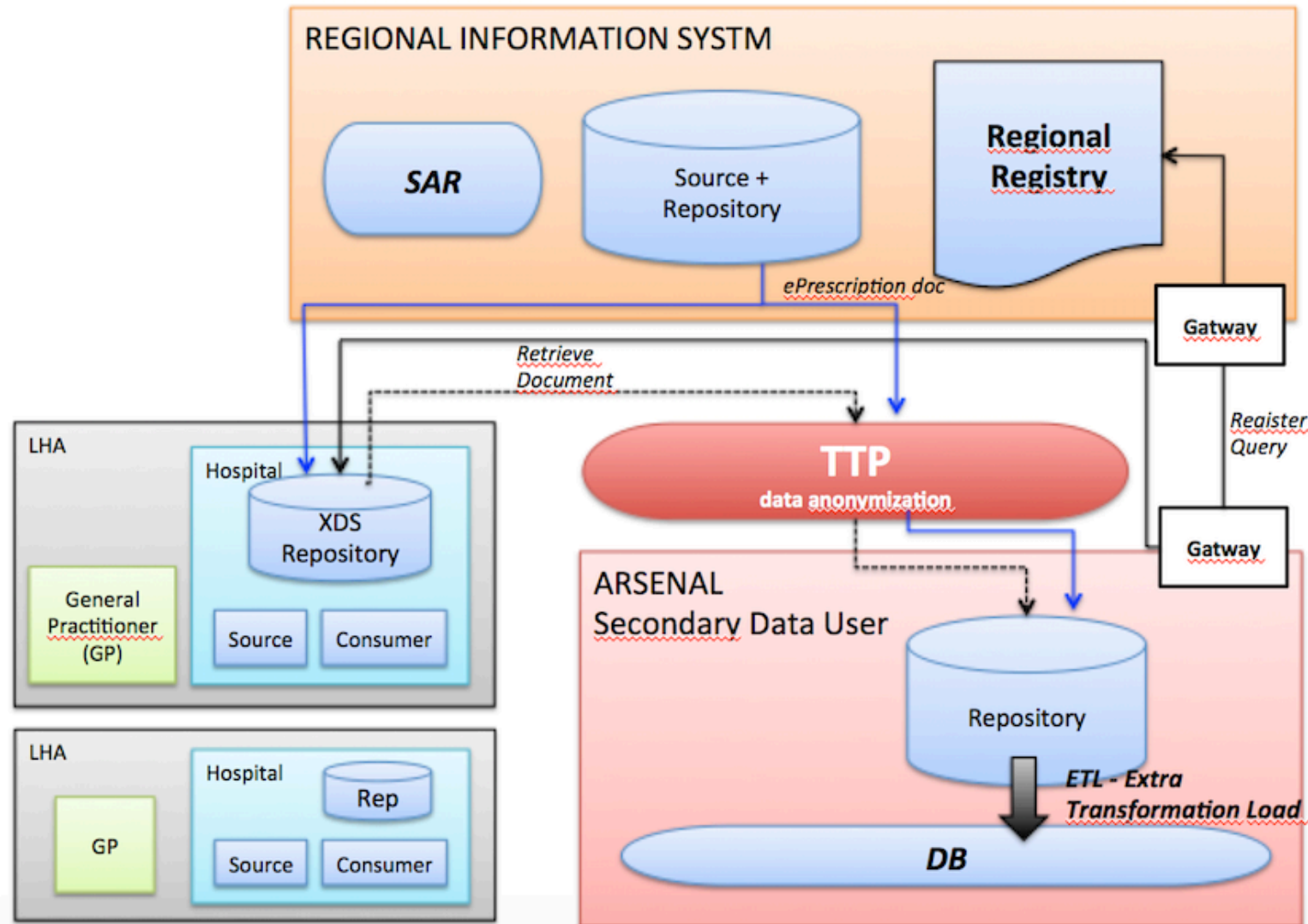
## The HIE project in the Veneto Region

- *Approved by the Veneto Region in August 2012;*
- *21 Local Health Authorities, 2 Hospital Trusts and 1 I.R.C.S.S involved;*
- *70.000 healthcare operators;*
- *4000 GP/pediatricians, over 50 health districts, 1300 pharmacies etc..;*
- *4,960,336 citizens;*
- *Project management, technical and administrative coordination assigned to Arsenà.IT that is supporting all the LHAs and HTs to achieve the implementation objective by 2015*



# FSEr actors architecture





## YESTERDAY

- **Fragmented and partial** information
- **“Postmen”** patients bringing with them your health information (not always, not all, not good) that are then typed from the GP
- **No reliable feedback** on the clinical workflow or therapy recommended

## TOMORROW

- **Complete information;**
- **Immediate accessibility;**
- **Feedback on the course of the treatment;**
- **Reduction of red tape;**
- From the GPs or specialists software will be possible to manage the whole clinical information and documentation of their patients, saving time and complexity

## HOW?

TODAY



Through the  
**Health Information Exchange System**

That is activated by the  
collection of  
the patient **consent**

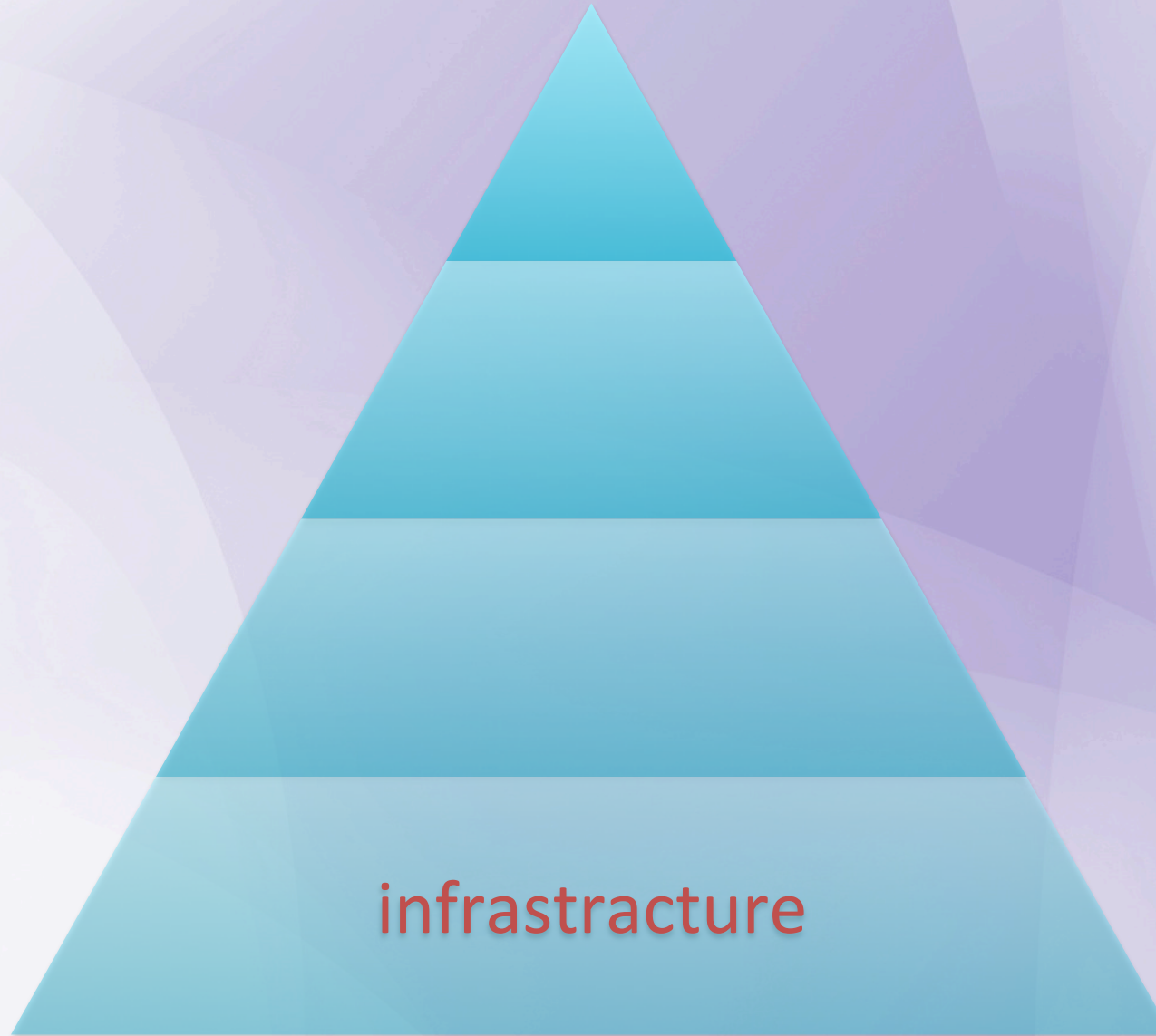
## In our way to think data have to move not the people



- All your data available using the HIE System
- onlinebooking
- on line reports
- online payment
- telemedicine
- and so on..

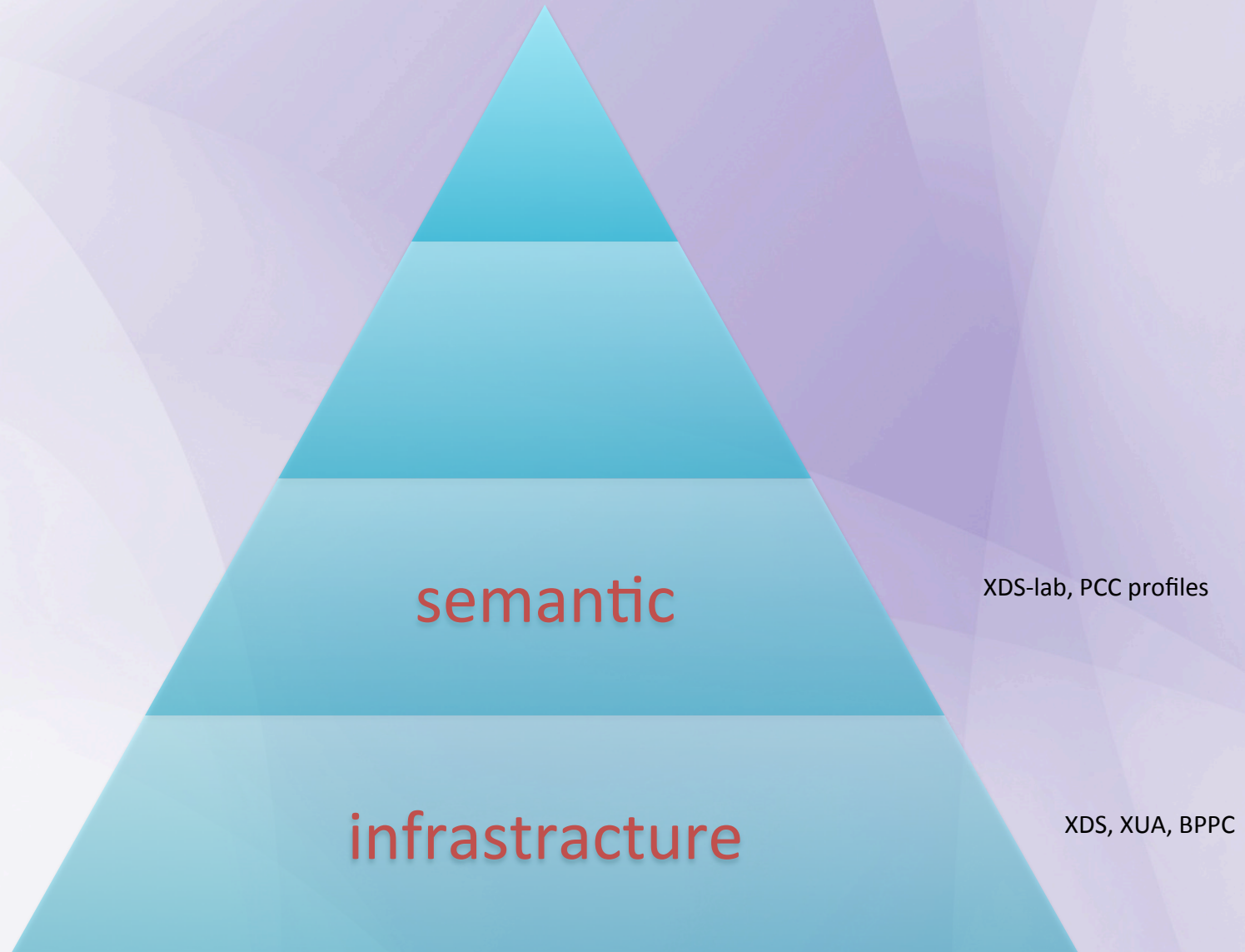


# HIE Veneto Region

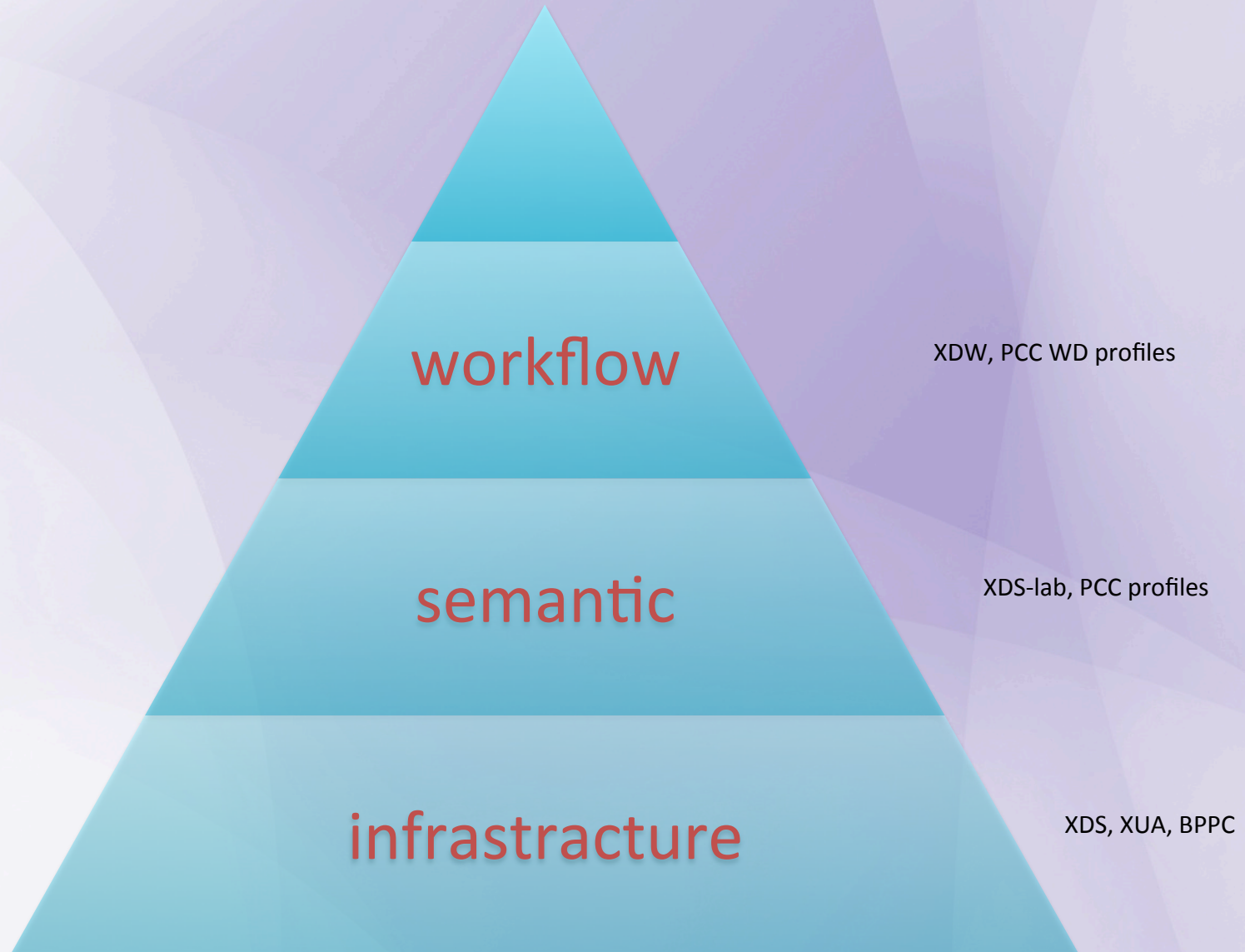


XDS, XUA, BPPC

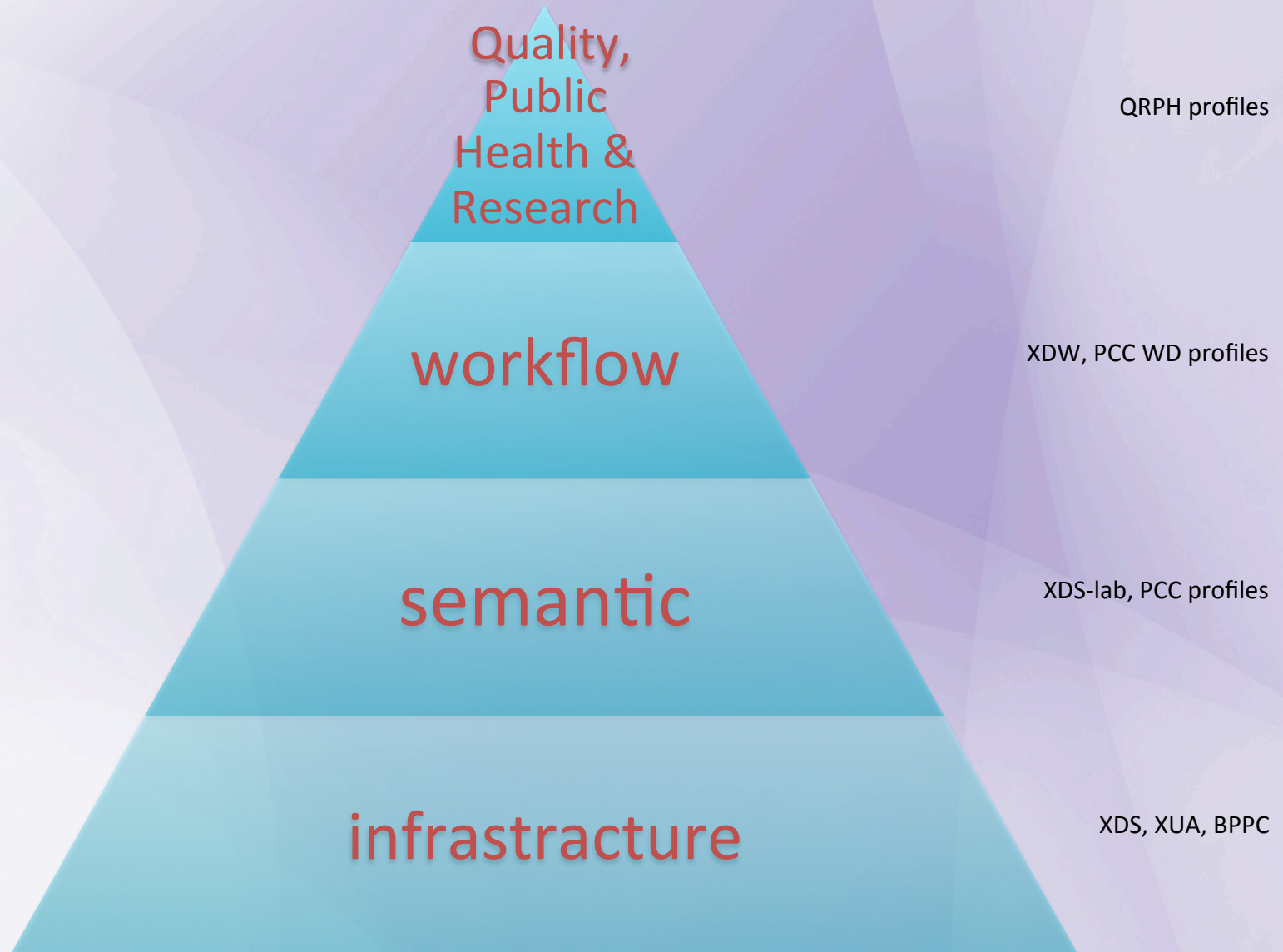
# HIE Veneto Region



# HIE Veneto Region



# HIE Veneto Region



# Testing & tools the platform

## Testing @ Consorzio Arsenal

### Access tools

Tool	Description
<a href="#">Gazelle Test Management</a>	The Gazelle Test Management Test Bed
<a href="#">EVSCient</a>	Access to Gazelle validation services
<a href="#">SchematronValidator</a>	Access to Gazelle Schematron Validator
<a href="#">Gazelle Proxy</a>	Access to Gazelle Proxy

### Modeling Dematerializzazione 2013/2014



#### Gazelle Technical Framework and Tests

The Gazelle Master Model application is used to manage data describing the components that comprise IHE Integration Profiles and the Gazelle test management system. The normal user functions such as

- Add a new domain
- Add a new profile to an existing domain
- Define new test cases

The managers responsible for Gazelle for IHE International are Eric Poiseau (INRIA) and Lynn Felhofer (IHE USA). If you are connected to a regional or private copy of this application, please contact the local manager.

#### Sessione di TEST - Progetto di Dematerializzazione FSER [Edit](#)

#### Benvenuti sulla Piattaforma di Test di Arsenal.IT !

Sono presenti due sessioni di lavoro:

- Sessione di TEST (Dematerializzazione Test)
- Sessione di LABELING

Attualmente vi trovate nella sessione per i test dedicati al progetto di dematerializzazione della ricetta rossa per il Fascicolo Sanitario Elettronico regionale.

#### Elenco endpoint di Test

MEF-1:Creazione ricetta	<a href="http://sar-test.regione.veneto.it/demInvioPrescritto">http://sar-test.regione.veneto.it/demInvioPrescritto</a>
MEF-1 con asserzione	<a href="https://sar-test.regione.veneto.it/asserzioni/demInvioPrescritto">https://sar-test.regione.veneto.it/asserzioni/demInvioPrescritto</a>
MEF-2:Presenza in Carico	<a href="http://sar-test.regione.veneto.it/demVisualizzaErogato">http://sar-test.regione.veneto.it/demVisualizzaErogato</a>
MEF-2:Rilascio	<a href="http://sar-test.regione.veneto.it/demVisualizzaErogato">http://sar-test.regione.veneto.it/demVisualizzaErogato</a>
MEF-2 con asserzione	<a href="https://sar-test.regione.veneto.it/asserzioni/demVisualizzaErogato">https://sar-test.regione.veneto.it/asserzioni/demVisualizzaErogato</a>
MEF-3:Erogato Totale	<a href="http://sar-test.regione.veneto.it/demInvioErogato">http://sar-test.regione.veneto.it/demInvioErogato</a>
MEF-3:Erogato Parziale	<a href="http://sar-test.regione.veneto.it/demInvioErogato">http://sar-test.regione.veneto.it/demInvioErogato</a>
MEF-3:Chiusura Errore	<a href="http://sar-test.regione.veneto.it/demInvioErogato">http://sar-test.regione.veneto.it/demInvioErogato</a>

# Testing & Tools approach

- **First step – Labelling** : testing performed in “vitro” situation using simulators to assess the adherence of Project technical specification (performed in the Arsenal.IT labs)
- **Second step – Pre Production Test**: testing performed in real condition (in particular using LHA systems) before starting with new software features

# Testing & Tools approach

systems	tested	retired	total
GPs	13	1	14
pharmacies	9	1	10
CPOE	8	0	8
EHR	12	0	12
<b>total</b>	<b>42</b>	<b>2</b>	<b>44</b>

# HIE status and the roadmap

- Complete the ePrescription and eDispensation (3.800 GPs, 4.300 Hospital physicians, 1.330 Pharmacies)  
*(40 Millions dispensation by year)*
- Complete eReferral request (20 M/year)
- Start at October 2016 CDA Lab Report sharing

From July first deployment of MHD

*Mobile app to support citizens in ePrescription (request new prescription to the GP) and eDispensation in Farmacies*



Estimated target 820.000 users

# Sanità kmzero



presentazione  
user interface

- 35-64 years
- To have a smartphone
- Almost 1 e-prescription/ 1 year

The possibility to manage your e-prescriptions on your own and with your GP

- To give FSEr consent to your GP
- Digital Identity
- To open your FSE
- First service of “Sanità KM 0” world to reset distances from my GP and me



1. Project Monitoring
2. Government aims
3. Clinical and Advanced Analytics

# Monitoring results: the regional dashboard

The screenshot displays the FSEr (Fascicolo Sanitario Elettronico Regionale) regional dashboard. At the top left is the FSEr logo, and at the top right is a search bar with the placeholder text "Qualsiasi Cosa". Below these are navigation tabs: Home, Materiale, FAQ, HIMSS, Questionari FSEr, Board Appropriatelyzza, and Catalogo. A secondary row of tabs includes Questionario, Cruscotto (selected), Public comment, and Formazione: Navigando verso il FSEr. A breadcrumb trail shows the path: Sito Arsenalà.IT > Fascicolo Sanitario Elettronico regionale > Cruscotto > Regionale.

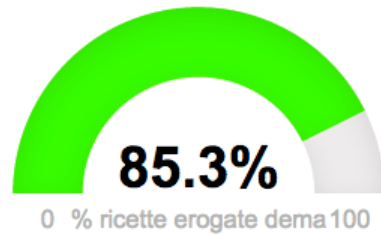
The main content area is titled "Cruscotto dematerializzazione" and features a sub-section "MMG/PLS: prescrizioni farmaceutiche - situazione odierna". This section contains three gauge charts:

- Ricette digitali:** A gauge showing 92,336 digital prescriptions out of a total of 150,000.
- % Ricette digitali:** A gauge showing that 94% of prescriptions are digital.
- Medici a regime dema:** A gauge showing that 99% of doctors are in a dematerialized regime.

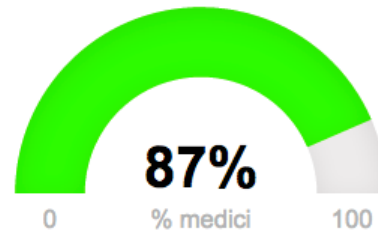
Below the gauges, a note states: "NB: nel grafico 'Medici a regime dema' un medico è considerato a regime se risultano dematerializzate almeno l'80% delle ricette farmaceutiche negli ultimi 30 gg sul totale di ricette prescritte (dematerializzate e cpcm)."

# Monitoring results: the LHAs dashboard

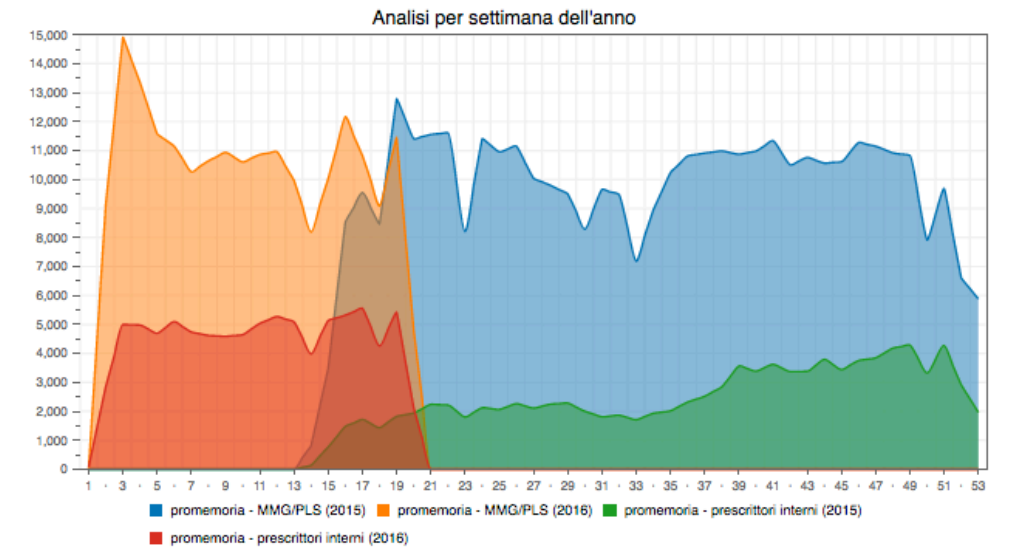
## Erogazione dema Azienda

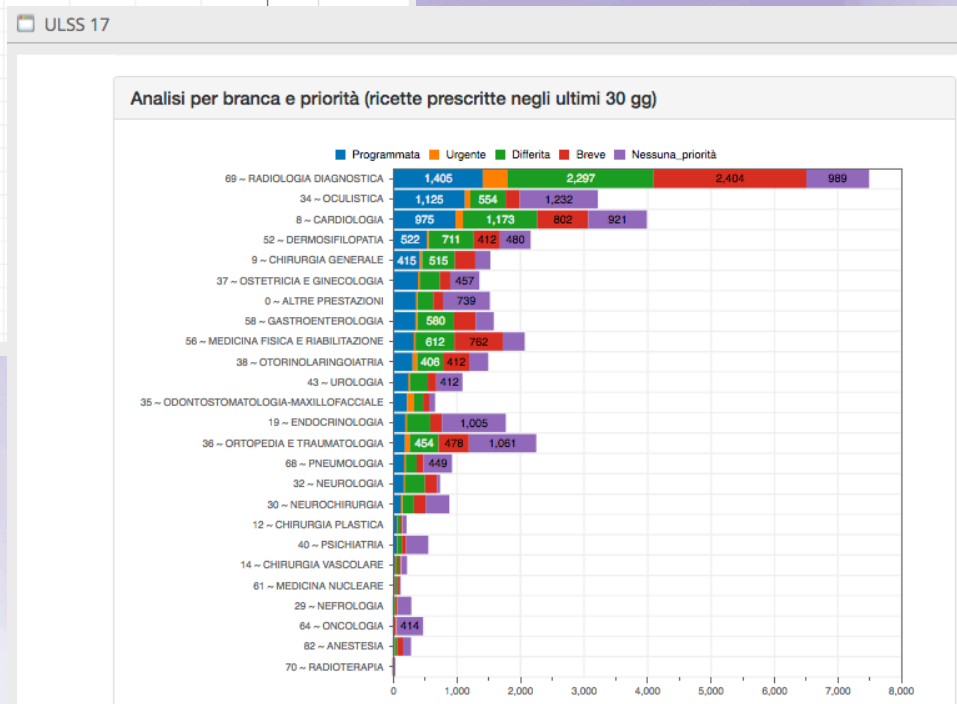
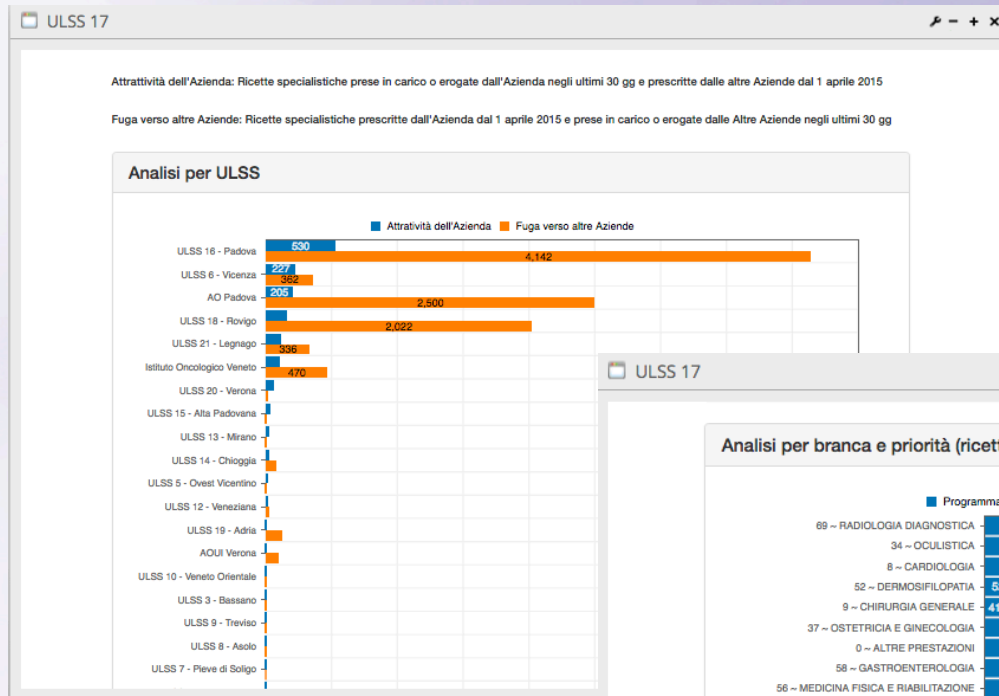


## Prescrittori interni dema

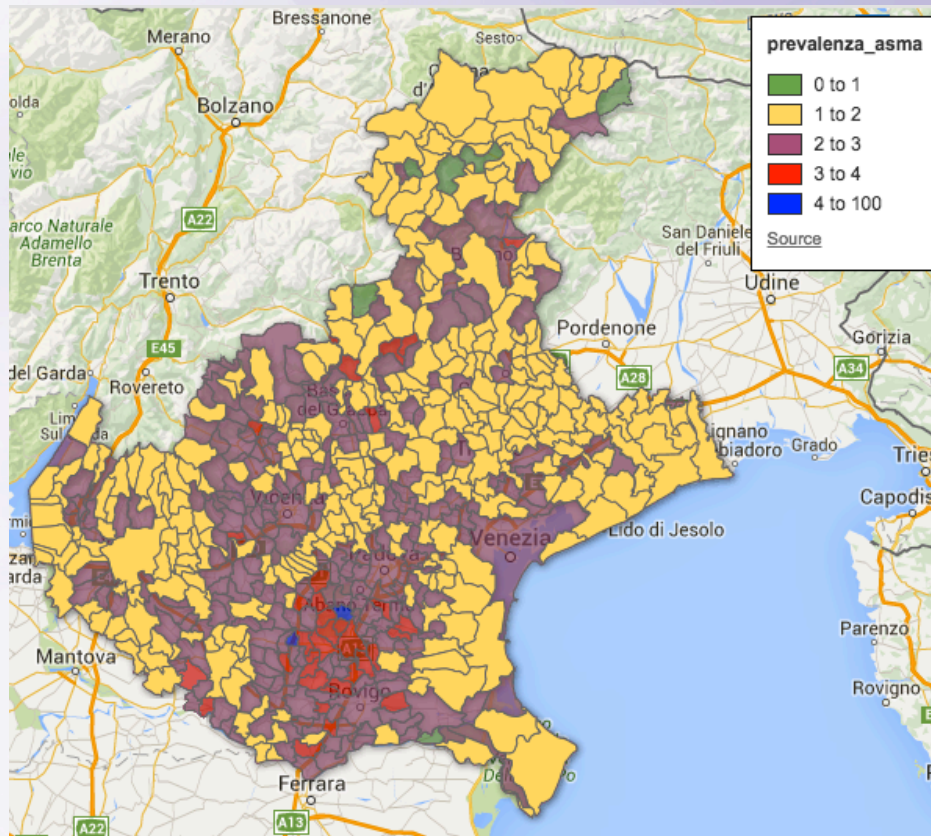


### Ricette specialistiche prescritte dall'Azienda



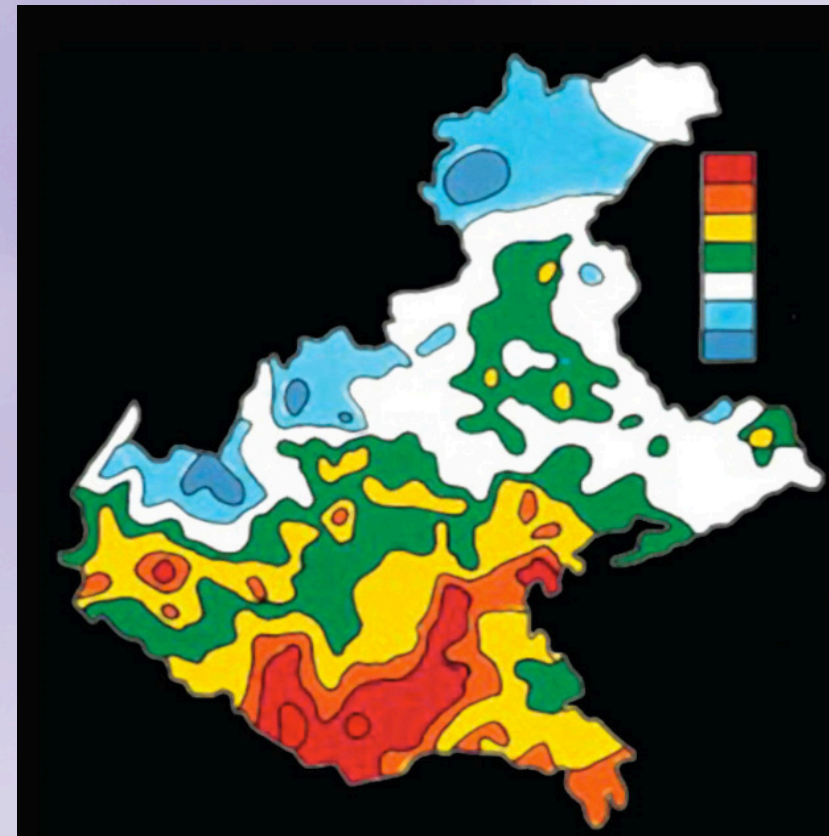


## Asthma prevalence of drug consumption



Evidence based medicine

## Air purity



## Focus on HIE National Level



## Italian plan for creation of the national infrastructure

- ***STARTS FROM:*** Creation of Regional HIEs: 2012-2015
- Development of technical Spec for Interoperability between regional HIEs. August 2014- August 2015
  - First Pilot to validate Tech specifications: Jan 2015 - Jan 2016 (with 3 regions: Veneto Lombardia and Emilia)
  - Spring 2016: test extended to other 10 regions.
- Go-live: expected by the end of 2016

***National***

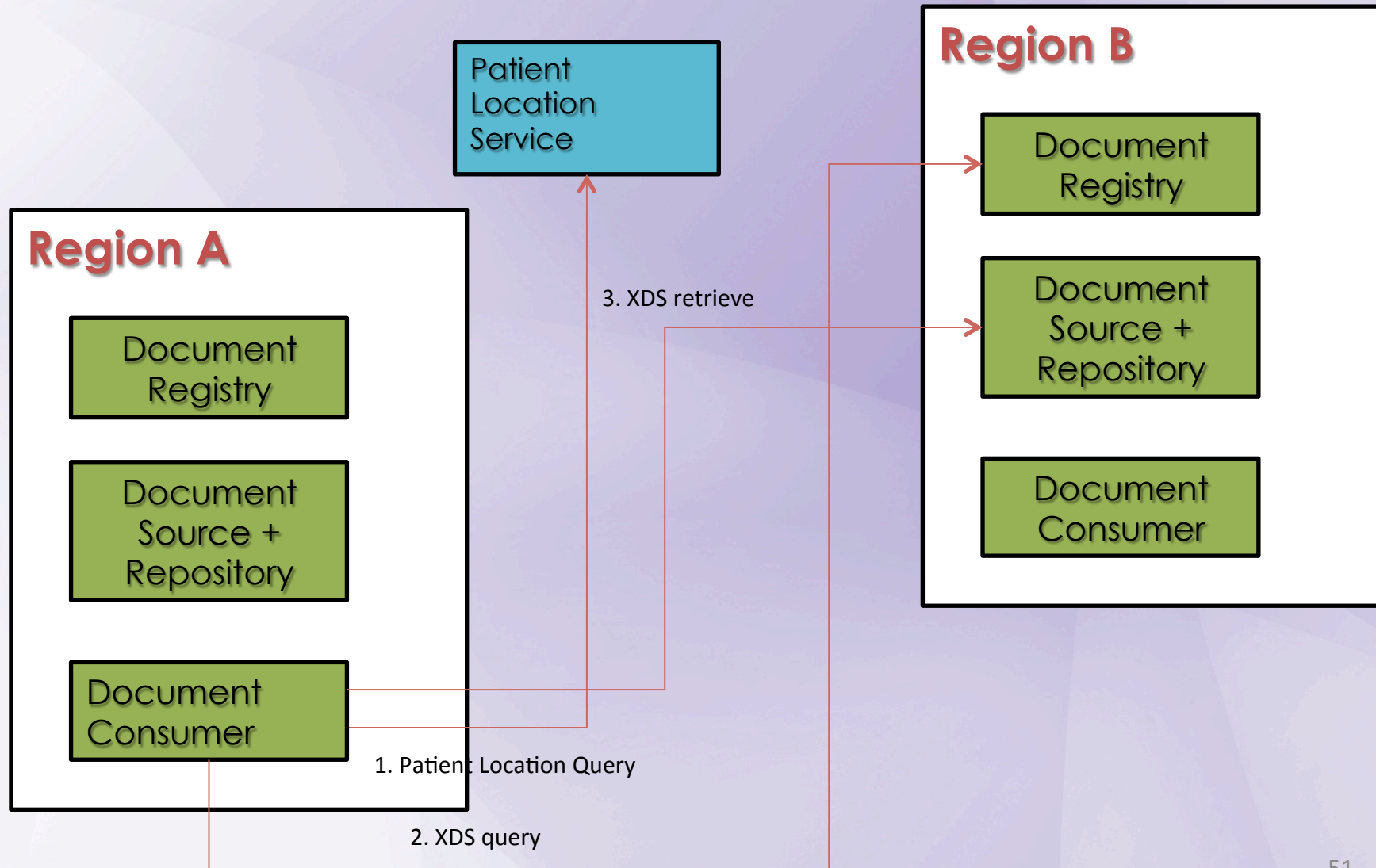
***Level***

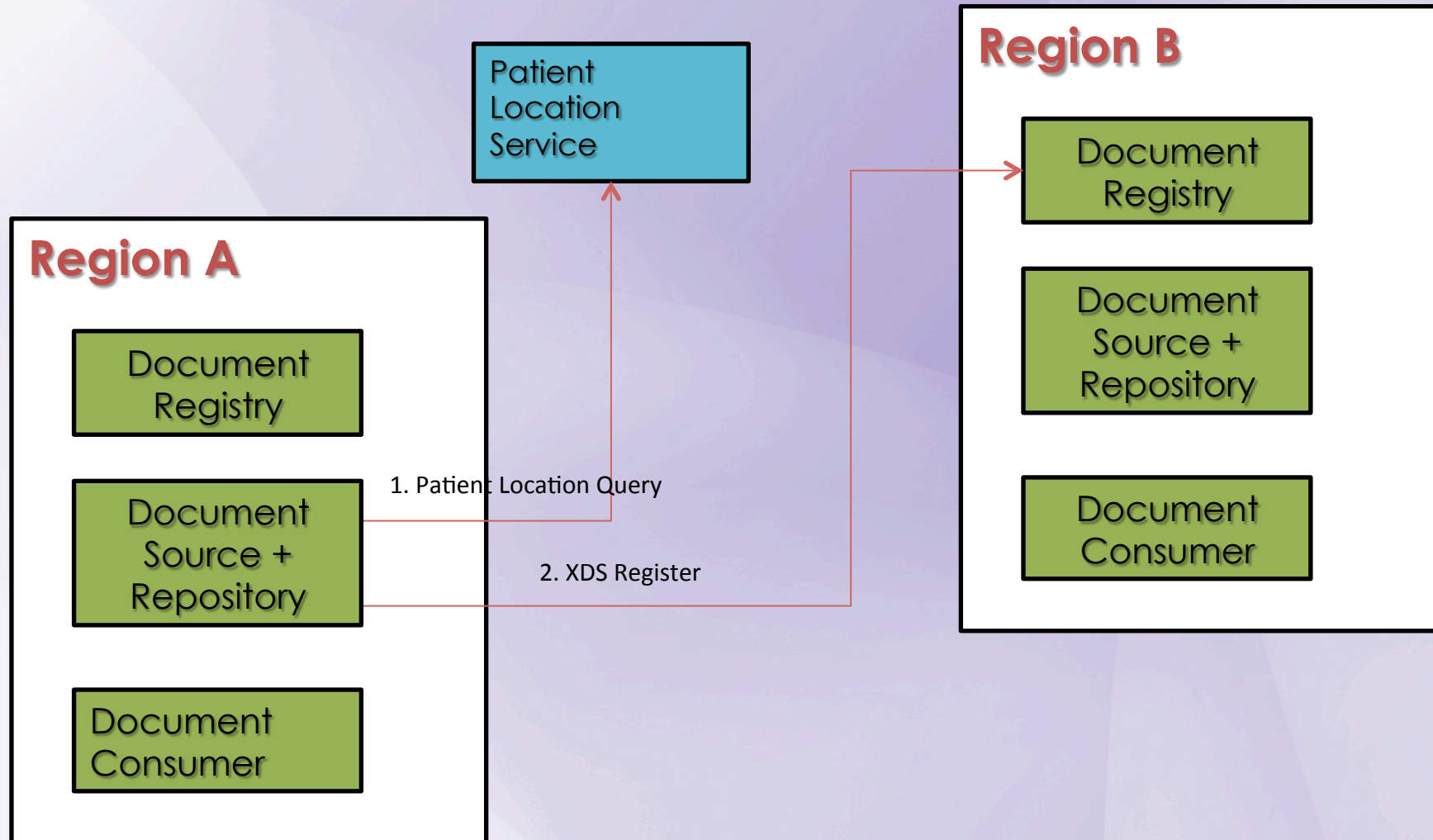


- Infrastructure based on XDS.b (we defined a National Affinity Domain...)

### WITH SOME DIFFERENT REQUIREMENTS:

- 20 Regions - 21 XDS Document Registries (each Registry manage documents related to patients in charge to that Region)
- A National Service (not IHE compliant) for Patient Location that provides the info about the Region of assistance for a specific patient.
- If the patient moves form one region to another, all the metadata are transferred to the new Registry (using XDS query and Metadata Delete)





- Formalize a testing process for Regional Systems (the testing should be in charge to the National Council of Research “CNR”)
- CEF: Connecting Europe Facility project integration.
- Extend functionalities of the national framework (now focused on the sharing of Laboratory Reports and Patient Summaries.)
- Provide national specifications for Document Digital Signature and Code Systems / Value Sets management.

# epSOS

- 1st July 2008 - 31st June 2014
- € 36,5 Million (co-funded by the European Commission Competitiveness and Innovation Programme (CIP) within the ICT Policy Support Programme)
- 45 Beneficiaries (formation of the consortium)
  - Consisting of national ministries of health, national/regional competence centers, a consortium of industry and the Project Management Team
  - 25 different European countries: 22 EU member states and 3 non-EU member states.

## epSOS moving to CEF/DSI

- epSOS aimed to design, build and evaluate a service infrastructure that demonstrates cross-border interoperability between electronic health record systems in Europe.
- First phase use case pilot 2013/2014:
  - Patient Summary: access to important medical data for patient treatment
  - Cross-border use of electronic prescriptions ("[ePrescription](#)" - or "eMedication" systems)
- epSOS transitions to Connecting Europe Facility (CEF) – Digital Services Infrastructure for operational availability in 2017

## epSOS

- The epSOS has delivered and tested building blocks to implement cross-border eHealth services in the future:
  - by defining the concept of National Contact Points (NCP)
  - each country establishes an NCP to control the exchange of information with other countries



# epSOS

- epSOS specifies the NCP-NCP interface based upon IHE Profiles :
  - 3 CDA r2 pivot documents defined (IHE PCC based)
  - Source original document (IHE XDS-SD)
  - Interchange (IHE XCA/XDR/XCPD)
  - Security (IHE ATNA)
  - Privacy (IHE XUA)
- epSOS testing performed with the support of IHE-Europe. 3 Projectathons and 5 Project Pre-production testing sessions organized
- testing and evaluating of the services made from health professional's and patient's perspective.

# Q&A

- ?
- ??
- ???

# Thank You!

## For More Information

### For IHE EU Affairs

Elena Vio

E-Mail: [eVio@consorzioarsenal.it](mailto:eVio@consorzioarsenal.it)

### For HE Europe Secretariat

E-Mail: [office@ihe-europe.net](mailto:office@ihe-europe.net)

### For IHE Services

Dr. Alexander Berler,

E-Mail: [alexander.Berler@ihe-europe.net](mailto:alexander.Berler@ihe-europe.net)

### For IHE Connectathon and Testing

Eric Poiseau,

E-Mail: [eric.poiseau@ihe-europe.net](mailto:eric.poiseau@ihe-europe.net)