



Design And Implementation Of The National Ehealth Interoperability Framework (Nehif)

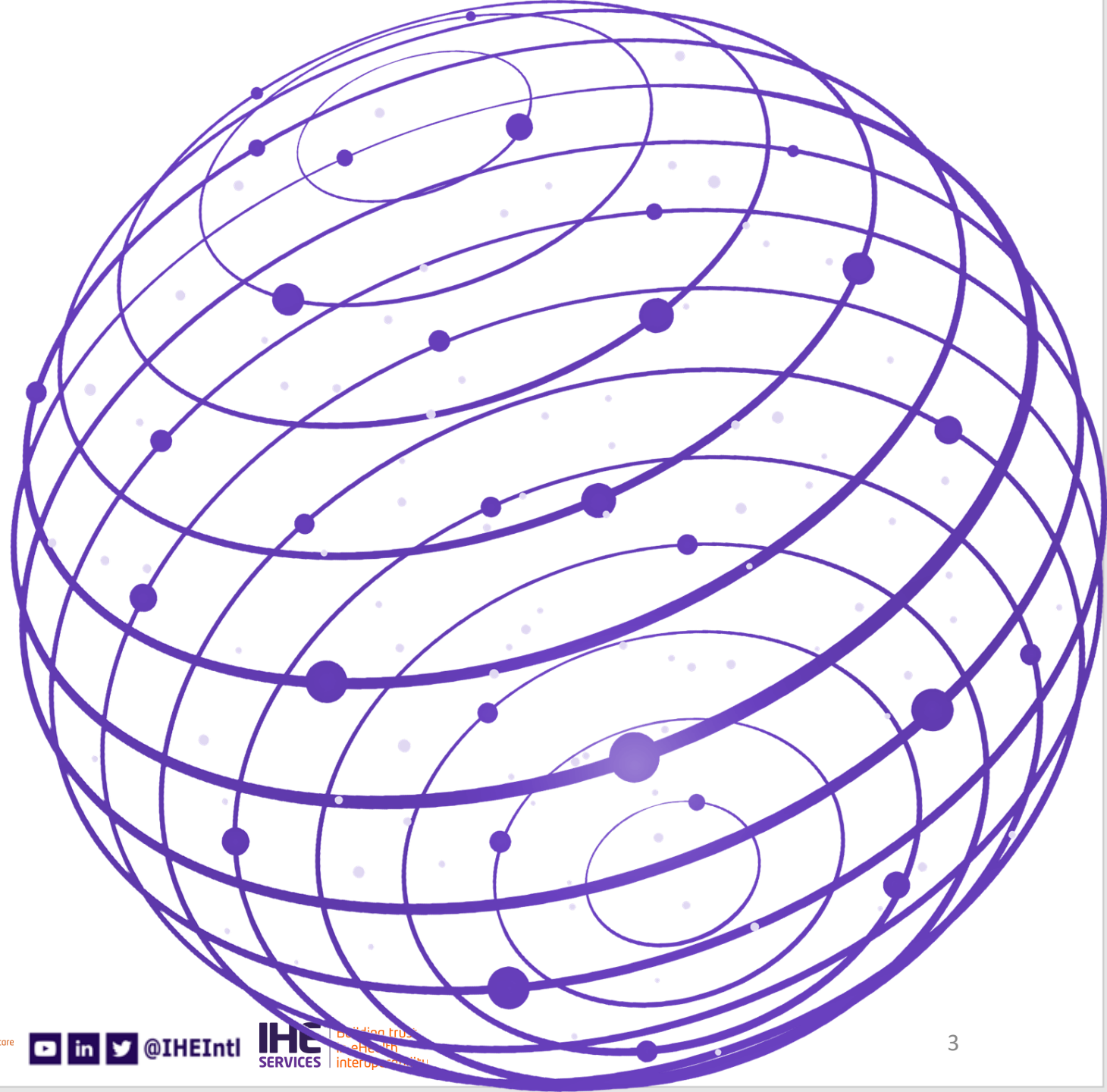
Best Practices on Interoperability Frameworks in Europe and Beyond

Charles Parisot, IHE Services Committee Chair

Agenda

- What is IHE
- Examples of IHE interventions
- IHE methodology for building an Interoperability Framework Governance

What is IHE?



What reasons ehealth programs/projects give for controlling interoperability?

- ***Solution choice:*** Enables procurement of the IT systems from different organizations, vendors or open source, initially and over time (replacement, future proofing).
- ***Consistent Security and Privacy:*** Policies are simpler to deploy when relying on same interoperability technical measures.
- ***Quality in exchange and information:*** Reduces finger pointing between:
 - care providers and health policy makers
 - systems buyers and vendors
- ***Reduce Costs and Project Risks:*** Building gateways is complex and needs constant investments to implement proprietary/ad-hoc interoperability specifications and maintain competences.

Help is out there: What is IHE

- IHE: Integrating the Healthcare Enterprise
- IHE uses an open, consensus-based process to engage users, providers and suppliers of health IT solutions to identify and solve interoperability problems
- IHE is:
 - an **international** SDO of authorities, users and vendors
 - Profiles formally **recognized by ISO** though being Liaison A
 - Sponsoring and fostering a robust **interoperability testing** ecosystem (cross-standards, open source tooling, process rigor across entire lifecycle)
 - Directly supportive of ehealth projects (use cases, interoperability specifications, conformity assessment, projectathon, national certification) via **IHE Services and National Initiatives**



How does IHE work: Connecting Standards to Care

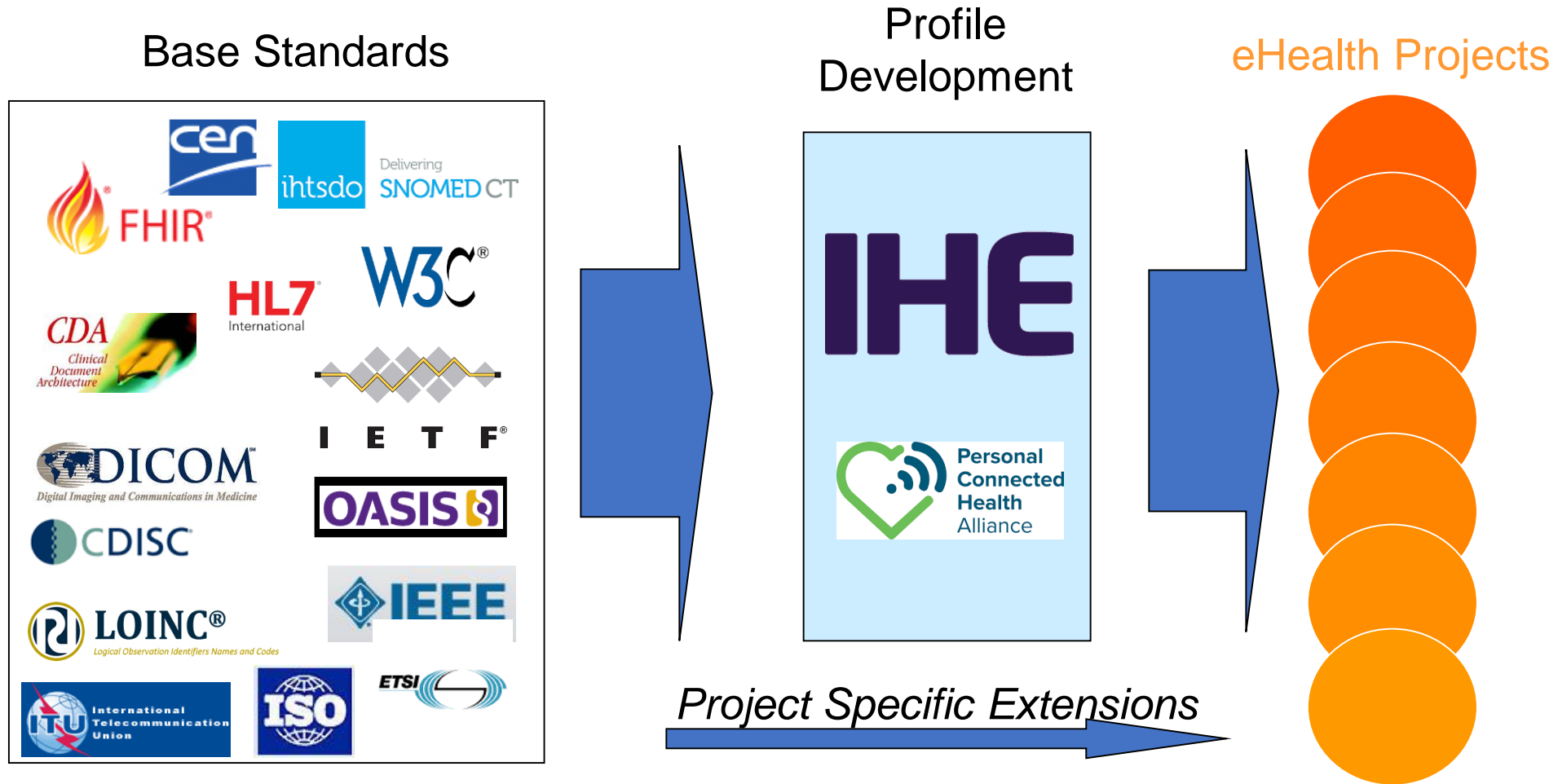
- Healthcare professionals work with industry
- Coordinate implementation of standards to meet clinical and administrative needs
 - Clinicians and HIT professionals identify the key interoperability problems they face
 - Providers and industry work together to develop and make available standards-based and tested specifications
 - Implementers follow common guidelines in purchasing and integrating effective systems

IHE: A forum for agreeing on how to implement standards and processes for making it happen

IHE: Framework for Interoperability

- A common framework for harmonizing and implementing multiple standards
 - “Meta-Standards”– Standardize the use of standards
 - Profiling existing standards to address specific use cases in healthcare
 - Addressing the procurement and testing challenge
- Promotes unbiased selection and coordinated use of established healthcare and IT standards to address specific clinical needs
- In collaboration with other SDOs, users and vendors develop profiles that enable seamless health information movement within and between hospitals, regions, nations

Interoperability: From a problem to a solution



Profiling Organizations Are Well Established

IHE Terminology

- Profiles

- Describe workflow use cases, standards and the overall relationships to achieve transparent interoperability

- Technical Frameworks

- The documents for each “domain” that specify the Profiles and the associated systems (actors) and transactions. Each Profiles is specified in details and leaves “specific customization points.

- Connectathons

- Neutral testing events with multiple vendors in one room, consisting of developers and testers (no marketing or sales / no customers), promoting rapid and robust interoperability testing of their profile implementations

- Integration Statements

- Vendor tells customers the IHE Profiles supported by a specific release of a specific product

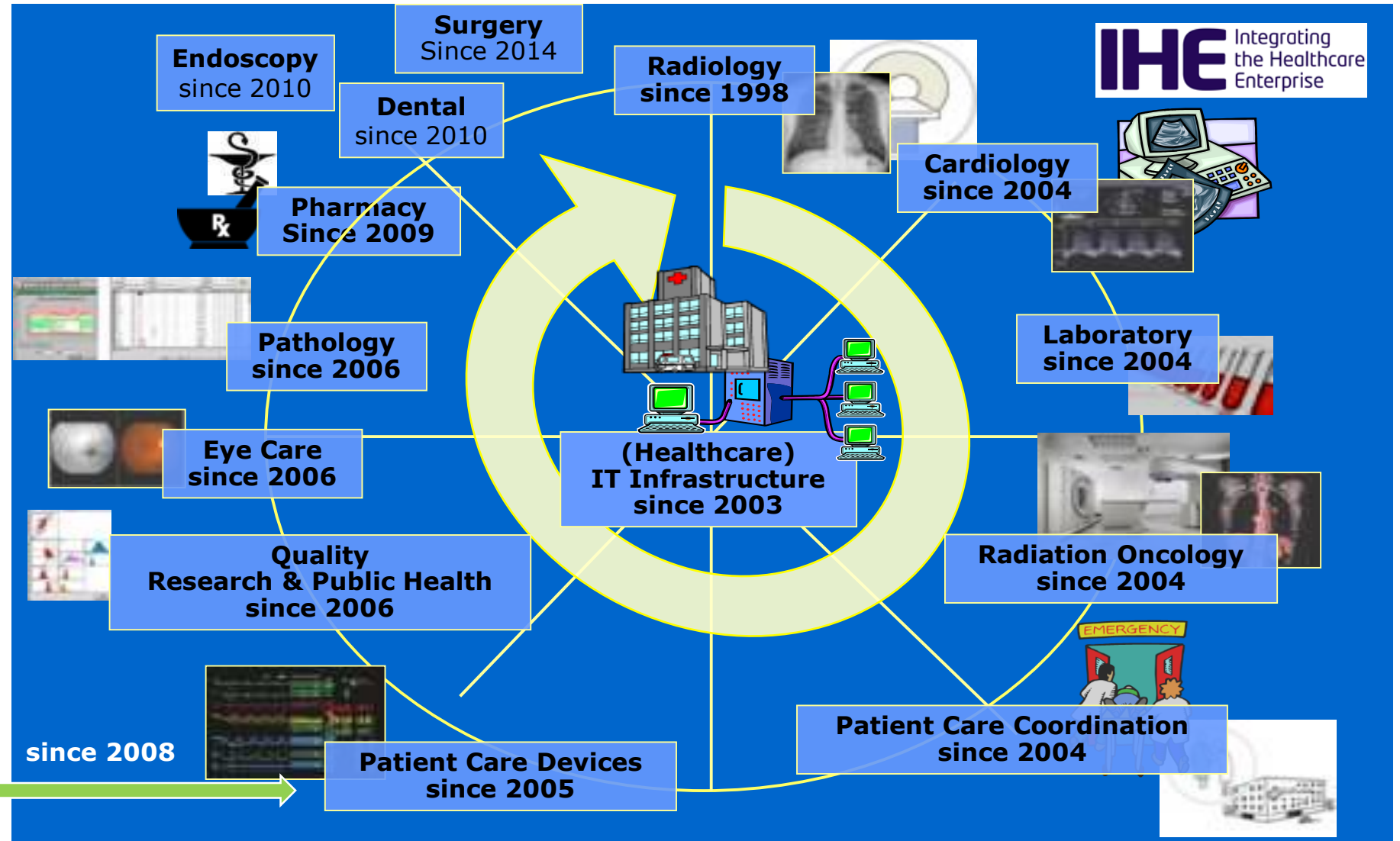
- Conformity Assessment

- An accredited test laboratory issues a test reports that states the IHE Profiles supported by a specific release of a specific product

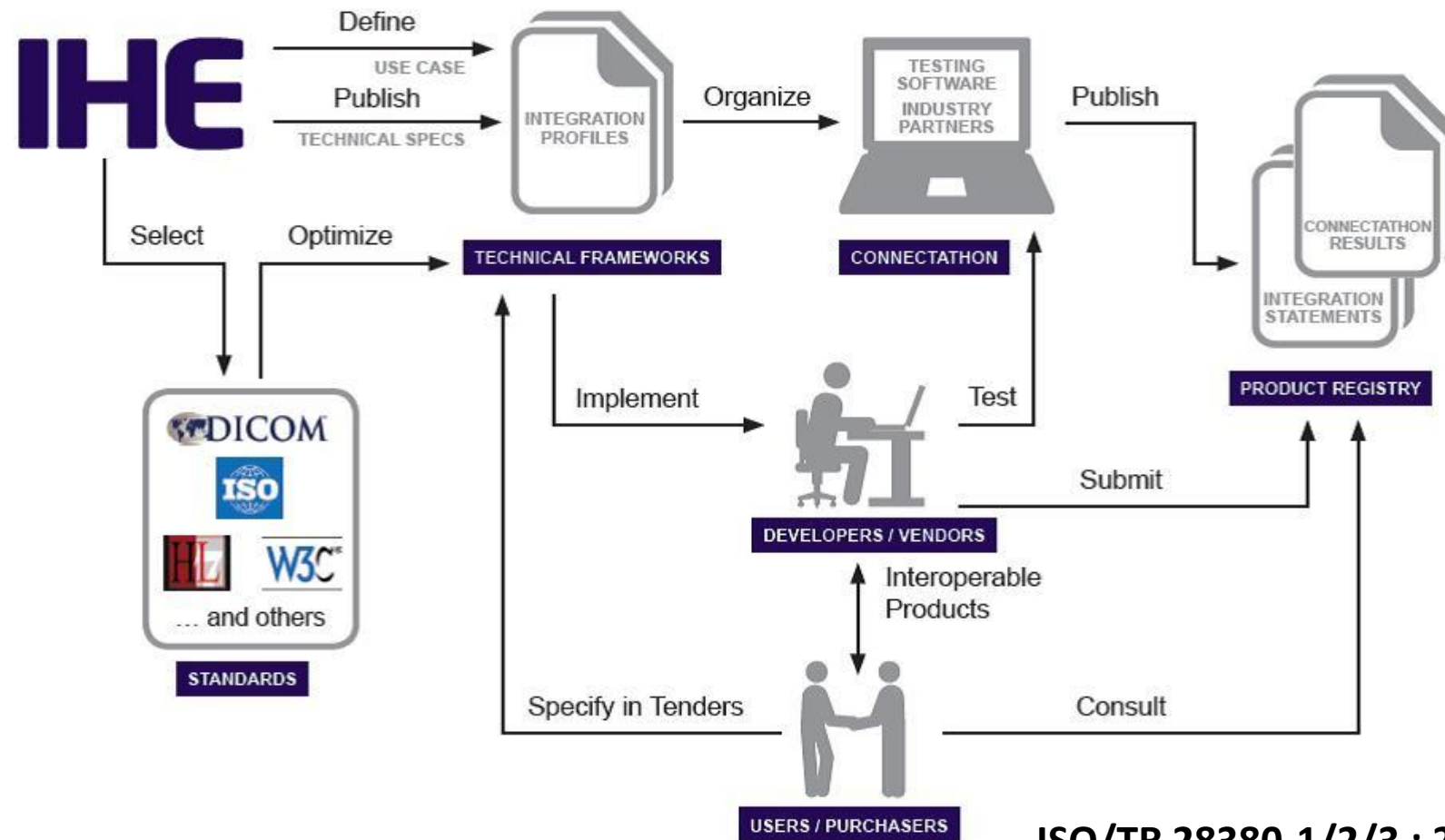
The IHE Development Domains

20+ Years of Steady Evolution 1998 – 2020

Today we have over
230 Integration
Profiles for
Interoperability
within the Enterprise
& National –
Regional Health
Information
Exchange
30+ profiles Using
HL7 FHIR



IHE Profiles Base Standards - Development Process

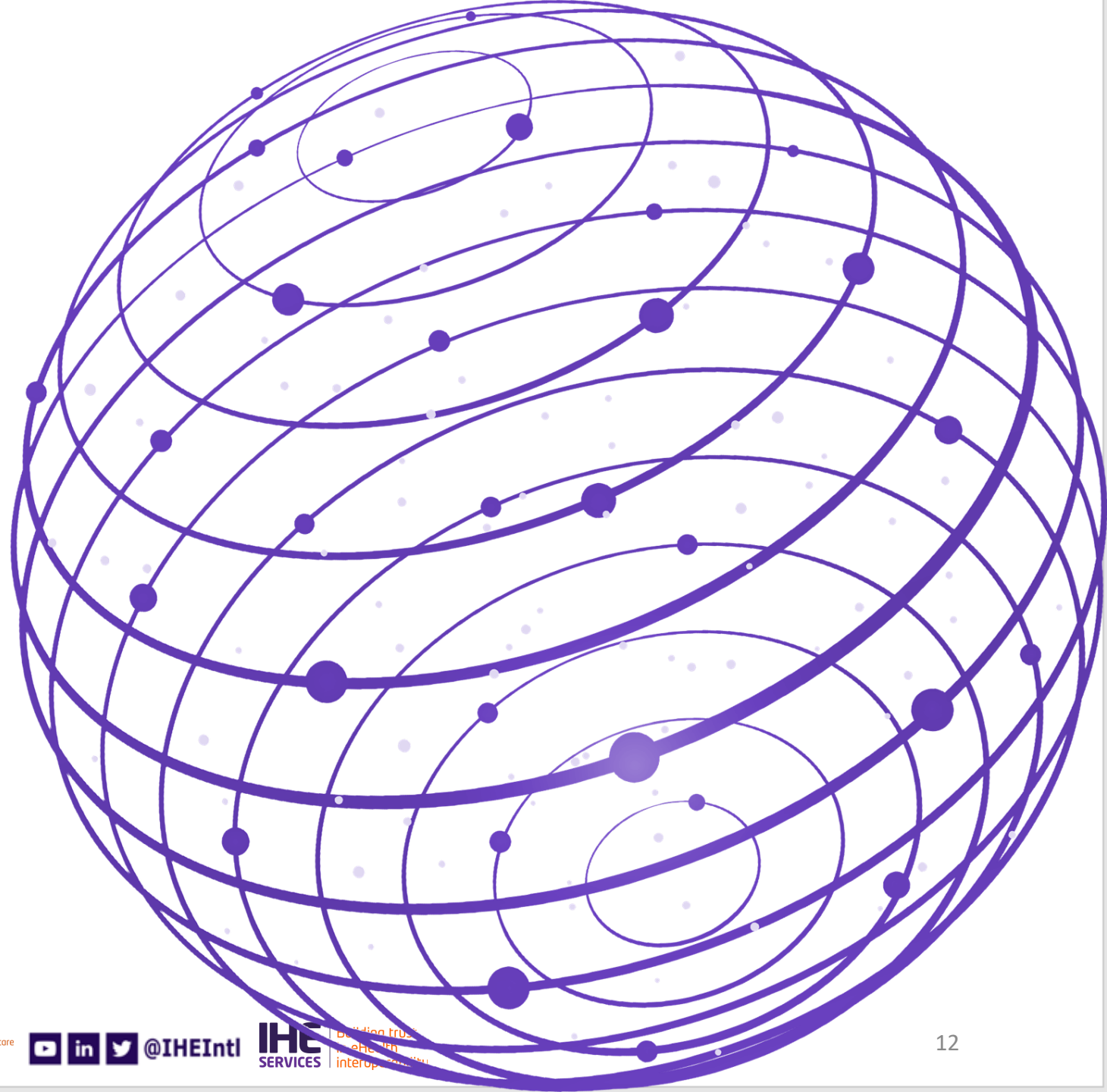


ISO/TR 28380-1/2/3 : 2014

Health informatics -- IHE global standards adoption

www.ihe.net

Examples of IHE interventions



Snapshot of IHE Examples in Practice

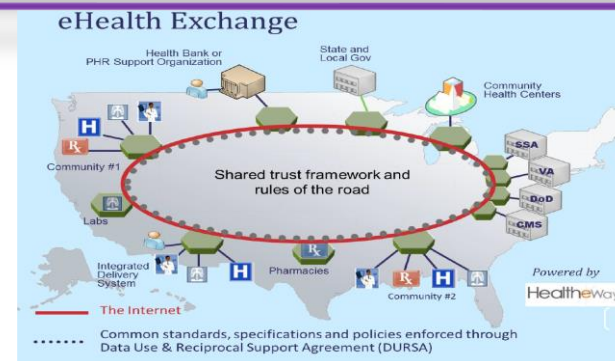
Where

USA



(HHS-ONC Recognized
Coordinating Entity)

What (Intervention)



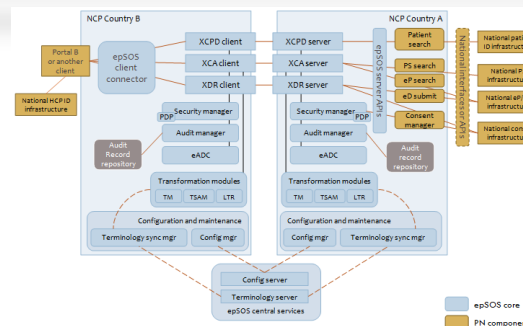
How (Profiles)

eHealth exchange & Carequality -

- Test tools & online content validation
- Profiles used: IHE XCA, XCPD, ATNA, BPPC, XUA, XDR/XDM
- HL7 CDA



EU Commission
eHDSI



Cross Border Healthcare Support

- Testing Strategy
- Projectathons
- Test Tools & Document Validation
- Profiles used: IHE XCA, XDR, XCPD, XUA, ATNA, etc
- HL7 CDA

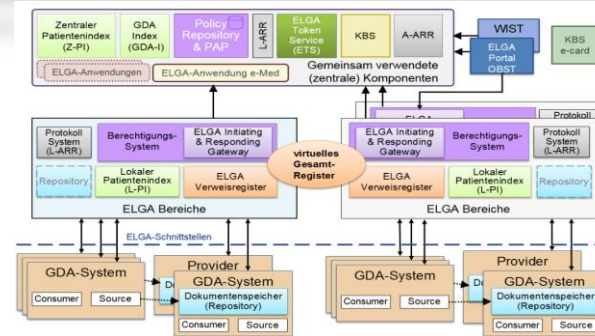
Snapshot of IHE Examples in Practice

Where



Austria
ELGA

What (Intervention)



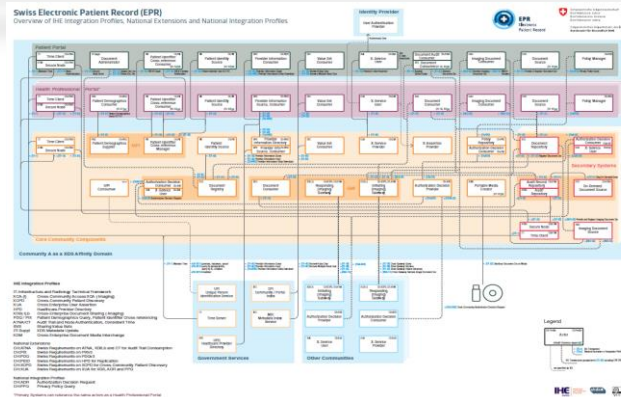
How (Profiles)

ELGA is Based on IHE Specifications

- Profiles used: IHE XCA, XDS, XDS-I, PIXv3, PDQv3, CMPD, PRE, DIS, PADV, ATNA, XUA, XDS-MS, XD-LAB
- HL7 CDA

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Switzerland
EPR Reference
Implementation



Support of Swiss EPR for testing and Certification

- Testing Strategy, Projectathons
- Test Tools & Document Validation
- Profiles used: IHE XCA, XCPD, XUA, HPD, XDS, XDS-I, PDQ, PIX, ATNA, SVS, XDM, etc

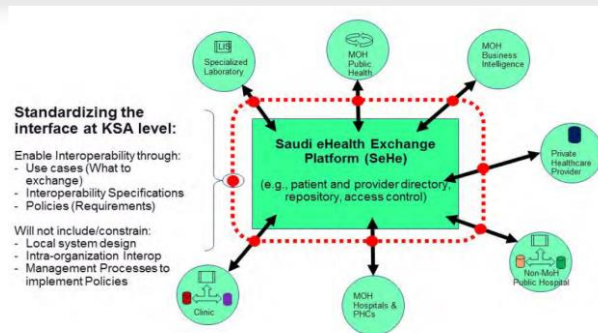
Snapshot of IHE Examples in Practice

Where



Saudi Arabia
SeHe

What (Intervention)



How (Profiles)

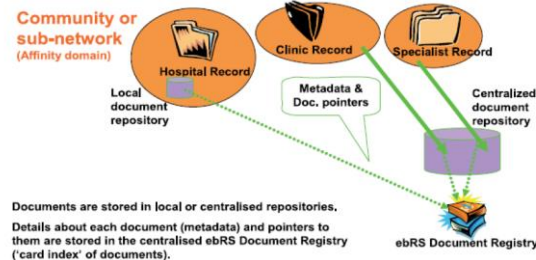
SeHe Interoperability Architecture

- Test tools, Specifications, Architecture
- Profiles used: IHE PDQv3, XD Lab, HPD, XDS.b, XDS-I, DSUB, ATNA, CT, SWF, PRE, DIS, XDW
- HL7 CDA



Belgium
eHealthBelgique
Brusafe +

IHE Cross Enterprise Document sharing - XDS



Support of Abrumet for testing

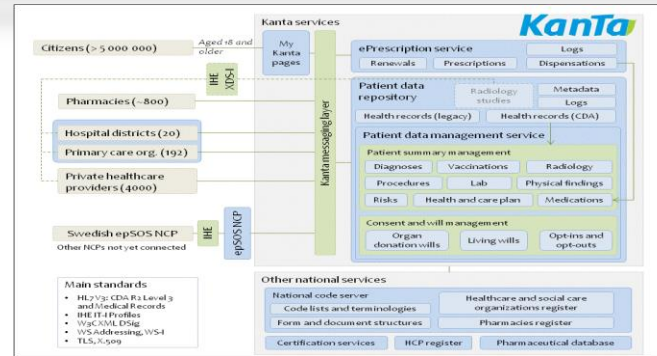
- Testing Strategy, Projectathons
- Test Tools & Document Validation
- Profiles used: IHE XDS, PDQ, PIX, XUA, ATNA
- HL7 CDA

Snapshot of IHE Examples in Practice

Where

Kela
Finland
Kela

What (Intervention)



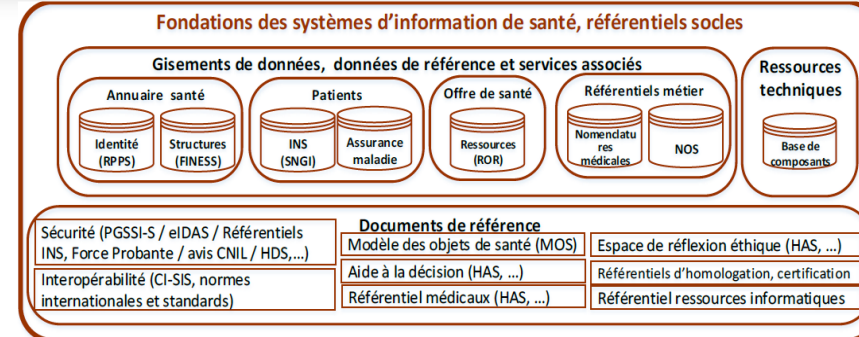
How (Profiles)

Support of Testing Framework of KANTA EHR

- Test tools
- Profiles used: IHE XDS-I
- HL7 CDA, HL7 FHIR, DICOM



France
ANS
InteropSanté



Support of InteropSanté -BP6 & ANS new Interoperability Framework

- Projectations, Test Tools & Document Validation
- Profiles used: IHE XDS, XDS-I, PDQ, PIX, ATNA, XUA
- HL7 CDA, HL7 FHIR

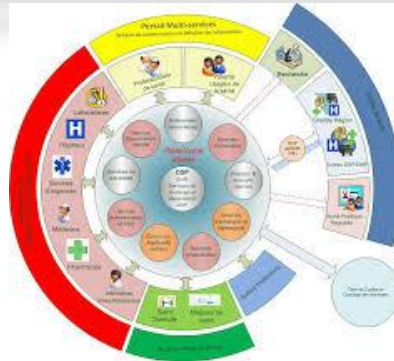
Snapshot of IHE Examples in Practice

Where



Luxembourg
myDSP

What (Intervention)



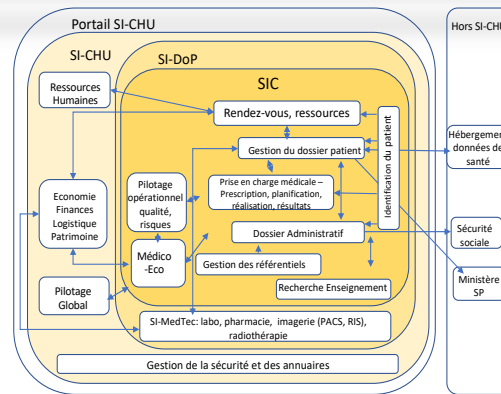
How (Profiles)

Support of Testing Framework Agence eSanté

- Specifications, Test tools & Document Validation
- Profiles used: IHE XDS, PIX, PDQ, ATNA, DIS, PRE
- HL7 CDA



Gabon Interoperability Framework



Support of eGabon MoH Interoperability Framework

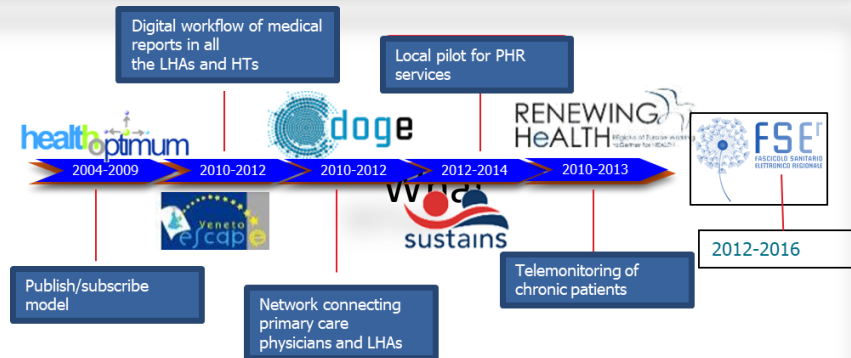
- Procurement IOP Specifications, Projectathons, Test Tools
- Profiles used: IHE SWF.b, LTW, XDS, PDQ, NPFS
- HL7 CDA, HL7 v2, DICOM

Snapshot of IHE Examples in Practice

Where



What (Intervention)



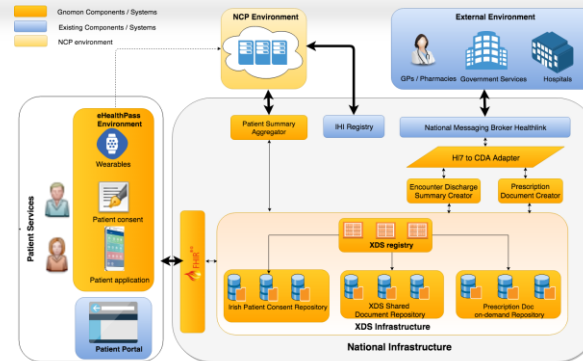
How (Profiles)

Testing Framework Veneto and Friuli

- Test tools, Projectathons, Procurement
- Profiles used: IHE XDS, PIX, PDQ, XDS-I, MHD, XDW, ATNA, XUA, BPPC
- HL7 CDA, HL7 FHIR, DICOM



Ireland
HSE



Support of HSE for Cross Border and Interoperability Framework

- Use Case Analysis & IOP Architecture, Projectathons
- Test Tools & Document Validation
- Profiles used: IHE XCA, XDS, PIX, PDQ, ATNA, XUA, BPPC, eHDSI
- HL7 CDA, HL7 FHIR

Moving from the business requirement to implementation in Europe

European Exchange Format of EHR Principles



The development of an European electronic health record exchange format is fundamental to achieve secure, interoperable, cross-border access to electronic health data in the EU.

get involved!



Cofunded by the European Union's Health Programme (2014-2020)



Joint Action supporting the eHealth Network

Source: European Commission

- Commission Decision on the identification of 27 IHE profiles for referencing in procurement, 28 July 2015 (MSP 1025/2012)
- Commission Recommendation on a European Electronic Health Record exchange format (C(2019)800) of 6 February 2019
 - (i) Patient Summaries
 - (ii) ePrescriptions/eDispensations
 - (iii) Laboratory reports
 - (iv) Medical images and reports
 - (v) Hospital discharge reports



27 IHE Profiles recognized under EU regulation - 2015

Regional, National, Cross-border:

- Share documents/records
- Patient Identification
- Imaging, Scanned Docs
- Summaries
- Pharmacy prescription/dispensation
- Laboratory reports, Privacy

XDS.b

XCF

XCA

XDR

XDM

XCPD

XDS-I.b

XDS-MS

XD-SD

XPHR

PRE

DIS

XD LAB

XUA

BPPC

Regional, National, Hospital:

- Patient Id
- Security

PIX

PDQ

ATNA

CT

Hospital:

- Patient Administration, Terminology
- Radiology
- Laboratory

PAM

SVS

SWF.b

SWF

PIR

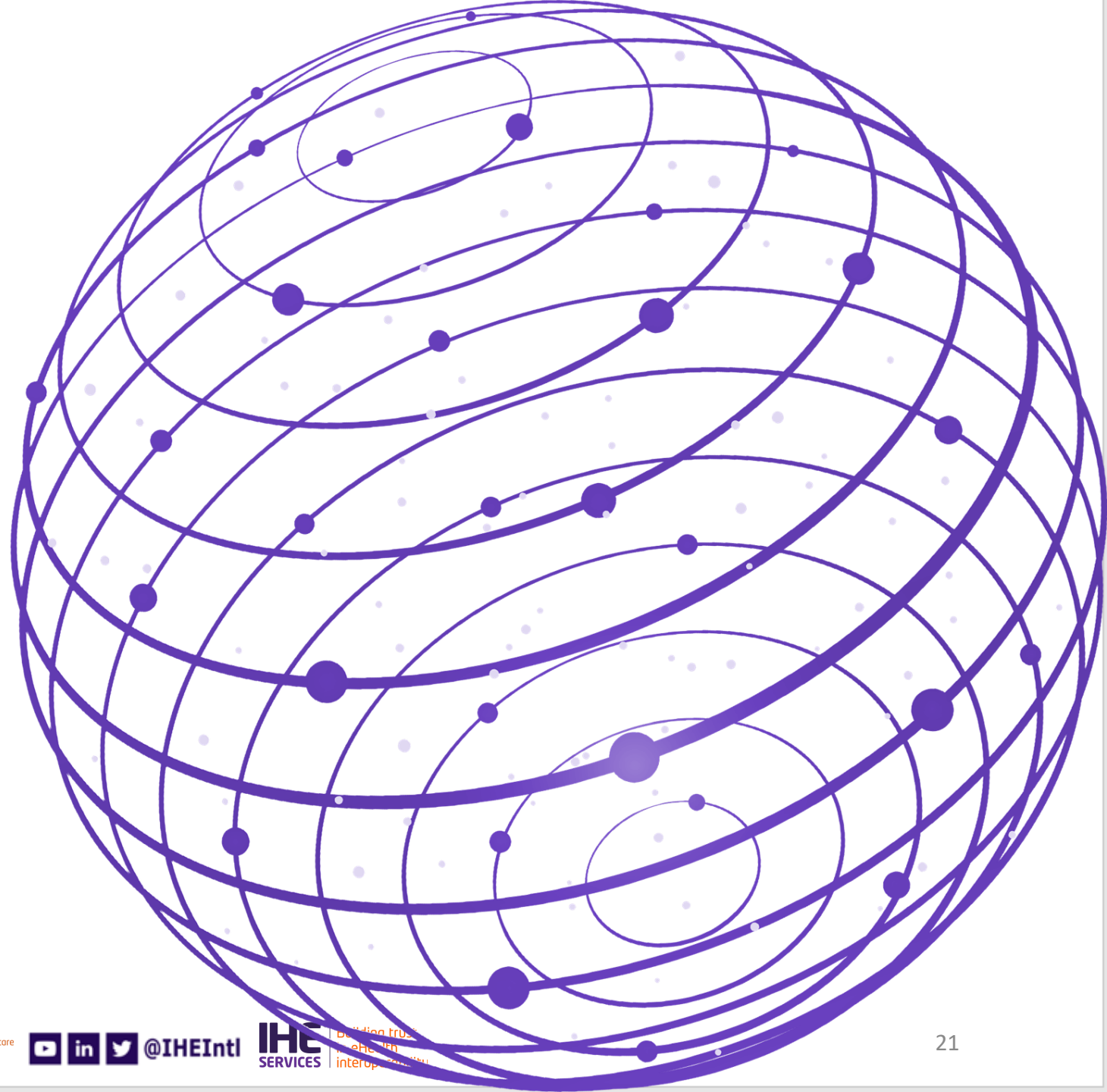
LCSD

LAW

LTW

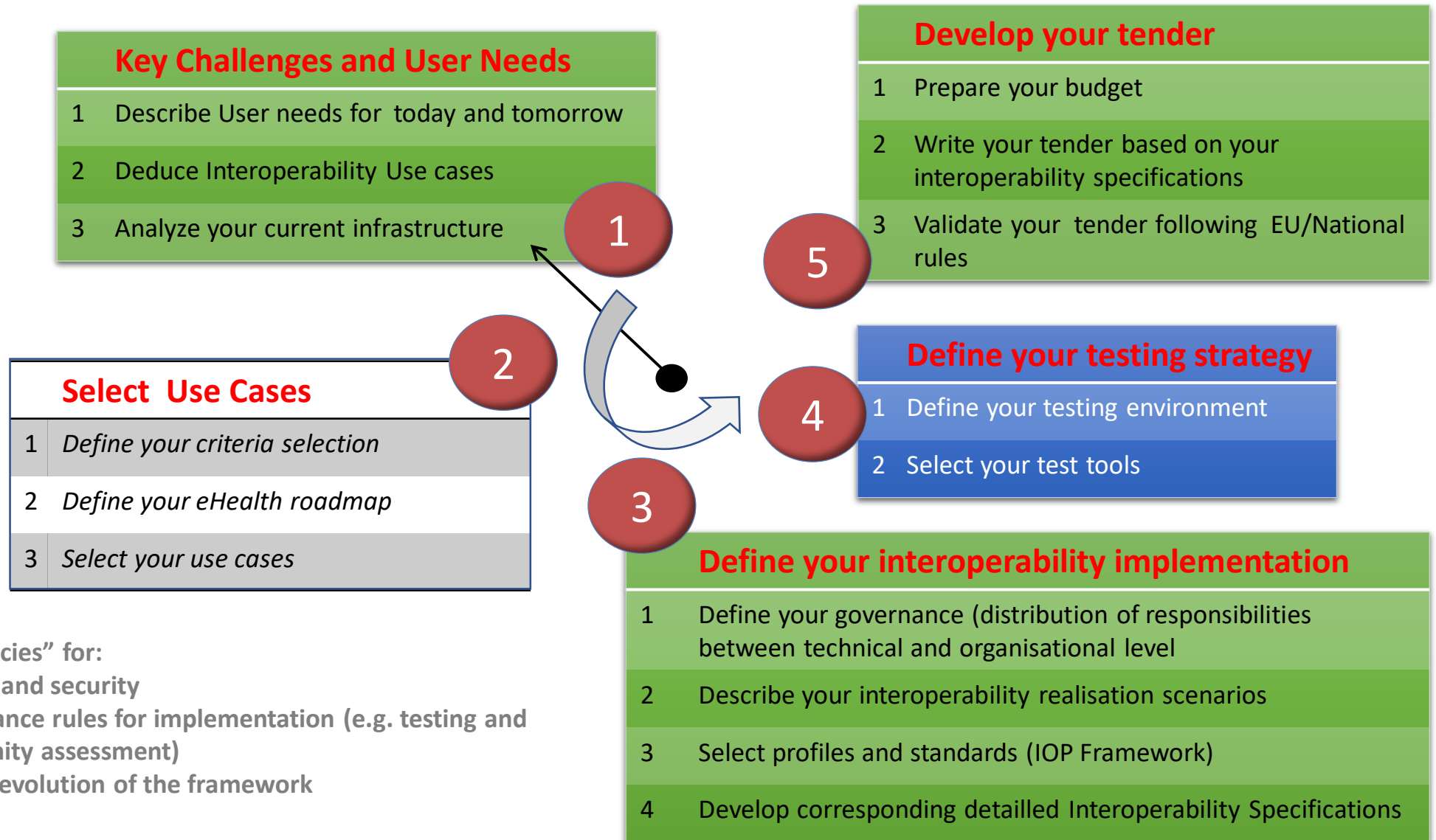


IHE methodology for building an Interoperability Framework Governance



Use case driven approach

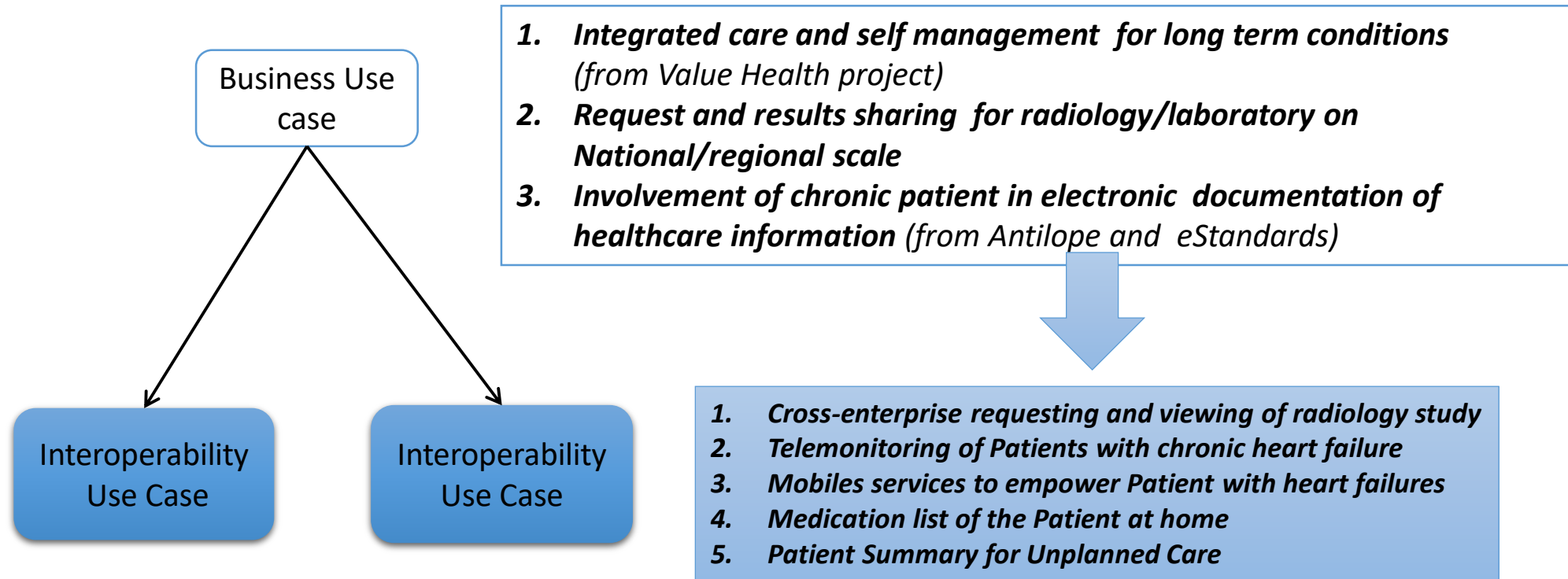
Trainings and methodologies available and operationally proven

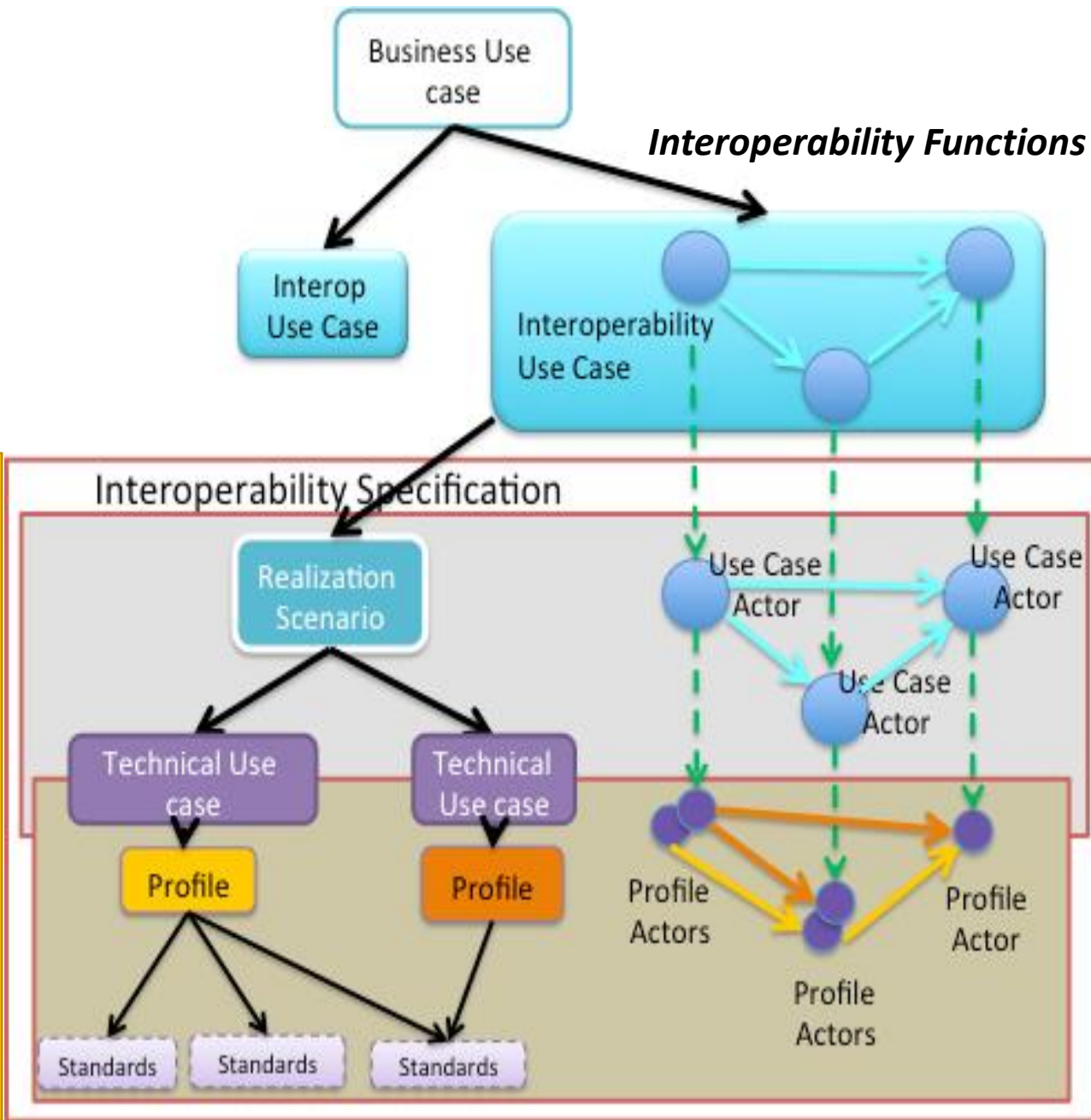


“Define policies” for:

- ➔ Privacy and security
- ➔ Governance rules for implementation (e.g. testing and conformity assessment)
- ➔ Govern evolution of the framework

Business cases and interoperability use cases





eHealth Business cases

Uses Cases to be defined that include interoperability functions

Interoperability architecture

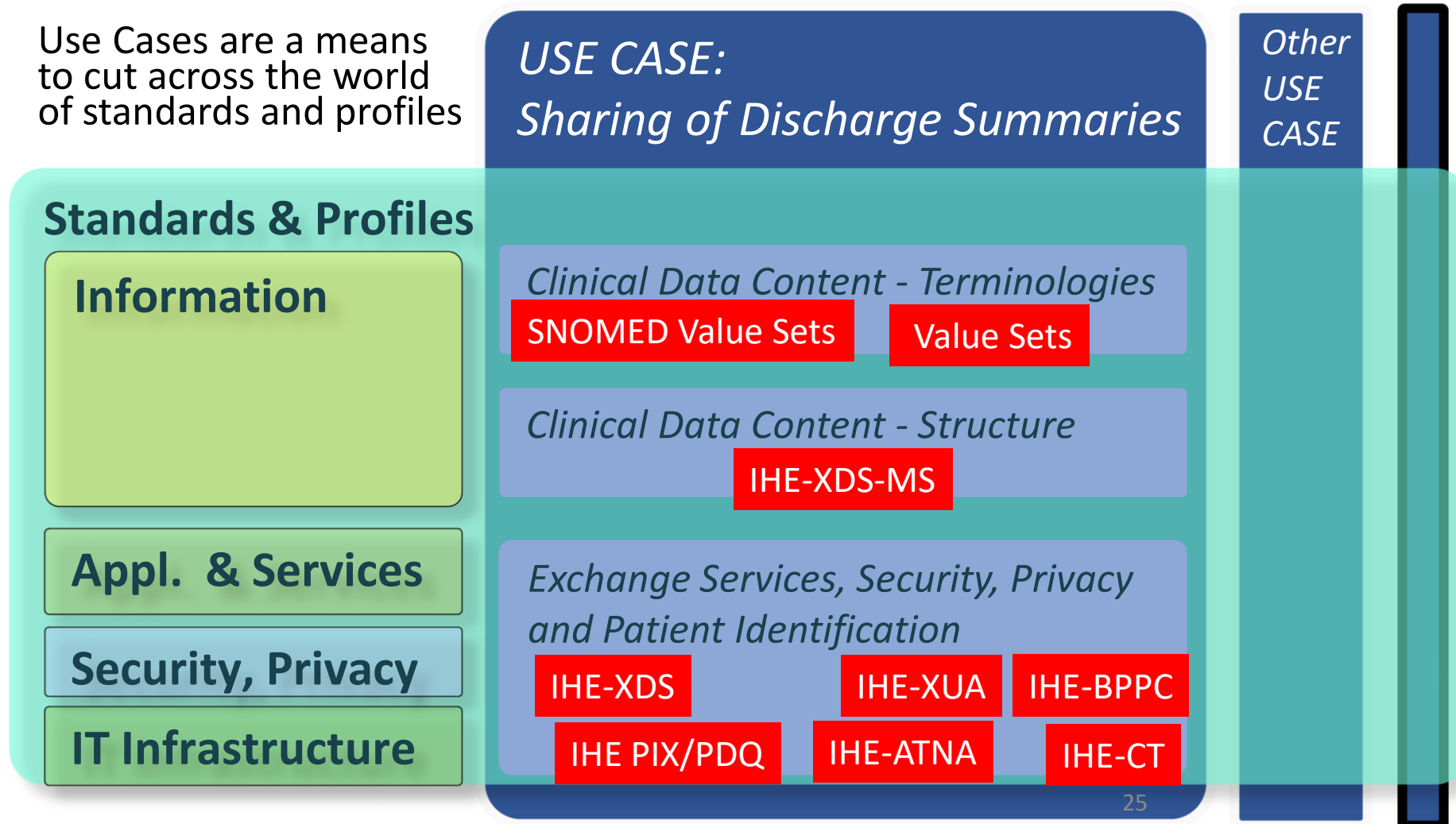
Realisation scenarios and Interoperability Specifications

TESTING Strategy

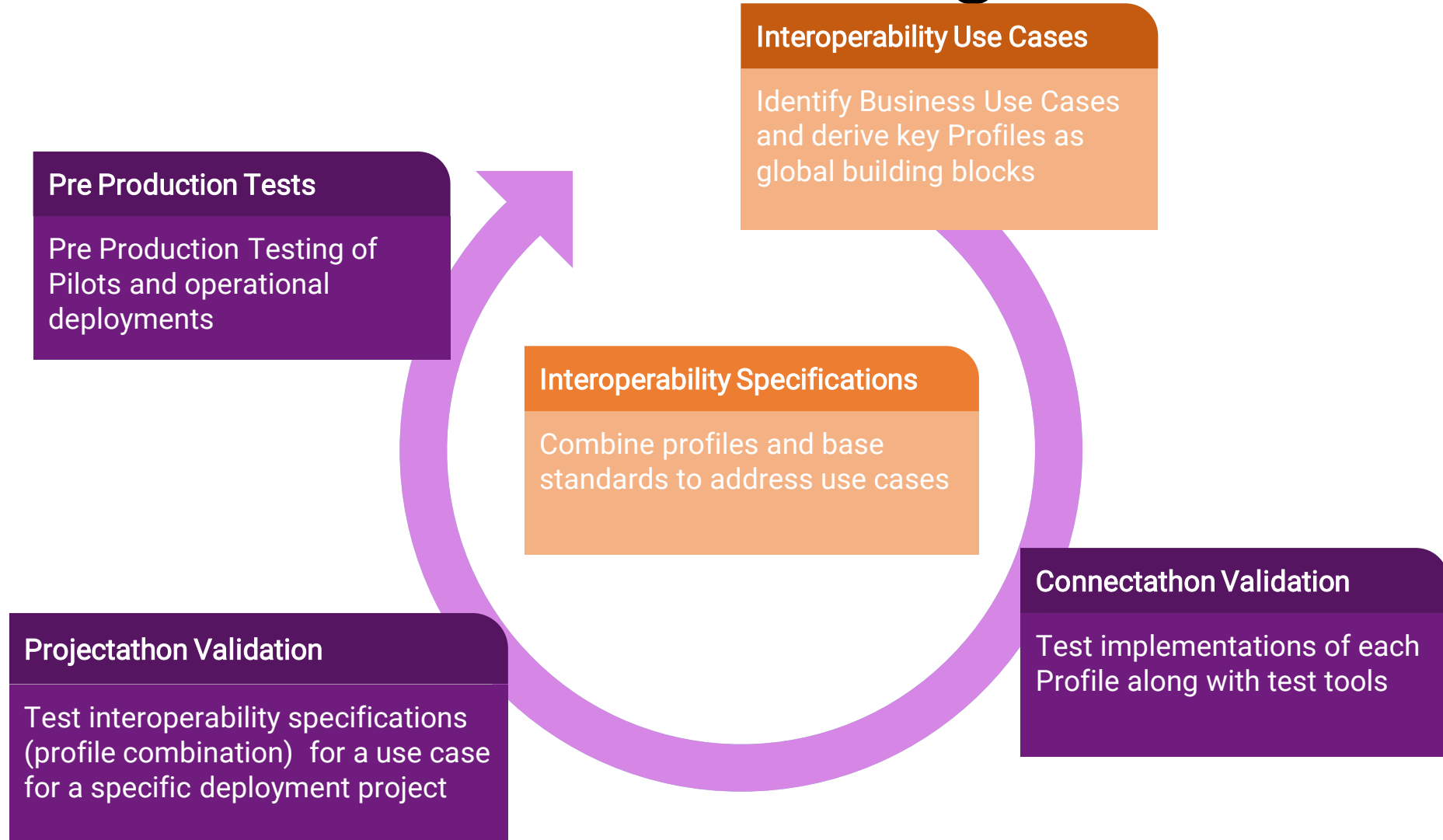
How to unpack standards and profiles ?

Role of Use Cases with an example

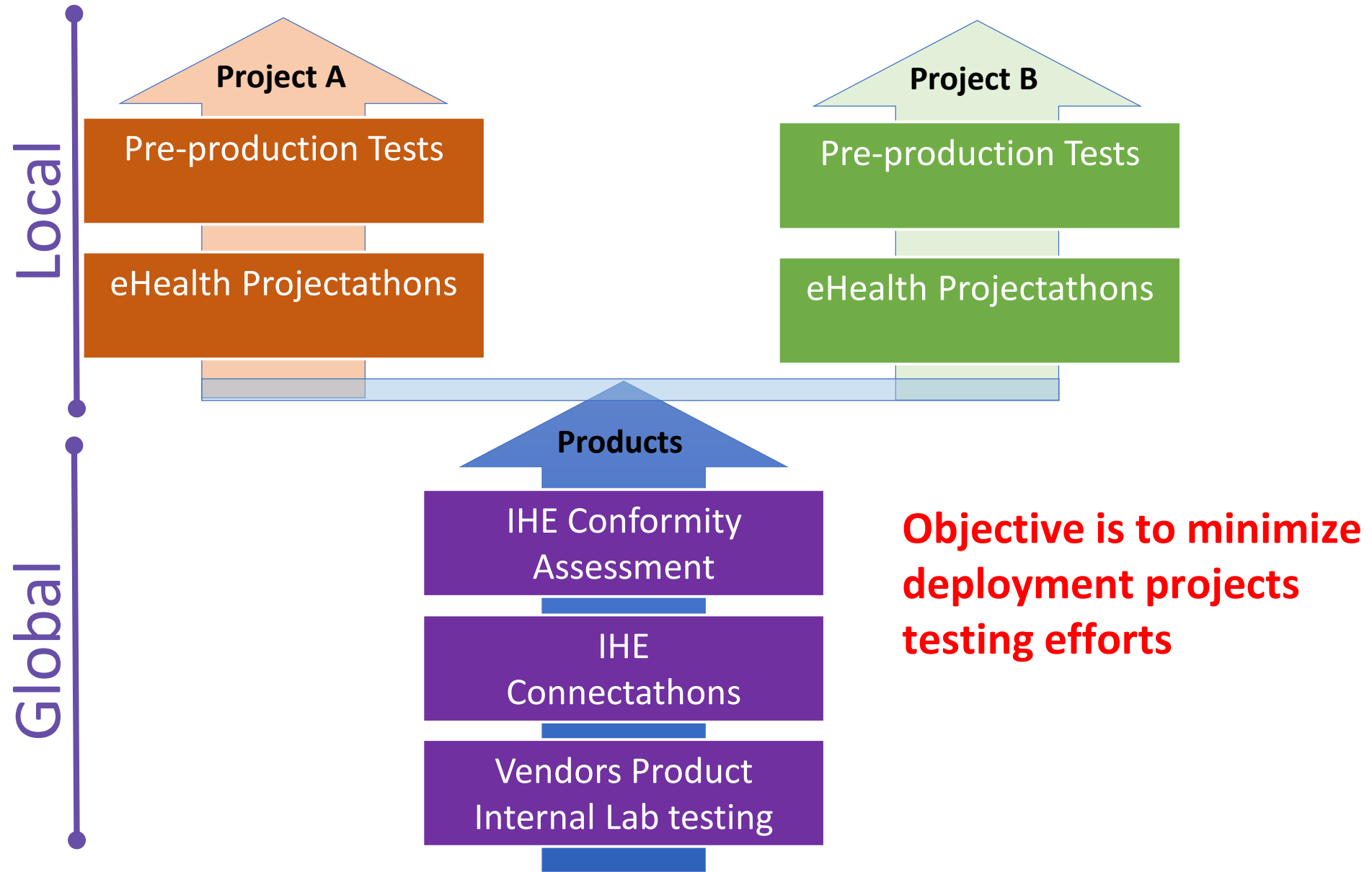
Use Cases are a means to cut across the world of standards and profiles



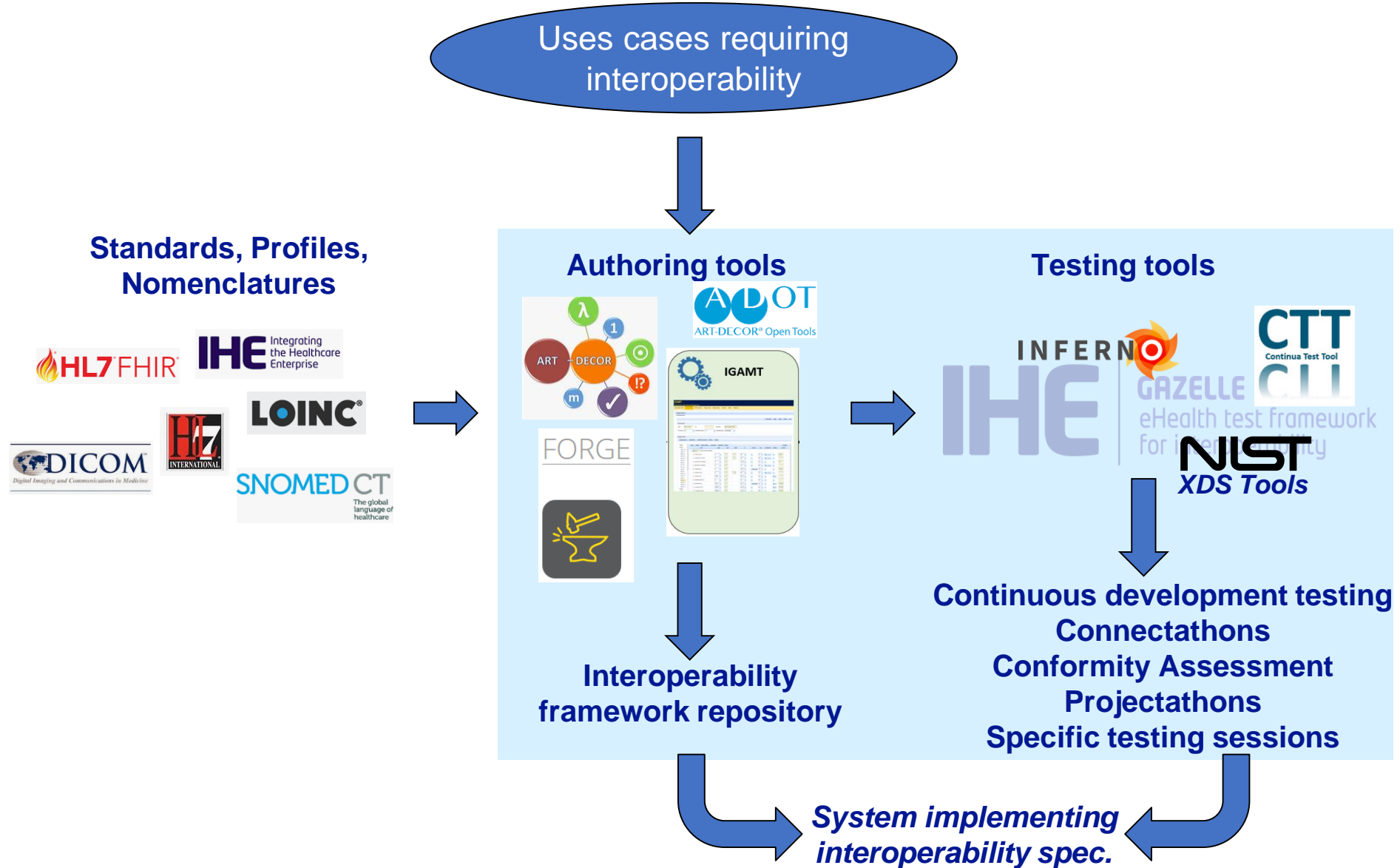
Realizing Interoperability is about teamwork: Needs Definition to Testing Continuum



Testing Continuum for Products and Deployment Projects



IHE Gazelle Ecosystem



The central role of the Gazelle Platform



Thank You!

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