



Advancing eHealth
Interoperability

Antilope – refinement of the eEIF

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MEDIQ

Denmark, Norway, Sweden Finland, Iceland, Estonia, Lithuania, Latvia



Poland, Czech Republic, Slovakia, Hungary



Ireland, United Kingdom



Belgium, The Netherlands, Luxemburg



France, Switzerland,



Germany, Austria



Slovenia, Croatia, Serbia, Bosnia, FYE Macedonia, Montenegro



Italy, Malta



Portugal, Spain



Romania, Bulgaria, Greece, Cyprus, Turkey



- Three key messages
- Goals and deliverables of Antilope
- eHealth European Interoperability Framework
 - Antilope Use Cases
 - Linking Use Cases to IHE and Continua Profiles
 - Templates for Use Cases and Realisation Scenarios
 - Refined interoperability schema
- Three key messages (with solutions from Antilope)



Interoperability requires a shared definition of interoperability levels, terms and use cases

Use Cases are important building blocks in the realisation of interoperability

Using open, international standards and profiles in the implementation of Use Cases is a future-proof investment and facilitates cross-border solutions



- Refinement of eHealth European Interoperability Framework
 - Provide a comprehensive set of Use Cases that can be used throughout Europe as a basis for national and regional implementations
 - Provide tools and schemas that can assist in a shared understanding of interoperability issues
- Educational material
 - For summits, discussions, collaborations and projects

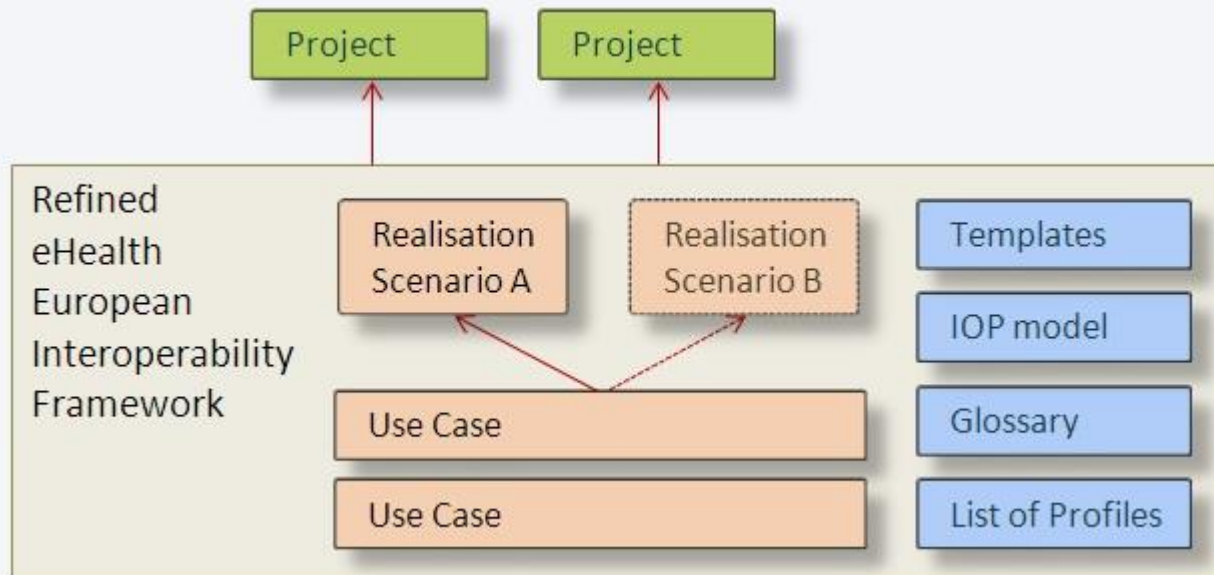


1. D1.1 Refinement Definition document

- Refined eHealth European Interoperability Framework
- Set of well-defined Use Cases, linking to interoperability Standards and Profiles (through Realisation Scenarios)
- Templates for the description of Use Cases and Realisation Scenarios
- Model for interoperability levels
- Glossary of interoperability terms and definitions
- Overview of the IHE and Continua Profiles mentioned in the Antilope Use Cases
- Recommendations for governance and lifecycle

2. D1.2 Educational material

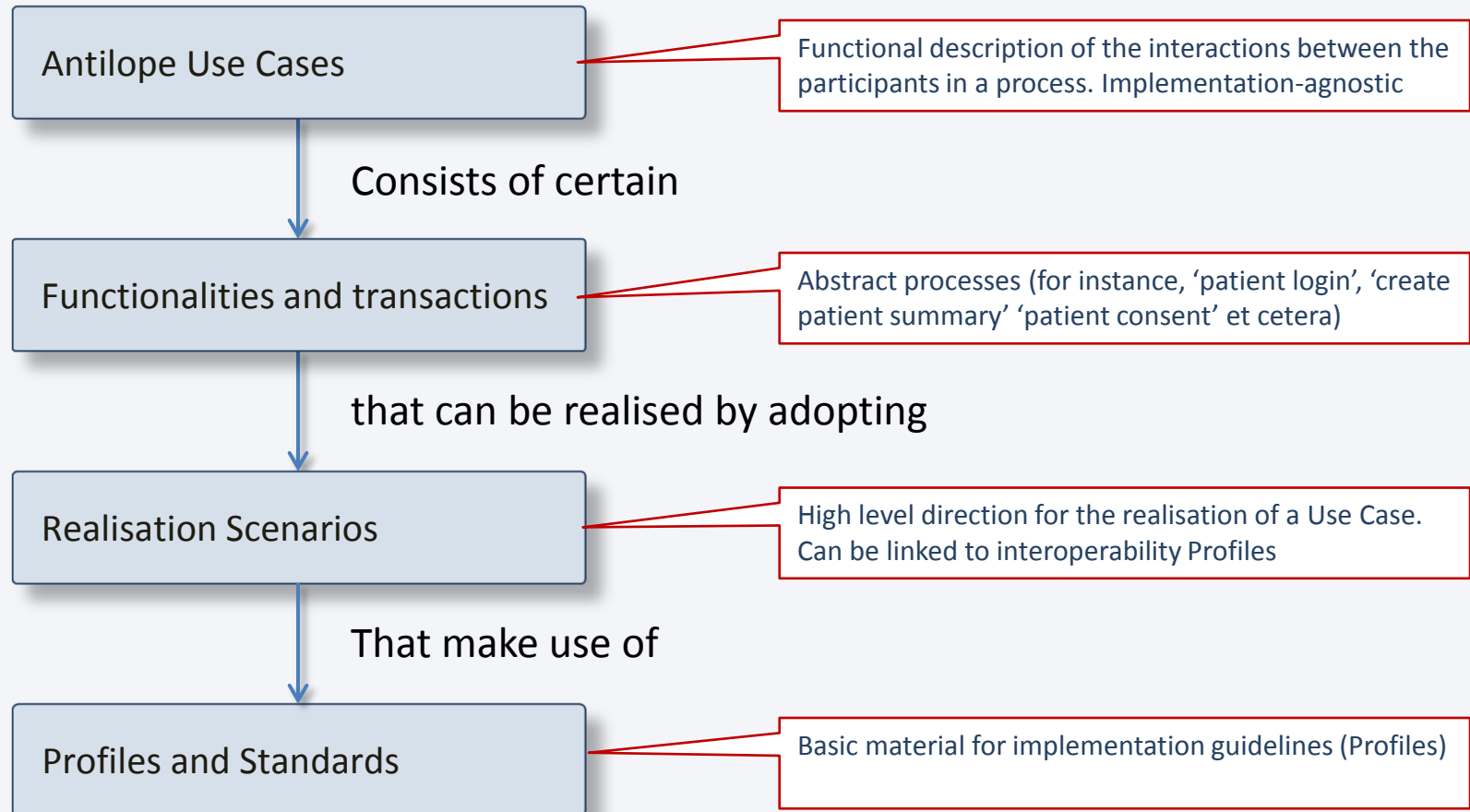
- PowerPoint presentation (this presentation)
- Refinement Definition document (see above)

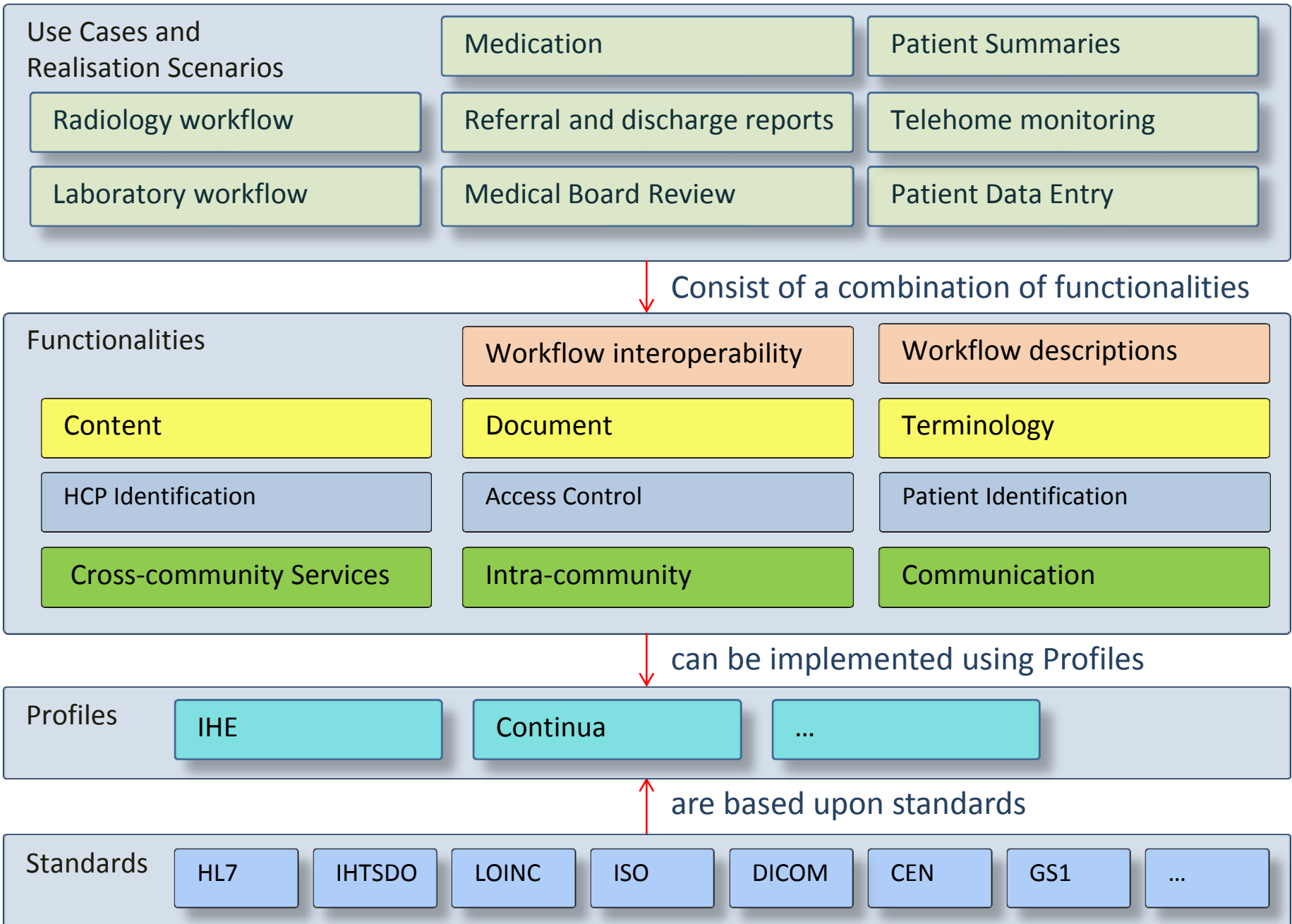




1 - Antilope Use Cases

#	Medical domain	Description	Scale
1	Medication	e-Prescription and e-Dispensing	1a) Cross-border 1b) National/Regional 1c) Intra-hospital 1d) Citizens at home
2	Radiology	Request and results sharing workflow for radiology	2a) National/Regional 2b) Intra-hospital
3	Laboratory	Request and results sharing workflow for laboratory	3a) National/Regional 3b) Intra-Hospital
4	Patient Summary	Patient Summary sharing	4a) Cross-border 4b) National/regional 4c) Citizens at home
5	Referral- and Discharge reporting	Cross-enterprise Referral and Discharge Reporting	National /Regional 5a) Referral of patient from primary to secondary care 5b) Discharge report from secondary care
6	Participatory healthcare	Involvement by chronic patients in electronic documentation of healthcare information	Citizens at home
7	Telemonitoring	Remote monitoring and care of people at home or on the move using sensor devices	Citizens at home
8	Multidisciplinary consultation	Medical Board Review	National/Regional





Using Profiles to realise functionalities in Realisation Scenarios

Workflow interoperability

XDW Document Workflow

XBeR-WD Basic eReferral

XTB-WD Medical Board Review

Workflow descriptions

LTW Laboratory Testing Workflow

SWF Scheduled Workflow (Radiol.)

CMPD Commun. Medic. PRE and DIS

Content

XPHR Exch. of Personal Health Record

XD-LAB Sharing Laboratory Results

DIS, PRE

MS Medical Summaries

Document

DEN Document Encryption

DSG Document Signature

DSUB Document Notification

Terminology

SVS Shared Value Sets

RTM Rosetta Terminology Mapping

LCSD Laboratory Code Sets Distribution

HCP Identification

HPD Healthcare Provider Discovery

Access Control

XUA(++) Rights and Authorization

BPPC Patient Consent

Patient Identification

PIX/PDQ Patient Discovery

PAM Patient Administration Mgt

XCPD Cross-Comm. Patient Discovery

Cross-community

XCA Cross-Community Access

Intra-community

XDS, XDR Document Sharing

ATNA Audit Trailing & NA

CT Consistent Time

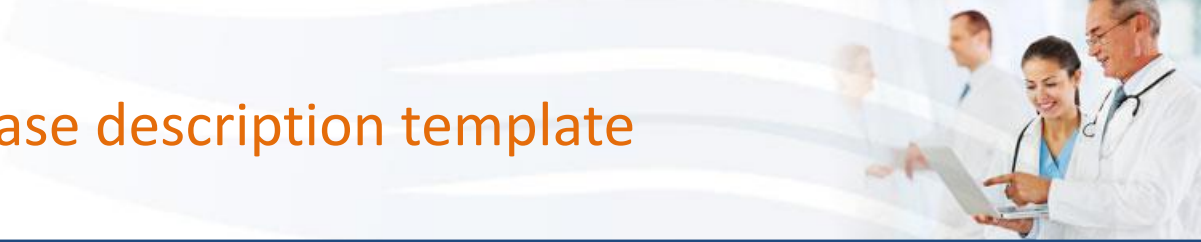
Communication

HRN Health Record Network

WAN, LAN, PAN Network protocols

DEC Device-Enterprise Communic.

- Structured description of Use Cases and accompanying Realisation Scenarios
- Separate templates for the Use Case (= problem description)
and the Realisation Scenario (= solution direction)
- Can be used for the structured description of additional Use Cases.



Title	(Number and) Name of the Use Case
Purpose	The Purpose of a Use Case describes the objective that needs to be achieved, the goal of the use case. It also describes the relevance of the Use Case (both from the care process and the economical viewpoint).
Domain	The key functional domain of the Use Case: Medication, Radiology, Laboratory, Patient Summary, Referral and Discharge Reporting, Participatory healthcare, Telemonitoring, Multidisciplinary consultation
Scale	Organisational dimensions of the Use. The following scales have been defined for the Antilope Use Cases: Cross-border, National/regional, Intra-hospital, Citizens at home and on the move
Business Case	The Business Case explains the 'why' of the Use Case. It describes the relevance of the Use Case (both medical and economical). This part can contain a short SWOT analysis.
Context	Describes the current situation, influencing factors
Information	High-level description of what type of information is shared, like 'patient summary' or 'medication prescription'
Participants	List of the main participants in the process. These can be individuals or organisational units. They are real-world parties.
Workflow steps	Real-world, functional description of a sequence of interactions between the participants in the different interaction steps of a process



Title	(Number and) Name of the Realisation Scenario
Related Use Case	Use Case that this Realisation Scenario is related to
Scenario context	Information and background about the real-world scenario.
Actors	List of the main participating systems, also (confusingly) called Actors, in the process. In this context, an Actor is an ICT system, as opposed to a participant (see above). Actors are involved with each other through transactions.
Transactions	Interoperability workflow steps describing the process steps between systems, including the information that is exchanged.
Process flow	A numbered list of process steps (optionally accompanied by a schematic overview), describing transactions between systems (actors), and the information 'units' that are exchanged. The process flow describes the interoperability steps, i.e. the steps <u>between</u> the systems, and not the steps <u>within</u> the systems. The process flow can be linked to IHE and/or Continua Profiles. In this part, also swimming lanes and other schemas can be used
Linked Profiles	A list of Profiles that are relevant for the entire process flow, and a numbered list of the Profiles that can be linked to the Process flow steps.
Possible issues	Issues such as legislation and guidelines, social acceptance, language issues, architectural flaws, et cetera, that may affect the realisation of this scenario.



Background - many different approaches for arranging interoperability levels

Authors	Goh	Goodchild et al.	Bishr	Shanzhen et al.	Ouksef and Sheth	Miller	Tolk	Tolk and Muguira	Bermudez	Shekhar	Schekkerman	Stroetmann	Ding	Nowak	Mohammadi et al.	Kalantari et al.	van Assche	Turnitsa and Tolk	Dekkers	Chen and Daclin
Interoperability level																				
Technical	x	X			x	x		x			x				x	x		x	x	x
Schematic or structural		x	X	x	x					x				x						
Semantic	x		x	x	x	x		x	x	x	x	x	x	x		x		x	x	x
Organisational		X		x			x				x				x				x	x
Physical																	x			
Empirical																	x			
Syntactic	x	X	x	x	x			x		x		x	x	x			x	x		x
Pragmatic		X		x	x			x									x	x		
Social					x										x		x			
Political or Human						x									x					
Legal		X				x									x	x				
International						x														
Dynamic		X		x	x													x		
Conceptual		X						x										x		



Level 6 Conceptual Interoperability
Level 5 Dynamic Interoperability
Level 4 Pragmatic Interoperability
Level 3 Semantic Interoperability
Level 2 Syntactic Interoperability
Level 1 Technical Interoperability
Level 0 No Interoperability

Many different representations

Often:

- too generic to be applicable, or
- too technical to be understandable, or
- too extensive to be practical



Subject Specification	Business Viewpoint "Why" - Policy	Information Viewpoint "What" - Content	Computational Viewpoint "How" - Behavior	Engine Viewpoint "Where" - In
Computational Independent Model - CIM (Conceptual)	EHR-S FM (IN) <ul style="list-style-type: none"> Inventory of Business Use Cases Capabilities-Services Requirements Contracts Stakeholders Business Scope Business Vision Business Objectives Policy & Regulations 	EHR-S CI-IM <ul style="list-style-type: none"> Conceptual Models Data Architecture CDA Inventory of Domain Entities Roles, Activities, Associations. 	EHR-S FM (DC & SC) <ul style="list-style-type: none"> Functional Profiles Inventories of Capabilities-Components, Functions Requirements Accountability, Roles Behaviors, Interactions Interfaces, Contracts Conceptual Functional Service Specifications 	<ul style="list-style-type: none"> Inventory Platform Environ Enterprise Bus Inventory
Platform Independent Model - PIM (Logical)	HDF or TOGAF <ul style="list-style-type: none"> Applicable Rules Use Case Specs Governance Technology Neutral Standards Wireframes of architectural layers Components and Associations 	Domain IMs <ul style="list-style-type: none"> Localized Constrained Project Message Content Specifications D-MIM R-MIM HMD CDA Specs. 	Domain Analysis Models (DAMs) <ul style="list-style-type: none"> System Use Cases Component Specs Interface Specs Interaction Specs Collaboration Participations Collaboration Types Function Types Interface Types Collaboration Scripts 	<ul style="list-style-type: none"> Existing models, Libraries, Versions Service Service
Platform Specific Model - PSM (Implementable)	<ul style="list-style-type: none"> Business Nodes Business Rules Business Procedures Business Workflow Technology Specific Standards 	<ul style="list-style-type: none"> Database Schemas Message Schemas Transformation Schemas (e.g., XSD) 	<ul style="list-style-type: none"> Automation Unit Technical Interfaces Transformation Orchestration Scripts 	<ul style="list-style-type: none"> Application Specs. GUI Specifications Component Designs Platform Bindings Deployment Topology

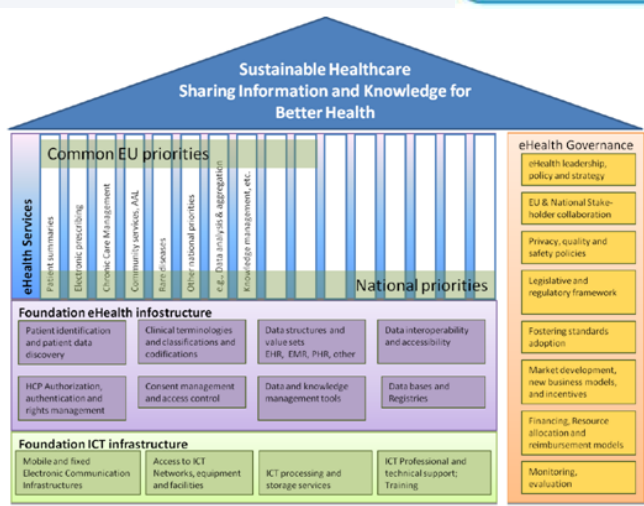
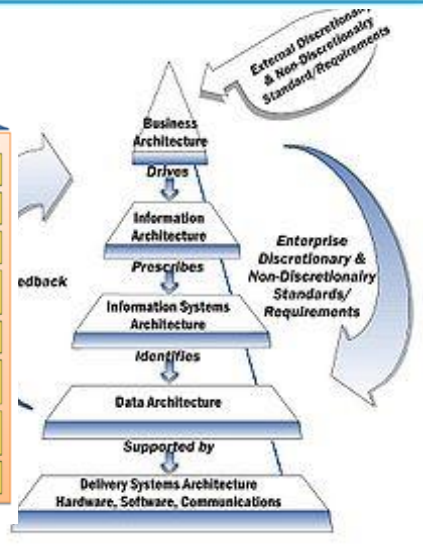


Figure 2 - CALLIOPE Working Model





Principles, Governance,
Agreements, Use Cases

Legal

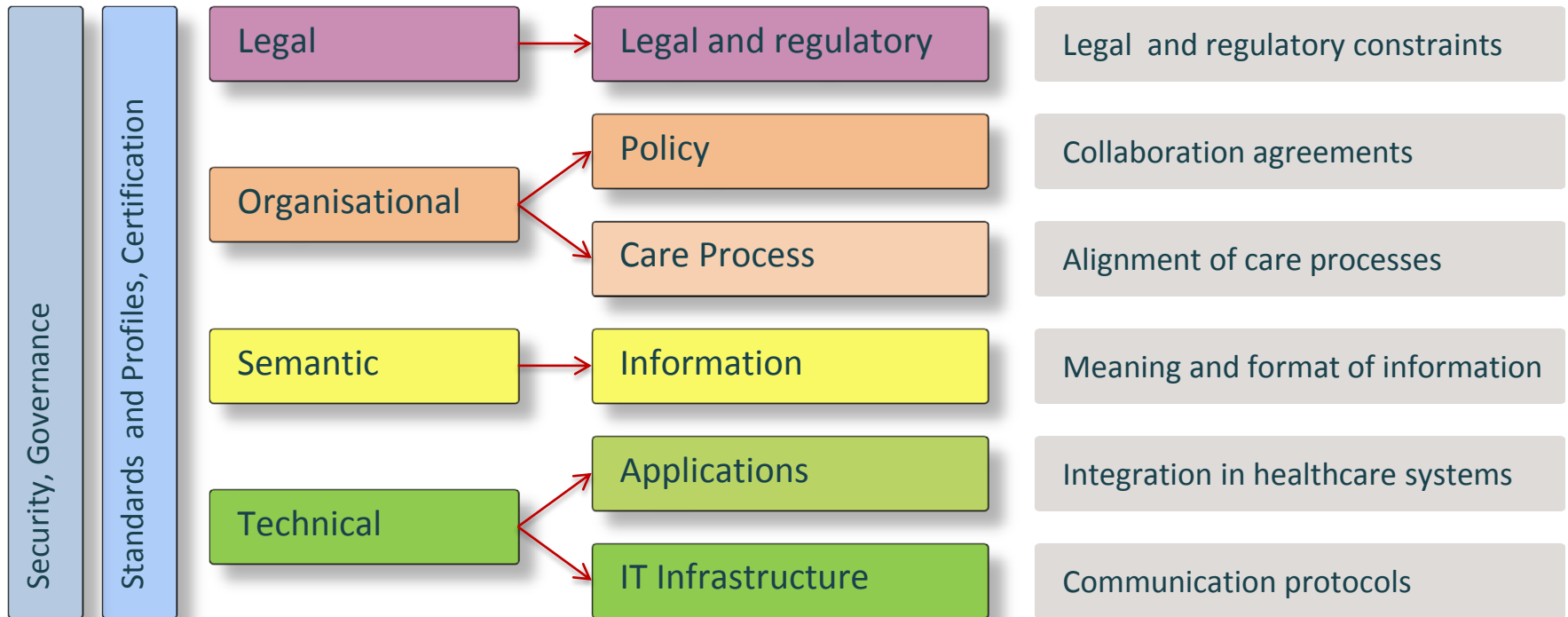
Organisational

Semantic

Technical

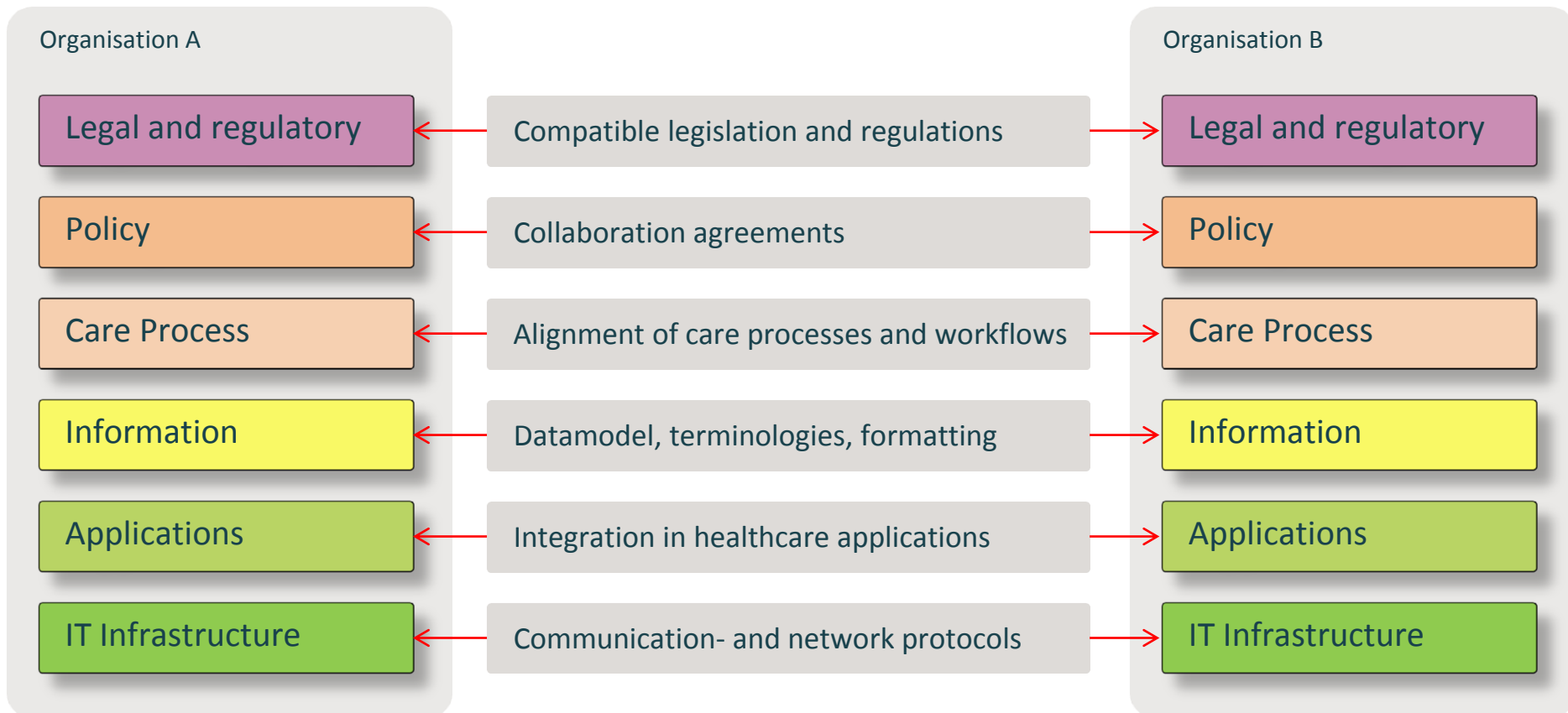


From conceptual to technical



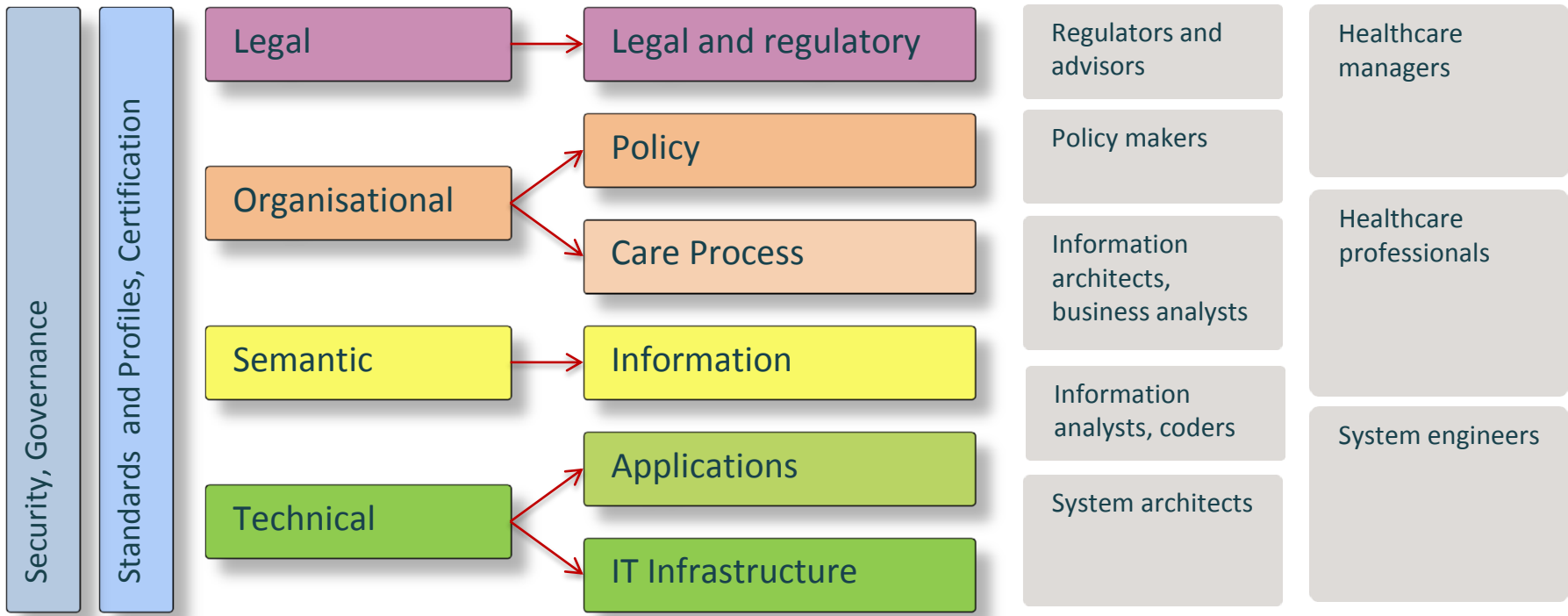


Interoperability between organisations



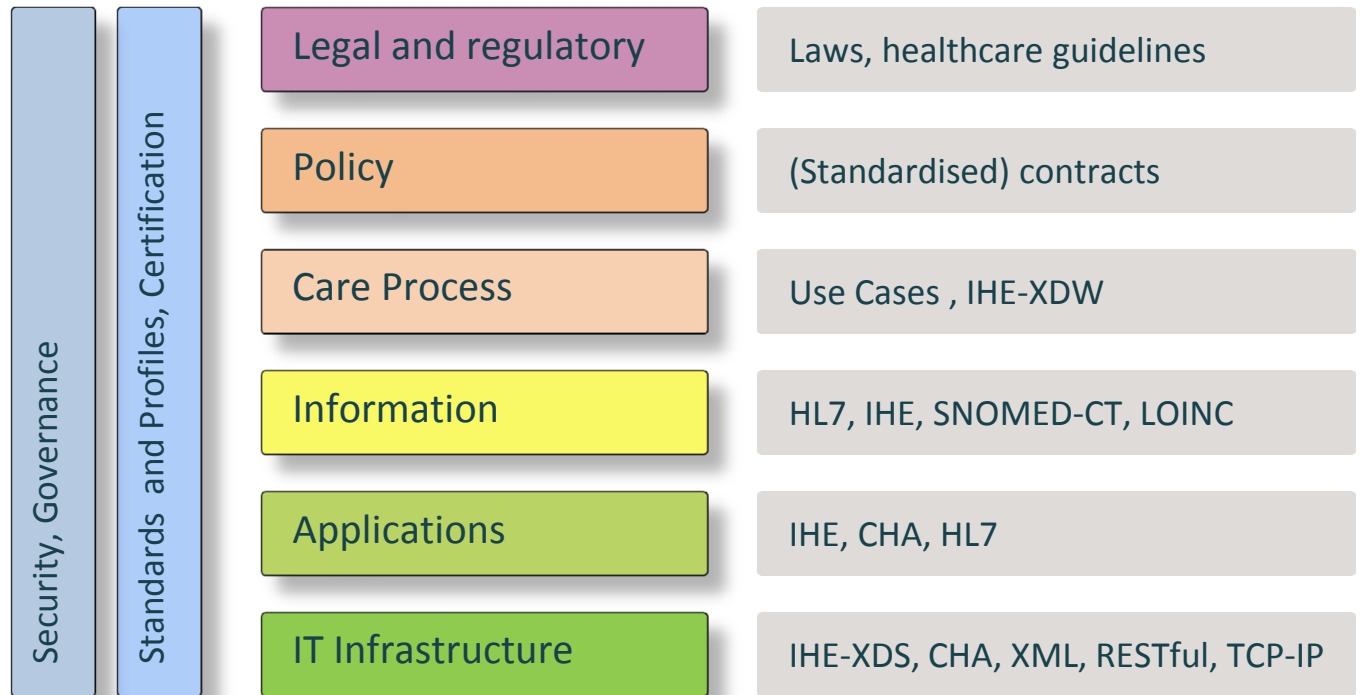


eEIF – stakeholders



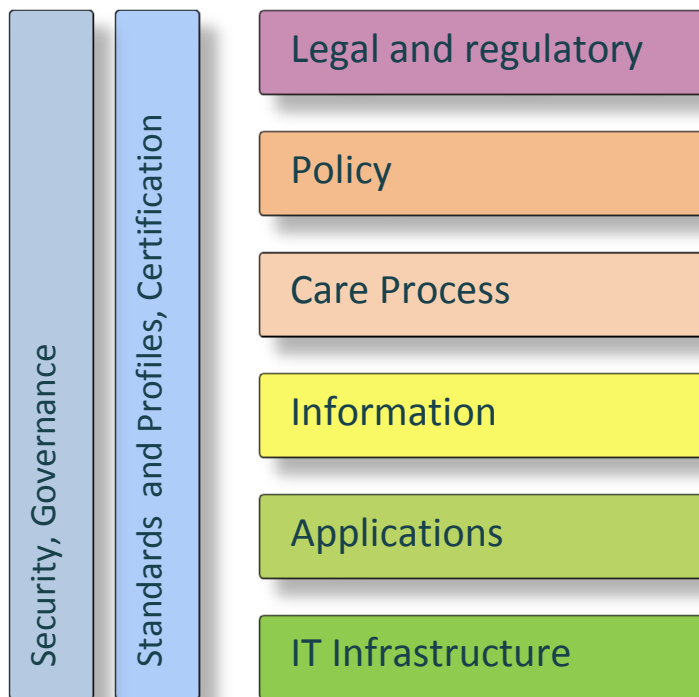
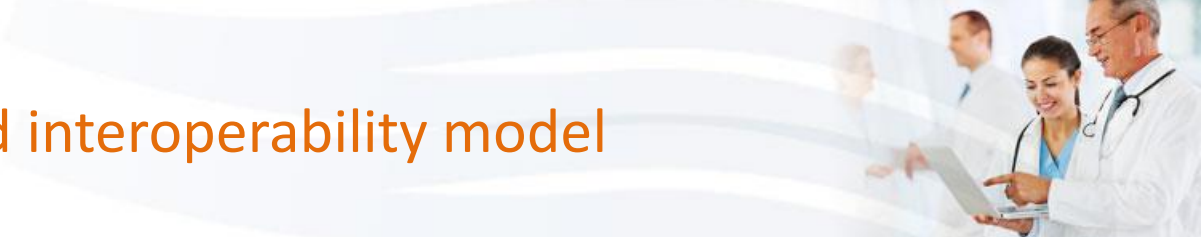


eEIF – linking to standards and profiles





eEIF – refined interoperability model





<p>Interoperability requires a shared definition of interoperability levels, terms and use cases</p>	<p>Antilope offers a set of Use Cases, a glossary of interoperability terms and definitions, a schema for interoperability levels, and a template for the description of use cases.</p>
<p>Use Cases are important building blocks in the realisation of interoperability</p>	<p>The Antilope Use Cases can be used as practical starting points for national/regional eHealth projects.</p>
<p>Using open, international standards and profiles in the implementation of Use Cases is a future-proof investment and facilitates cross-border solutions</p>	<p>The Antilope Use Cases are linked to proven and widely accepted standards and profiles.</p>



More information is available at the Antilope website:

<http://www.antilope-project.eu/>