National and Regional experiences in eHealth deployment

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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 indentification)
- 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 Connectahon - Vienna
- 2014:
  - IHE European Connectahon – 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 flexibitlity
  - 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, PDQV3
  - 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

IHE EUROPE Integrating the Healthcare Enterprise

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 & Arsenàl.IT

- 4,9 M inhabitants (2013 data)
- 18.391 km² of land surface

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 Arsenàl.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.

1 – Veneto Region

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

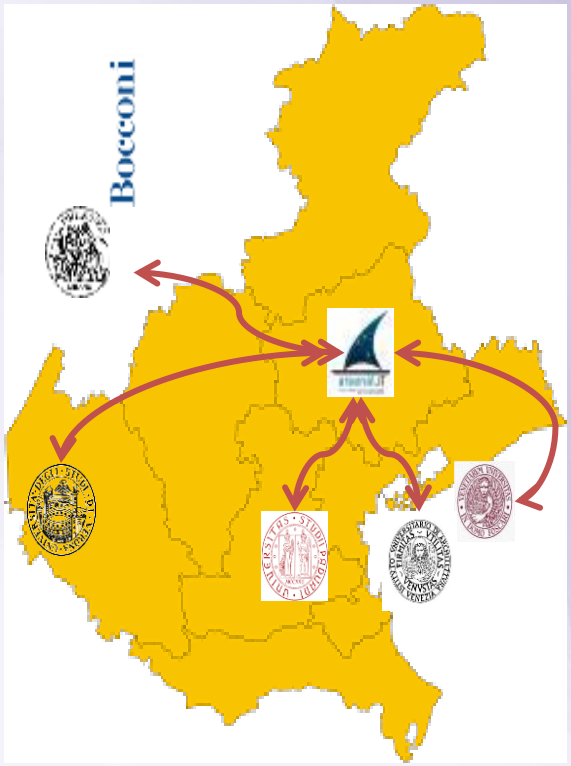
2 – The Territory

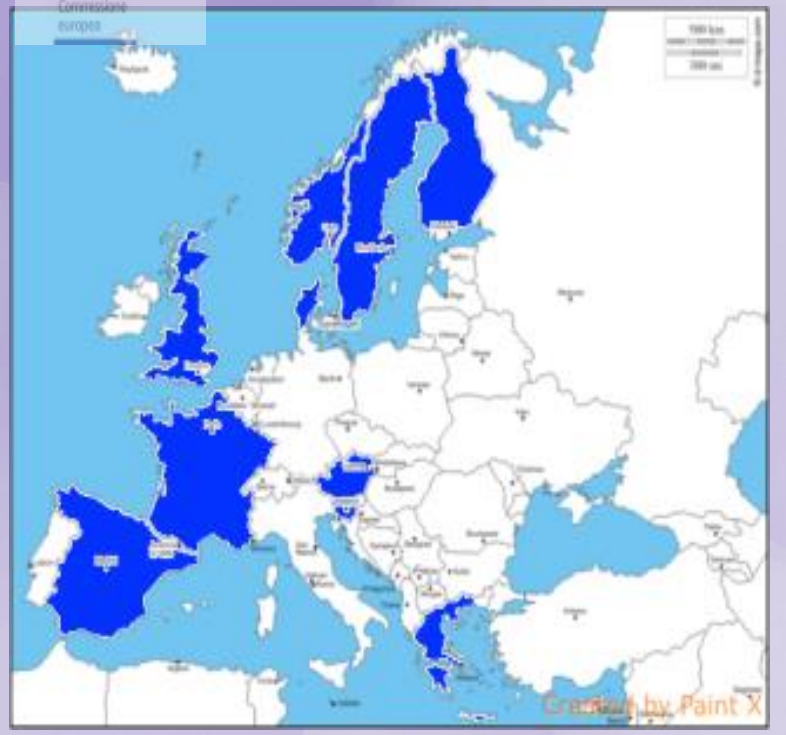
- Coordination between Region and LHAs
- 8340 professionals involved in the 23 LHAs and Hospital Trust
- IT and organizational solutions as answer to local needs

3 – The Arsenàl.IT Team

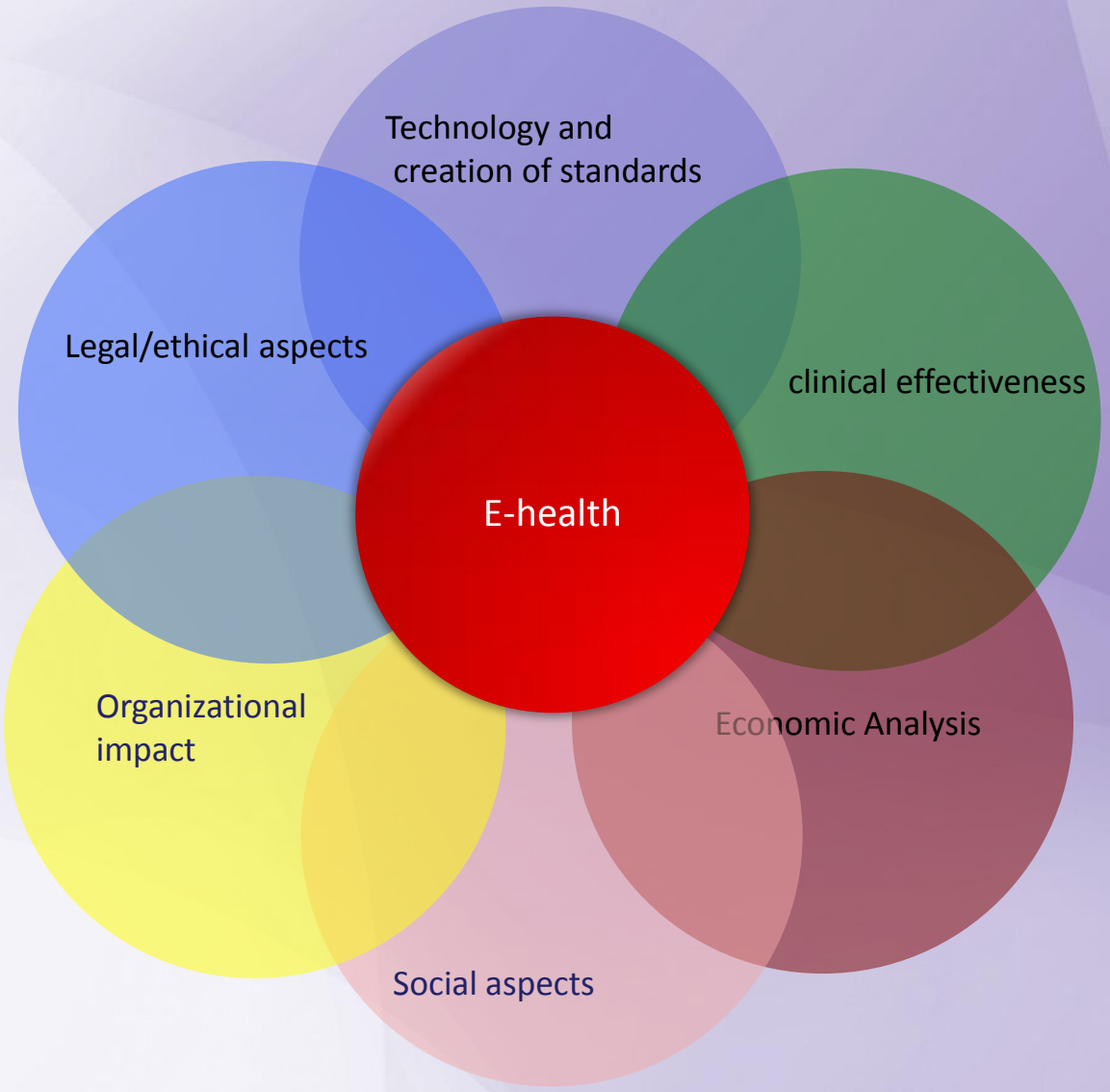
- 60 Collaborators
- Multidisciplinary skills
- Focused to results
- Strong ability to find solutions “out of the box”

4 – The network of the expertise of Arsenàl.IT

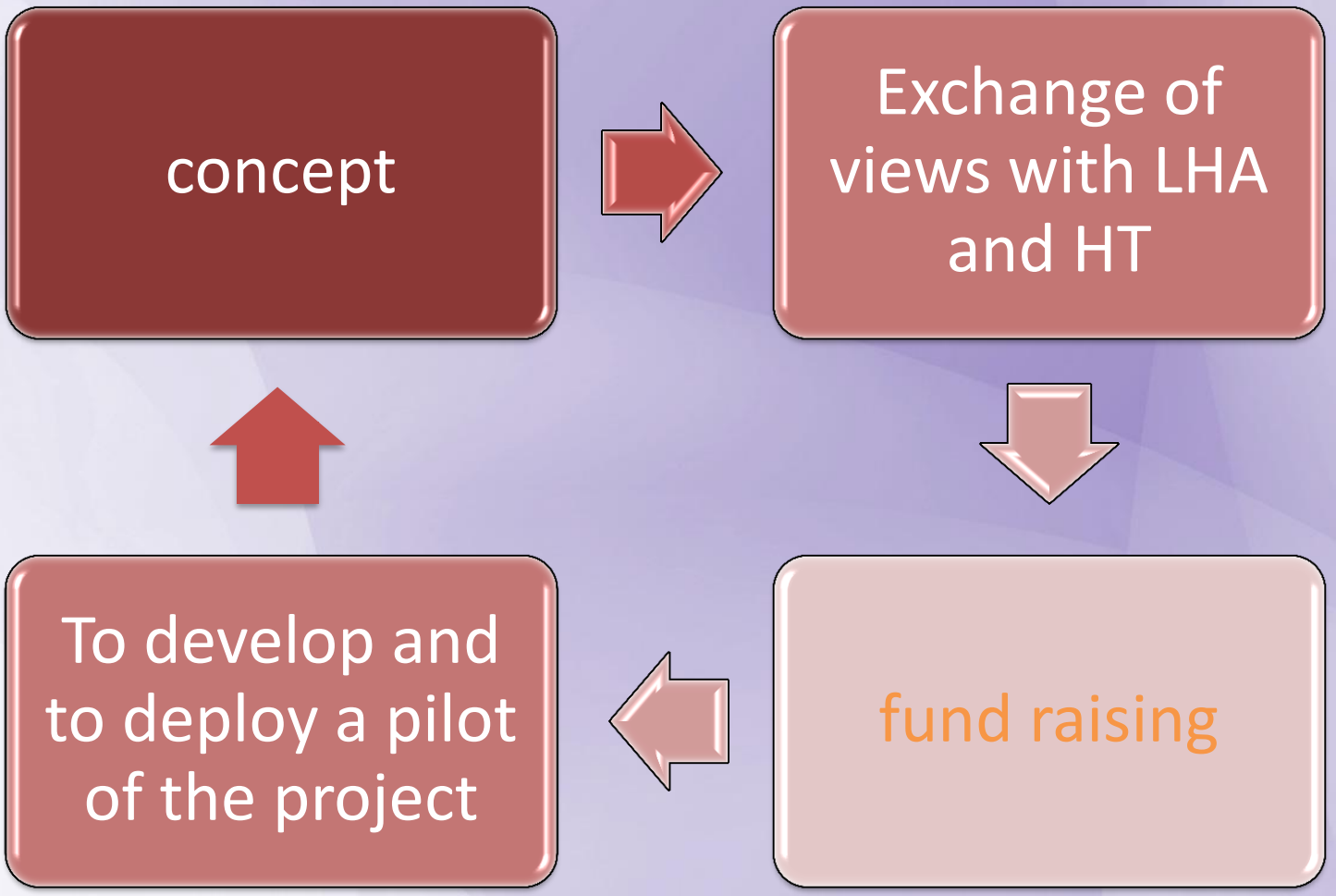




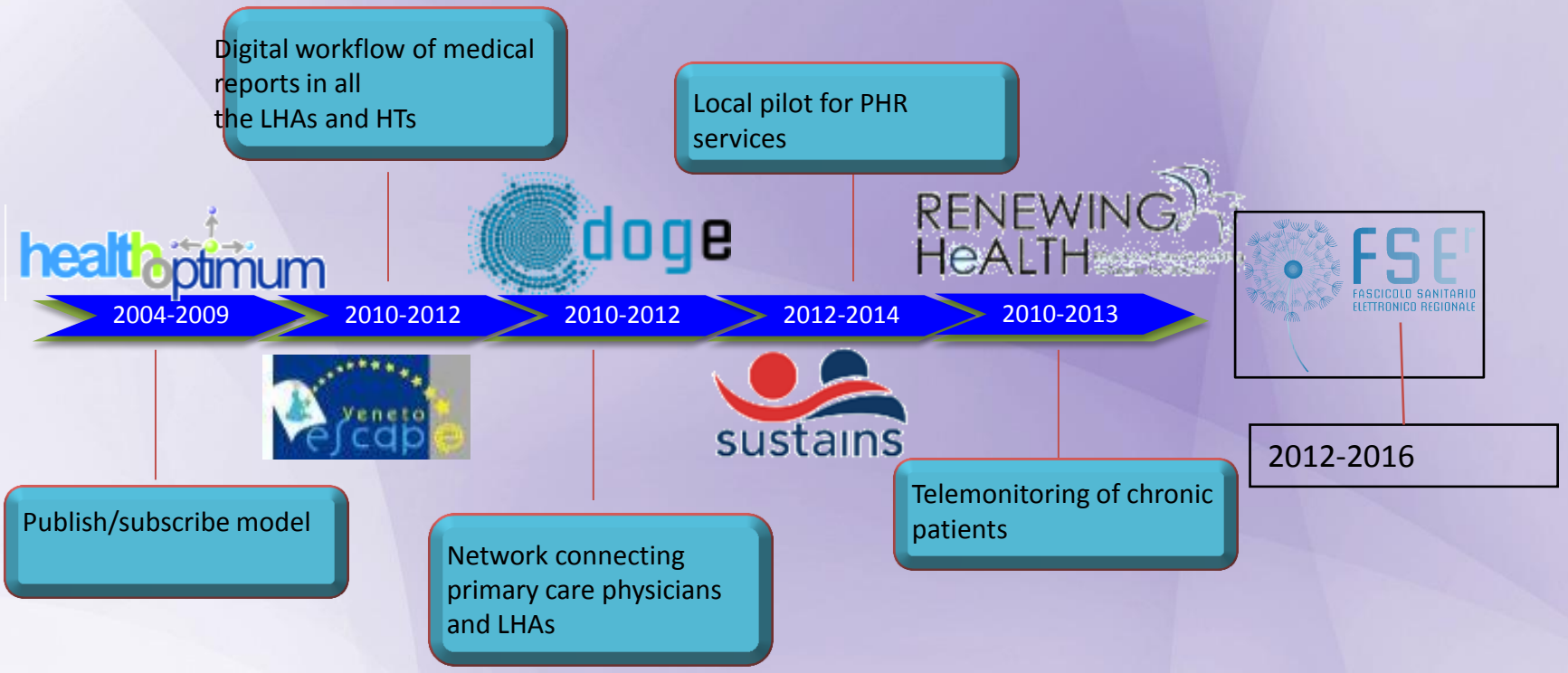
5 – 360° Innovation



6- the business model



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*

HIMSS assessment

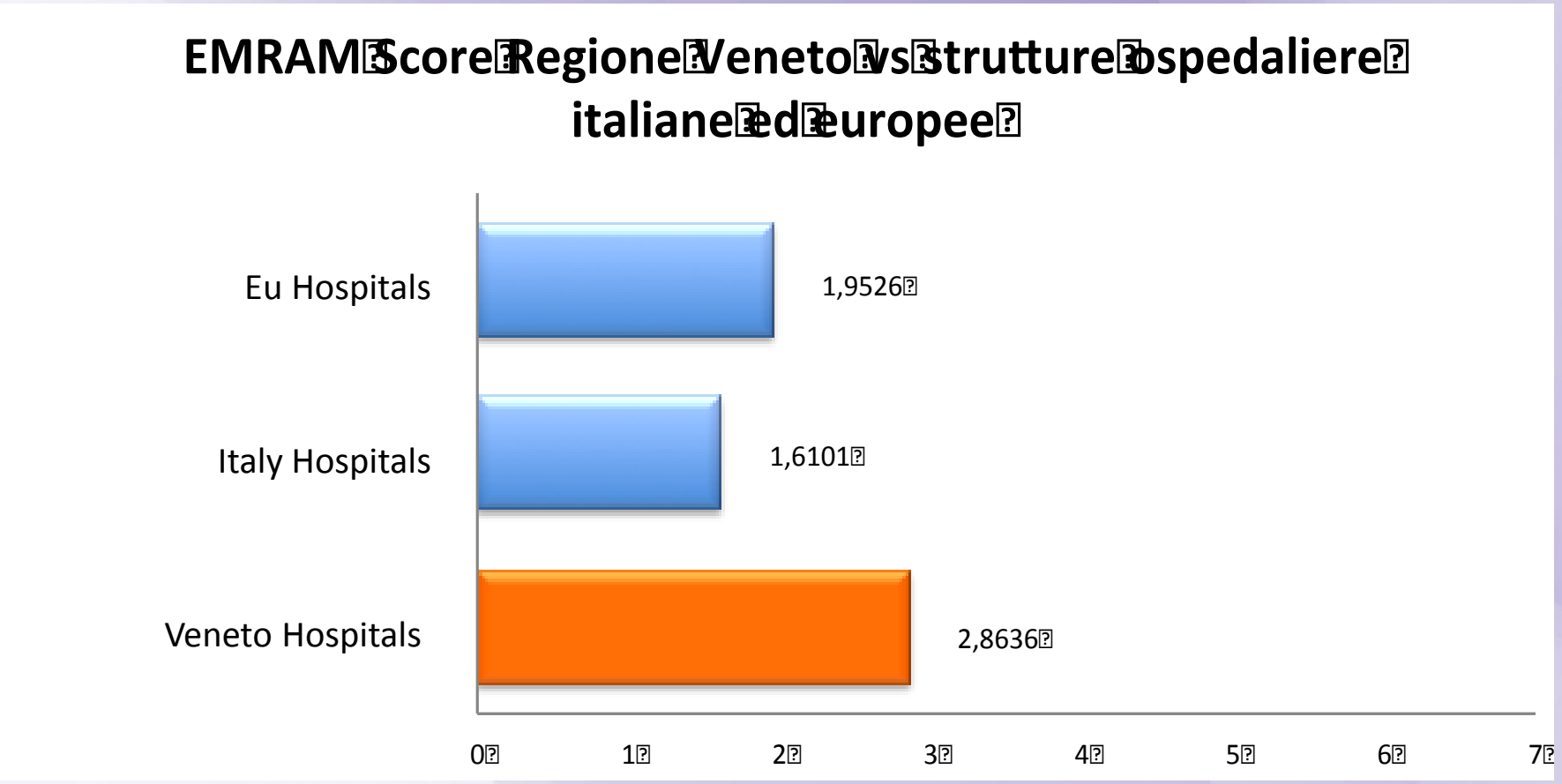
The **EMRAM (E**lectronic **M**edical **R**ecord **A**doption **M**odel**)** is an eight-step process that allows you to analyze your organization's level of EMR adoption, chart your accomplishments, and track your progress against other healthcare organizations across the country. View and compare your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

IHE EUROPE Integrating the Healthcare Enterprise

EMRAM

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

Veneto Region Hospital EMRAM in 2013 and in 2016…



From 2.8 to 3.4..

Italian/Regional foundational Legislations:

- ***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

Spending review and healthcare new reform in Veneto Region

- In 2016 after a regional law, has been adopted the reform of the healthcare systems;
- From 21 Local Healthcare Authorities and 2 Hospital Trust and 1 IRCSS to 11 Local Healthcare Authorities and 2 Hospital Trust and 1 IRCSS;
- All the systems at a organizational and technical level have to be engineered and put in production without disruptions for helathcare professionals and citizens.
- Key words: analysis, unification, migration,interoperability
- In 2017 will be created the “Azienda zero”, a unique business center for the LHAs, HTs, and IRCSS for the IT management

The rationale

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.

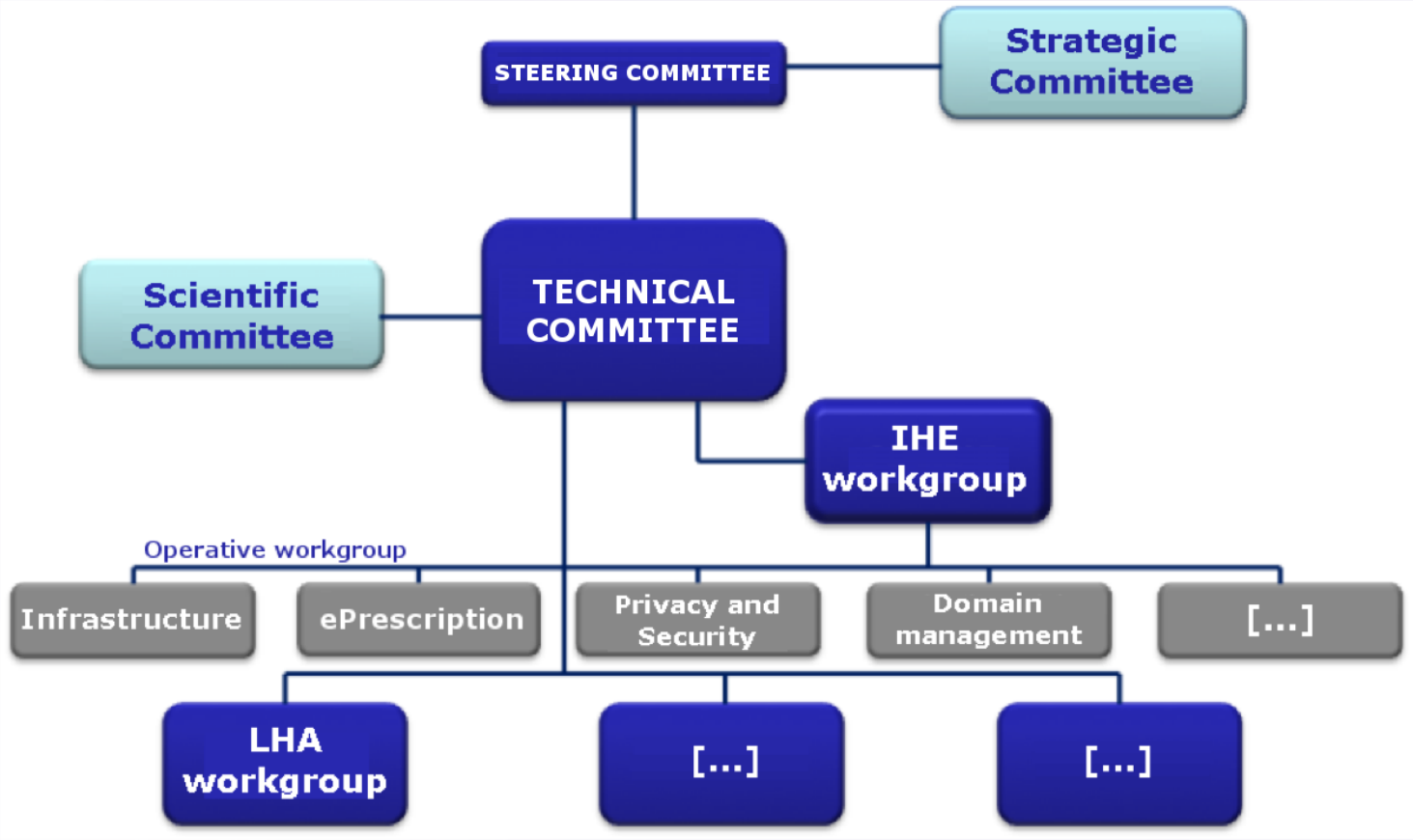
All the already-existing local EHRs will be transformed in a regional Health Information Exchange network based on an interoperability platform.

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

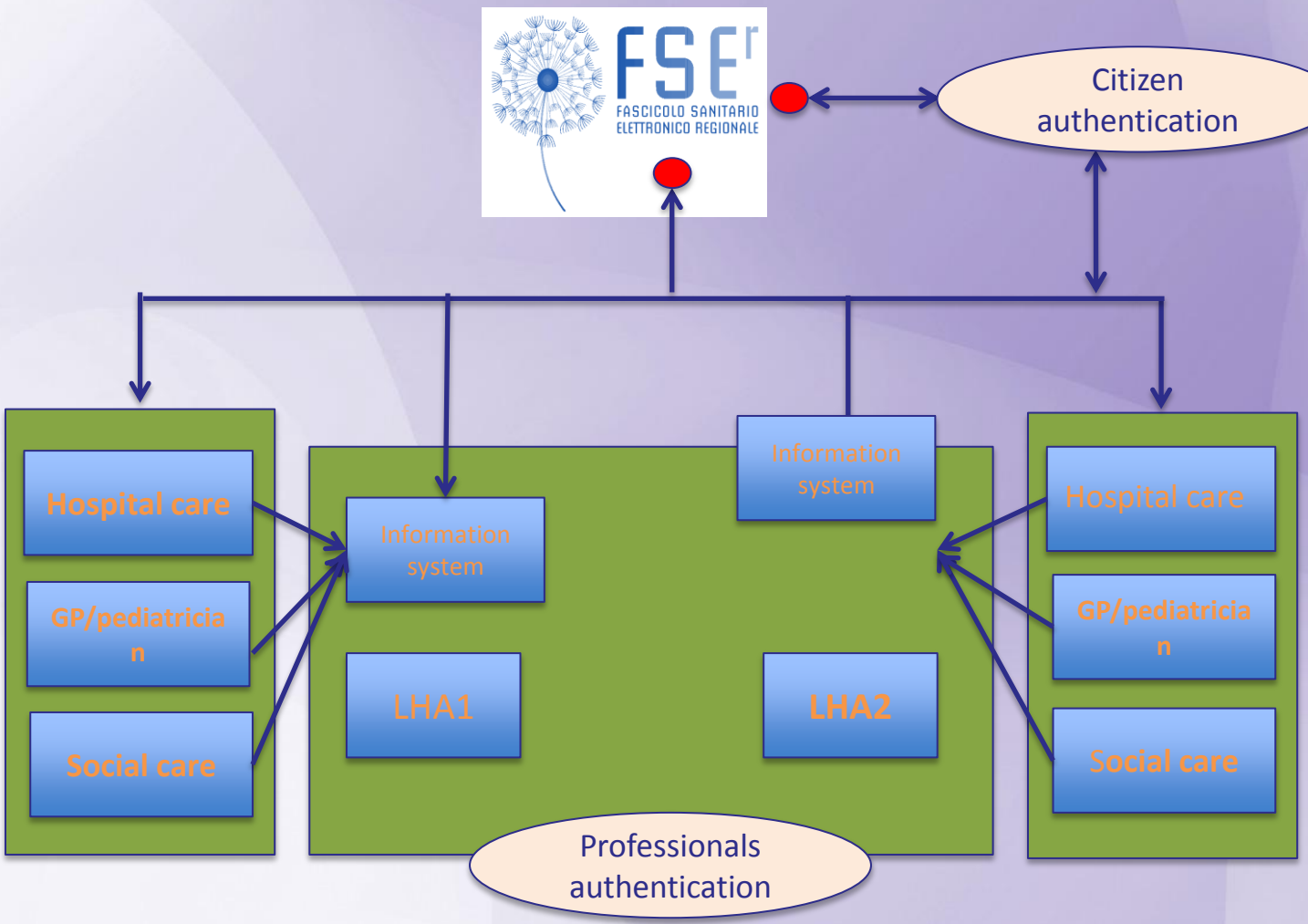
The HIE project in the Veneto Region

- *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 Arsenàl.IT that is supporting all the LHAs and HTs to achieve the implementation objective by 2015*

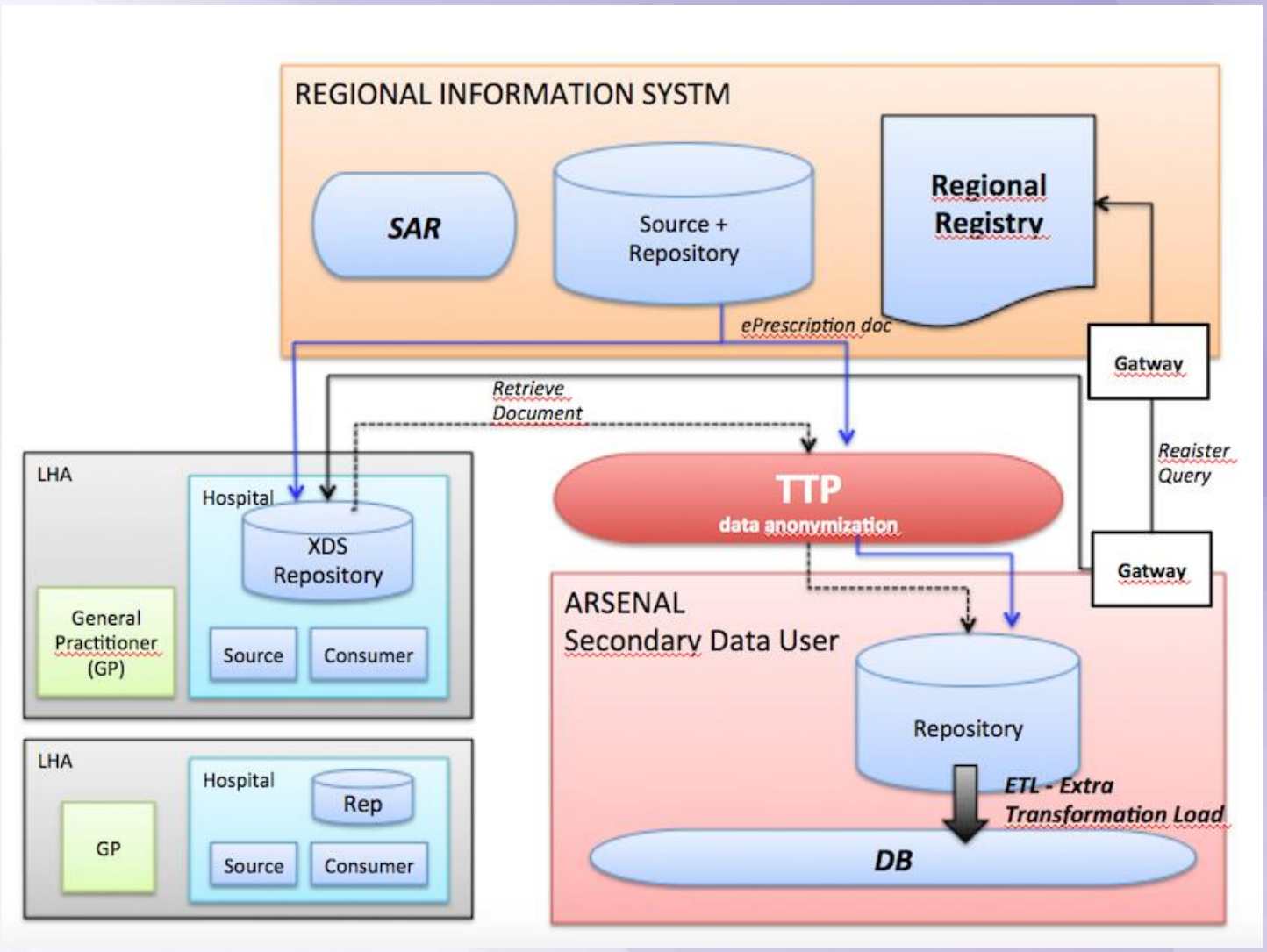
Project Organization



FSEr actors architecture



FSEr data sharing



The HIE as a motor working for a“Sanità KM Zero” to reset the distances

- **It’s a tool for a good health**;
- It’s an **ecosystem of e-health services to reset the distances** among the actors of the heathcare system

New ways to, new pathways, new tools to have access to the healthcare world for citizens and social and helthcare operators, everywhere in every time.

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 ad 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**

Connectting the network points

Citizens

Patients

Caregivers

Healthcare operators:

GPs

Specialists

Pharmacists

Administratives

Comuni

Enti locali

Terzo settore

In "*Sanità km 0*" 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..

EHR in Veneto Region: the FSEr project

First step:

Pharmaceutical prescription & electronic referral

Main standards/guidelines

The technical specifications took into account several IHE (Integrating the Healthcare Enterprise) integration profiles. The most relevant are:

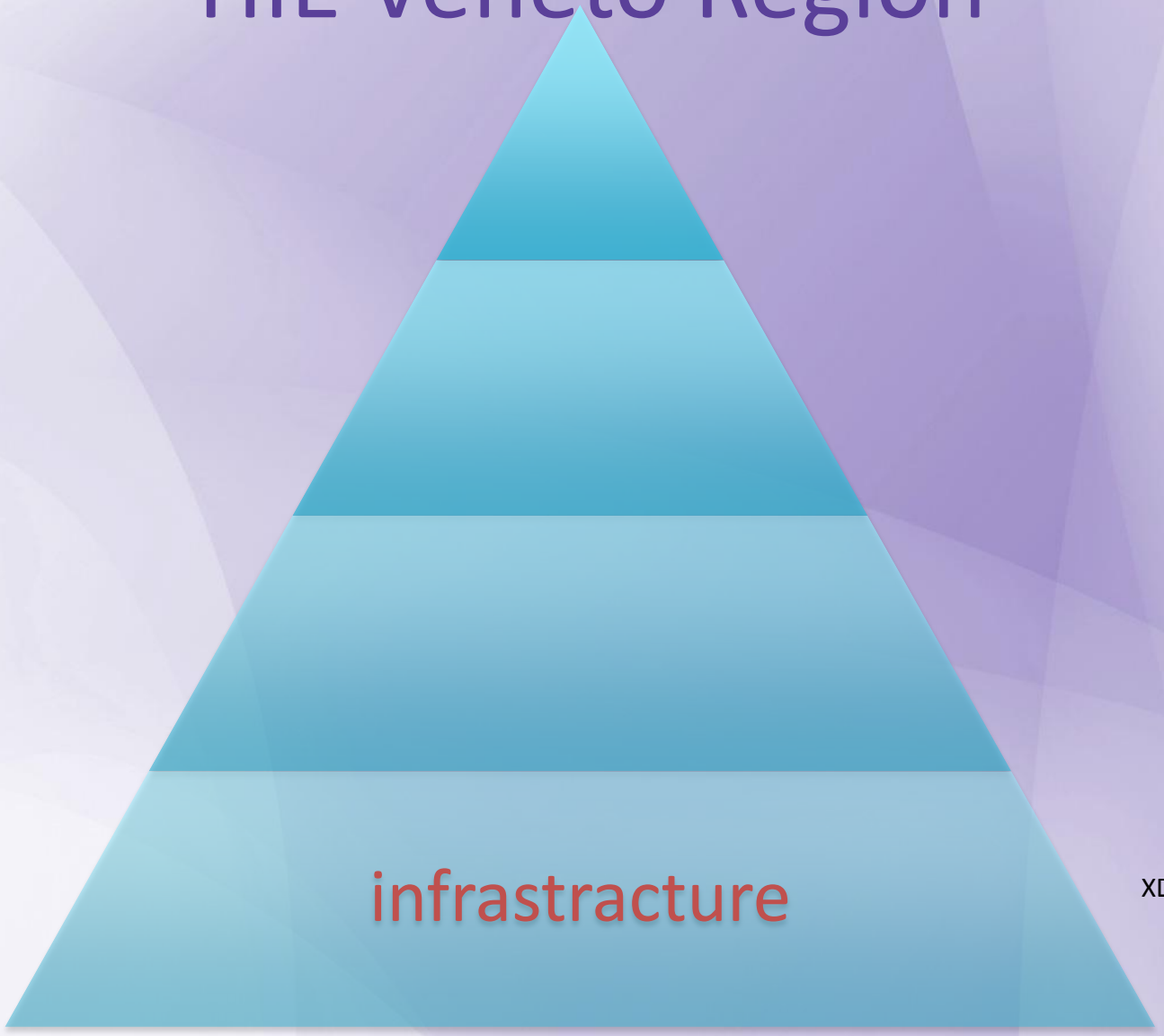
- Storage and query of ePrescription and eReferral
  - ✓ XDS.b (Cross - Enterprise Document Sharing)
- ePrescription and eReferral workflow tracking
  - ✓ XDW (Cross - Enterprise Document Workflow)

Document format:

- ✓ HL7 CDA-2 (Health Level 7 Clinical Document Architecture release 2)

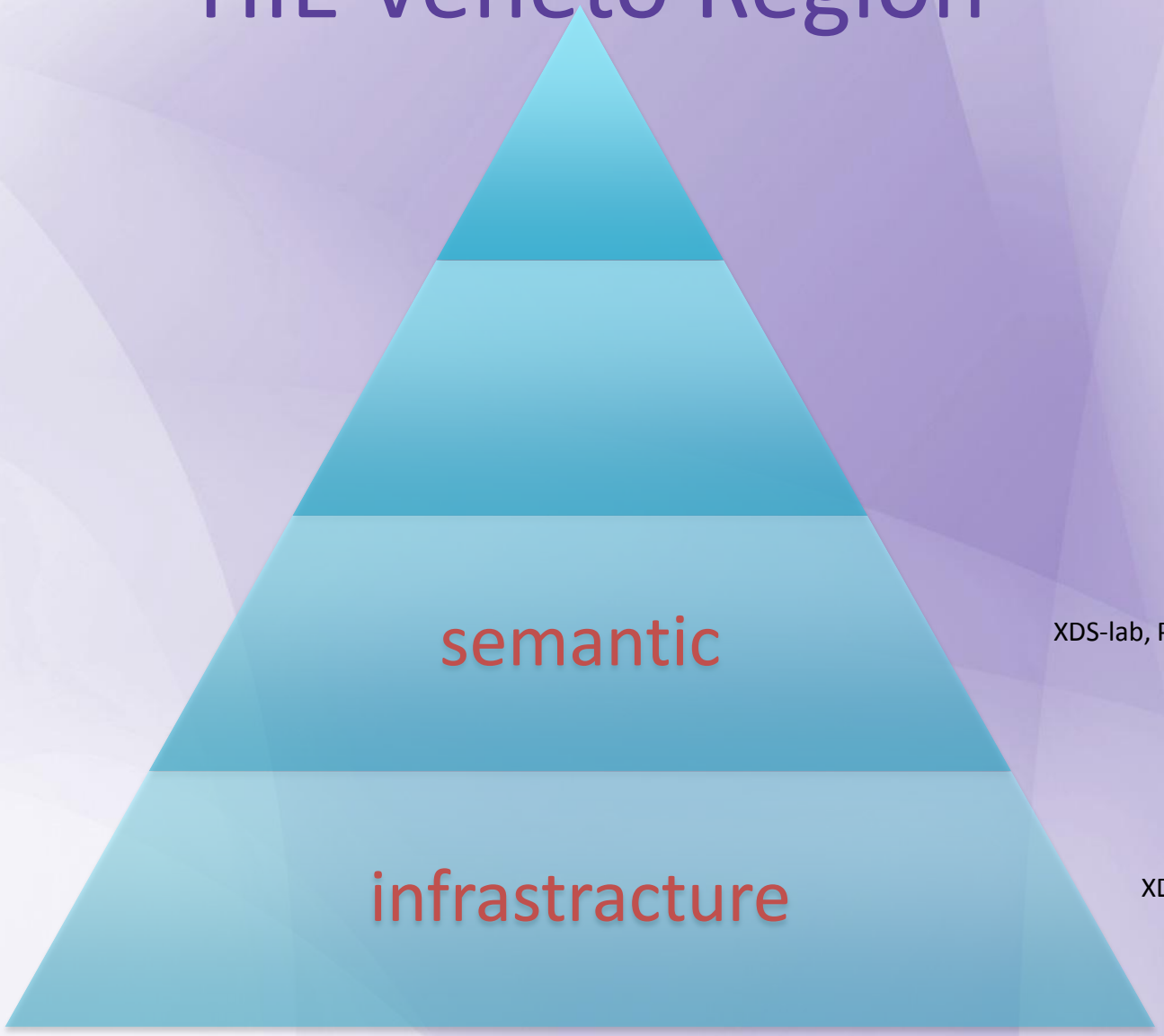
Source: www.ihe.net

HIE Veneto Region



XDS, XUA, BPPC

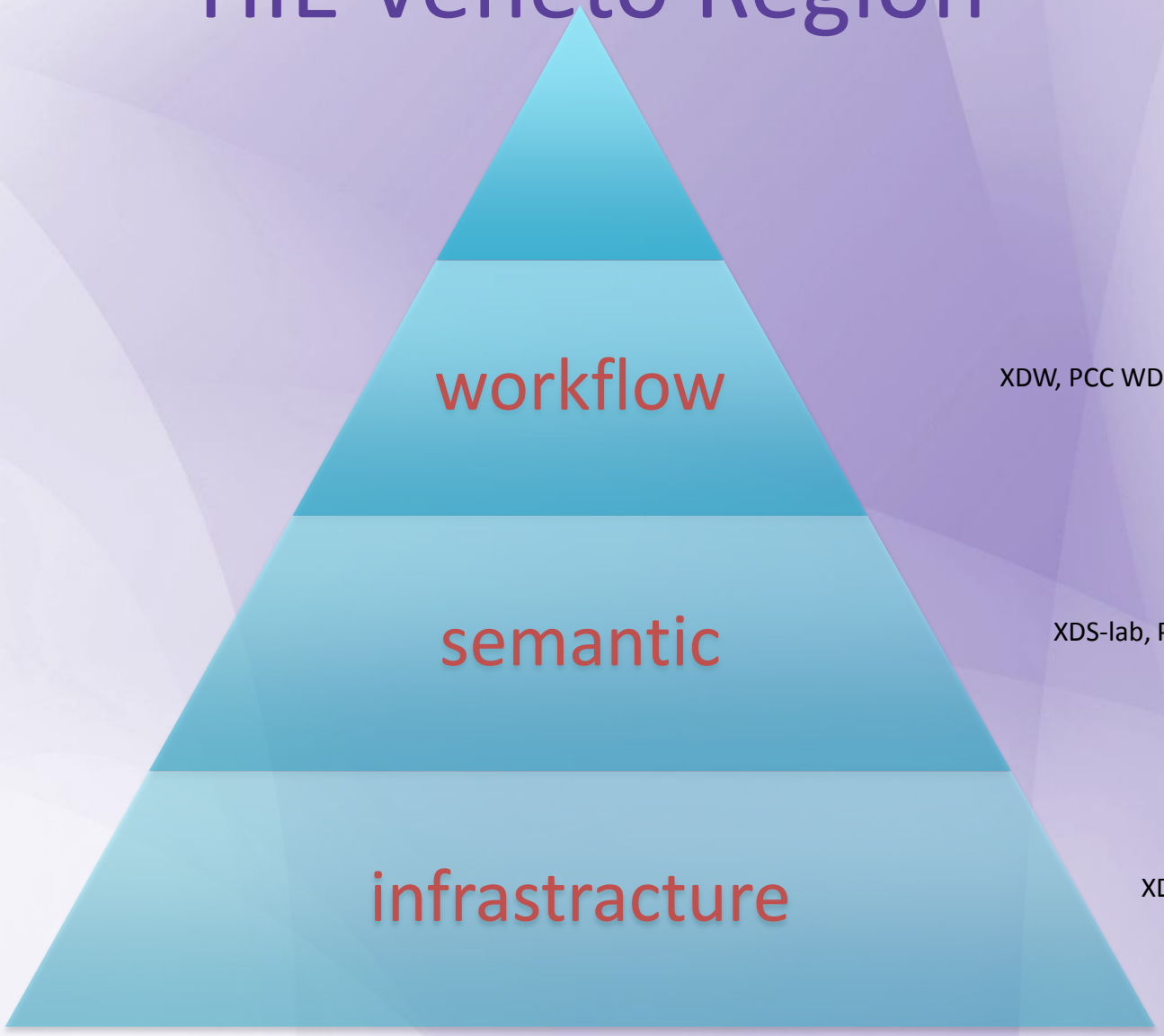
HIE Veneto Region



XDS-lab, PCC profiles

XDS, XUA, BPPC

HIE Veneto Region



XDW, PCC WD profiles

XDS-lab, PCC profiles

XDS, XUA, BPPC

HIE Veneto Region

QRPH profiles

XDW, PCC WD profiles

XDS-lab, PCC profiles

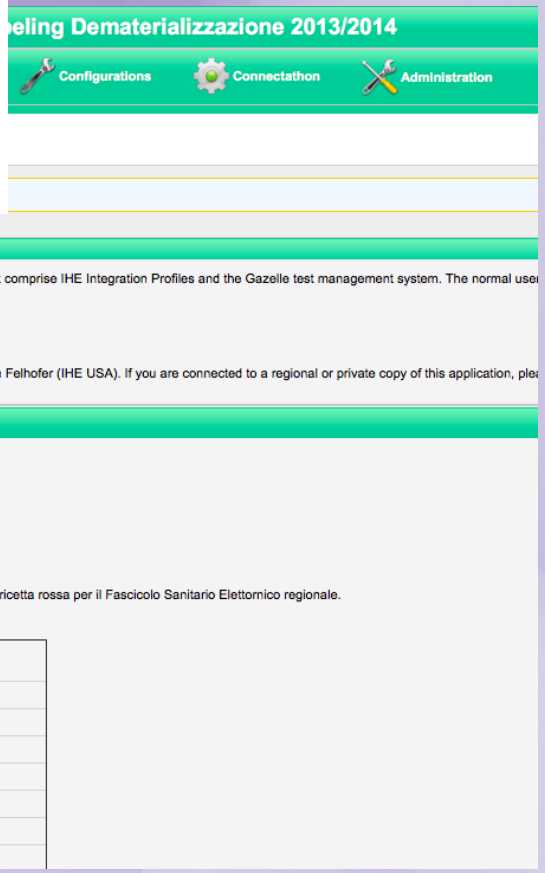
XDS, XUA, BPPC

Testing & tools the platform

Testing @ Consorzio Arsenal

Access tools

Tool	Description
Gazelle Test Management	The Gazelle Test Management Test Bed
EVSClient	Access to Gazelle validation services
SchematronValidator	Access to Gazelle Schematron Validator
Gazelle Proxy	Access to Gazelle Proxy



Testing & Tools approach

- **First step – Labelling** : testing performed in “vitro” situation using simulators to assess the adherence of Project technical specification (performed in the Arsenàl.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
total	**42**	**2**	**44**

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

Starting with..

Estimated target 820.000 users

Sanità kmzero

presentazione
user interface

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

APP FSEr

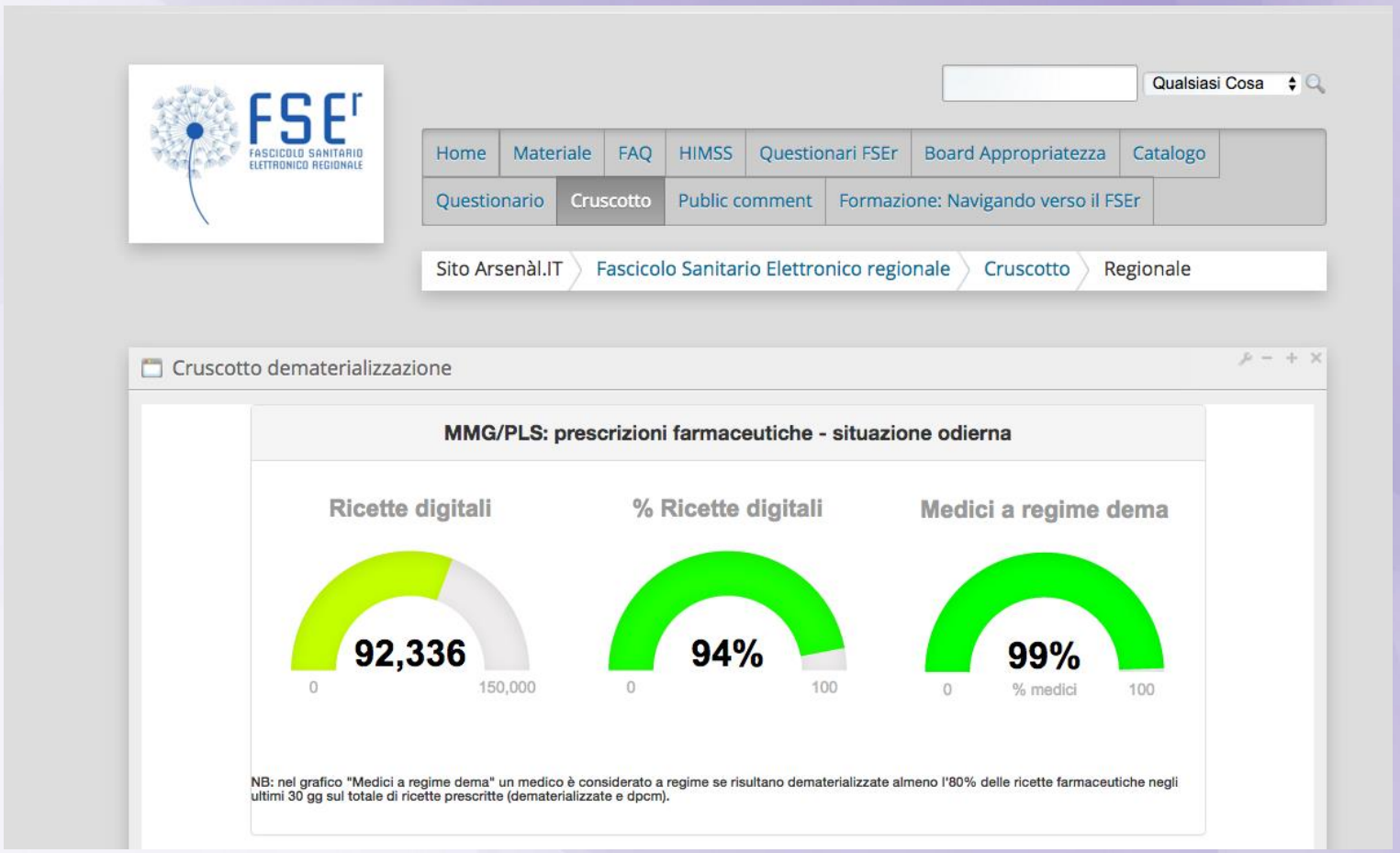
The possibility to manage your e-prescriptions on your own and with your GP

- 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

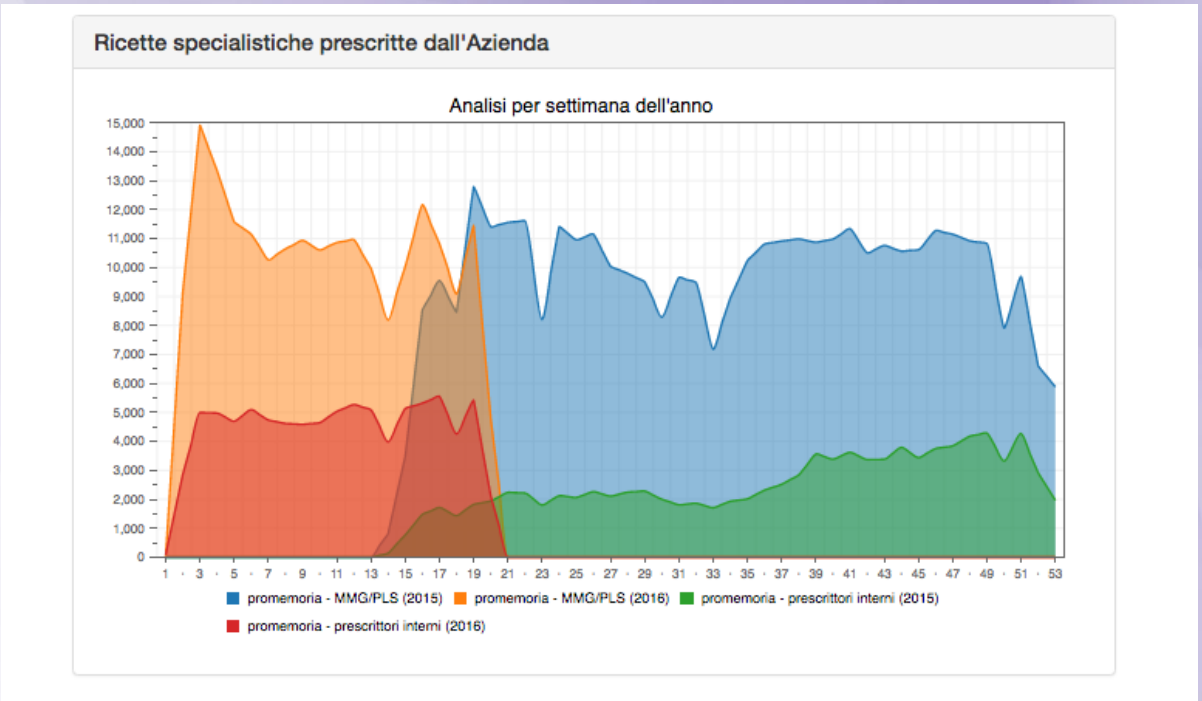
The BIG DATA system from HIE

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

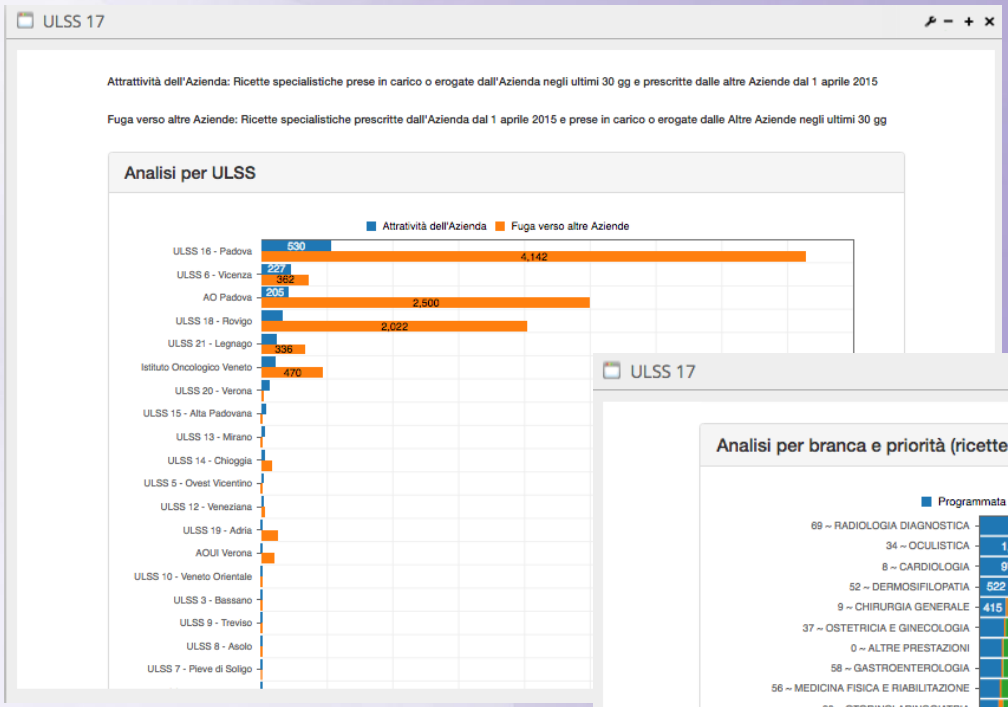
Monitoring results: the regional dashboard

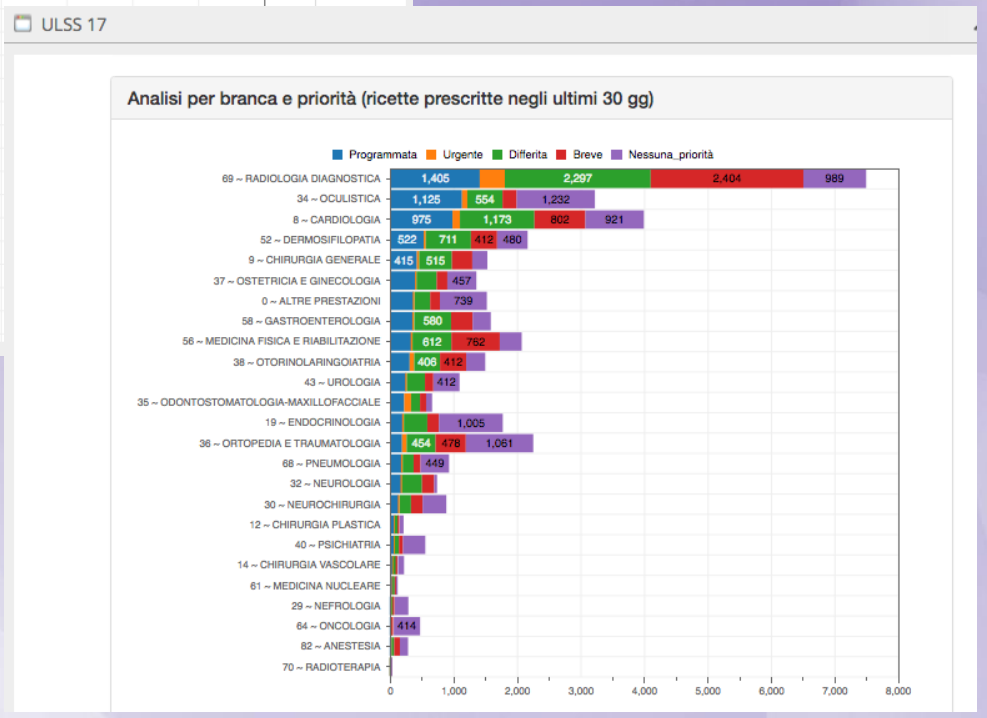


Monitoring results: the LHAs dashboard



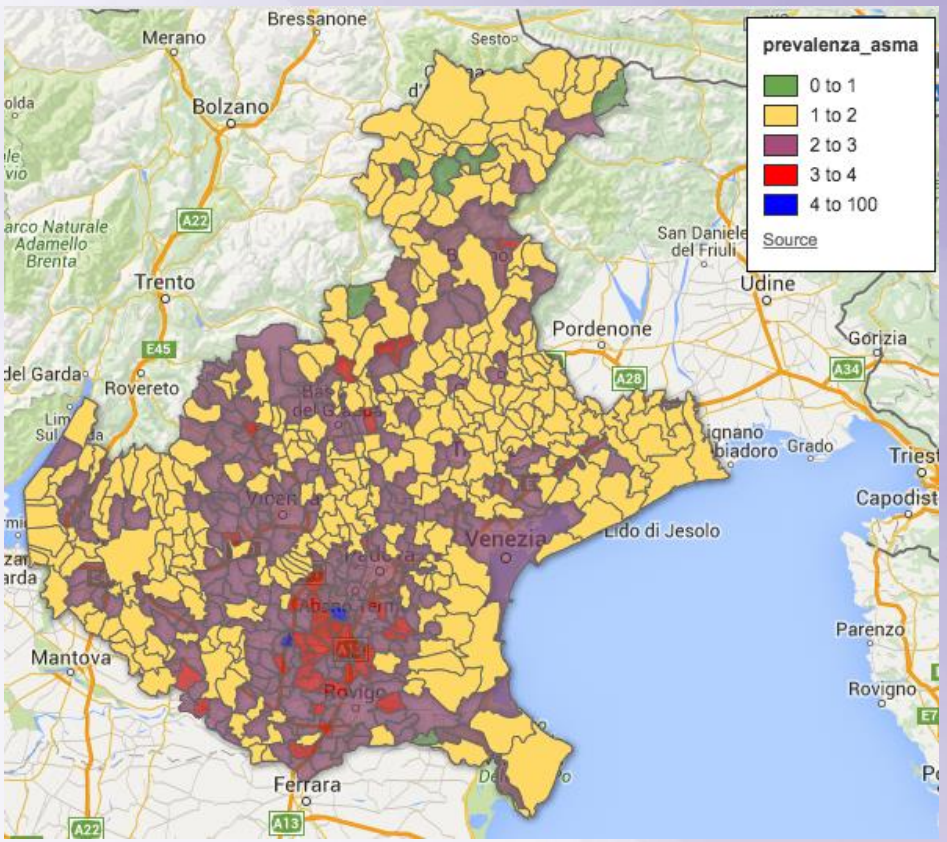
Government aims



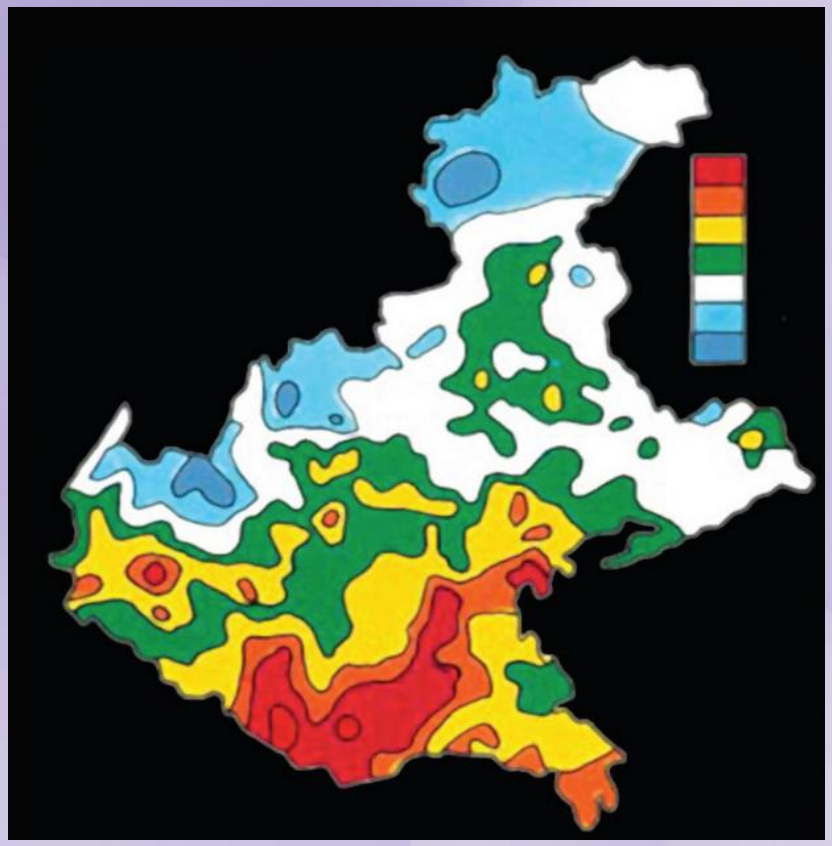


Clinical & Advanced analytics

Asthma prevalence of drug consumption



Air purity



Evidence based medicine

Focus on HIE National Level

Italian plan for creation of the national infrastructure

- ***STARTS FROM***: Creation of Regional HIEs: 2012-2015
- Development of techincal Spec for Interoberability between reigonal 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

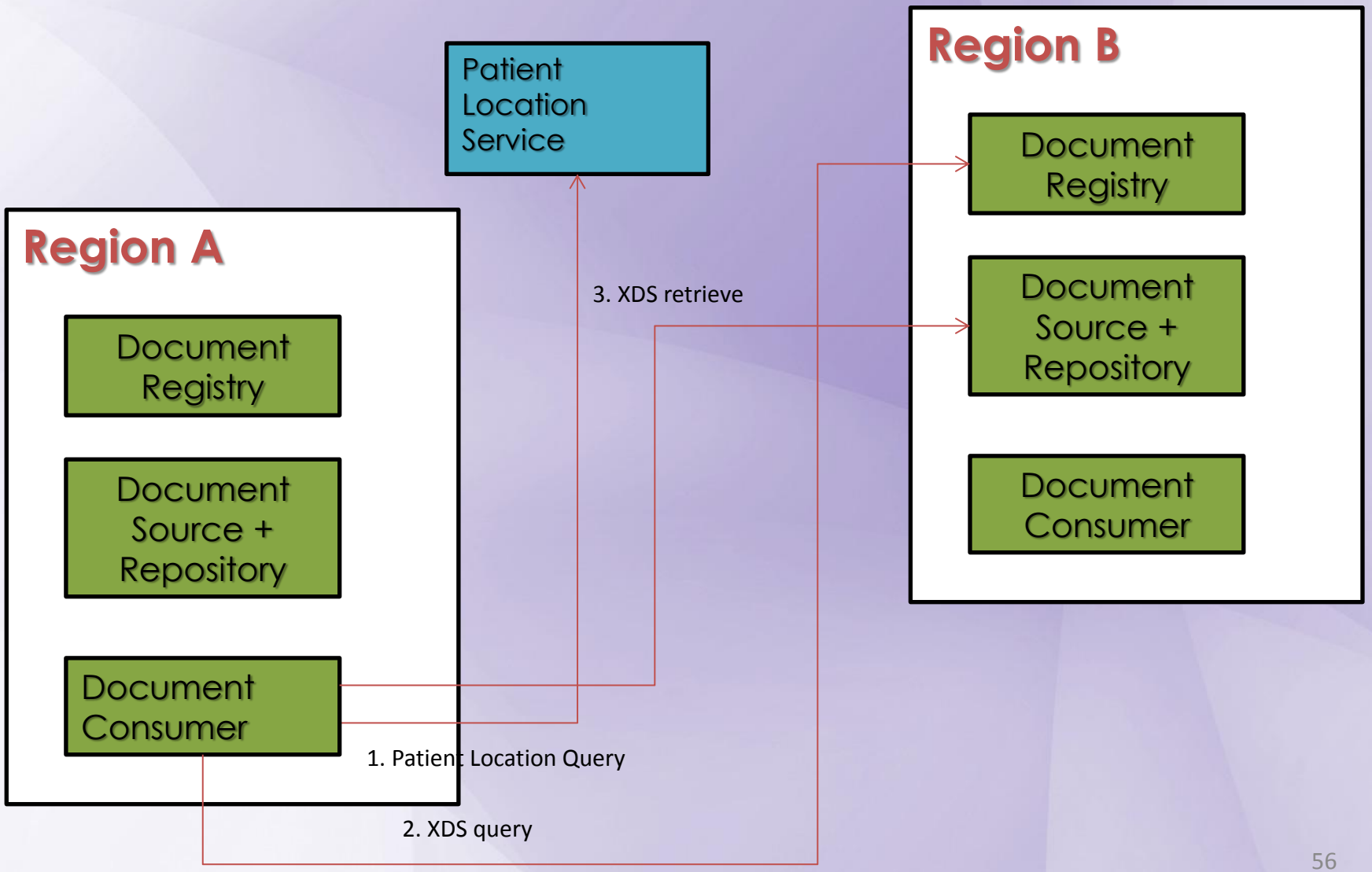
Technical Solution Defined

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

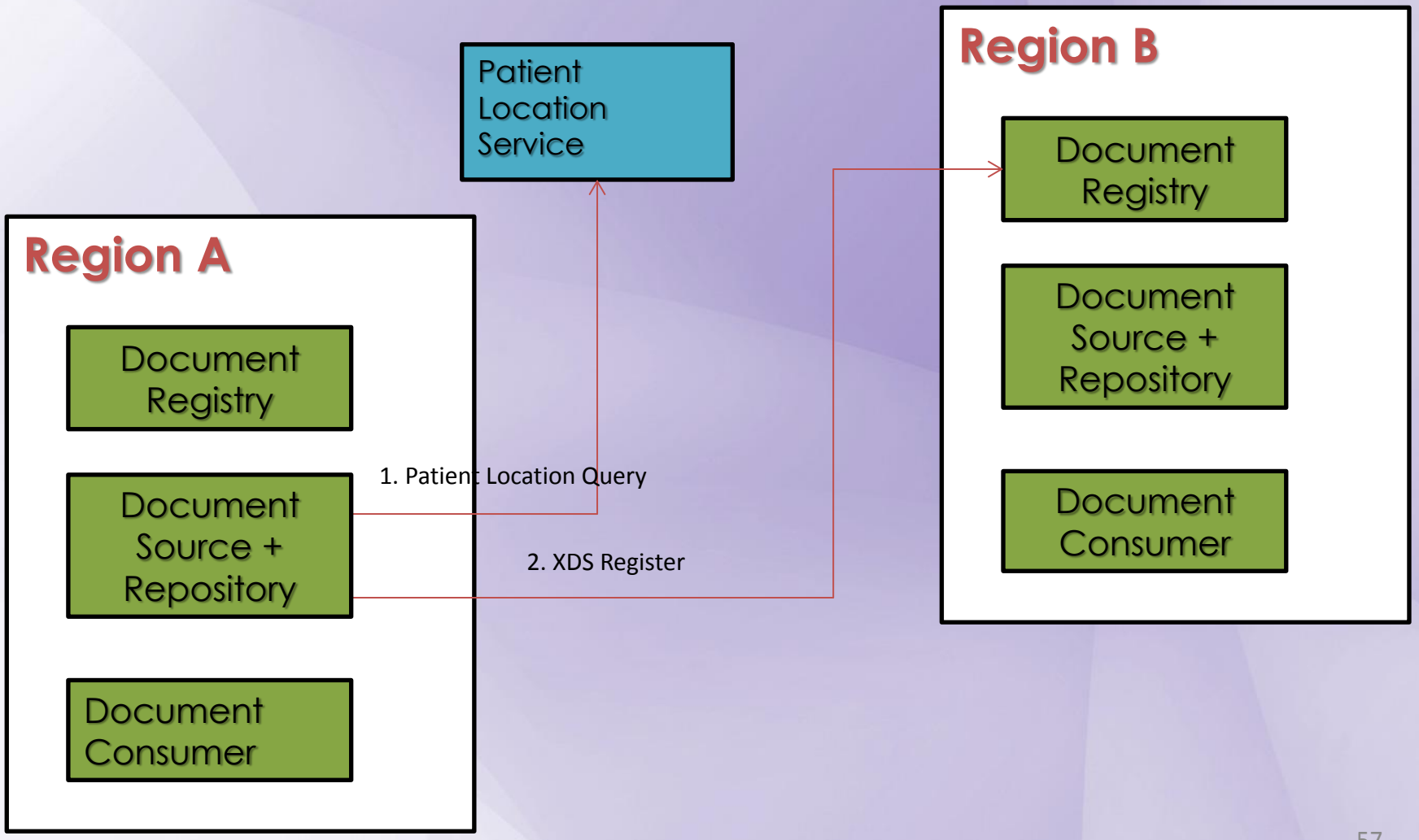
WITH SOME DIFFERENT REQUIREMENTS:

- 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 assistence 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)

Document Discovery/Access



Document Creation



Next Steps

- 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 te 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

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