



## Semantic Interoperability for Health Network

# Deliverable 7.1 Identification of stakeholders

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## Document description

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Contact:	joerg.artmann@empirica.com
Editors:	Jörg Artmann, Veli Stroetmann, Karl Stroetmann, Dipak Kalra

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## 1 Introduction

This deliverable provides an initial overview of key stakeholders involved in semantic interoperability in eHealth in the context of concrete use cases and a potential European Virtual Organisation based on a workshop organised together with epSOS and introduces business modelling concepts and discussion results that will further drive the value proposition analysis of stakeholders in the next WP7 deliverable.

The European policy background to the work of SHN is described in chapter 2. Its purpose is to put the work of the SemanticHealthNet (SHN) project into the larger context of European efforts towards semantically interoperable electronic patient summaries and ePrescription systems. This will help to identify those organisations and/or individuals who will contribute to or be a consumer of the SHN output.

The business modelling concepts that will guide all future work in WP7 are introduced in chapter 3, alongside key results of an EC sponsored workshop on the sustainability of semantic assets such as those developed in the framework of the epSOS large scale pilot.

Following the review of business modelling concepts and stakeholder views on the business model for the epSOS semantic assets, chapter 4 reviews the SHN use case of a heart failure summary to briefly illustrate which stakeholders will be required to contribute to its realisation.

The deliverable closes with an outlook on the relevance of the business modelling workshop findings for future work in the project, notably on the European Virtual Organisation and describes activities in the coming months, until the release (in project month 20) of D7.2, which will elaborate on the value propositions of the stakeholders.

### 1.1 The SemanticHealthNet project

Semantic interoperability of EHR systems is a vital prerequisite for enabling patient-centred care and advanced clinical and biomedical research. SemanticHealthNet will develop a scalable and sustainable pan-European organisational and governance process to achieve this objective across healthcare systems and institutions.

A clinical focus on chronic heart failure and cardiovascular prevention in the workplan will drive the semantic resources to be developed. The exemplars in cardiology and public health are specific enough to permit comprehensive development and validation of these resources, and yet typical enough for wider generalisation of the methodology and its governance. SemanticHealthNet will capture the needs articulated by clinicians and public health experts for evidence-based, patient-centred integrated care in these domains. Existing European consensus in the management of chronic heart failure and cardiovascular prevention will then be integrated in EHR architectures, clinical data structures, terminologies and ontology by leading technical experts.

Clinical and Industrial Advisory Boards will provide links with other domains in which these results can be used beneficially. The project will investigate how best to combine and adapt informatics resources to support semantic interoperability, and how these can be developed and supported at scale. Results of this investigation will be generalised and formalised. The involvement of health

authorities, clinical professionals, insurers, ministries of health, vendors, and purchasers will ensure that the project approach and results are realistically adoptable and viable. This work will also build on the SemanticHEALTH and CALLIOPE roadmaps for eHealth interoperability.

A business model to justify strategic investments, including the opportunity costs for key stakeholders such as Standards Development Organisations (SDOs) and industry, will be defined. Links with the epSOS large scale pilot and the eHealth Governance Initiative, will inform the shape of the Virtual Organisation that this Network will establish to sustain semantic interoperability developments and their adoption.

The consortium comprises 17 Partners and more than 40 internationally recognised experts, including from USA and Canada, ensuring a global impact.

### **Project Plan**

Workstream I:

- WP1: Patient care exemplar (heart failure)
- WP2: Public health exemplar (coronary prevention)
- WP3: Stakeholder validation

Workstream II:

- WP4: Harmonised resources
- WP5: Infostructure and tools
- WP6: Industrial engagement

Workstream III:

- WP7: Adoption and sustainability**
- WP8: European Virtual Organisation**
- WP9: Project management, dissemination, promotion

The work presented in this document is located in Workstream III, WP7, but has immediate relevance for WP8 as well.

## 1.2 Executive Summary

The work of the SemanticHealthNet project (SHN) on a semantically interoperable heart failure use case is embedded in a larger European effort to develop semantically interoperable patient summary and ePrescription services. A number of stakeholders are already engaged in this endeavour (Member States, SDOs, Health informatics experts etc.) and they will equally be necessary to engage with for SHN.

Analytically, stakeholders should be understood as any organization or individual who has a stake in the value created through the development of a heart failure summary (and later on public health tools). These stakeholders are for example

- those who are requirements holders and users of semantically interoperable solutions, such as clinicians, patient organisations, public health systems, health authorities, insurers, educators and research organisations;
- those who will design and maintain semantic interoperability resources including health in-formatics SDOs, health informatics research institutes, tool developers and certification bodies which will certify high quality resources,
- industry which will implement, productise and maintain interoperable systems and support an infostructure, and certification bodies which will certify semantically interoperable products
- funders whose resources to support widespread semantic interoperability need to be committed and justified.

How value can be created and sustained in the eHealth environment in which SHN operates depends on the appropriateness of the value proposition to individual stakeholders and the following sustainability dimensions, to which the value proposition needs to answer:

- Business sustainability
- Governance sustainability
- Marketing and recruitment sustainability
- ICT sustainability
- Financial sustainability

Further work in work package 7 of the SHN project will explore the above dimensions with stakeholders to refine the business modelling concepts around the heart failure summary and the public health tools that SHN will develop. Non-monetary values such as better quality and safer health care services, as well as benefits to society, will also be considered.

## 2 The European semantic interoperability context

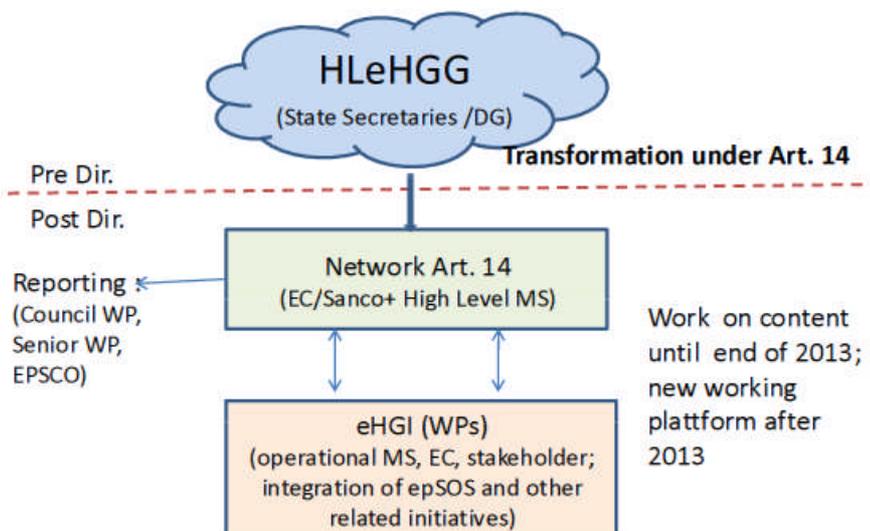
This chapter briefly sets the European policy scene for the work undertaken in work package 7 on semantic interoperability. It is indeed not possible to understand the dynamics of the discussions without a brief review of previous European efforts on semantic interoperability and current sustainability and upscaling debates in the context of the Connecting Europe Facility.

### 2.1 The role of the epSOS large scale pilot and the eHealth Governance Initiative

The epSOS large scale pilot on interoperable patient summary and ePrescription services is the flagship pilot project of the European Commission and Member States in the eHealth domain. Its 23 Member State beneficiaries and national competence centres are currently piloting the services, based on a model of interconnected national contact points, which integrate with existing national infrastructures. The semantic work in the project focussed on the representation of a patient summary and ePrescription/eDispensation data sets, based on international terminologies and the HL7 CDA r2 document architecture. IHE Profiles are also used.

Further activities to promote interoperable electronic services in Europe are now focusing on the use-case based definition of a European Interoperability Framework, a study commissioned to Deloitte.<sup>1</sup> Policy development and consensus building on eHealth is taking place in the High Level eHealth Governance Group, which is now taking over the functions of the Art. 14 Patients Rights Directive high level group of Member States. This is illustrated in the figure below:

Figure 1: eHealth Governance Initiative and the patients' rights directive



© eHealth  
Governance Initiative eHGI

<sup>1</sup> See EUROPEAN INTEROPERABILITY ARCHITECTURE (EIA): Phase 2 – Final Report: Common Vision for an EIA, prepared for the ISA workprogramme by Deloitte, November 2011, available at [http://ec.europa.eu/isa/documents/isa\\_2.1\\_eia-finalreport-commonvisionforaneia.pdf](http://ec.europa.eu/isa/documents/isa_2.1_eia-finalreport-commonvisionforaneia.pdf)

## 2.2 The Connecting Europe Facility: towards upscaling of pilots

The Connecting Europe Facility (CEF) is an EC sponsored programme “which will fund €50 billion worth of investment to improve Europe's transport, energy and digital networks.” It is intended to finance projects which are in Europe's energy, transport and digital backbone.

In terms of services in the Telecommunications and ICT domain (which here includes eHealth) the "Connecting Europe Facility" foresees almost €9.2 billion to support investment in fast and very fast broadband networks and pan-European digital services. The CEF finance will leverage other private and public money, by giving infrastructure projects credibility and lowering their risk profiles. On the basis of conservative estimates, the Commission considers that the network infrastructure finance could stimulate investment worth more than €50 billion. The Digital Agenda for Europe set targets for 2020 of broadband access for all at speeds of at least 30 Mbps, with at least 50% of households subscribing to speeds above 100Mbps.

As regards digital services, the money would be used for grants **to build infrastructure needed to roll-out** e-ID, eProcurement, **electronic health care records**, Europeana, eJustice and customs-related services. The money would serve to ensure interoperability and meet the costs of running the infrastructure at European level, linking up Member States' infrastructures.<sup>2</sup>

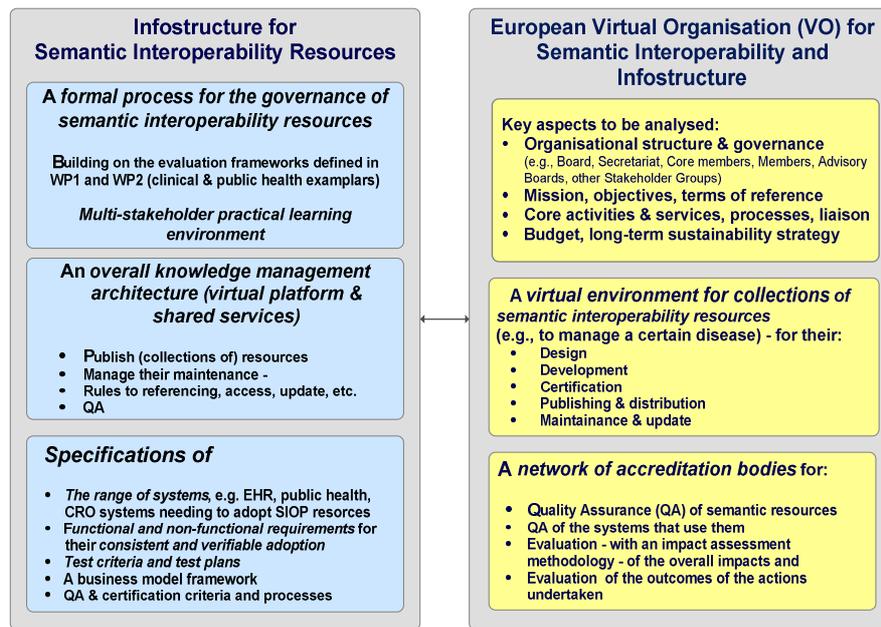
## 2.3 Implications for SHN: role of a European infostructure and European Virtual Organisation

The above mentioned initiatives epSOS and CEF pave the way for planning and investing in European (central) services for eHealth. On the level of semantic interoperability, these may consist in particular in the governance processes and services depicted in Figure 2: Infostructure for semantic interoperability resources - components.

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<sup>2</sup> Based on EC press release “Connecting Europe Facility: Commission adopts plan for €50 billion boost to European networks”, Reference: IP/11/1200 Date: 19/10/2011

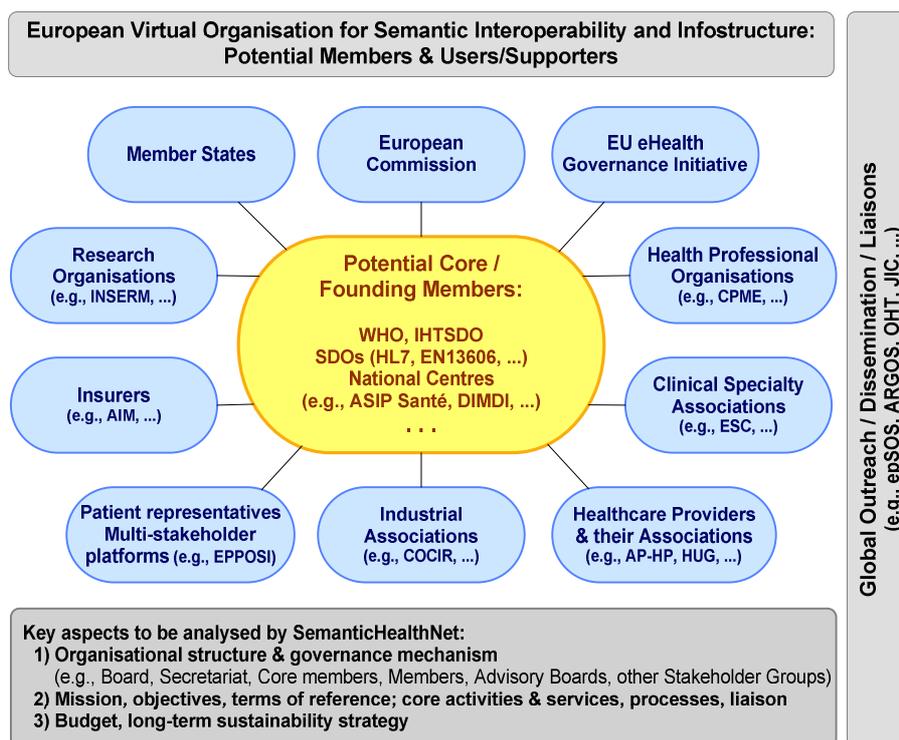
Figure 2: Infostructure for semantic interoperability resources - components



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In terms of stakeholders, the membership of any future European Virtual Organisation capable of delivering the above mentioned services and processes may include organisations as mentioned in Figure 3 below.

Figure 3: European Virtual Organisation



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The core membership consists of representatives of important standardisation or terminology development bodies such as IHTSDO responsible for SNOMED CT, Health Level 7, CEN and ISO (responsible for ISO EN 13606). These members are supplemented with representatives of national eHealth implementation bodies such as ASIP Santé or the German Institute for Medical Documentation and Information DIMDI. The World Health Organisation as the developer of its own terminologies should obviously also be part of the group.

The surrounding stakeholders can be considered as consumers of output or parties interested in influencing the direction in which standards are developed and their purpose. Associations of clinical professionals could for example suggest new use cases worthwhile investigating and developing standards for. Associations representing the healthcare industry such as COCIR are then likely to make assessments on the industry's readiness to implement and use output produced by the core group.

These dynamics are equally relevant to output produced by the SHN consortium, if these outputs are to be sustainable in the long-run.

### 3 Results of the 1<sup>st</sup> semantic interoperability business modelling workshop

To prepare for the large scale deployment of eHealth services under the Connecting Europe Facility (see section 2.2 above), and referring to the European eHealth interoperability vision, mission and values, this workshop reaffirmed the importance of achieving interoperability, as well as the interest of designing robust business models to support sustainable cross-border eHealth services in Europe.<sup>3</sup>

The need for ensuring cross-border connectivity through optimizing functional, semantic and technical interoperability was highlighted, including enabling cross-organizational & cross-border information flows to support further clinical needs/scenarios being developed by SemanticHealthNet, such as chronic disease management (e.g. a chronic disease tailored summary).

The relevance of deploying a systematic approach to business model design was addressed, with particular interest in the Smart Open Services for European Patients (epSOS) cross-border use of patient summary and electronic prescription. The importance of establishing the overall value and cost-benefit of cross-border eHealth services to assist resource allocation decisions was also highlighted, including the development of customized value propositions.

Further to several short presentations highlighting key strategic imperatives relevant to achieving sustainable cross-border eHealth services in Europe, the cross-functional working sessions focused on:

1. Defining the perceived key drivers for achieving and sustaining interoperability in Europe relevant to epSOS scenarios;
2. Determining the factors which may favourably influence the development and adoption of interoperable assets towards achieving sustainability;
3. Describing the perceived benefits that key stakeholders value the most about cross-border/organizational interoperability, and the type of robust evidence that would be needed to establish and promote its added value;
4. Establishing the success criteria that should be used to define the achievement of sustainable interoperability in Europe.

Special attention was given to the maintenance of the required infra- and info-structure (incl. subsets of terminologies, multilingual semantic assets, terminology servers, technical specifications, open source components, national reference/contact points, quality requirements of EHR).

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<sup>3</sup> The documentation of this workshop is available at <http://www.epractice.eu/node/5363901>

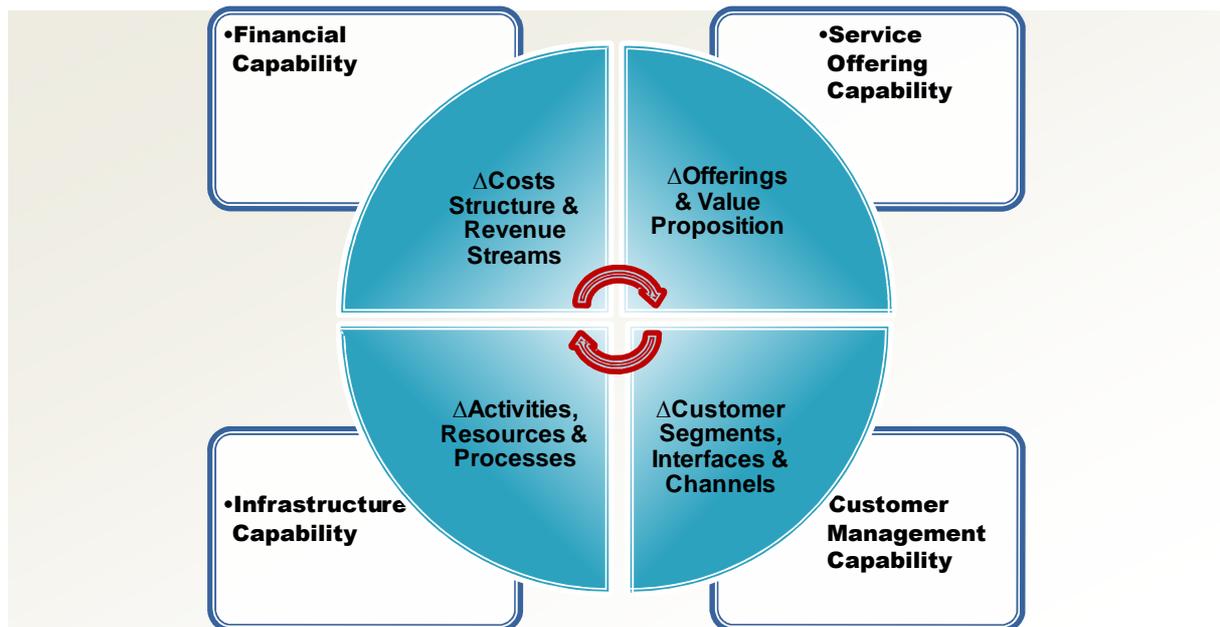
We are grateful to our Project Officer, Benoit Abeloos, European Commission, who developed the idea for this workshop in the context of CEF; to our experts and colleagues from the eHGI and epSOS for their excellent contribution; our scientific coordinator, Prof. Dipak Kalra, for moderating the WS; our external expert Danielle Dupont, Data Mining International, for her guidance on business model canvas; the ePractice team, for organising the logistics and their great support to this very successful event.

### 3.1 Business modelling concepts

Prior to the expert discussions in the afternoon, an introduction to business modelling concepts was delivered by Danielle Dupont (Data Mining International). This introduction is summarized in this section.

As a general definition, business modelling is dealing with the question how a firm creates, delivers and captures value. The capability of a firm to achieve this, relies on four distinct capabilities:

Figure 4: Value creation capabilities

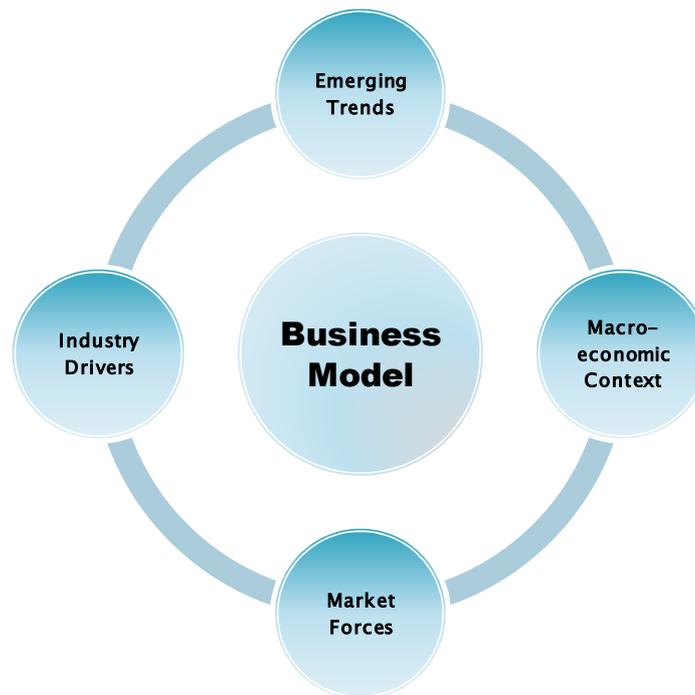


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These four capabilities and activities are constantly interacting with each other and shape the business model that a firm is able to propose.

In order to understand the value proposition of a new service, such as the one prepared by the SHN project, it is necessary to scrutinize the market environment in which the service or product is offered.

Figure 5: A business model in its market environment



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The topics mentioned in Figure 2 above, notably the market forces, emerging trends and the macro-economic context, were put for discussion to a number of eHealth stakeholders, who analysed the currently prevailing eHealth service propositions in the European Union: patient summary and ePrescription services.

### 3.2 Sustaining pilot services: the epSOS approach

epSOS as a key European large scale project developing testing and implementing patient summary and ePrescription services provided its own assessment of the factors that influence the sustainability of its operations, its business model. Discussions on the sustainability of epSOS services can be structured according to the following levels:

- Business sustainability
- Governance sustainability
- Marketing and recruitment sustainability
- ICT sustainability
- Financial sustainability

All these aspects under a common governance process & workflow are in progress in epSOS and embodied in the epSOS sustainability roadmap.

In more detail, business sustainability implies that epSOS services remain available and continue to be operational after the EU project ends in 2013. This requires the ability of the project and subsequently stakeholders to:

- expand to 23 countries (and more)

- expand with new services
- safeguard specifications
- perform continuous testing

At the level of semantic interoperability, the challenge can be formulated as the securing of the possibility of scaling up epSOS / a semantic model. This implies the ability to:

- interpret health data cross border
- share data with other areas of healthcare, e.g. patient registries, decision support
- include more stakeholders, e.g. the pharmaceutical industry

Figure 6 below illustrates, where funding for key components and processes of epSOS may come from and why. It emerges that the EC or more generally the European level could bear an important share of costs for those activities that have relevance across the EU and cannot be easily managed by single Member States.

These aspects include new service definition activities that have cross-border relevance, but also central support and standards development and use. Central services in the form of system registers or master data are another option to be funded centrally. However, this function could also be envisaged in a decentralized manner. Conformance testing of deployed solutions, an activity offered by IHE, is something that industry (the market) can offer to Member States. The costs for internal maintenance and operation should be borne by Member States themselves.

**Figure 6: eHealth (epSOS) service components and their source of financing**

Areas	Funding Source	Why
Cross-border components, e.g. new service definition, networks of excellence	EC	EC responsibility particularly for establishment of new use cases and new projects
Central services, e.g. system registers, master data (or decentralised/distributed solution – subject to discussion in WP2.2)	EC / MS (under discussion)	Needed to support cross-border care
Standards support, e.g. semantics	EC	Where common services are needed across Europe
Conformance Testing	Market	Part of market response to MS
Internal services and operations	Each Member State	MS responsibility; majority of spend applies to internal work in each country

© epSOS

### 3.3 epSOS approach to semantic interoperability

Semantic Interoperability as approached in epSOS, is characterised by the following process:

- Clinical/Functional experts identify the information needs of each use case (common context) Identified the concept domains to deal with (e.g. administrative Gender, Illnesses, Surgical Procedures)
- Terminology and Clinical/Functional experts identify the set of coded concepts that fulfil the information needs and defined the Value Sets binding for each concept domain within a specified context (e.g. Patient Summary).
- National experts define - where needed - the mappings between the locally used vocabularies and the epSOS Value Sets and the translations for the designations
- Technicians serialize the conceptual model and define the implementable specification (including the vocabulary bindings)

All these steps presume a revision, approval (QA) and publication process. The epSOS master value set catalogue and transformation catalogue (MVC/MTC) are subject to a maintenance process which consists in the collection and analysis of feedback (from pilot, SMEs) and subsequent MVC/MTC revision where needed.

This process in the epSOS pilot environment will have to find a more institutional format, if pan European semantically interoperable services are to become a reality. This underlines the importance of the work in SemanticHealthNet on a European Virtual Organisation, which could take over part of the above process.

### 3.4 Infostructure as a public good: a business modelling perspective

In accordance with the strategic reflections offered by epSOS on its long term sustainability, the workshop briefly considered the functions and form of a future European Virtual Organisation that would govern a European “infostructure”, maintain registers of semantic assets and act as a co-ordination centre for further efforts to enrich European capability for semantic interoperability.

It is clear from the network character of such services and its associated externalities that individual stakeholders such as groups of hospitals, a single insurance company, the healthcare device industry or others do not have a value proposition to establish a regional/ national infrastructure (governance, competent authorities, standards, ID management, security, semantics, etc.). The more people/providers participate in an eHealth network, the greater will be the value/ benefits for all. Faced with such a prospect, the initial investment costs for a single stakeholder (and the subsequent effort to connect others) would outweigh any possible benefits. It would additionally be difficult for any one such stakeholder group to objectively reflect the needs and priorities across this network.

It is more likely that an independent Institute-like organisation would be best placed to carry this agenda.

### 3.5 Stakeholder views on eHealth value propositions and drivers

With reference to the prevailing cross-border/cross-organizational interoperability scenarios (use cases) for Europe (derived from epSOS), expert participants divided in Working Groups (A and B) were asked to address the following business modelling strategic imperatives:

1. Define the perceived key drivers for achieving and sustaining interoperability in Europe relevant to these scenarios;
2. Determine the factors which may favourably influence the development and adoption of interoperable assets towards achieving sustainability;
3. From a value proposition standpoint, describe the perceived benefits that key stakeholders value the most about cross-border/ organizational interoperability, and the type of robust evidence that is needed to establish and promote their added value;
4. From a business model standpoint, establish the success criteria that should be used to define the achievement of sustainable interoperability in Europe.

While both teams provided complementary input, some key elements seem to emerge, as summarized in the following observations.

#### 1. Perceived key drivers for achieving and sustaining interoperability in Europe relevant to epSOS scenarios

- The many potential tools, assets & services suggest a need for prioritization and for providing validated/dependable services aligned with business needs
- The identification of multiple stakeholders confirm the need to conduct customer segmentation/prioritization and to develop customized value propositions
- Achieving optimal EU/national integration through consensus building appears of interest, in addition to building further synergies with standard development organizations and expert groups
- Establishing an integrated governance model (combining bottom up/top down approaches and step-by-step + feedback) also appears relevant
- Diversed potential funding sources confirm the need to assess different pricing schemes and revenue streams and to conduct business model simulation

#### 2. Perceived factors which may favourably influence the development and adoption of interoperable assets towards achieving sustainability

- Again, multiple potential scenarios highlight a need for prioritization
- Market forces include economic pressures, patients/consumer rights, need for convergence and opportunity to optimize service offerings (ex: Apps)
- Emerging trends include complexity of care and decision making, opportunity to leverage social media as interoperable tool and smart apps, and interest in using EHRs for research purposes
- Industry developments comprise the need for offering integrated/efficient services, the emergence of personal health records and “cloud”
- Macro-economic aspects highlight global economic pressures and cost containment

measures, mutualization of investments and commoditization of IT infrastructure (“cloud”)

### **3. Perceived benefits that key stakeholders value the most about cross-border/ organizational interoperability and the type of robust evidence that is needed to establish and promote their added value**

- Relevant to different scenarios, multiple stakeholders and their respective perceived benefits were identified. Again, this confirms the interest of focusing on specific services and of aligning/customizing value propositions by customer segment, based on their respective incentives.
- Amongst the perceived benefits of interoperability, adding value, enabling better and safer health care, building efficiencies and generating potential cost savings appear most relevant.
- Regarding the type of evidence needed to demonstrate the added value of interoperability, the need to conduct qualitative and quantitative assessments was identified by both teams, including conducting robust cost-effectiveness analyses (to establish the overall clinical and economic benefits), quality of life assessments (to assess the humanistic impact), and business model simulations (to demonstrate business relevance, benchmarking and sustainability).

### **4. Perceived success criteria that should be used to define the achievement of sustainable interoperability in Europe**

Numerous success criteria were proposed, including customer satisfaction surveys, specific metrics such as the percentage of patients with a patient summary activated and performance targets measurable by customer segment, and market demand. Further examples of success criteria include:

- % of cross-border cases where doctors accessed patient summary data
- % of health providers think patient summary is useful
- Number of patients with epSOS consent

Customer demand for new services/apps being proposed as success criteria, this further supports the relevance of achieving business model innovation.

## 4 The SemanticHealthNet heart failure summary use case

In order to understand who the stakeholders of SemanticHealthNet outputs are, it is imperative to understand what the project itself intends to produce as outputs. In the following section, one of these outputs, the heart failure care summary will be briefly presented. The next chapter then moves on to propose a short overview of key stakeholders who will need to contribute to the development of the heart failure summary or will be consumers of it.

### 4.1 The heart failure care summary

The group of experts in workpackage 4 of SHN, dealing with the semantic preconditions for a heart failure summary use case have developed the following story-line to illustrate the clinical documentation challenges that will have to be solved.

USE CASE #1: HEART CARE SUMMARY

VISIT DATE: 21/07/2004

PATIENT: Minnie Mouse

HOSPITAL: Hospital no 1

HISTORY: An 80-year-old patient presents herself in an outpatient clinic due to breathlessness lot of fatigue. The primary diagnosis is heart failure. Allergies are unknown. The patient is not diabetic and there is no answer to the question whether the patient had pain.

HEART FAILURE EVALUATION: BP is 104/58. Current status of heart failure is moderate to severe, and the disease is stable.

ON EXAMINATION (21/07/2004): Oedema around knees. JVP at ear lobes level. Tachycardia.

Most recent ECG (17/07/2004) shows a heart rate of 73, atrial fibrillation and previous anterior infarct.

REQUESTED TESTS: glucose tolerance test

Patient was recommended to start spironolactone 25mg/d. Check potassium in two weeks.

### 4.2 Implications for stakeholder identification

The first and most obvious observation on this use case is that it involves and positively affects the work of heart failure clinicians. A working HF summary record will be able to record and hand over vital clinical information as the patient moves along the care pathway.

Secondly, and more complex, this use case also involves in-depth work of semantic interoperability experts, who will have to find a way to display not only information on what is known about the patient or explicitly not known (“not diabetic”) at a given point in time, but also where no information on a given item (here: pain) is available.

Further, this use case points to important data integration work ahead, notably on the integration of

laboratory results and other device data into the care summary. The SHN General Assembly has pointed out that technical device interoperability is still a field in which further efforts are required to ensure that data from different devices can be exchanged and integrated within a care summary. The stakeholder affected by this requirement is the healthcare device industry and in particular the Continua health alliance.

Embedded in the larger topic of Semantic Interoperability in Europe, work of SHN needs to take into account stakeholder expectations on the progress of electronic health record and ePrescription services (the two flagship applications in Europe) more generally. These expectations were formulated during a business modelling workshop for semantic interoperability in June 2012 in Brussels, the results of which are presented in the following chapter.

## 5 Workshop implications for upcoming work in WP7

The discussions at the above mentioned business modelling workshop focused on the sustainability of semantically interoperable patient summary and ePrescription services as defined in the epSOS context. Results do however have clear implications for work in the SemanticHealthNet project.

Not only does epSOS offer a semantically structured patient summary, which may form the basis of future adaptations towards a specific heart failure summary. The discussions at the workshop have also pointed to the concrete implementation steps that are still required to make the epSOS services a sustainable part of healthcare services across Europe. The observations formulated in this respect are key elements of individual stakeholder value propositions.

In upcoming work, WP7 will make use of the following definition of a “customer value proposition” to analyse the value propositions of the individual stakeholders

*A customer value proposition is “a business or marketing statement that describes why a customer should buy a product or use a service. It is specifically targeted towards potential customers rather than other constituent groups such as employees, partners or suppliers. It is a clearly defined statement that is designed to convince customers that one particular product or service will add more value or better solve a problem than others in its competitive set.”<sup>4</sup>*

Each stakeholder needs to be offered a specific value proposition, which does not always evolve around financial gain but rather improved workflows or more reliable data collection. Some initial thoughts on individual stakeholder value propositions – limited, for simplicity, to the heart care use case only - follow.

### 1. Value proposition to clinicians

Clearly, a structured condition specific EHR has the potential to provide vital information for treatment decisions, making the delivered care evidence based and safer, both for the patient and the clinician. However, clinicians are usually consumers of innovations which are decided upon on a higher level (e.g. the hospital management). While an innovation cannot be developed against clinicians’ needs, it is difficult to imagine that clinicians would lobby actively for the introduction of a hospital information system that featured the innovations developed by SemanticHealthNet.

### 2. Value proposition to citizens

Similarly to clinicians, citizens receiving treatment for heart failure or other CVDs may prefer hospitals which have a reputation for delivering high quality care based on a condition specific EHR. However, it is unclear how the patients’ voice will make itself heard, especially in health systems where patient choice of hospitals may be limited.

### 3. Value proposition to standardisation organisations

Standardisation organisations concerned with health information standards development are usually not driven by a profit motive. However, their constituent stakeholders (which may include industry

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<sup>4</sup> Adapted from the wikipedia entry: „Customer value proposition” available at [en.wikipedia.org/wiki/Customer\\_value\\_proposition](https://en.wikipedia.org/wiki/Customer_value_proposition)

representatives) need to jointly agree that it is worth pursuing the formalisation of semantic resources developed by a project such as SemanticHealthNet. The EC funded large scale pilot project epSOS has indeed succeeded in having its results formalised as part of IHE Profiles.

#### 4. Value proposition to insurers (payers)

Depending on the set-up of the respective healthcare system, insurers (third party payers) may have an influence on the quality of hospital care provided by signing selective contracts. This power could be exerted to push for the introduction of a condition specific summary EHR into hospital's information systems. The value to third party payers would consist in increased client/patient satisfaction. In single payer systems this transformation could happen much more rapidly as decision-making is usually top-down. The concrete value proposition for insurers was outlined at the business modelling workshop by a representative of AIM (International Association of Mutual Insurers). The promise of semantically interoperable health records and in extension, a semantically interoperable heart failure summary for insurers is the enabling of the following new services/organisational models:

- Coordination of care
- Predictive modelling – testing
- Coaching programs – training, quality
- HTA – quality systems
- Patient empowerment - Personal Health Record, telemonitoring
- Data management

Success factors from a business model perspective of insurers were notably identified as follows:

- Integration of primary and secondary care
- Financial accountability of all

From an organisational perspective, insurers may well play the role of a disease management company which would contract units of care for its clients/patients.

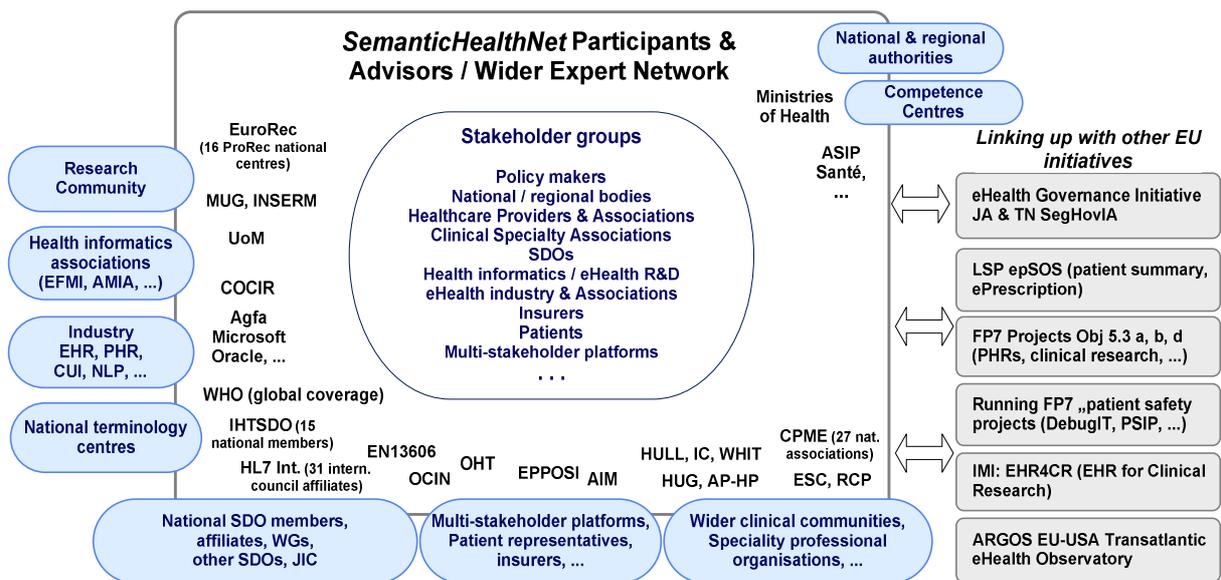
## 6 Next steps

Workpackage 7 relies on output from other workpackages to drive forward the development of the HF summary and thereby the analytical work that is possible in WP7. The value proposition core needs to come out of WP4 work on the SHN use case.

The next deliverable (D7.2) will elaborate on the value propositions of the individual stakeholder groups. This can be done by a careful analysis of the changes in the delivery of heart failure care that can be expected from the widespread introduction of a heart failure summary care record in hospitals. This analysis will also take into account, once available, the public health use case that is still to be developed within SHN. To that effect, work package 7 members, in close cooperation with WP1 and WP4, will organise a business modelling workshop in the first half of 2013, which will gather a similar audience as the first business modelling workshop in June 2012. The second workshop will elicit the experts' opinions on the most important impacts of a seamless heart failure care record. The value propositions for each stakeholder group will be focussing on any one of these impacts.

Next to analysis based on SHN use cases, the whole stakeholder universe as illustrated in the next Figure will be considered. This is particularly important to ensure sustainability of SHN efforts.

Figure 7: The SHN stakeholder universe



One aspect of the sustainability discussions in the following project months will deal with the kind of data quality that is needed to underpin the SHN model. Here, the cooperative design of the semantic assets with the support of patients (crowd sourcing) will be very important.

Also, the discussion of alignment between SDOs: the business models for standardisation are rather unclear. However, SDOs are now collaborating (e.g. via JIC). (The SDO dimension of the overall semantic interoperability business model innovation will need to be investigated in more detail within WP7.)

## 7 Annex: Business Model Workshop - Working Sessions Input

This Annex summarises the results of the working sessions of the eHealth business modelling workshop jointly organised by the EC, SemanticHealthNet, ePractice in June 20012 in Brussels.<sup>5</sup>

The working sessions objectives were - with reference to the prevailing cross-border/cross-organizational interoperability scenarios (use cases) for Europe (derived from epSOS) - to address the following business modelling strategic imperatives:

1. Define the perceived key drivers for achieving and sustaining interoperability in Europe relevant to these scenarios;
2. Determine the factors which may favourably influence the development and adoption of interoperable assets towards achieving sustainability;
3. From a value proposition standpoint, describe the perceived benefits that key stakeholders value the most about cross-border/ organizational interoperability, and the type of robust evidence that is needed to establish and promote their added value;
4. From a business model standpoint, establish the success criteria that should be used to define the achievement of sustainable interoperability in Europe.

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<sup>5</sup> Special thanks to our external expert Danielle Dupont, Data Mining International, who guided the work on business model canvas and summarised the results of these working sessions, and to the moderators: Jan-Eric Slot, IHTSDO, and Jörg Artmann, empirica, for their hard work and enthusiasm stimulating all participants to contribute their stakeholder perspective to the interactive discussions.



## 4. “Shaping the Future Through Business Model Innovation”

### Working Sessions Summary

The Business Case for Interoperability:

Towards Enabling Cross-border and Cross-organizational Information Flows

**SemanticHealthNet eHealth Business Model Workshop**

**Working Sessions Input**

e-Practice Workshop: eHealth Business Modelling; Brussels June 22<sup>nd</sup>, 2012, Afternoon Session

### Working Sessions Objectives

With reference to the prevailing cross-border/cross-organizational interoperability **scenarios** (use cases) for Europe (derived from epSOS), address the following business modelling strategic imperatives:

1. Define the perceived **key drivers** for achieving and sustaining interoperability in Europe relevant to these scenarios;
2. Determine the **factors** which may favourably influence the development and adoption of interoperable assets towards achieving sustainability;
3. From a value proposition standpoint, describe the perceived **benefits** that key stakeholders value the most about cross-border/ organizational interoperability, and the type of robust **evidence** that is needed to establish and promote their **added value**;
4. From a business model standpoint, establish the **success criteria** that should be used to define the achievement of sustainable interoperability in Europe.

## 1. Perceived Key Drivers (TEAM A)

### ► What are the necessary elements for achieving and sustaining interoperability in Europe?

Tools, Assets, Services	Stakeholders	Organizational Structures	Processes	Funding Sources
<ul style="list-style-type: none"> <li>• Disease Management Workflow Systems for EU</li> <li>• Shared models (paradigm, multiple approaches)</li> <li>• EHR info model for professional standards, structure and content of clinical records (clinical paradigm)</li> <li>• EHR system that records the clinical dialogue according to the clinical paradigm</li> <li>• Maturity of national programs that provides sources of data</li> <li>• Shared models of professional standard record keeping</li> <li>• 2 different EHR detailed vs summary (easy &amp; fast)</li> <li>• If my patient summaries are shared within my country, why not Europe-wide?</li> <li>• Shared conceptual models (asset)</li> <li>• eID, terminology services</li> <li>• DHR EU level</li> </ul>	<ul style="list-style-type: none"> <li>• GPs, payers consensus</li> <li>• Mobilize support from public health level for data exchange</li> <li>• Clinicians/patients/ EHR vendors</li> <li>• All eHealth organizations (competence centres, user groups, ...)</li> </ul>	<ul style="list-style-type: none"> <li>• Strong interlinks between SDOs</li> <li>• Permanent structure to engage experts                             <ul style="list-style-type: none"> <li>• Legal</li> <li>• Organizational</li> <li>• Process</li> <li>• Semantic &amp; Tech</li> </ul> </li> <li>• Explicit will by the MS to collaborate (HC)</li> <li>• Central vs/and national levels</li> <li>• EU + national level</li> <li>• Each EU member has 1 unique health ID!</li> <li>• Disease Management structure EU level: establish consensus</li> <li>• Professionally owned governance for clinical record structure &amp; content standards</li> </ul>	<ul style="list-style-type: none"> <li>• EU (Health) policy/MS coordination</li> <li>• Well established governance process (e.g. combination of bottom up &amp; top down approach)</li> <li>• Integrated governance</li> <li>• All parties involvement (MS political leadership)</li> <li>• Collaboration workshops across DG</li> <li>• Interconnected (EU-MS) governance</li> <li>• Clinical consensus for professional record standards (the clinical paradigm)</li> </ul>	<ul style="list-style-type: none"> <li>• EC</li> <li>• MS</li> <li>• Private Sector/Industry</li> <li>• Insurers</li> <li>• MSS</li> <li>• Those that benefit</li> <li>• Building up infrastructure vs pay per service (utility)</li> <li>• Share software</li> <li>• Free licensing</li> <li>• Licence vs maintenance + clinical</li> <li>• Industry system certification fee (meaningful use) to maintain governance</li> </ul>

## 1. Perceived Key Drivers (TEAM B)

### ▶ What are the necessary elements for achieving and sustaining interoperability in Europe?

**Patient Summary (PS) Focus:** Provide good tools for physicians in a trustworthy environment using an incremental approach with federated investment in public goods.

Tools, Assets, Services	Stakeholders	Organizational Structures	Processes	Funding Sources
<ul style="list-style-type: none"> <li>• Make sure there is a true PS available not just latest encounter</li> <li>• Terminology service and useable integration in CIS</li> <li>• Tools for monitoring and applying standards</li> <li>• Express and share what we loose without interoperability</li> <li>• Valid Business model</li> <li>• Testing, testing, testing and validation</li> <li>• A shared platform for services [App Store]</li> </ul>	<ul style="list-style-type: none"> <li>• Physicians (show value)</li> <li>• Doctors must be willing to use a PS (legally allowed/payed)</li> <li>• Find one good reason for each type of stakeholder (1/3 model)</li> <li>• Patients</li> </ul>	<ul style="list-style-type: none"> <li>• Terms of reference for VO</li> <li>• Non-profit thursted 3rd party</li> <li>• Begin by governance consensus, not by structure</li> </ul>	<ul style="list-style-type: none"> <li>• Don't try to make the ultimate single ontology</li> <li>• Routing between national contact point</li> <li>• Stepwise (voluntary, incentive in place)</li> <li>• Maintenance procurement</li> <li>• Step by step process</li> <li>• Feedback mechanism</li> </ul>	<ul style="list-style-type: none"> <li>• Participating nations (as part of their ehealth plan)</li> <li>• Health insurers = smart buyers</li> <li>• Federated investment reduces need for resources, increase interoperability</li> </ul>

## 2. Perceived Influential Factors (TEAM A)

- ▶ **Which key factors (market forces, emerging trends, industry developments and macro-economic aspects) may favourably influence the development/ adoption of interoperable assets?**

Cross-Border/ Cross-Organizational Scenario	Market Forces	Emerging Trends	Industry Developments	Macro-Economic Aspects
<ul style="list-style-type: none"> <li>• Establish benchmark</li> <li>• Share research results</li> <li>• MS learning together</li> <li>• Chromics: patients</li> <li>• EESSI/Wellness</li> <li>• Transborder care</li> <li>• Border regions</li> <li>• Very specific: pensioners, migrants, tourists (med)</li> <li>• GEF getting funded</li> <li>• Trans cross-border tourists</li> </ul>	<ul style="list-style-type: none"> <li>• Convergence                             <ul style="list-style-type: none"> <li>○ Standards</li> <li>○ Workflows</li> <li>○ Specifications</li> </ul> </li> <li>• Prices</li> <li>• Quality of care</li> <li>• Patient rights</li> <li>• Consumer rights</li> <li>• Extending &amp; optimizing offering</li> </ul>	<ul style="list-style-type: none"> <li>• epSOS consensus on standards and profiles</li> <li>• Regional EHR-s</li> <li>• Social media as interoperability tool</li> <li>• Smart Apps Development</li> <li>• Personal Health Management</li> <li>• Social media/personal control</li> </ul>	<ul style="list-style-type: none"> <li>• Standard based systems</li> <li>• Too costly to develop locally (EHR)</li> <li>• Invisible data captors (DM/MD)</li> <li>• Products and infrastructure solution based on IME profiles</li> <li>• Integrated services</li> <li>• Intraoperable personal health records</li> </ul>	<ul style="list-style-type: none"> <li>• Increasing cost of health systems</li> <li>• EU single market (health care)</li> <li>• The need to contain cost and increase accountability</li> <li>• Cost pressures to reuse interoperability rather than re-invent</li> <li>• HC/surgery as a “product”</li> <li>• Mutualization of investment (common repositories)</li> </ul>

## 2. Perceived Influential Factors (TEAM B)

- ▶ **Which key factors (market forces, emerging trends, industry developments and macro-economic aspects) may favourably influence the development/ adoption of interoperable assets?**

**Patient Summary (PS) Focus:** A demand for tailored care under complex conditions, enabled by advances in IT which rely on globalization

Cross-Border/ Cross-Organizational Scenario	Market Forces	Emerging Trends	Industry Developments	Macro-Economic Aspects
<ul style="list-style-type: none"> <li>• EU Commission</li> <li>• Centres of Excellence</li> <li>• Integrated care                             <ul style="list-style-type: none"> <li>○ Social</li> <li>○ Health</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Cost pressure                             <ul style="list-style-type: none"> <li>○ Pharma</li> <li>○ Countries</li> </ul> </li> <li>• Personalized medicines</li> <li>• Privatization</li> <li>• Ageing</li> <li>• “Apps” with personal health data (not interoperable yet)</li> </ul>	<ul style="list-style-type: none"> <li>• Patient reported outcomes</li> <li>• Secondary use of EHR for clinical research</li> <li>• Complexity of care</li> <li>• Standards for decision support based on summary</li> <li>• Profiling and standardization</li> <li>• Consumerism</li> </ul>	<ul style="list-style-type: none"> <li>• Personal health records</li> <li>• National language processing &amp; speech recognition</li> <li>• Global clinical research</li> <li>• Semantic technology</li> <li>• Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• Impact on the job market</li> <li>• Workforce mobility</li> <li>• Reduced health care costs (lower fees for patients)</li> <li>• Patient safety concerns</li> <li>• Commoditization of core IT infrastructure (eg. Cloud)</li> </ul>

### 3. Perceived Benefits and Added Value (TEAM A)

- ▶ **From a value proposition standpoint, what are the perceived benefits that stakeholders value the most about cross-border/organizational interoperability? What type of robust evidence would be needed to establish their overall added value with key stakeholders?**

Cross-Border/ Cross-Organizational Scenario	Key Stakeholders	Perceived Benefits	Type of Evidence Needed to Demonstrate Interoperability Overall Added Value
<ul style="list-style-type: none"> <li>• Cost pressure</li> <li>• Market systems for some CBC (open market)</li> <li>• Focus on coded info only on key common elements:                             <ul style="list-style-type: none"> <li>▪ Med</li> <li>▪ Allergies</li> <li>▪ Pbs</li> <li>▪ Procedures</li> </ul> </li> <li>• International benchmarking</li> </ul>	<ol style="list-style-type: none"> <li>1. Payers</li> <li>2. Clinicians (MDs)</li> <li>3. Public administrators</li> <li>4. Patients &amp; care givers</li> <li>5. Industry</li> </ol>	<ol style="list-style-type: none"> <li>1. Price-control /increased volume/cost reduction</li> <li>2. Shared goal (research objectives)/support to clinical practice/easier to follow patient trajectory/understanding what the previous health provided did</li> <li>3. Cost control/health system sustainability/improved knowledge for better health care/better and safer health care/more efficient health systems/clinical governance planning (indirect)/long term investing/efficiency</li> <li>4. Patient safety: the next doctor understands what the first did/opportunities for new services/increased benchmark + transparency in each country/quality of life &amp; continuum of care/empowerment when in situations where communication is not happening/better health care</li> <li>5. Economy of scale on products &amp; services/provide a consistent market for interoperability to reduce costs &amp; risks</li> </ol>	<ol style="list-style-type: none"> <li>1. Process optimization/cost-effectiveness evaluation</li> <li>2. Exchange unstructured data first to make <i>clinicians</i> demand structured data/easier health care process/reduced workload and improved efficiency &amp; care</li> <li>3. Cost-effectiveness analysis (how?)/reduced health care costs/clinical outcome (better conditions for health care providers)</li> <li>4. Improved quality of life/improved medical outcomes (QALY?)</li> <li>5. Successful international products/good business models</li> </ol>

**3. Perceived Benefits and Added Value (TEAM B)**

► **From a value proposition standpoint, what are the perceived benefits that stakeholders value the most about cross-border/organizational interoperability? What type of robust evidence would be needed to establish their overall added value with key stakeholders?**

**Patient Summary (PS) Focus:** An health care provider can treat a multimorbid patient on reliable complete data and thereby ensure patient loyalty

<b>Cross-Border/ Cross-Organizational Scenario</b>	<b>Key Stakeholders</b>	<b>Perceived Benefits</b>	<b>Type of Evidence Needed to Demonstrate Interoperability Overall Added Value</b>
<ul style="list-style-type: none"> <li>• Patient choice</li> <li>• Patient helping monitoring</li> <li>• Investigations performed in another country</li> <li>• Vaccination records in migrant children</li> <li>• Care @ border regions + establishment of Centres of Excellence</li> </ul>	<ul style="list-style-type: none"> <li>• Health system authorities</li> <li>• Payers/insurers</li> <li>• Health care providers</li> <li>• Patients</li> </ul>	<ul style="list-style-type: none"> <li>• Cost savings</li> <li>• A solution to “I left my medication at home”</li> <li>• Market systems for some CBC (open market)</li> <li>• Facilitating the EU market in health services</li> <li>• Complete medical record</li> <li>• Ability to deliver care of better quality</li> <li>• Patient safety</li> <li>• Health care quality (efficiency, speed, accuracy)</li> <li>• Choice and flexibility</li> </ul>	<ul style="list-style-type: none"> <li>• Cost-effectiveness assessment</li> <li>• Measured patient loyalty</li> <li>• Measured patient satisfaction</li> <li>• Accuracy and validity</li> <li>• Less medical/medication errors</li> <li>• Reduced costs due to reduced amount of medical/medication errors (especially for the management of chronic diseases)</li> </ul>

**4. Perceived Success Criteria (TEAM A)**

► **From a business model standpoint, which success criteria should be used and under which priority level to define the achievement of sustainable interoperable assets?**

Cross-Border/ Cross-Organizational Scenario	Success Criteria Defining Achievement of Interoperable Assets	Sustainable	Priority Level (High, Medium, Low)
<ul style="list-style-type: none"> <li>epSOS cross-border summary</li> </ul>	<ul style="list-style-type: none"> <li>Automatic cross-border reimbursement (DRG)</li> <li>Efficiency (cost/treatment from administrative data/file)</li> <li>Performance targets (90% of hospitals and 60% of GPs may access my summary)</li> <li>Number of patients with epSOS consent</li> <li>Real use of services beyond implementation &amp; informing national developments</li> <li>Deployment of services &amp; integration into national solutions</li> <li>Number of patients with epSOS consent</li> <li>MS commitment for cross-border health care (increased %)</li> <li>Registration statistics</li> <li>% PS summary available (x patients)</li> <li>Shared clinical knowledge (research basis &amp; trust)</li> <li>Increased market shares of eHealth products/vendors</li> <li>Overall savings &amp; employment created through market development</li> <li>Two most common use cases deployed in 20 out of 27 countries</li> <li>% of cross-border cases where doctors accessed patient summary data</li> <li>General public (&gt;90%) awareness of existence of interoperable EHR</li> <li>% coded information available</li> <li>Reduced price of technology</li> <li>Experts and IT resources availability</li> <li>Continuity of care proven by record over time</li> <li>10,000 individual projects using architecture</li> <li>eHealth interoperability framework adopted by 20 out of 27 countries</li> <li>% of health providers think patient summary is useful</li> <li>Number of patient summary access events</li> <li>Supporting innovations (a few / country)</li> <li>Quality of data confirmed by health providers</li> </ul>		<p>H (hope or high)</p> <p>M (meaningful – medium)</p> <p>L (Liberty or lean management)</p>

**4. Perceived Success Criteria (TEAM B)**

- ▶ **From a business model standpoint, which success criteria should be used and under which priority level to define the achievement of sustainable interoperable assets?**

Patient Summary (PS) Focus: Technology-driven (built-in) , Stakeholder driven (use, satisfaction, revenues), Public Health/Health system driven

<b>Cross-Border/ Cross-Organizational Scenario</b>	<b>Success Criteria Defining Achievement of Sustainable Interoperable Assets</b>	<b>Priority Level (High, Medium, Low)</b>
<ul style="list-style-type: none"> <li>• Patient Summary</li> </ul>	<ul style="list-style-type: none"> <li>• Routine use by X% of HCP</li> <li>• Completeness of medical record/patient summary</li> <li>• Satisfaction surveys</li> <li>• Service availability/reliability</li> <li>• Increased patient demand</li> <li>• EHR vendors revenues from selling epSOS services</li> <li>• Financial forecasts met for specific stakeholders</li> <li>• Interest from the pharmaceutical industry</li> <li>• Demand for new use cases/functionalities</li> <li>• % of antibiotics prescribed when patient is allergic</li> <li>• Overall impact (clinical and financial) on health care systems efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Technology driven (high)</li> <li>• Stakeholder driven (high)</li> <li>• Public Health/Health system driven (medium)</li> </ul>