



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)

## Three key messages

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



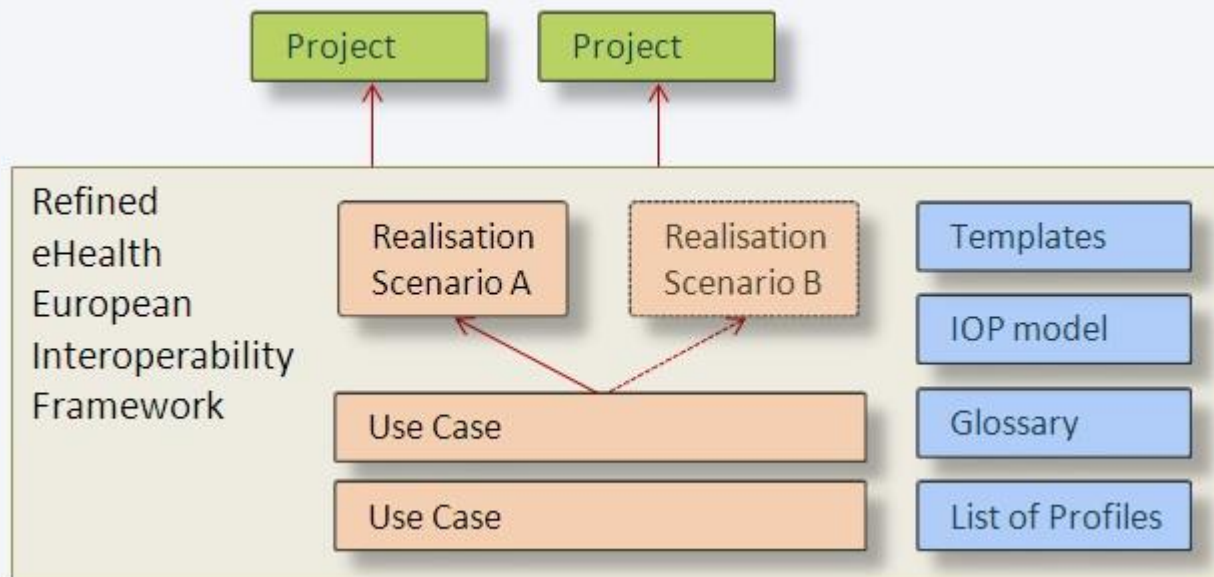
## 1. D1.1 Refinement Definition document

- Refined eHealth European Interoperability Framework
- Set of Use Cases
- Linking to interoperability Standards and Profiles (through Realisation Scenarios)
- Templates for 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)

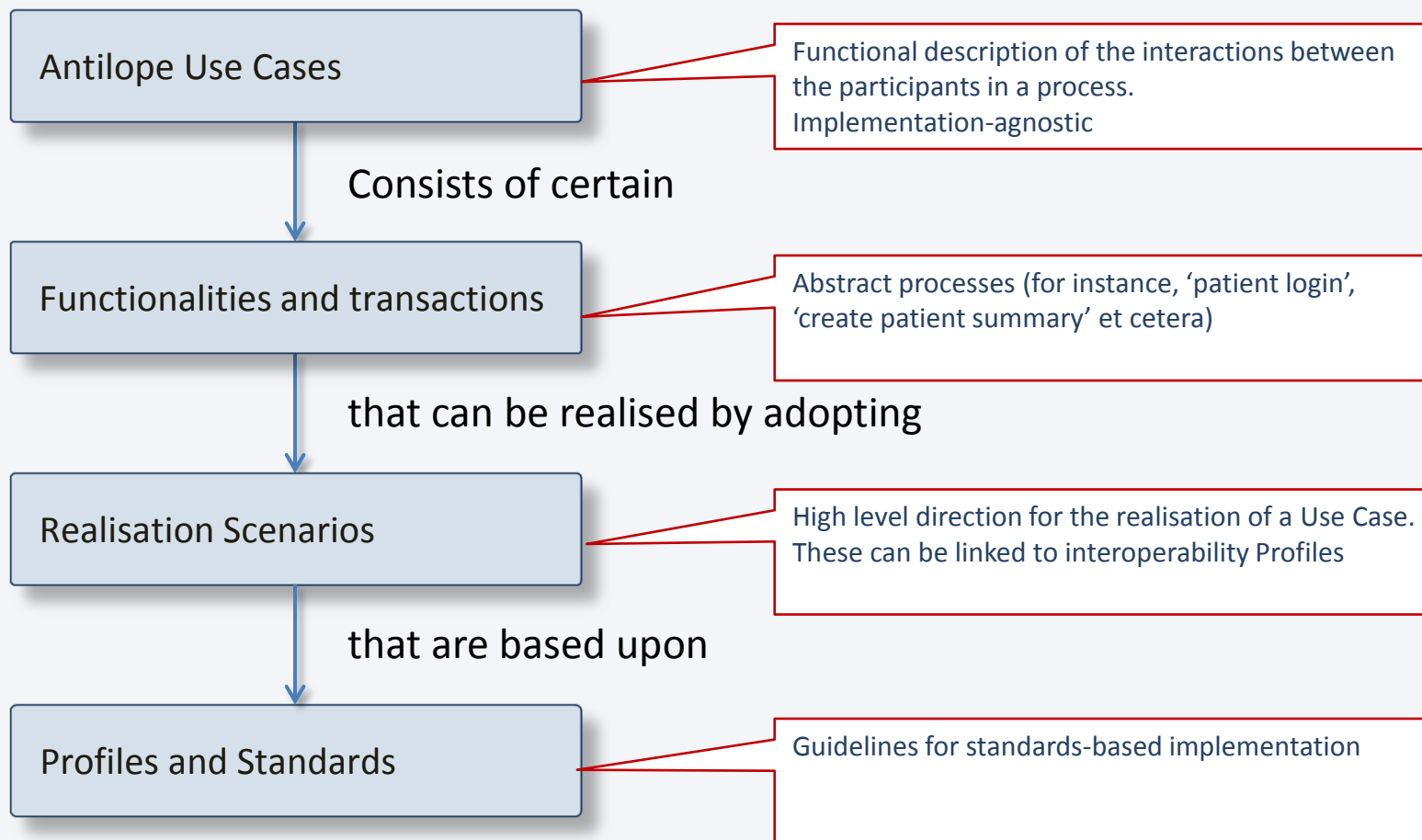


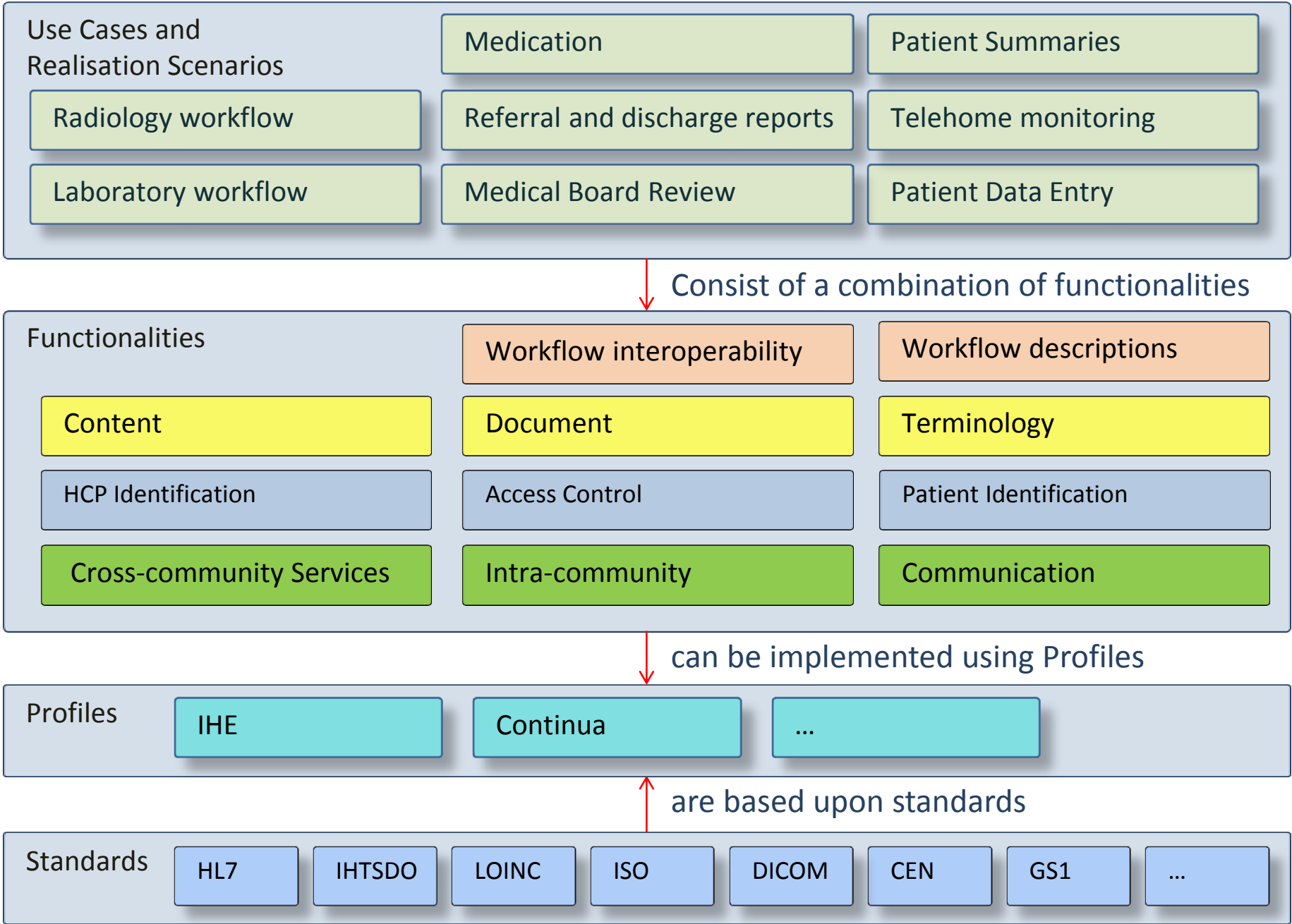




# 1 - Antilope Use Cases

#	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.

## 2 - Templates for Use Case description

- 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.



Many different approaches for arranging interoperability levels

Authors	Goh	Goodchild et al.	Bishr	Shanzhen et al.	Oukel 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						
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		



Many different representations

Often:

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



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

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

**HL7 SAIF ECCF**

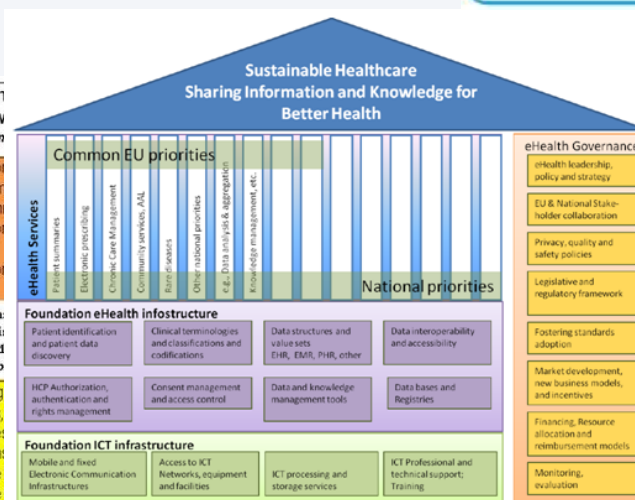
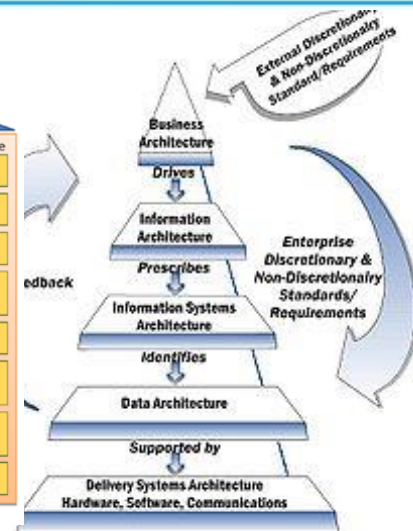
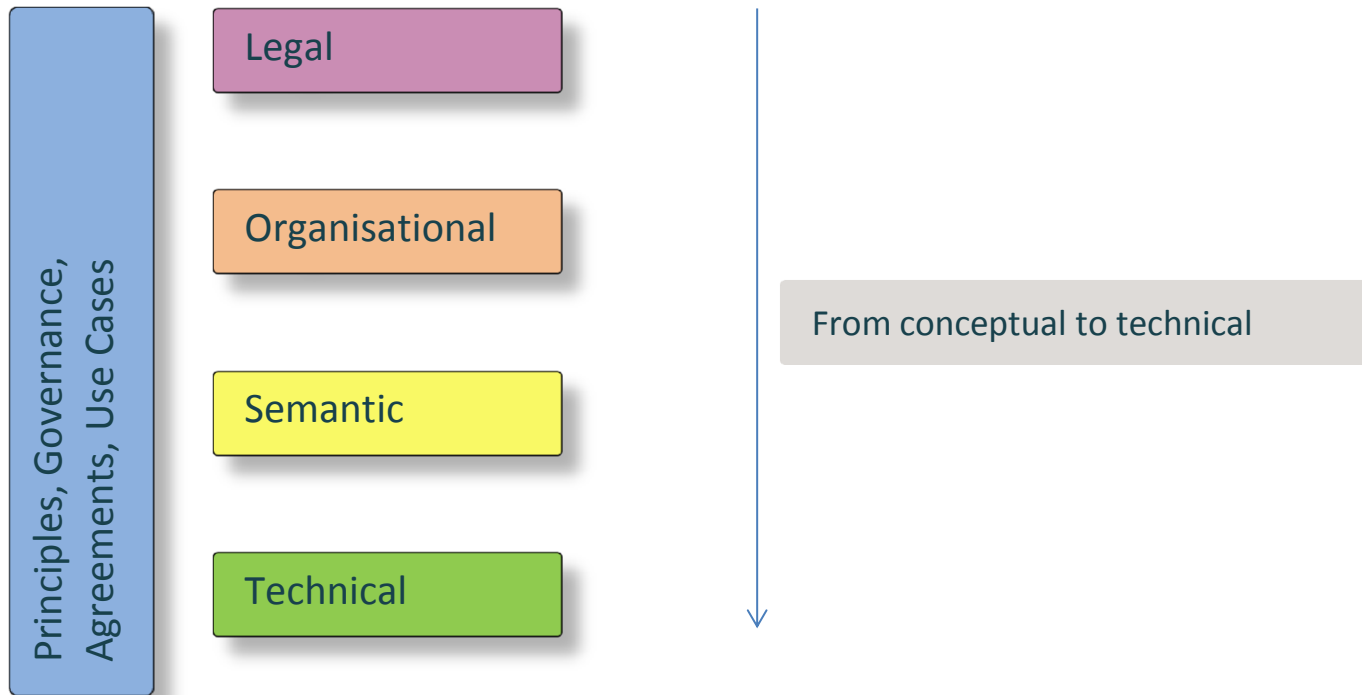
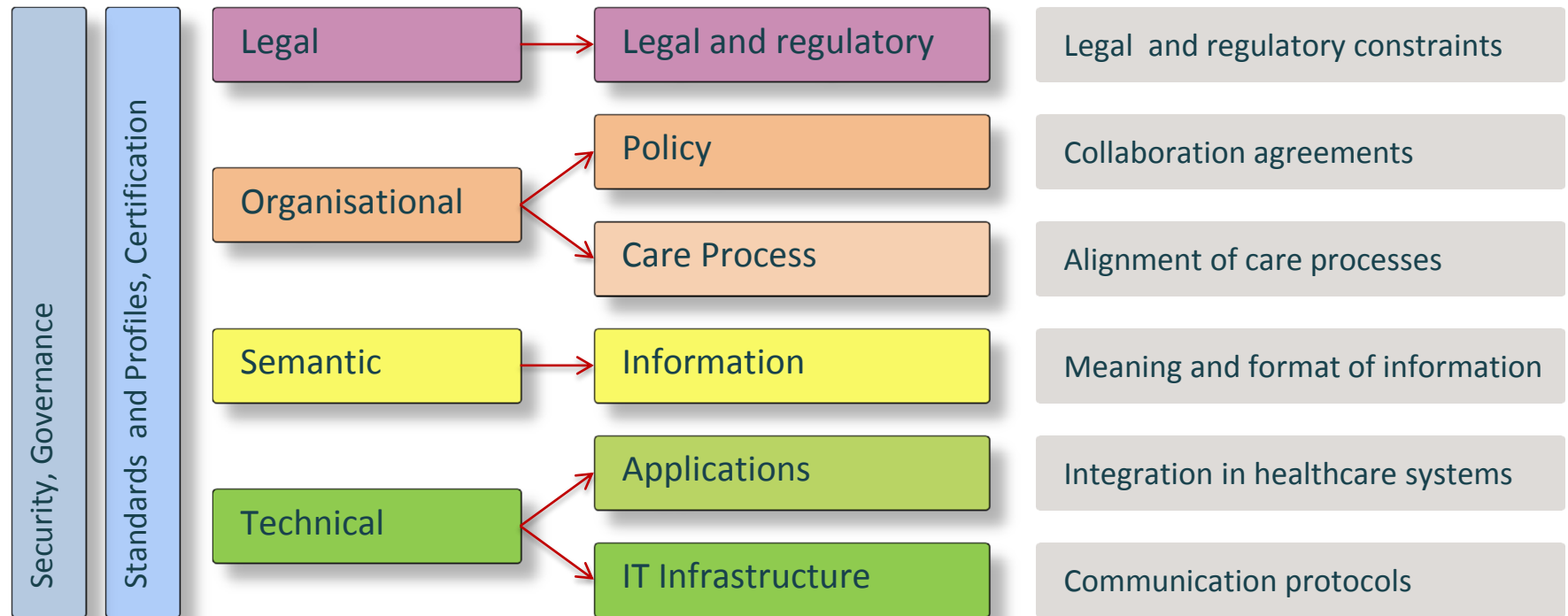
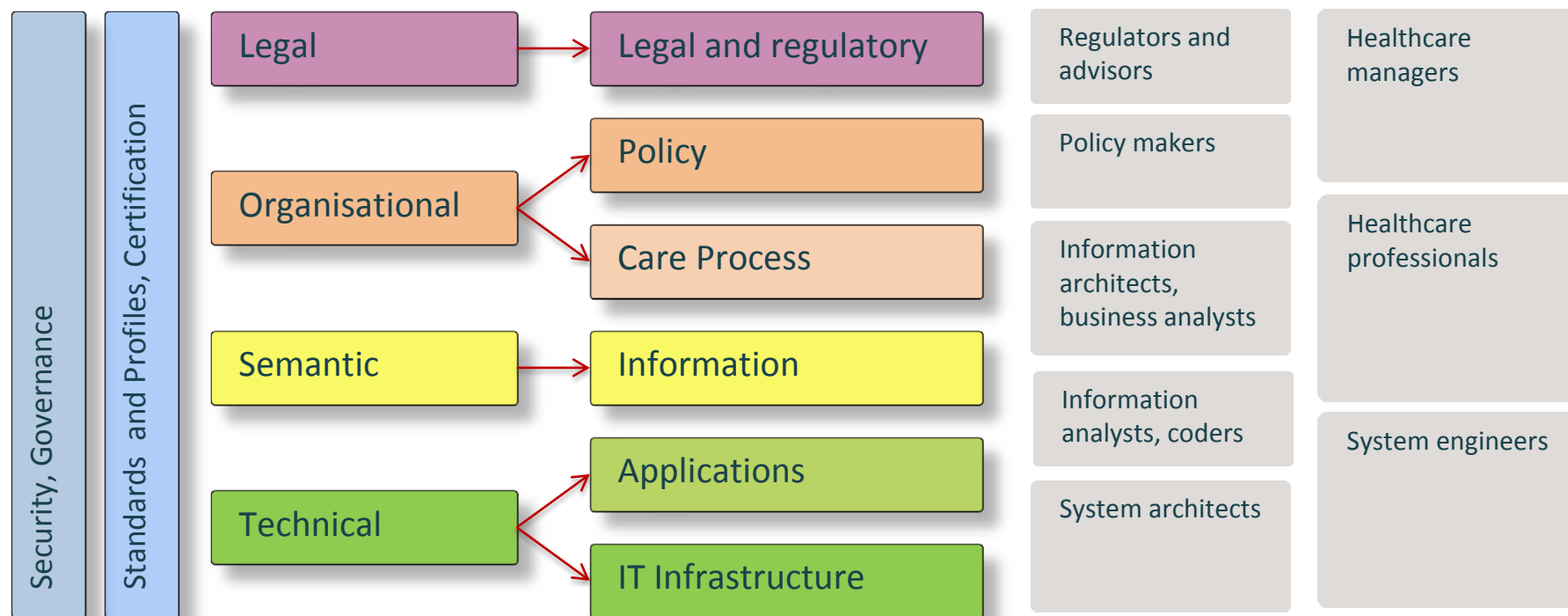


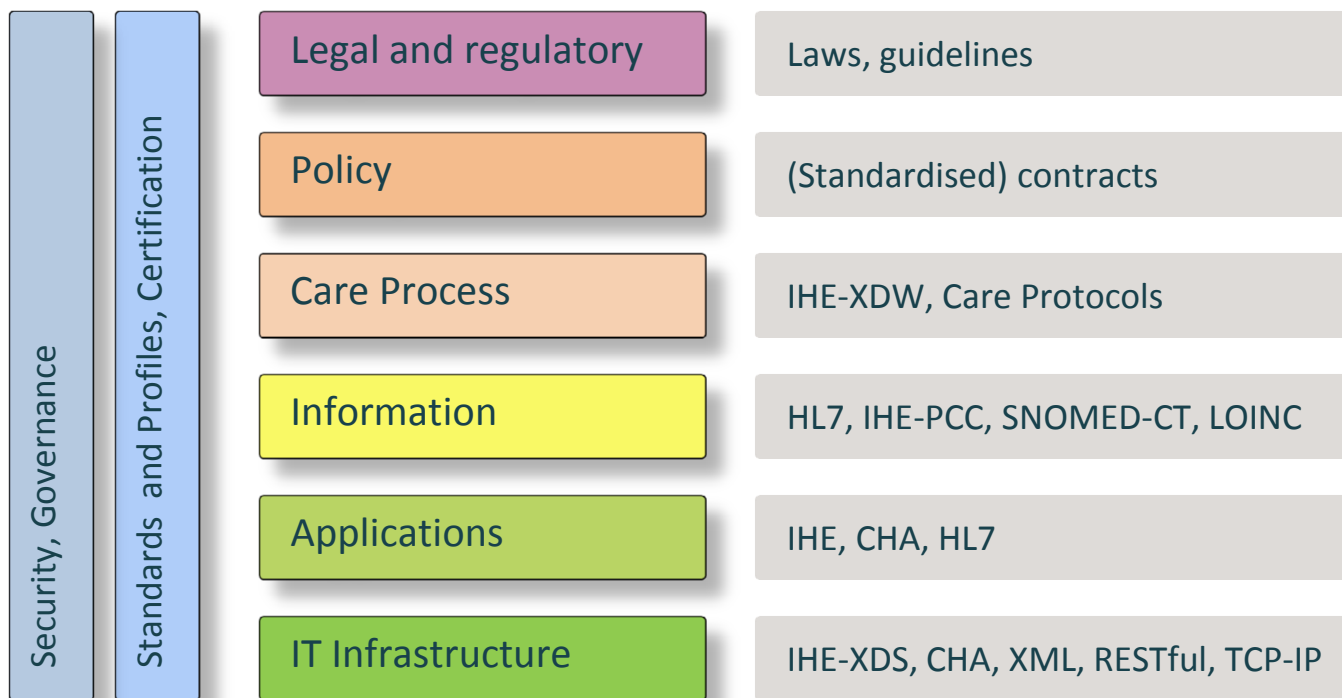
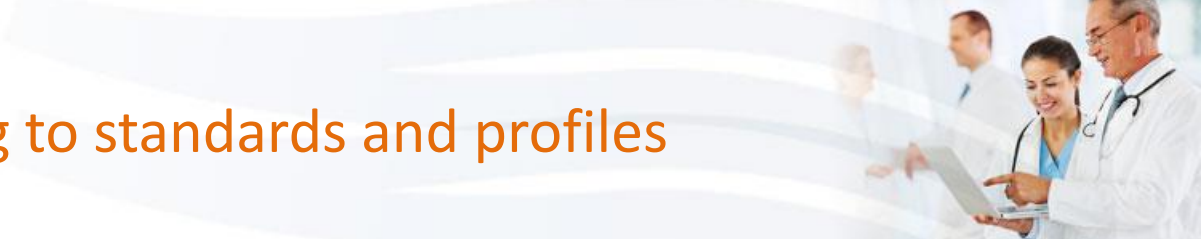
Figure 2 - CALLIOPE Working Model

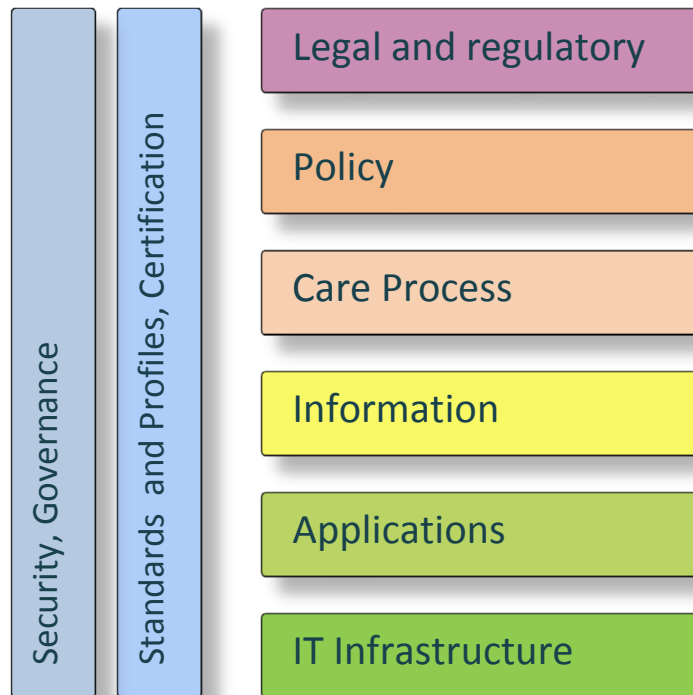








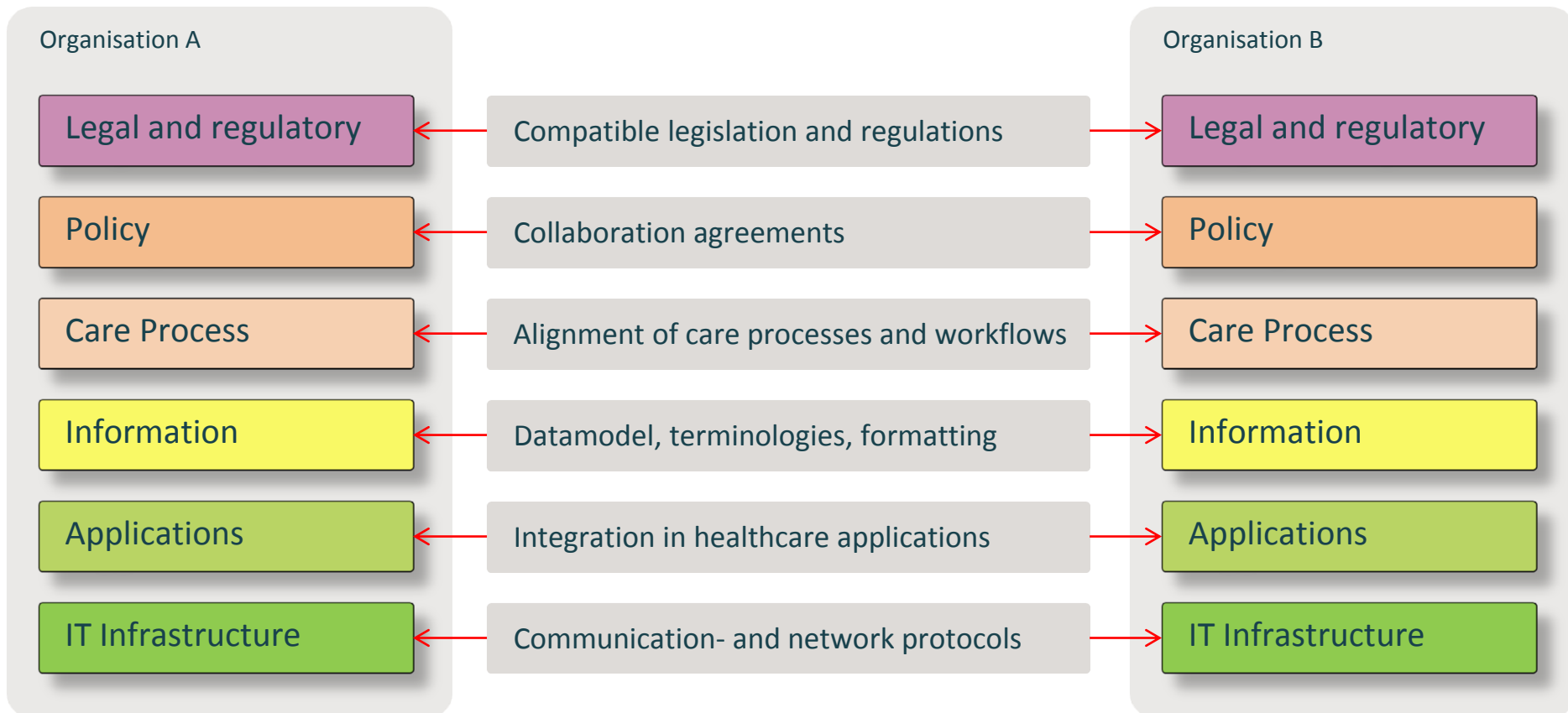








## Interoperability between organisations







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



More information is available at the Antilope website:

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