



IPE Event – Leiden

Block 1: IHE Introduction and overview



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Co-chair, Pharmacy Planning committee

Co-chair, Global Deployment Coordination Committee (GDC)

Member, IHE International Board

CodeWerk Software GmbH, Austria

Agenda

- What is IHE?
 - What is the actual problem IHE is solving?
 - What is IHE's place in the SDO landscape?
- Introduction into the IHE methodology
 - The two pillars of IHE: Profiling and Testing
- The IHE organizational structure
 - How is IHE organized on a global scale?
- Leveraging of IHE in Healthcare
 - Prominent examples how IHE solved „unresolvable“ interoperability problems in Healthcare

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Standards: Necessary, but not sufficient

- **Standards are needed for achieving Interoperability**
- But Standards are ...
 - Foundational - to interoperability and communications
 - Broad - varying interpretations and implementations
 - Narrow - may not consider relationships between standards domains
 - Plentiful - often redundant or disjointed
 - Focused - standards implementation guides focus only on a single standard

IHE provides a standard process for implementing multiple standards

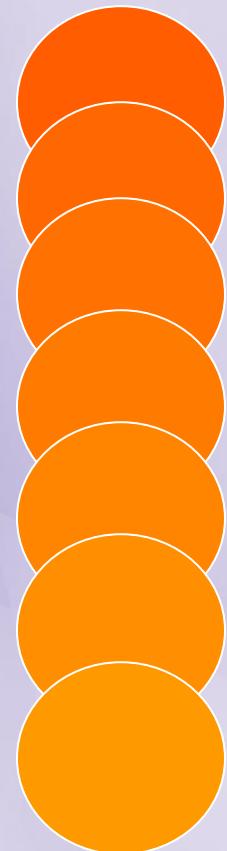
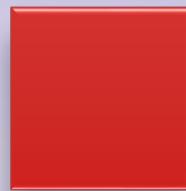
What is IHE?

Standards



eHealth Projects

Interoperability use cases typically require „combinations“ of standards
- but how to compose?



What is IHE?

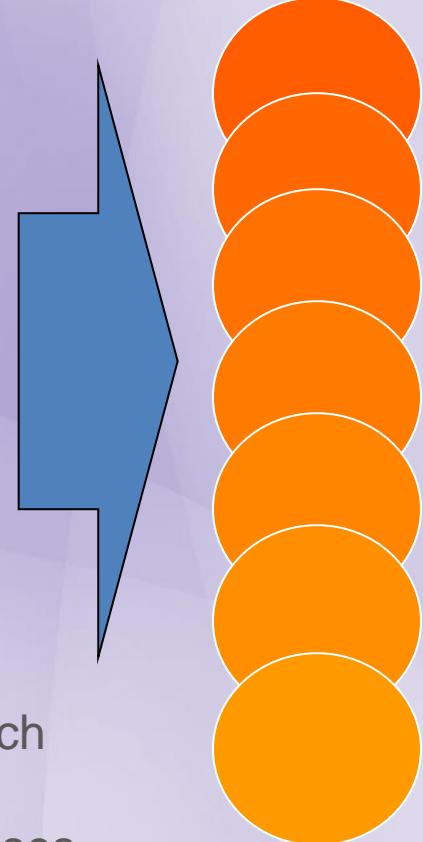
Standards



Profiling and Testing



eHealth Projects

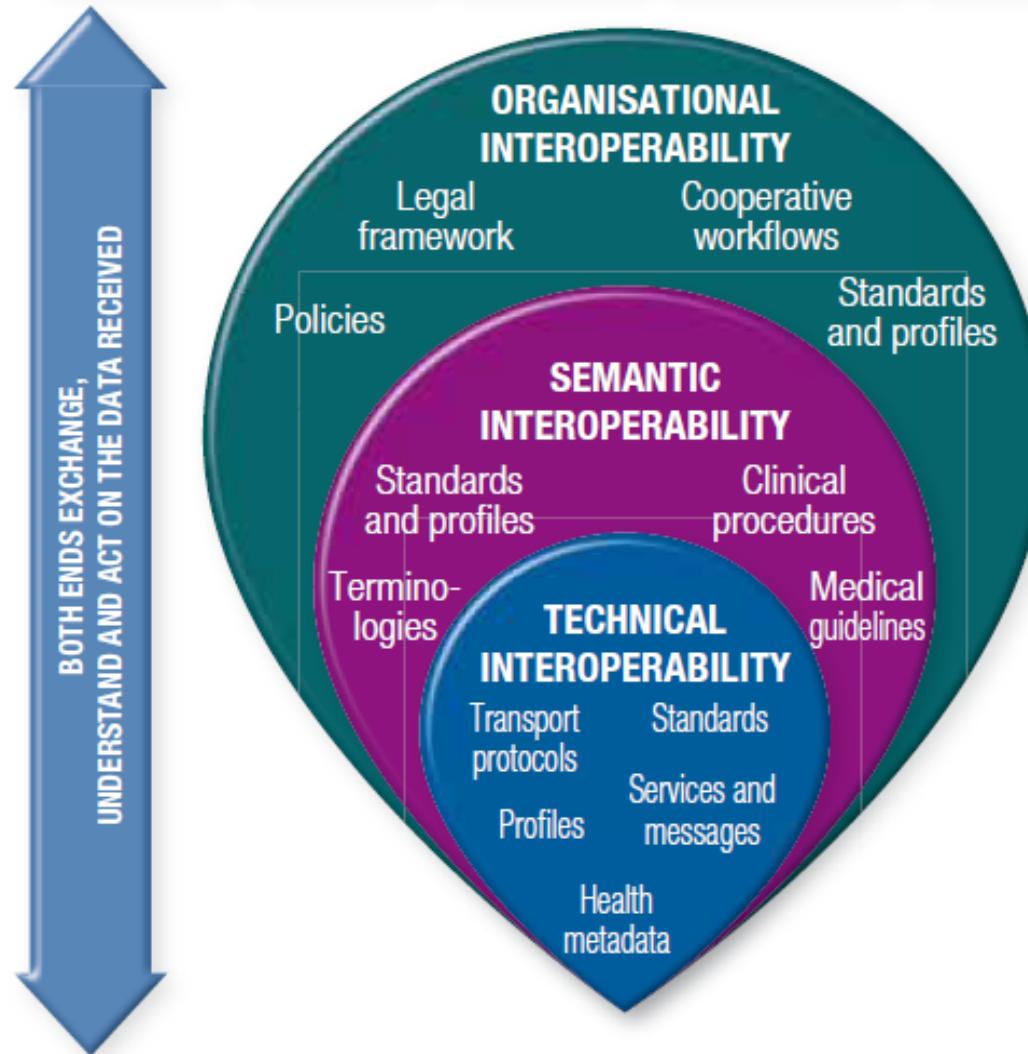


IHE is a ***non-profit*** SDO which uses „***existing***“ standards to profile Interoperability use-cases

IHE in a nutshell

- IHE is a non-profit SDO which uses „**existing**“ standards to profile **Interoperability** use-cases
 - Define the exact “composition” of the different base standards to fulfill the use-case
- Operates in the **intermediate layer** between the Base standards and the Interoperability Specifications of eHealth projects
- IHE is based on two pillars: **Development** of Profiles and **Testing** and Deployment
- IHE follows a consequent “**user**” and “**vendor**” collaboration **paradigm**
- Integration Profiles divide the use-case into **Actors** and **Transactions**
- Profiles cover the **80%** which are “**globally common**”

Layers of Interoperability



ORGANISATIONAL INTEROPERABILITY

is the will and ability to work together and exchange information. It depends on the overarching environment composed of laws, policies, and cooperation agreements

SEMANTIC INTEROPERABILITY allows both sides to understand the meaning of the information exchanged across cultural and linguistic barriers

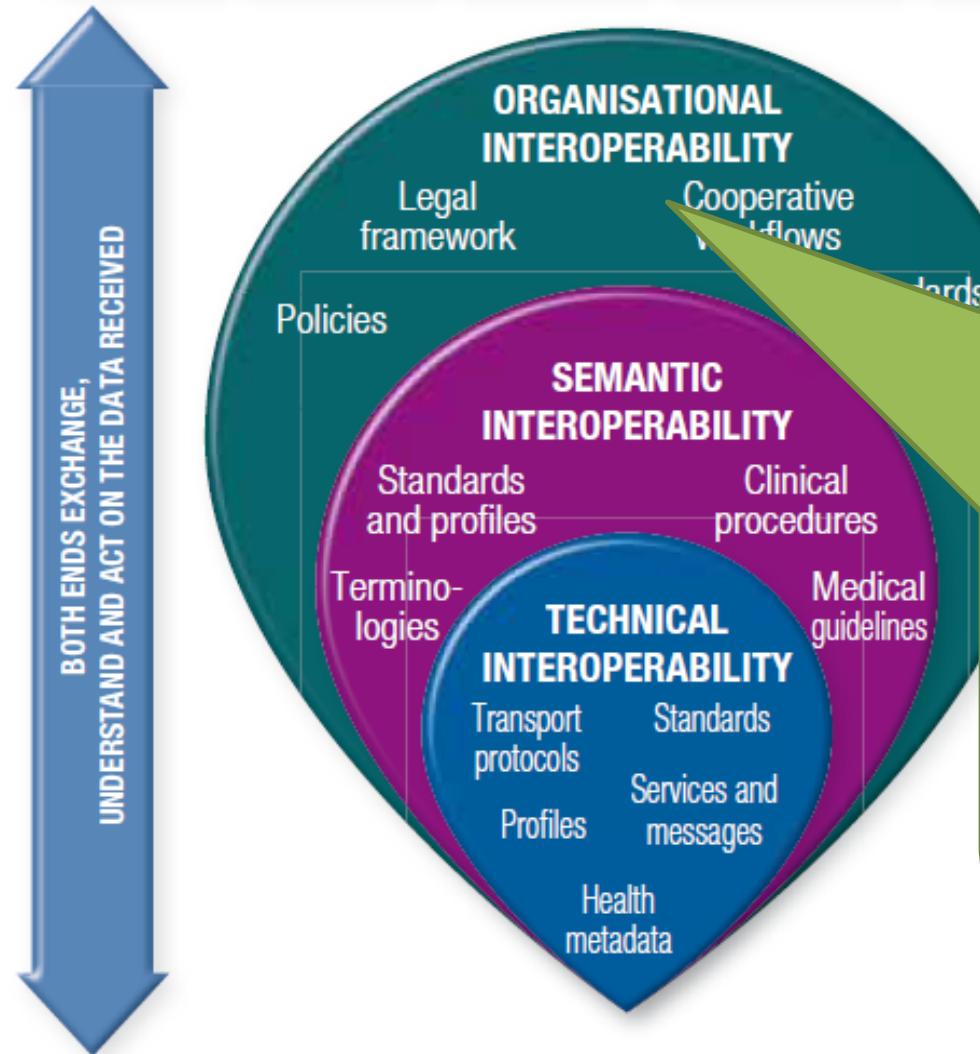
TECHNICAL INTEROPERABILITY enables the exchange of information from a technical standpoint and guarantees:

- data security and privacy
- data integrity
- access to relevant data associated with an identified patient

eHealth Stakeholder Group: Report "Perspectives and Recommendations on Interoperability", March 2014

http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=5168&usg=AFQjCNEkGJHkR4TyyycRbj5FmDif3T7YPA&sig2=WHoQC4xURmGXaJTYt-Mt1A

Layers of Interoperability



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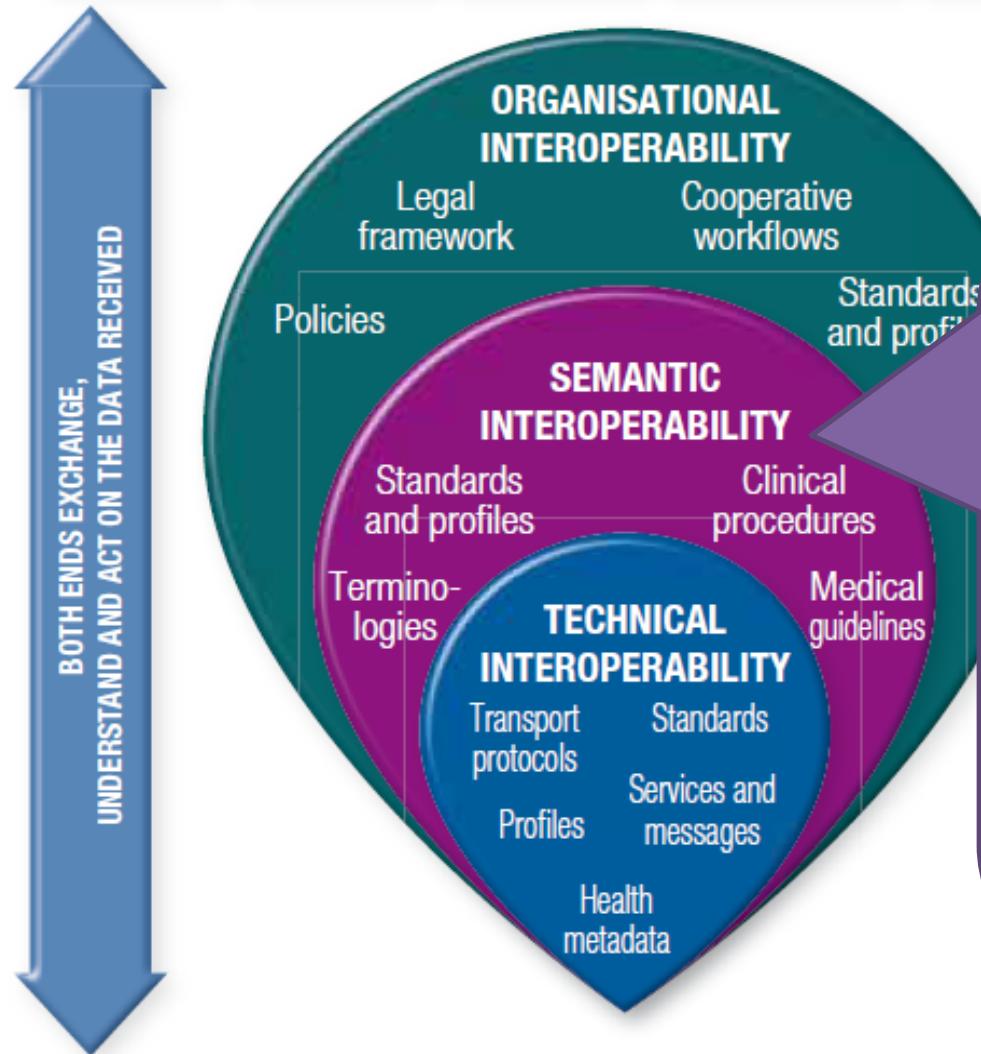
Usually most complex and lengthy layer

- Much politics involved
- Convince stakeholders to pull on the same string
- Overcome hidden agendas and attitudes
- Harmonize supra-organizational workflows (process perspective)

eHealth Stakeholder Group: Report "Perspectives and Recommendations on Interoperability", March 2014

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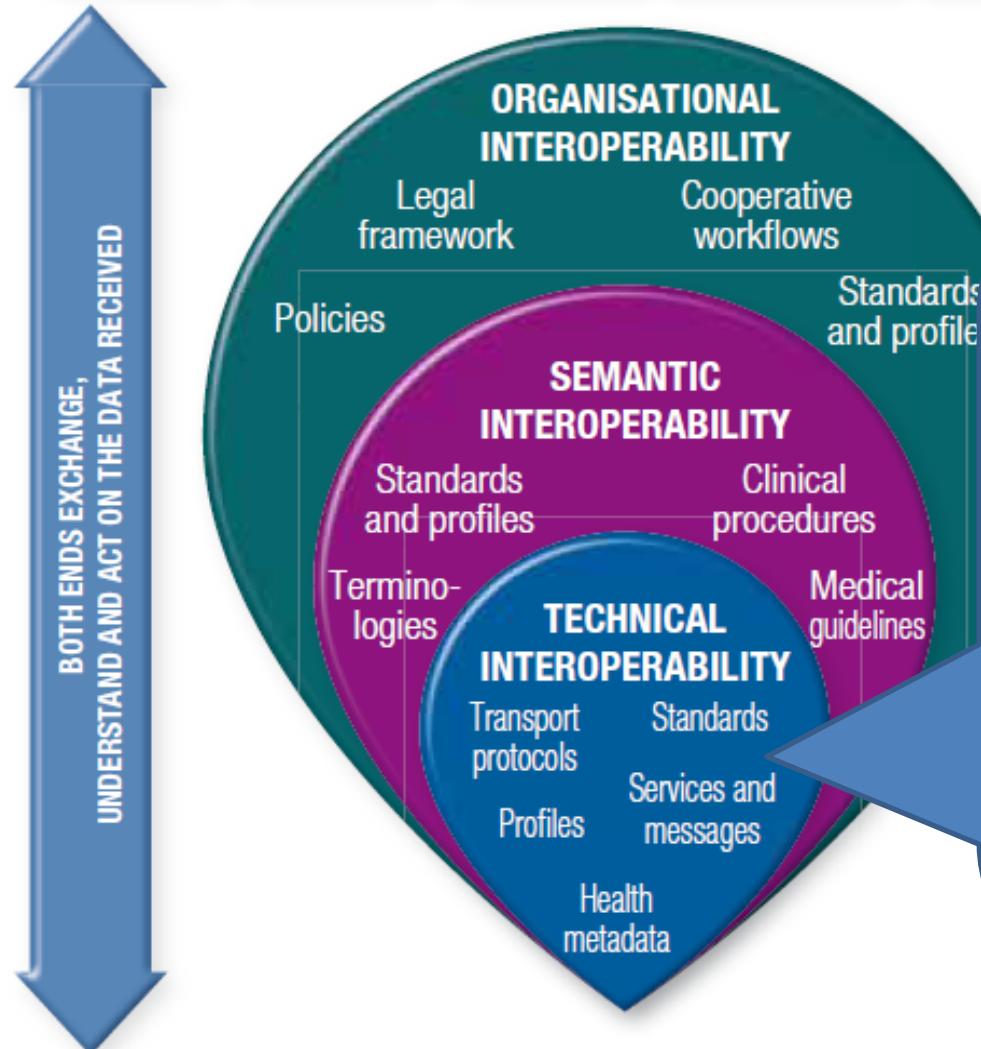
Medium complex layer

- Harmonize supra-organizational workflows (content perspective)
- Harmonize Terminologies
- Involvement of Medical personell required

eHealth Stakeholder Group: Report "Perspectives and Recommendations on Interoperability", March 2014

http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=5168&usg=AFQjCNEkGJHkR4TyyycRbj5FmDif3T7YPA&sig2=WHoQC4xURmGXaJTYt-Mt1A

Layers of Interoperability



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Low complex layer

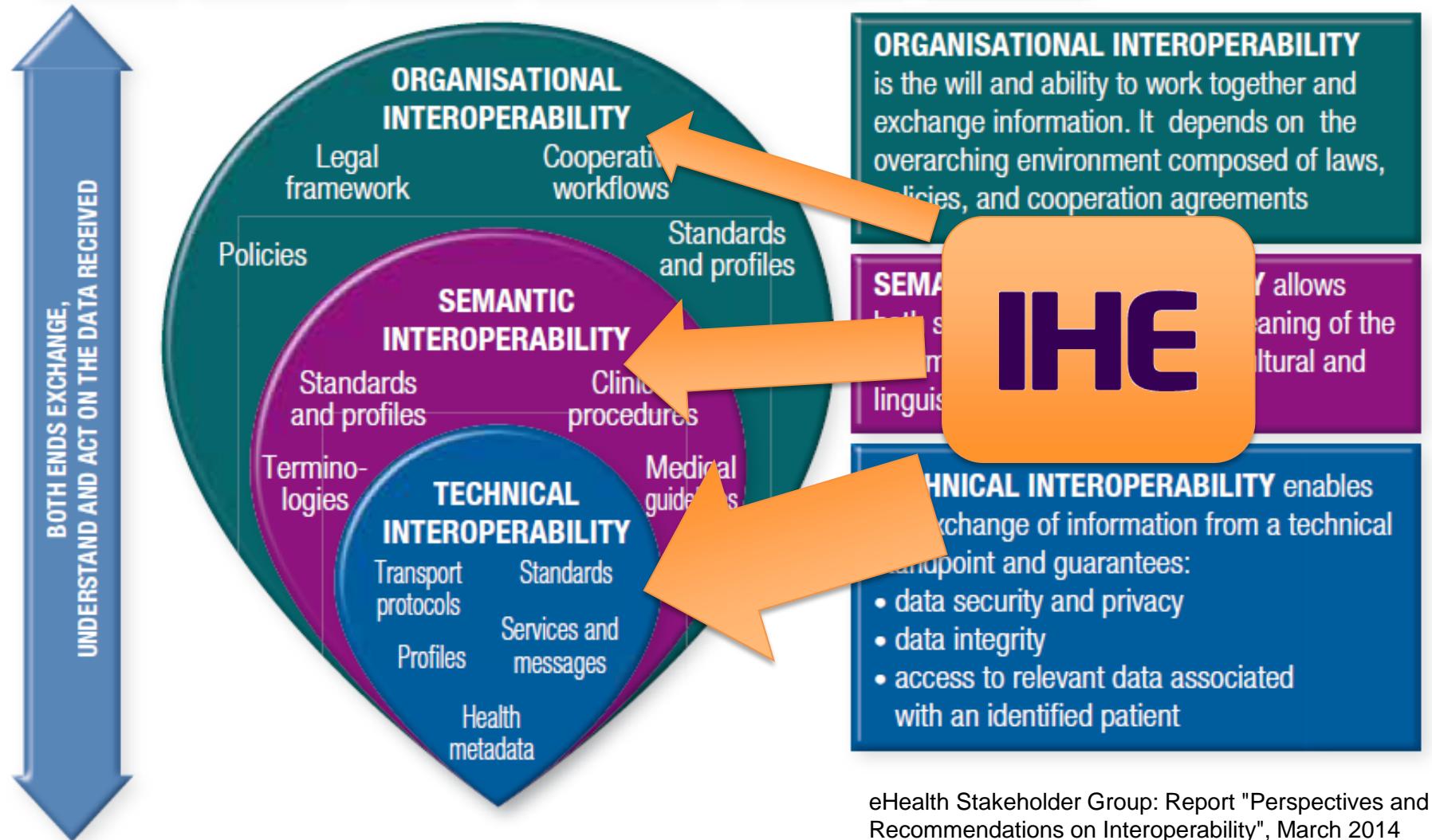
- Define architecture
- Define HIE components
- Create interoperability specification
- Do interoperability testing

Standards and best-practices in place

eHealth Stakeholder Group: Report "Perspectives and Recommendations on Interoperability", March 2014

http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=5168&usg=AFQjCNEkGJHkR4TyyycRbj5FmDif3T7YPA&sig2=WHoQC4xURmGXaJTYt-Mt1A

Layers of Interoperability



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Challenges of HIE

- **Multi-stakeholder, multi-systems**
 - Paradigm change needed towards cooperation and collaboration
- **Significant investment needs to be channelled**
 - Maximum sustainability needed, multi-vendor approach
 - Avoid stranded costs
- **Commonly accepted Interoperability specification needed**
 - Based on international standards
 - Stable guidance needed
 - Best-practise needed
- **Procurement and testing procedures must be created**
 - Extensive specifications raise efforts and costs (not only in the beginning)

IHE as framework for HIE

IHE's philosophy **stimulates cooperation** on organizational, strategical and political levels

Users and Vendors work together!

Engagement in IHE results in benefit for yourself

IHE **supports the paradigm change** needed nowadays

Stakeholders have to work together to solve the challenge

IHE is a **stable guidance**

By profiles, best-practices, others doing the same, etc.

IHE is a **solid basis** for the Interoperability specification

Open, free, vendor-neutral

Typical use-cases already profiled: Patient identification and demographics, Sharing clinical documents, eP/eD, ...

IHE **cuts costs on every edge**

Specification, Procurement, Testing

Bet on IHE as early as possible to leverage maximum benefits

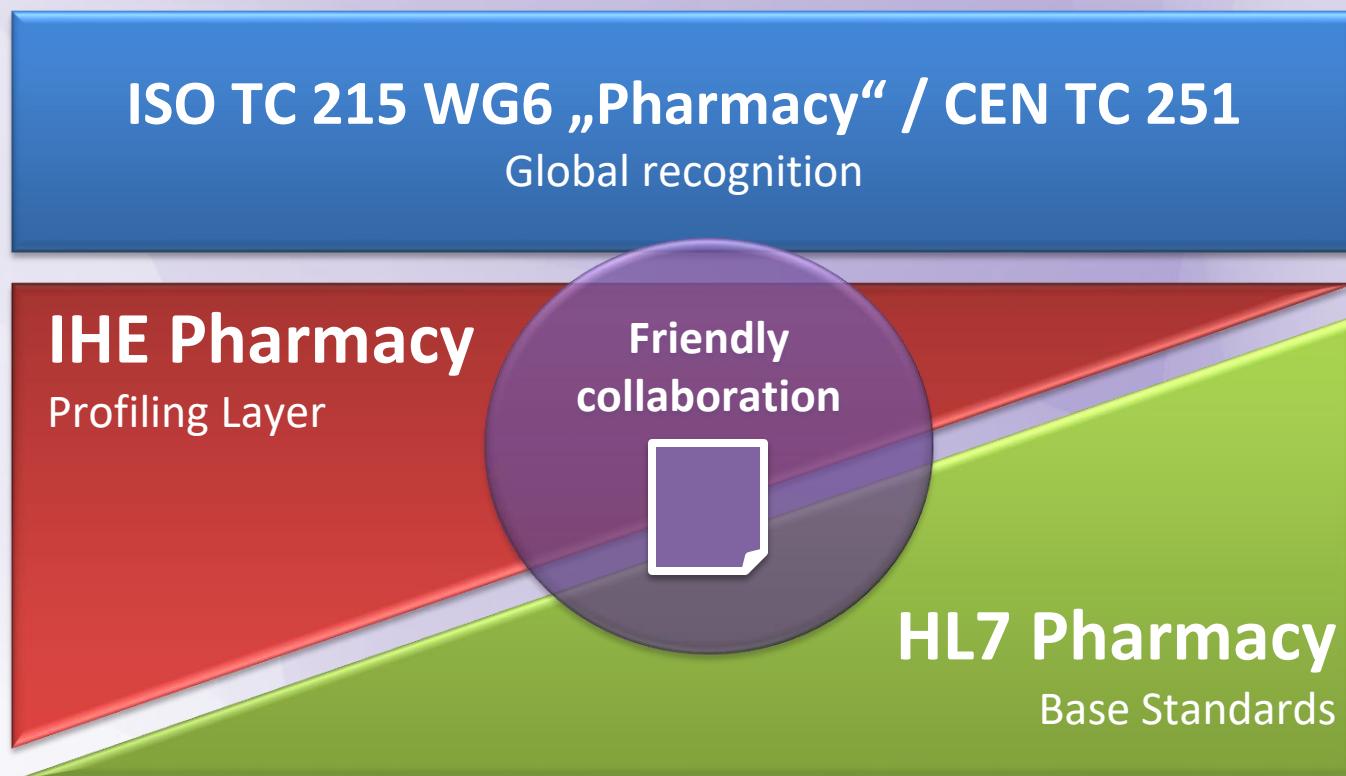
Liaisons to other SDOs

- IHE is maintaining relations to other SDOs
 - HL7
 - ISO TC215, Member of “Joint Initiative Council”
 - DICOM
 - SNOMED
 - GS1
 - CDISC
 - Personal Connected Health Alliance (“Continua”)
 - ...



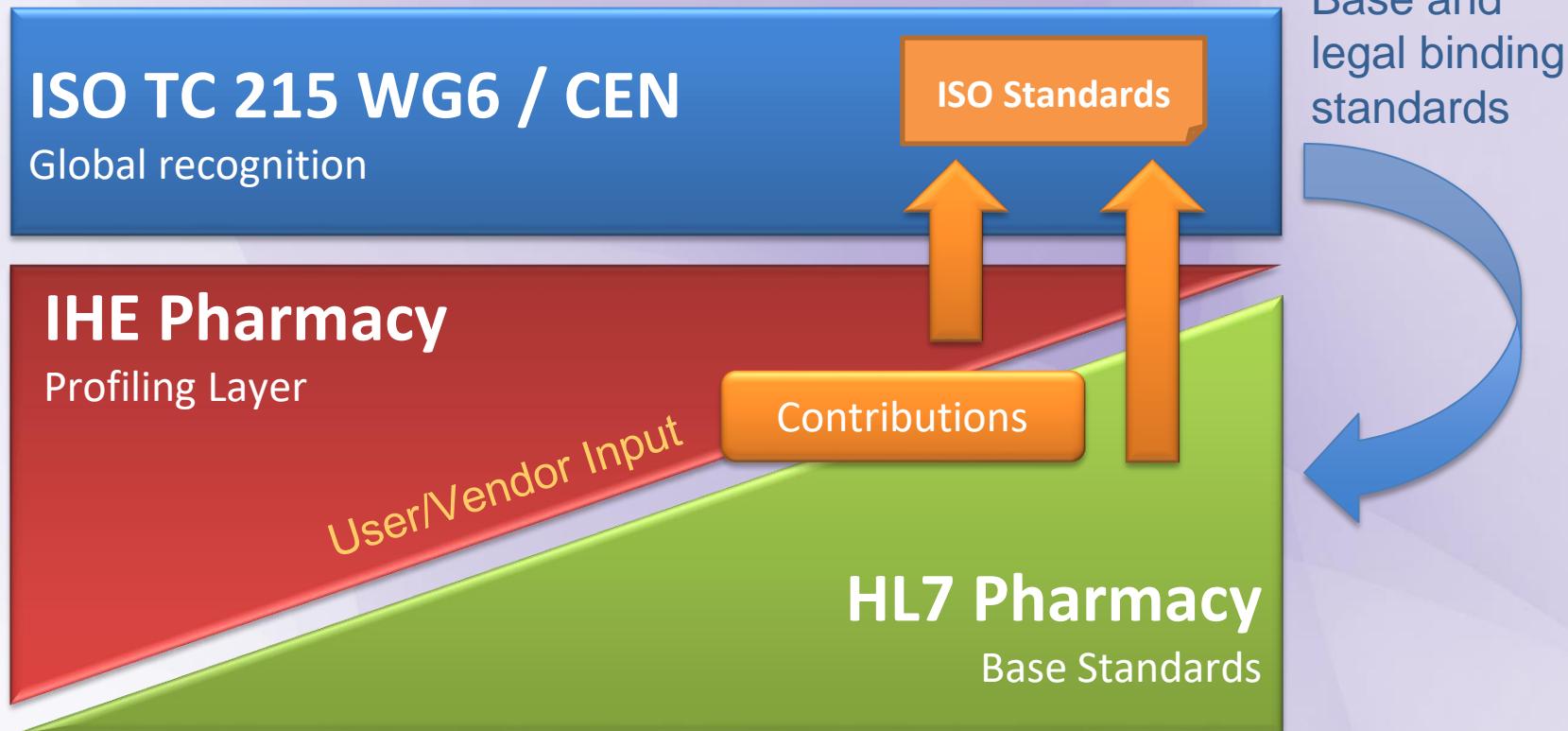
Liaisons

Example: IHE Pharmacy Liaison with ISO



Liaisons

Example: IHE Pharmacy Liaison with ISO



Liaisons

Example: IHE Pharmacy Liaison with ISO



Questions?

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IHE methodology (ISO TR 28380-1 to 3)



IHE methodology (ISO TR 28380-1 to 3)



Profile cycle results in ...

- **Technical Framework for each Domain**
 - Volume 1: **Integration Profiles**
 - Usecase-, Actors/Transaction- and Process Flow descriptions
 - Volume 2: Transactions
 - Detailed description of the transactions
 - Volume 3: Cross-Transaction and Content- Specifications
 - Volume 4: National Extensions
- **Integration Profiles**
 - Cover a specific use-case
 - Divides the use-case into ...
 - **Actors**, later implemented as software modules, and
 - **Transactions** between them
 - Cover the 80% which are common
 - Stages of maturity
 - Trial Implementation
 - Final text

Integrating the Healthcare Enterprise

IHE

IHE IT Infrastructure Technical Framework

Volume 2a
(ITI TF-2a)

Transactions Part A – Sections 3.1 – 3.28

Revision 12.0 – Final Text
September 18, 2015

Please verify you have the most recent version of this document, which is published [here](#).

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IHE methodology (ISO TR 28380-1 to 3)



Testing as part of the cycle

- Everyone accepts: **Testing is crucial for success of a project**
- But reputation of testing is low
 - It is a lot of effort and expensive
 - Nothing is „created“, no innovation -> simply boring!
- Everyone relies on that „it is done by someone, somehow“
- Problem: Testing becomes a bottleneck in the future
 - Large-scale eHealth projects are starting up everywhere, vendors start getting overloaded by many tailored testing needs
- Solution: Synergies in testing must be found!

That's why IHE invented the Connectathon!

CAT – Triple purpose

- 1. Test implementation of the IHE profiles** within product/open source
 - Verify that the vendors did a good job
- 2. Verify that what the committees specified** is clear!
 - Verify that the Technical Frameworks are not ambiguous
 - Verify that the Technical Committee did not miss anything
- 3. Build a community** of computer geeks who loves local brewed beers and have fun working together to connect healthcare



IHE CONNECTATHON
EUROPE VENICE APRIL 3-7 2017

Home | Connectathon | Contact us

What is Connectathon?
A five-day "connectivity marathon" for testing the interoperability of health information systems.

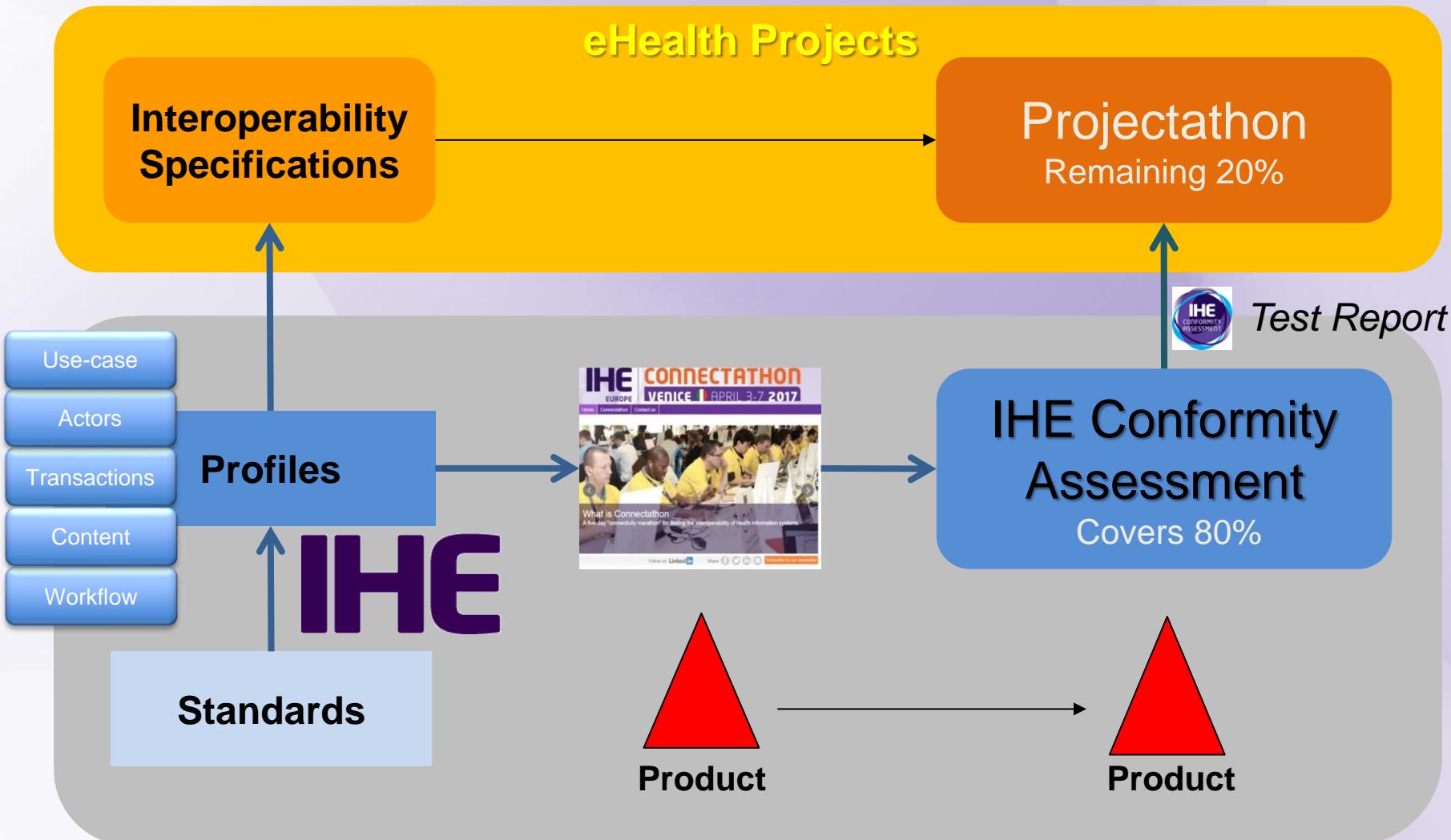
Follow on LinkedIn Share Subscribe to our newsletter

Conformity Assessment

- **IHE International Conformity Assessment** program was launched in 2015 and is the next step in testing rigor
 - More rigorous testing process
 - Assessment at product level
 - Stronger assurance of interoperability to marketplace
- Based on an internationally recognized quality system
 - Testing for specific IHE Profiles is performed by Testing Laboratories **ISO17025 accredited**
- Conformity assessment scheme
 - **Ensure world-wide equivalence**



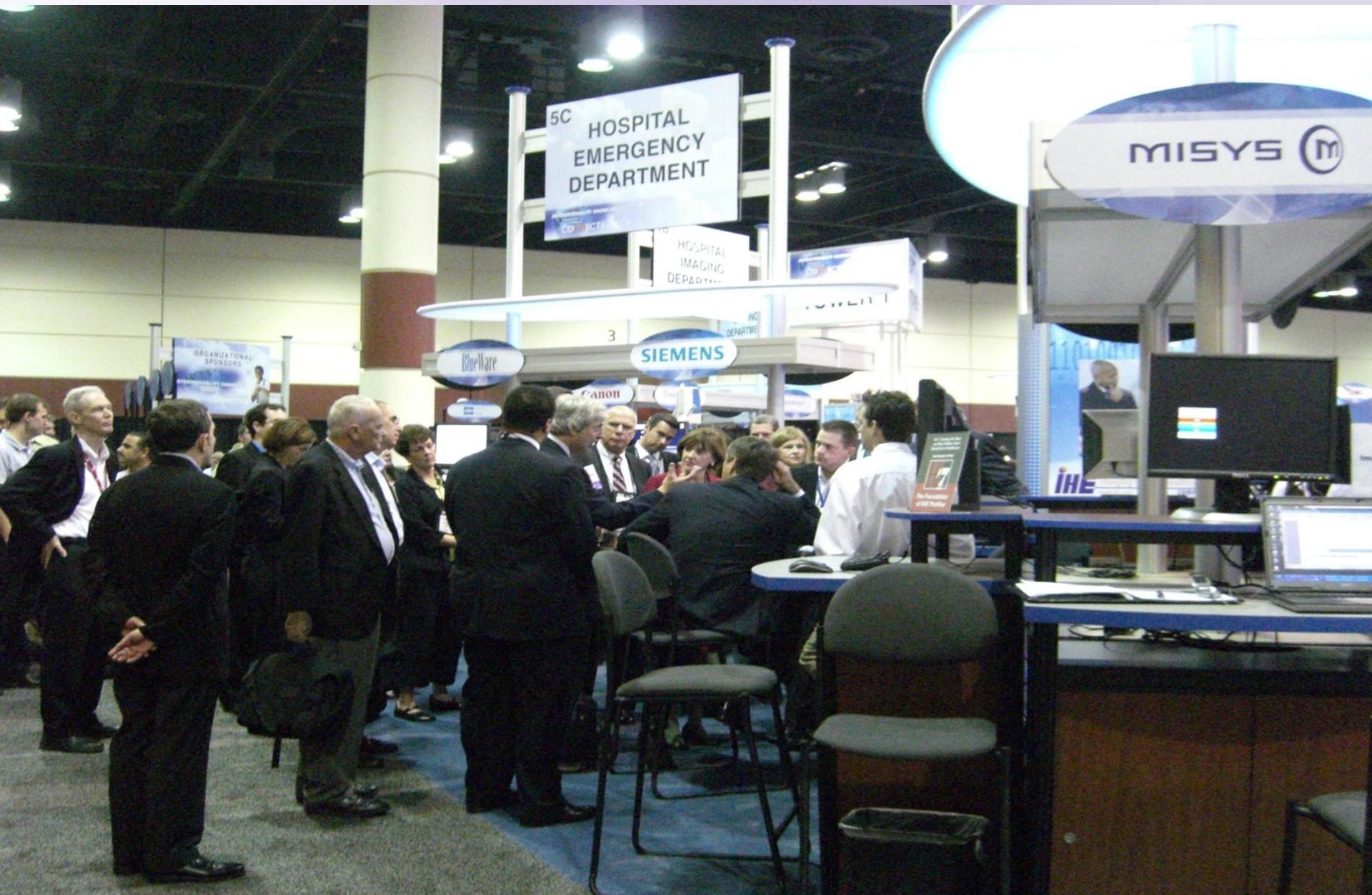
Conformity and eHealth Projects





Integrating
the Healthcare
Enterprise

Interoperability Showcase



Questions?

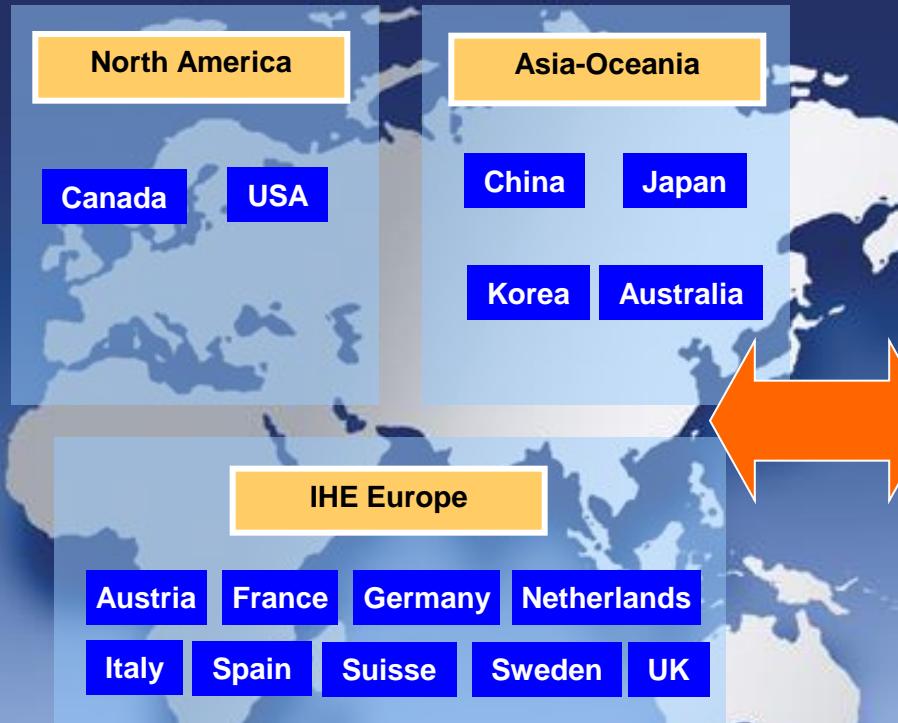
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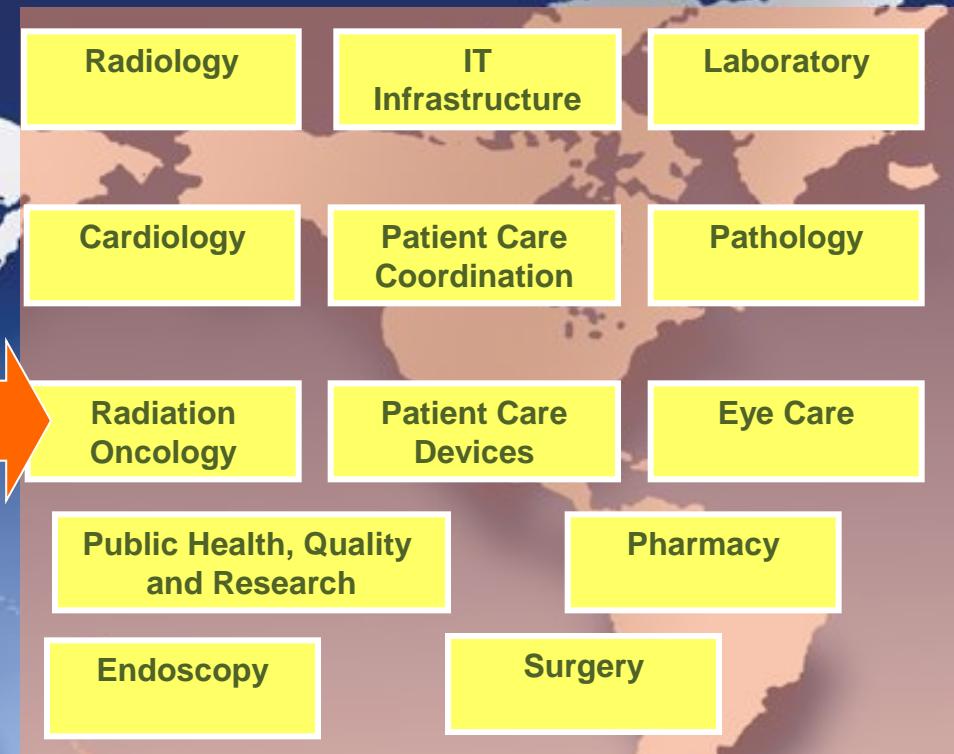
- **Umbrella organization of IHE**
- Website: <http://www.ihe.net>
 - Governance
 - Overview on all domains (ITI, PCC, RAD, etc.)
 - Final version of Technical Frameworks / Profiles / Whitepapers
 - Explanation on the IHE Process
 - Connectathon results
 - Product registry
 - Integration Statements
- Responsible for ...
 - Brand, mission and strategy
 - Global scale liaisons
 - Global MarCom
 - Conformity Assessment
 - Professional certification (upcoming)

IHE International Board

Deployment Committees



Development Domains



Professional Societies / Sponsors

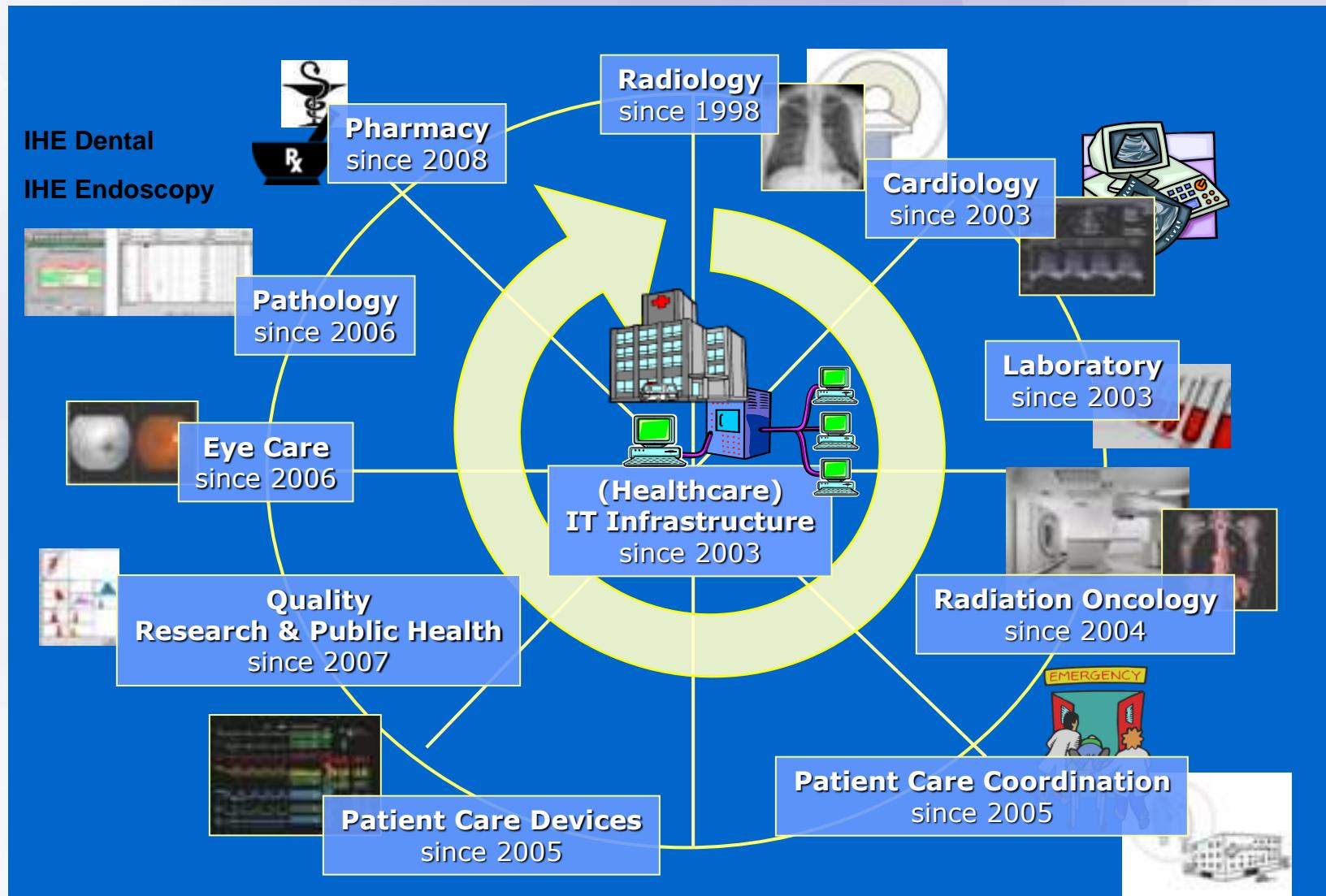


Contributing &
Participating
Vendors

Development Domains

- Main mission: **Profile creation**
- Scope: **International**
- Recognized and organized by IHE International
 - Have a seat in IHE International Board
- Have to be self-sustaining entities
 - Need own budget / leadership
 - Need sponsors
- Organize themselves by
 - Development Coordination Committee
 - Focus: Synchronize

The IHE Development Domains



Deployment Committees

- Main Mission: **Promotion of the deployment of IHE**
- Scope: **National or regional**
- Recognized by IHE International
 - Have a seat in IHE International Board, fee applies
- Have to be self-sustaining entities
 - Need own budget / leadership / association type
 - Need benefactors / sponsors out of user community
 - Must hold to only a very few constraints
 - Totally independent entities
 - Results in a very heterogeneous landscape
- Loosely organized by
 - Global Deployment Coordination Committee
 - Focus: Information Exchange

- Regional Deployment Committee founded in 2000
 - <http://www.ihe-europe.net>
- Overarches European National Deployment Committees
 - Austria, Belgium, Finland, France, Germany, Italy, Luxembourg, Spain, Switzerland, The Netherlands, Turkey, United Kingdom
- Several committees
 - IHE Services
 - EU Affairs
 - MarCom
- Organizes the European CAT
 - Since 2001 in Paris
 - 2018: Den Haag, The Netherlands



- **IHE Wiki**
 - <http://wiki.ihe.net> (free access)
 - Main resource for detailed information to domains and committees
 - Drafts, Appointments, Roadmap, Minutes, ...
 - Supporting document to IHE processes
 - HowTo, Templates, ...
 - Implementation Guides and resources for vendors
 - Mailinglists
 - Mostly Google-Groups

- **IHE FTP**
 - <ftp://ftp.ihe.net> (free access)
 - IHE document archive
 - All working documents of the domains / committees
 - Technical Frameworks
 - Profiles
 - Whitepapers
 - Change Proposals,
 - etc.

Questions?

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Interoperability „small“



Modality



PACS



HIS

...



Hospital



Transport

Interoperability „small“



Base Standards available



...

Modality

Use case profiles available for „plug&play“ connectivity



Hospital



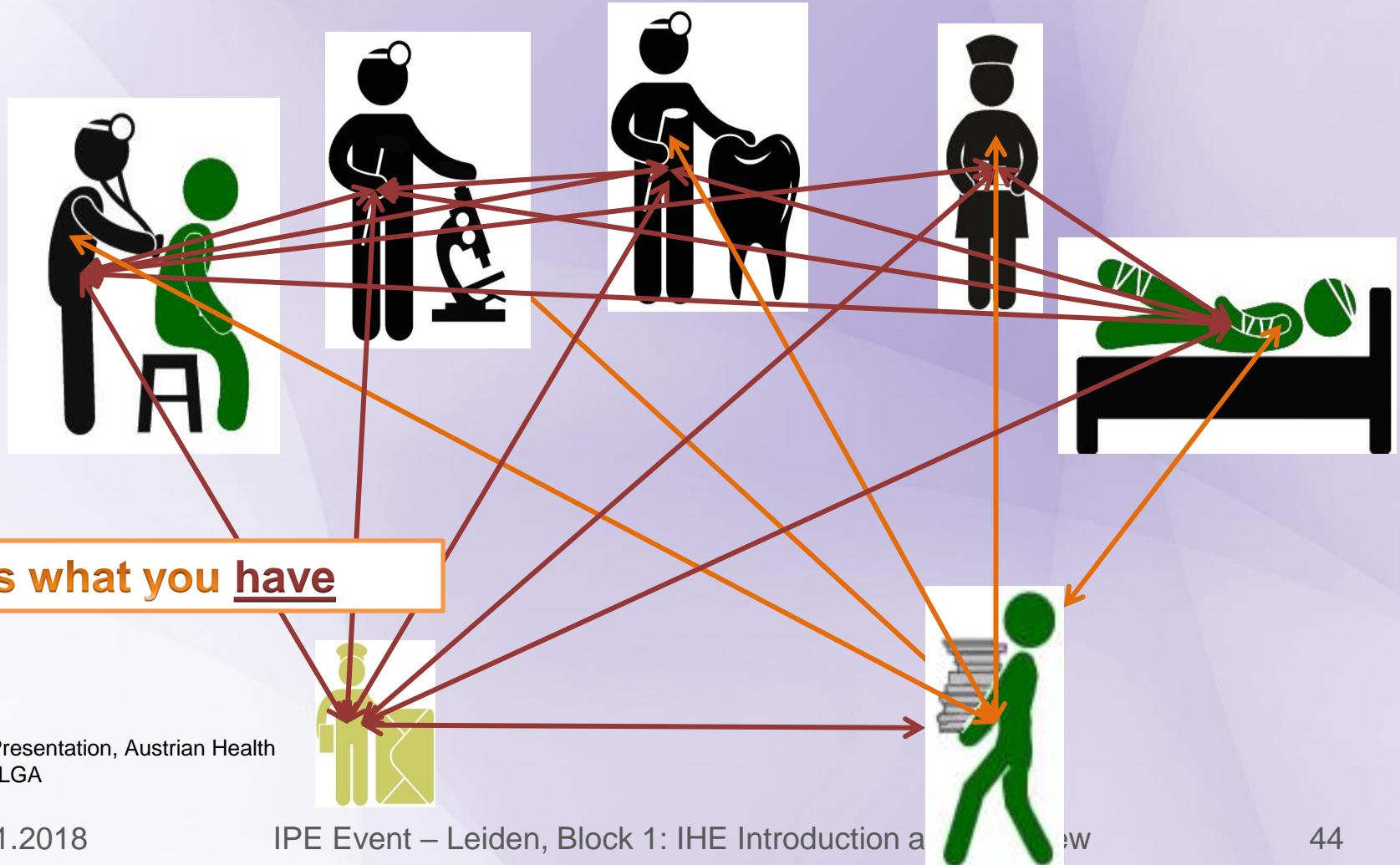
Transport



Done

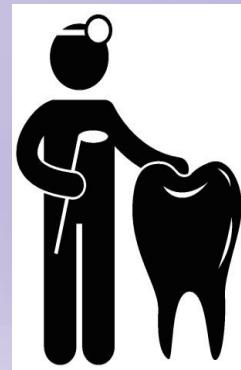
Interoperability „large“

National / regional HIEs require interoperability in large scale



Interoperability „large“

National / regional HIEs require interoperability in large scale



Medical information,
whenever and wherever needed

This is what you want

Source: Presentation, Austrian Health
Record ELGA



What HIE parts do you have to establish

- **What shall be exchanged/shared/operated?**

- **Administrative**

- Patient ID, Patient information, Healthcare Provider Information

- **Security and Privacy**

- Access Control, Audit and Logging, ...

- **Clinical**

- Documents, Images, Medication information, Immunizations, ...

- **Other**

- Advanced directives, Birth, Death, Cancer-Registers, ...

1
**Interoperability
use-cases**

2

3

IHE Profiles Adoption: Europe

CEF eHDSI



IHE Profiles Adoption: Global

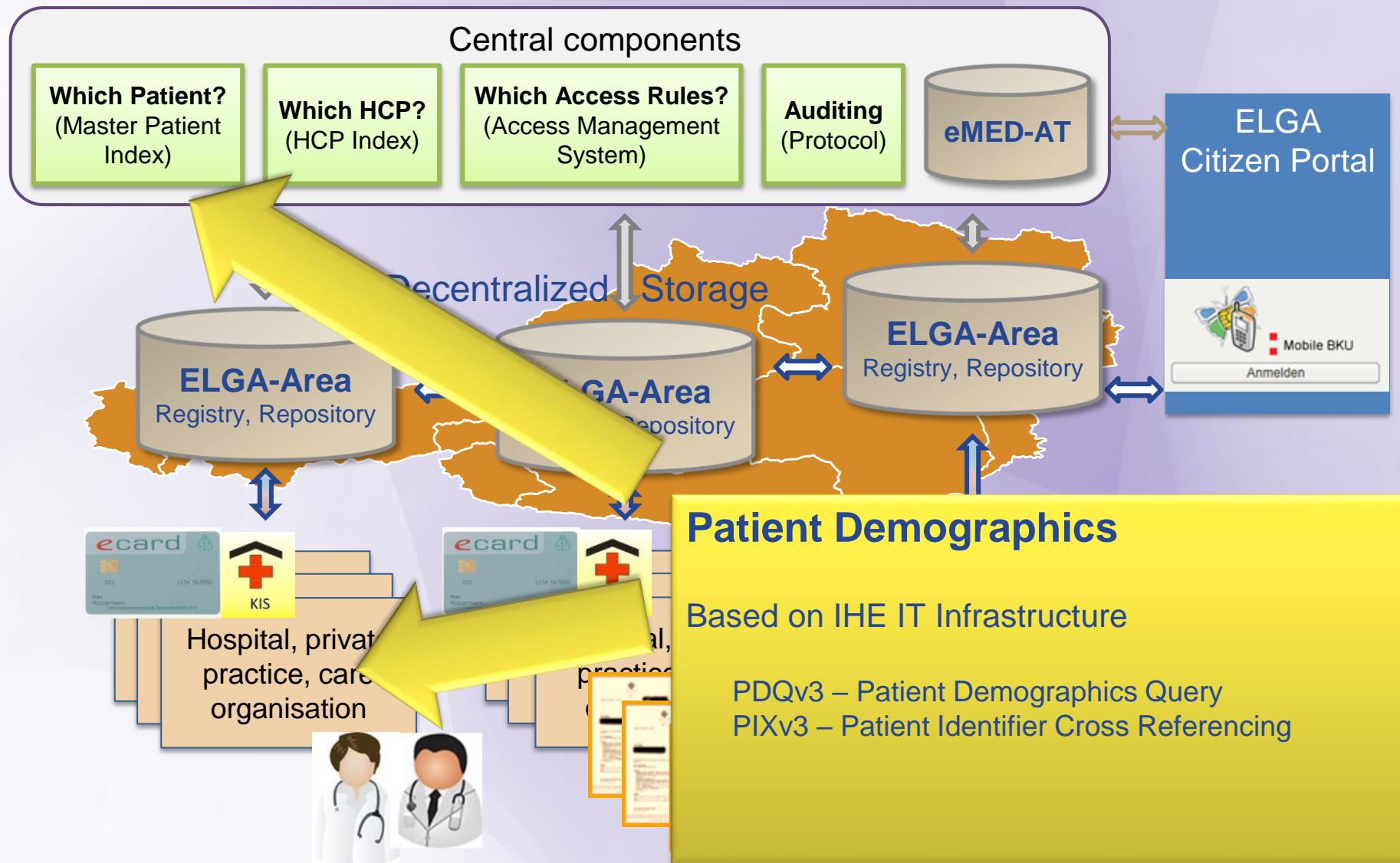


Austrian National Health Record Project ELGA

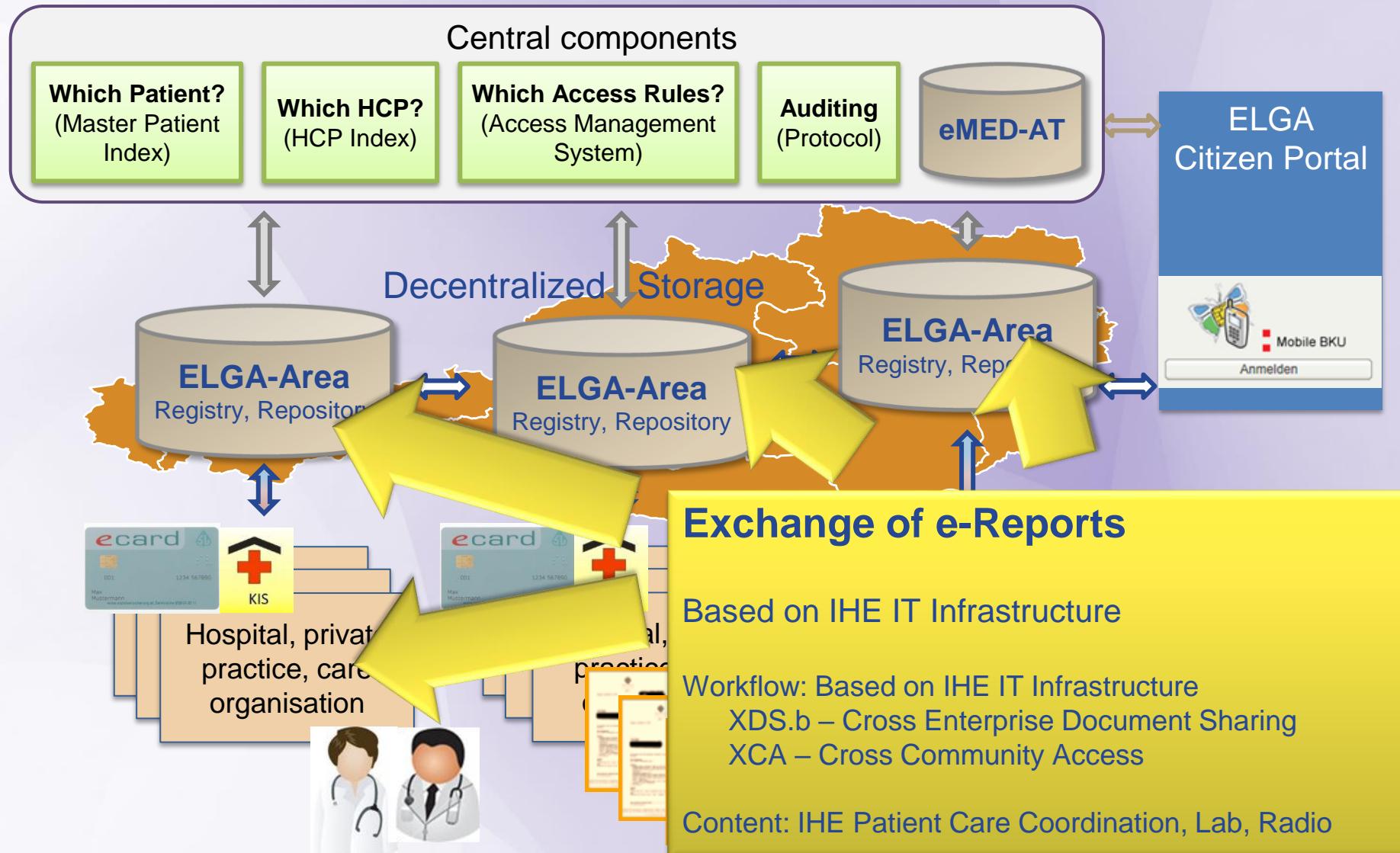
- Making **clinical documentation** available
 - „e-Reports“
 - Registration and access to clinical documents
- Making **medication data** available
 - „e-Medication“
 - Prescription and dispenses are documented
 - List of medication can be retrieved
- ELGA in general
 - **Authentification** of health service provider and patient
 - **Access control** and **logging**
 - Access to **demographic data** of patients



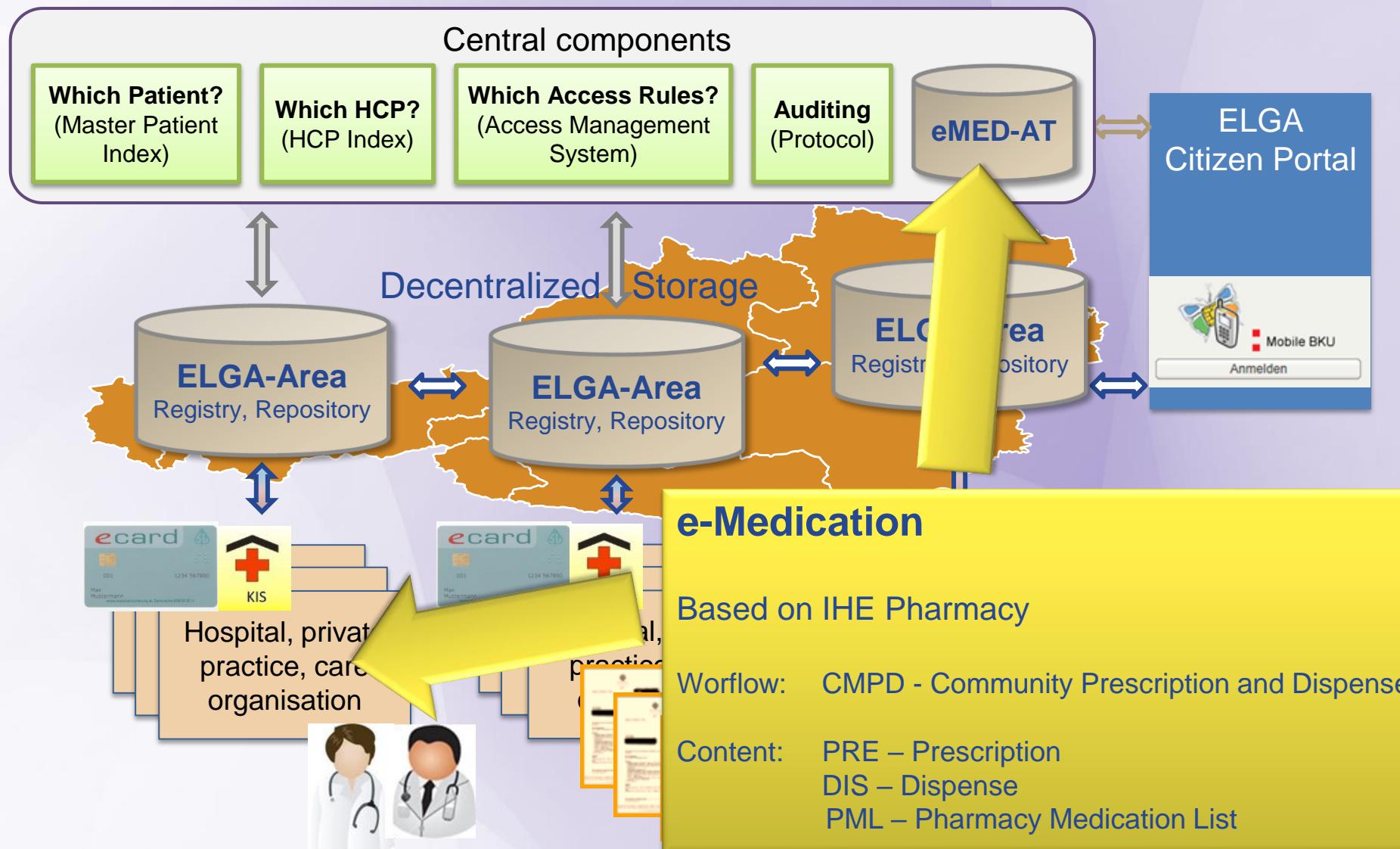
ELGA Overview architecture



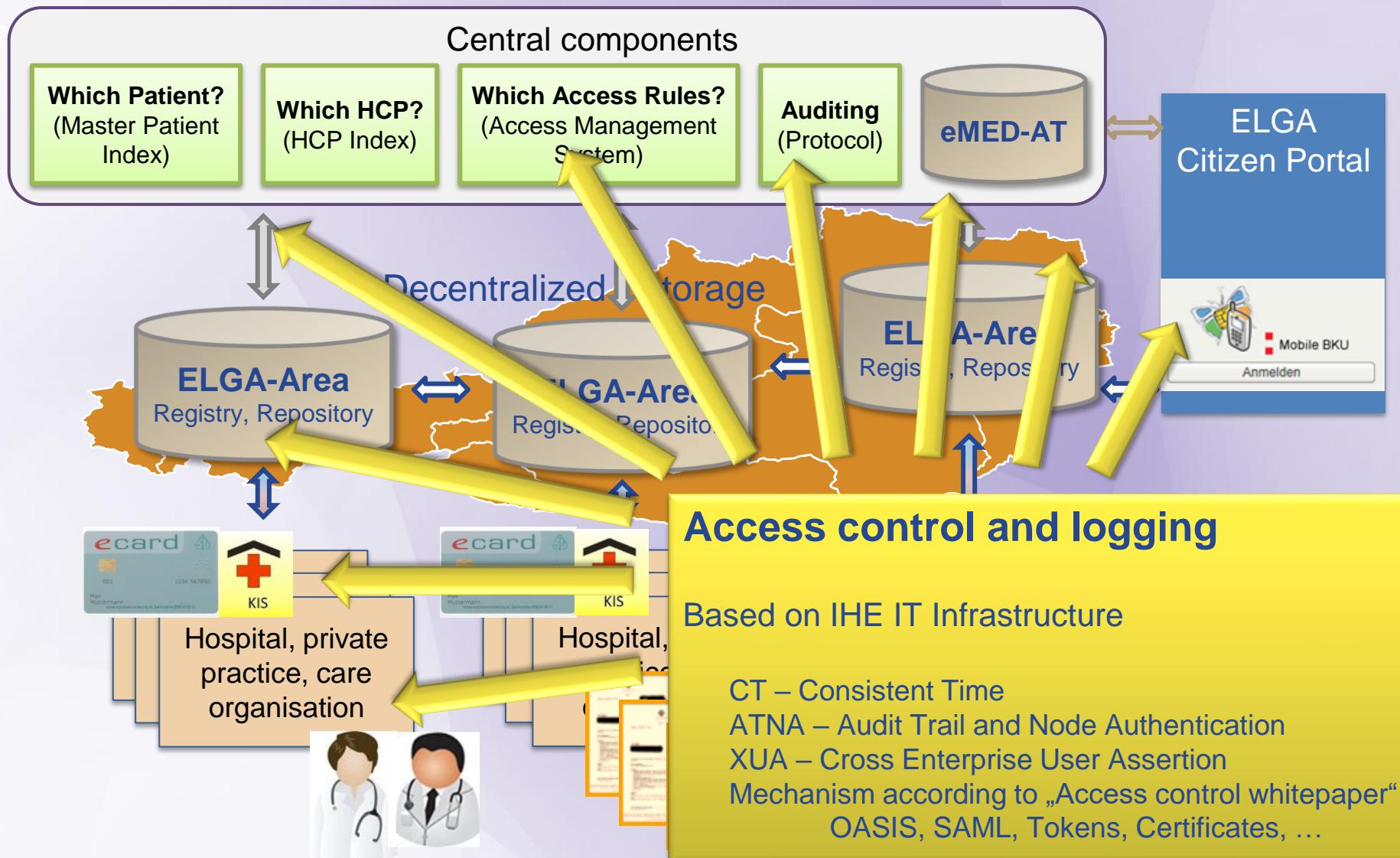
ELGA Overview architecture



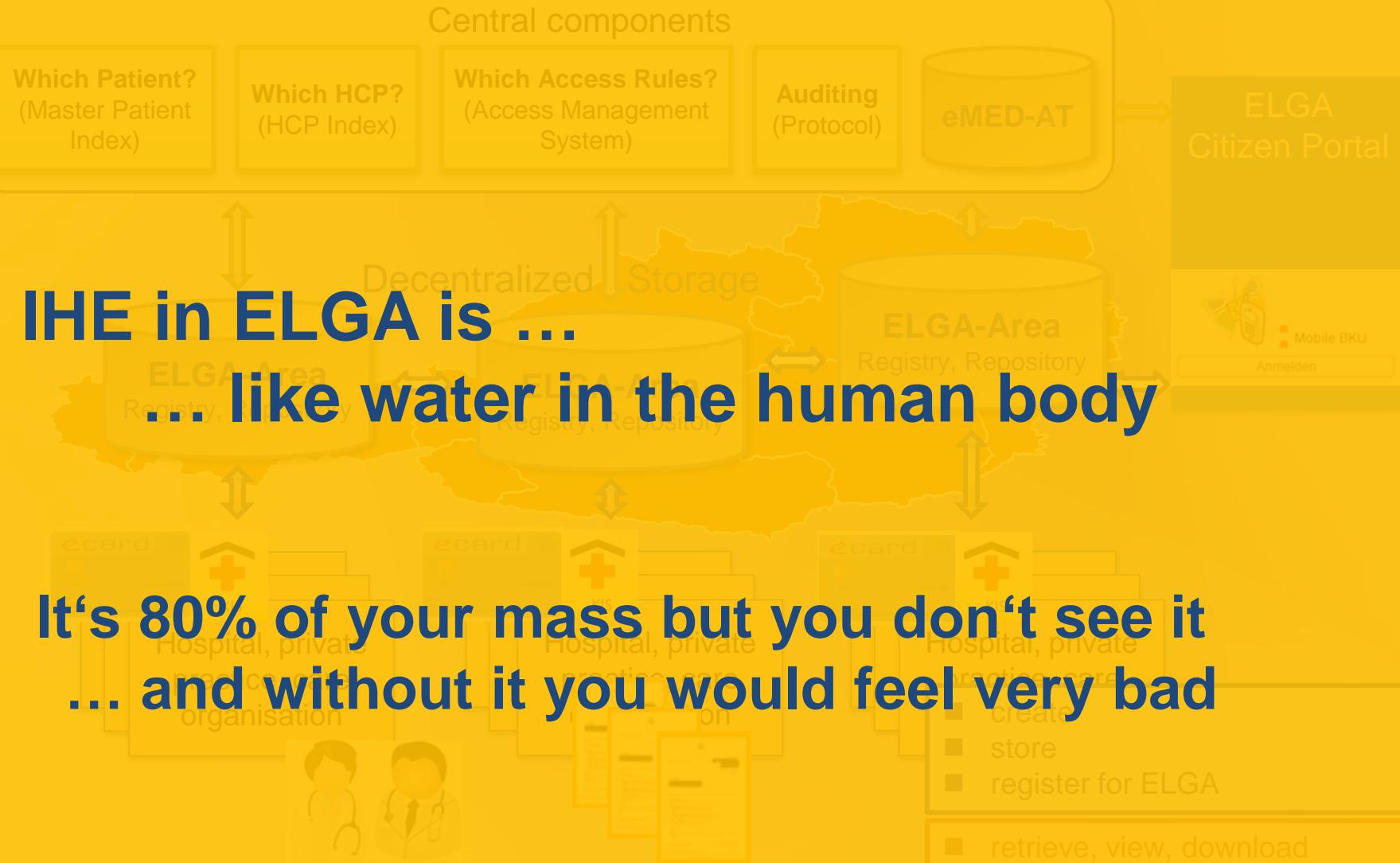
ELGA Overview architecture



ELGA Overview architecture



ELGA Overview architecture



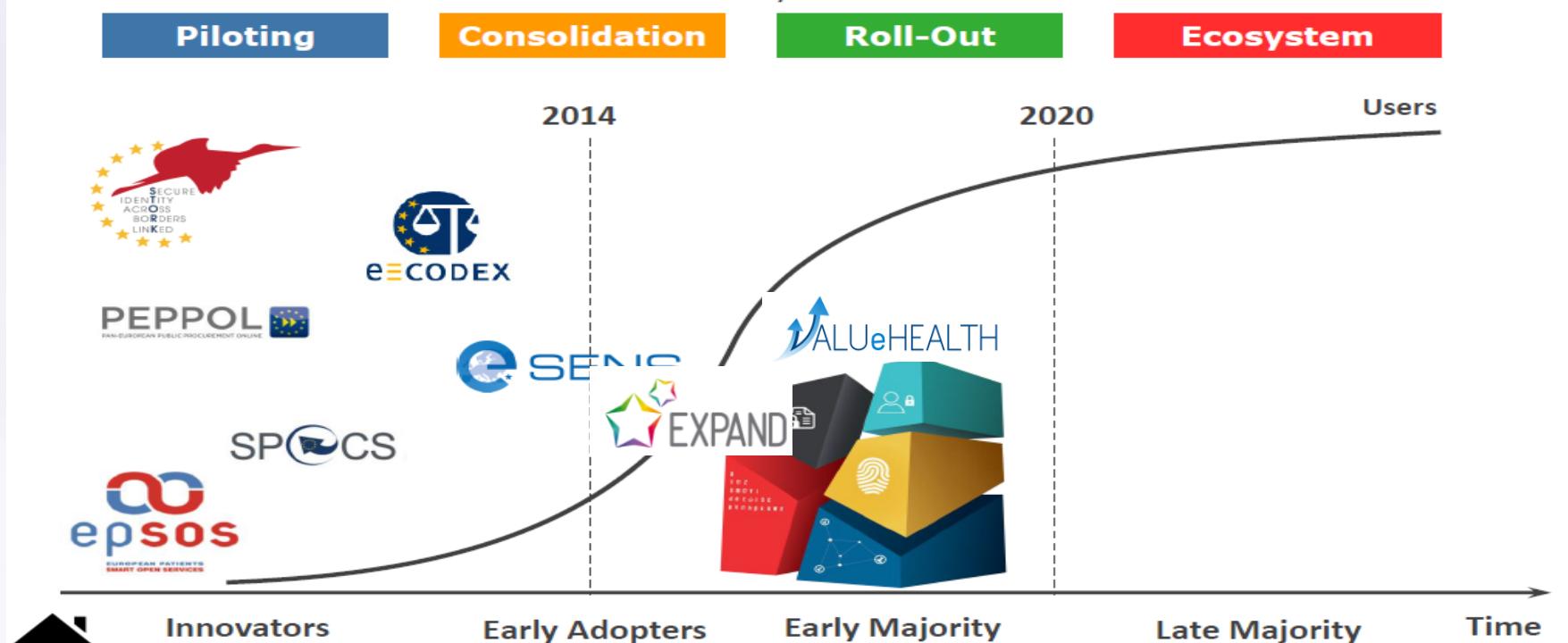
Europe



First eHealth large scale deployment: European Patient Smart Open Services
2008 – 2014
36,5 Mio € spent
25 European countries

Creating a #DigitalSingleMarket

The building blocks represent a massive investment since their creation by the Large Scale Pilots. As their user base grows, the Commission is already working on their sustainability beyond CEF.



Source: Gerald Cultot, European Commission, Keynote speech at IHE World Summit 2016

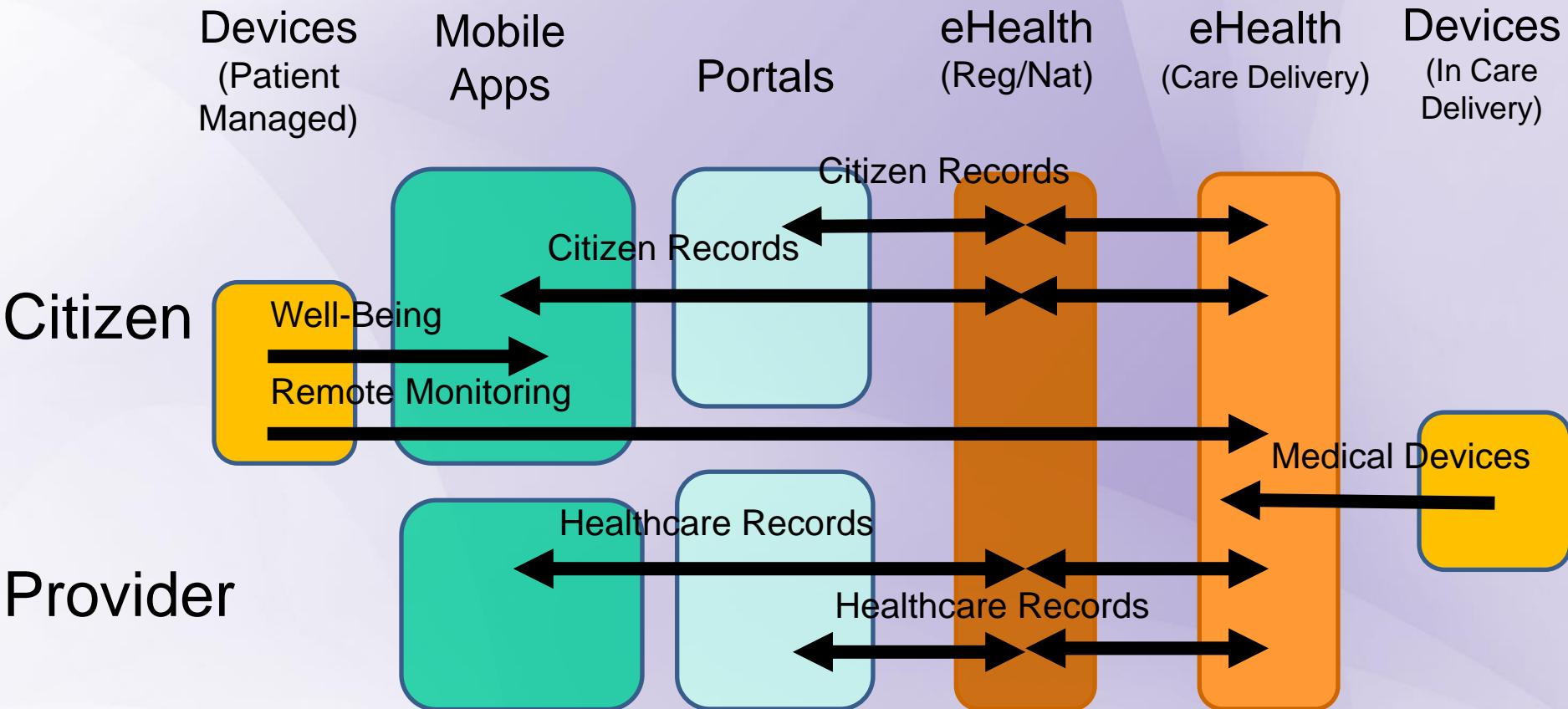
- **Commission Decision 2015/1302**, published on 31 July 2015, identifies **27 IHE Integration profiles for referencing in public procurement**
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:JOL_2015_199_R_0011
- These IHE profiles have the potential to increase interoperability of eHealth services and applications to the benefit of patients and medical community
- The 27 IHE profiles should therefore be identified as ICT technical specifications eligible for referencing in public procurement

Profiles assessed for conformity

LAW - Laboratory Analytical Workflow
PAM - Patient Administration Management
PDQ - Patient Demographics Query
PDQV3 - Patient Demographics Query HL7 V3
PIV - Point-of-Care Infusion Verification
PIX - Patient Identity Cross-Reference
PIXV3 - Patient Identity Cross-Reference HL7 V3
XCA - Cross Community Access

The IHE profiles identified by the European Commission are already included in the IHE Conformity Assessment

Patient Empowerment, mHealth, eHealth



mHealth, eHealth and Health/Medical Devices as components of the connected health system

Current Mobile App ecosystem in health

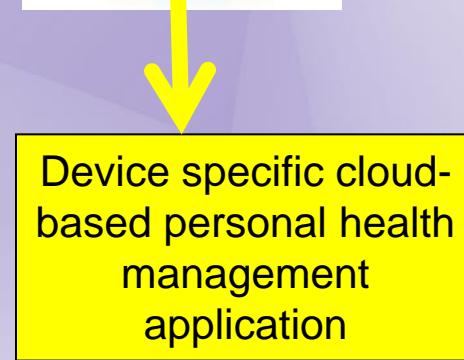
Mobile App for health professionals



Patient access App to a portal (appointments, reminders, access to results and records).



Personal health management app either stand-alone or connected



Mobility increases number of silos

How to engage

You are warmly welcomed!



How to engage

- **Informational**

- Listen and be aware about what's going on
- Website, Newsletters, Blogs, Social media

- **Strategical**

- Become member of IHE International and/or an IHE deployment committee
- Become active as a volunteer
- Engage in projects and activities around IHE

- **Technical**

- Join a Development Domain and write profiles
- Implement profiles and participate at a Connectathon

Get in touch with IHE



MARINA BAY SANDS
SINGAPORE
11 September 2017

In conjunction with

Himss AsiaPac 17



Questions?

- IHE Homepage
 - <http://www.ihe.net/>
 - <http://www.ihe-europe.net/>
- IHE Wiki
 - <http://wiki.ihe.net/>
- IHE International Social Media
 - YouTube channel: <https://www.youtube.com/user/IHEIntl>
 - IHE Webinars: <http://www.ihe.net/Webinars/>
 - Twitter: <https://twitter.com/IHEIntl>
- Google groups
 - <https://groups.google.com/forum/#!search/ihe>





Changing the Way Healthcare CONNECTS

<http://www.ihe.net>



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Twitter: JuBrandstaetter