Semantic Interoperability for Health Network

Deliverable 7.2
Analysis of stakeholder value propositions and adoption strategies

Stakeholder segmentation & development of customised and evidence-based value propositions; adoption strategies

[2014-02-04]

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<tr>
<td>Contact</td>
<td><a href="mailto:jess.vogt@empirica.com">jess.vogt@empirica.com</a></td>
</tr>
<tr>
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<td>Jess Vogt, Veli Stroetmann, Dipak Kalra, Danielle Dupont, Tom Jones, Zoi Kolitsi and Jeremy Thorp Review by the SSI-TF members</td>
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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.

The Project Plan is organised in three workstreams:

**Workstream I - Health-directed requirements, success criteria, governance:**
- WP1: Patient care exemplar (heart failure)
- WP2: Public health exemplar (coronary prevention)
- WP3: Stakeholder validation

**Workstream II - Harmonised and tailored health informatics resources, tools, methods:**
- WP4: Harmonised resources
- WP5: Infostructure and tools
WP6: Industrial engagement

Workstream III - Sustainability / Network co-ordination:

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.
2 Executive summary

The SemanticHealthNet project (SHN) aims to develop a scalable and sustainable pan-European organisational and governance process for the semantic interoperability of clinical and biomedical knowledge, to help ensure that EHR systems are optimised for patient care, public health and clinical research across healthcare systems and institutions. Workpackage (WP) 7 of the project is concerned with the establishing of a pan European organisation to champion and co-ordinate efforts and initiatives amongst multiple stakeholders. In order to achieve this WP7 will develop a generic business model to underpin strategic investments in this field, including a critical appraisal of the opportunity costs for key stakeholder groups and decision makers. Specifically, WP7 will identify the relevant stakeholders establish their needs/value proposition, benefits and costs, barriers and success strategies for supporting semantic interoperability and ultimately seek to involve them. The workpackage draws on the experience and expertise from the preceding workpackages 1-6, especially WP3 and WP 6, which themselves comprise multi-stakeholder expert groups.

In order to establish a pan European organisation for enabling sustainable semantic interoperability SHN has taken into account other initiatives carrying out activities that influence the Semantic Interoperability landscape including the eHealth Governance Initiative (eHGI), Joint Interoperability Council (JIC) and Clinical Information Modeling Initiative (CIMI). SHN is therefore seeking, where possible, to coordinate with and utilise outputs of these initiatives, please see section 4.2. To guide the SHN project team in conceptualising this vehicle for sustained and co-ordinated action on interoperability, and to ensure that the resulting organisation can function in the real world, a Sustainable Semantic Interoperability Task Force (SSI-TF) was established with experts and stakeholders from all relevant fields. The SHN project team were then able to draw on the expertise and experience of the SSI-TF in shaping the organisation and its associated business model through a series of workshops and other exercises. Although the business modelling process is not yet concluded nor is the sustaining organisation operational, substantial progress has been made towards these ends and is reported in this deliverable D7.2.

In particular the original concept (as stated in the Description of Work) has evolved from the SemanticHealthNet Virtual Organisation (SHN VO) which was envisaged as a central, unifying body to a more concrete catalyst organisation which seeks to coordinate, promote, accelerate and focus semantic interoperability (SIOp) activities across Europe. This catalyst organisation (CO) is connected to, and largely functions through, an additional network of actors, either impacted or benefiting from the CO, which would compose the more virtual organisation (VO). Further refinement has led to the CO being defined as the SemanticHEALTH Institute (SHI) which will facilitate and co-ordinate the prioritization, development, harmonization, and adoption of high quality, trusted, SIOp assets. Additionally the vision of the VO has evolved to become the SemanticHEALTH Alliance (SHA) which represents the whole ecosystem of stakeholders involved in SIOp and will lead, foresee and undertake the development, the harmonization and the implementation of high quality trusted (SIOp) assets. Vision, mission and value statements have been developed for both organisations (SHI and SHA) and are being validated. Please see section 7.1 for more details.

The business model for these respective organisations has also evolved since Deliverable 7.1 was published. Through workshops the SSI-TF has applied a traditional business
ecosystem that generates revenue to sustain the development and adoption of semantic interoperability assets to the SemanticHEALTH organisations. Although, ensuring best value and maximal benefits to the social good of healthcare, the SSI-TF has primarily focused its thinking on the economic forces that will generate added value and catalyse richer and more interoperable health records.

Utilising this business ecosystem, stakeholders have been defined and categorised into tiers in terms of their impact on the business, in particular in financial terms. For each tier, a preliminary customised value proposition has been developed describing the perceived added value of a European SemanticHEALTH organizations for this particular tier. From this, an overall value chain was mapped out which will allow the value of SIOp to be optimised across all stakeholder groups. However, further revision and consolidation of the value proposition statements will be undertaken by the SSI-TF at future business modelling workshops to emphasize the value of SIOp which will be created, delivered and captured by SHI, and leveraged jointly with the SHA, together with the results of the cost-benefit analysis.

A cost-benefit analysis (CBA) model is being developed for calculating the costs and benefits of SIOp. The framework of the model was presented at an initial workshop in November 2013. Accordingly, further evidence gathering and validation of assumptions are required before application. The CBA methodology that is being proposed is summarised only briefly in this deliverable, and will be presented in more detail in a later report.
## 3 List of abbreviations

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<th>Description</th>
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<td>BM-</td>
<td>Business Model</td>
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<td>SDOs</td>
<td>Standards Development Organizations</td>
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<td>SSI-TF</td>
<td>Sustainable Semantic Interoperability Task Force</td>
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<td>CBA</td>
<td>Cost Benefit Analysis</td>
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<td>eHI</td>
<td>eHealth Impact</td>
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<td>EHR</td>
<td>Electronic Health Record</td>
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<td>EHRI</td>
<td>EHRImpact Study</td>
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<td>epSOS</td>
<td>European Patients Smart Open Services</td>
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<td>FSIOp</td>
<td>Full Semantic Interoperability</td>
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<td>HIE</td>
<td>Health Information Exchange</td>
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<td>Healthcare Professionals</td>
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<td>Interoperability</td>
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<td>SIOp</td>
<td>Semantic Interoperability</td>
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<td>SSIOp</td>
<td>Substantial Semantic Interoperability</td>
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4 Introduction

4.1 Aims and structure of deliverable D7.2

This deliverable 7.2 presents how the design of a business modelling framework and its value propositions have been customised by involving relevant stakeholders, experts and other work packages of the SemanticHealthNet consortium and community in the context of a dedicated Sustainable Semantic Interoperability Task Force (SSI-TF). By providing expert guidance and input in the design of a relevant business model and of customized value propositions, the SSI-TF members also constitute an advocacy base to promote and support the successful launch and deployment of the business model at project completion.

For business modelling purposes, the deliverable includes the definition of the semantic interoperability stakeholders landscape and their segmentation into tiers based on their perceived unmet needs. Defining and segmenting the semantic interoperability market landscape will contribute to delivering a business model framework that will be relevant and that will optimise the adoption and success of semantic interoperability solutions in Europe. When detailing their relevant characteristics, attention is paid to stakeholders’ interests in, benefits from and potential role in establishing a pan-European semantic interoperability infostructure.

Following on from the establishment of relevant segments of stakeholders, this deliverable will identify, analyse and synthesise for each of these groups, their specific requirements, barriers to adoption, acceptance criteria, success factors, costs and benefits, and potential adoption strategies and incentives. These items will be used at a later stage in the SemanticHealthNet project for empirically founded, evidence-based ideas and recommendations, including the business case, towards establishing a sustainable eHealth semantic interoperability infostructure across Europe and beyond. Importantly, these findings will inform the development of highly customized value propositions that will convey the expected specific benefits that semantic interoperability solutions will deliver to each stakeholder group.

In addition, this deliverable points to the need for a cost-benefit analysis to persuade stakeholders of the benefits of SIOp in relation to the costs. The steps towards developing and implementing the CBA are described in section 8, and will be documented in more detail in a later project report.

To accomplish the above stated aims this deliverable begins by defining the strategic vision, mission and core values of the semantic health concrete and virtual organizations that must be established to jointly drive and ensure the sustainability of the semantic interoperability solutions in the long term, namely the SemanticHEALTH Institute (SHI) and the SemanticHEALTH Alliance (SHA). The business model scope is then refined accordingly, including the definition of relevant stakeholders/customers segments and the development of a multi-stakeholder value chain that will be optimized and leveraged by both organisations. For that purpose, the expectations of the future of semantic interoperability are examined in section 5.1. In section 5.2 how the adopted business modelling approach can support the

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1 An infostructure is the information view of an infrastructure: it defines the information flows between actors, systems and services, how the information is in each case represented and how interoperability at the structural level and at the level of meaning are preserved.
sustainability of semantically interoperable assets is examined before summa-
rising what the project has achieved so far in section 5.3.

Chapter 6 then examines the results of the stakeholder segmentation process, including their perceived roles within the SemanticHEALTH Alliance and Institute organisations (subsection 6.2). Subsection 6.3 then outlines the business model framework for the SemanticHEALTH Institute, including the optimisation of its multi-stakeholder value chain.

The implications of the progress achieved in the previous sections for the project’s next steps are then described in section 7. For that purpose, the proposed vision, mission and core value statements for the SemanticHEALTH Alliance and the SemanticHEALTH Institute are provided in subsection 7.1. Immediate project next steps conclude section 7 in section 7.2.

4.2 The strategic context of SemanticHealthNet

The SemanticHealthNet project (SHN) work needs to be seen in the wider context of numerous other initiatives carrying out activities that influence the semantic interoperability landscape. SHN is therefore seeking, where possible, to coordinate with and utilise outputs of these initiatives. The sub-sections below briefly describe relevant initiatives including a proposal by the eHealth Governance Initiative for a standing group to coordinate in a sustainable way efforts for both technical and semantic interoperability, numerous EU-supported projects as well as two relevant standardisation coordination initiatives bringing together SDOs and other stakeholders.

4.2.1 EU and MSs cooperation on eHealth

The European Commission has long supported collaboration initiatives through both its policy support and its research funding instruments within the key priorities of citizen mobility and borderless healthcare. In 2008 three interlinked initiatives in support of eHealth interoperability were launched:

- A Recommendation on cross-border interoperability of electronic health record systems\(^2\), which puts forward a number of recommendations for eHealth interoperability involving policy, social, and legal aspects; and technical and semantic interoperability. At the same time, the Recommendation addresses the creation of processes and structures towards interoperability in Europe, security and privacy as well as certification issues.
- epSOS, a Large Scale Pilot\(^3\), and
- CALLIOPE\(^4\), a European Thematic Network, representing collaborative approaches between MS national authorities, stakeholders and industry.

epSOS focused initially on providing solutions for interoperable Patient Summaries and ePrescription services to be piloted in a limited number of MS. In addition epSOS added on
new use cases and new countries demonstrating that epSOS services are both extensible to other use cases and replicable to other MSs. CALLIOPE supported this process by establishing an open, stakeholder-driven process, and defining a European eHealth Interoperability Roadmap which captured the knowledge and experience emerging from epSOS. The Roadmap builds on the vision of a desired future for all parties involved and provides a framework for its realisation proposing actions primarily at EU level which benefit also national eHealth deployment efforts.

The **eHealth Governance Initiative** (eHGI) was launched in 2011 with its primary goal to establish a strategic governance structure for eHealth within Europe and support technical and political cooperation including also with eHealth Stakeholder Groups.

An important milestone has been the adoption of the **Cross Border Healthcare Directive 2011/24/EU**. MS co-operation on eHealth has since rested on the legal basis provided by Article 14 of the Directive on eHealth and the establishment of the voluntary Network of MSs (“the **eHealth Network**”).

The eHGI is working in close collaboration with the eHealth Network. It has identified a need to establish a long-term “**Standing Coordination Group For Semantic And Technical Interoperability**”. The standing coordination group is to consist of a coordination team and a permanent group of experts. In order to reconcile national and European strategies, the standing coordination group shall be tied to and utilise national competence centres wherever possible. To this end, the permanent group of experts shall be drawn preferably from national eHealth competence centres. Additional experts from academia should be invited to contribute to specific topics if needed. Stakeholders are to be consulted via the eHealth Stakeholder Group. The tasks of the standing coordination group will be decided by the eHealth Network, and may include:

- Recommendation of eHealth standards and profiles for selected eHealth use cases
- Recommendation of terminologies for selected use cases
- Minimum dataset for patient summary
- Strategic relations with standardisation organisations and European standardisation working groups
- Assessment and operational implementation of the results of European projects (e.g. epSOS, SemanticHealthNet). This may include the further development and maintenance of long term assets from these projects (e.g. Master Value Catalogue created in epSOS)
- Provision of terminologies and standards for their use in all European Member States
- Facilitation of interoperability tests
- Understanding of strategies of Member States

Organisational interoperability challenges should not be the focus of this group and should rather be referred to the eHealth Network or other experts groups.

The eHealth Network will be responsible for the steering and political alignment of the standing coordination group and for the adoption of its multi-annual work plan. The standing coordination group will report to the eHealth Network annually.

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5 [www.ehgi.eu](http://www.ehgi.eu)
6 Member States may choose to select distinct experts for technical and semantic interoperability.
7 In particular IHE integration profiles.
8 This may include the assessment of selected national projects with European significance.
Subsequently, the eHGI recommends the setting up of a standing coordination group for semantic and technical interoperability using funds from the Connecting Europe Facility (CEF). The eHealth Network mandates that the eHGI specify the details of the funding, scope and procedure of the standing coordination group.

It should be noted that SHN is closely collaborating with members of the eHGI – several members of eHGI are also members of the SHN Sustainable Semantic Interoperability Task Force (SSI-TF.)

**European Interoperability Framework (EIF):** The purpose of the EIF is:
- to promote and support the delivery of European public services by fostering cross-border and cross-sectoral interoperability;
- to guide public administrations in their work to provide European public services to businesses and citizens;
- to complement and tie together the various National Interoperability Frameworks (NIFs) at European level.

The EIF is maintained under the ISA programme, in close cooperation between the Member States and the Commission. An EIF recent study funded by the EC focussed on the development of an **eHealth Interoperability Framework**. It considered how the criteria for assessment, stipulated by the Standardization Regulation for specifications could be applied in the domain of eHealth. The study also performed an assessment for a number of such specifications on behalf of the EC. There is an ongoing discussion at present on appropriate modes of consultation with the appropriate eHealth governance bodies on the endorsement of these specifications as well as specifications that will be submitted to a proposed Multi-stakeholder Platform for consideration in the future by the EC or any other interested party.

**eSENS** project aims to develop an infrastructure for interoperable public services in Europe. It will support the creation of a Digital Single Market by facilitating the delivery and usage of electronic public services. eSENS will consolidate building blocks of the existing Large Scale Pilots (LSP), focusing strongly on the core building blocks such as eID, eDocuments, e-Delivery, semantics and e-Signatures. Potential of more sector-specific building blocks to offer value for cross-border services in other domains will also be assessed by eSENS. These building blocks aim to provide the foundation for the platform of “core services” for a future eGovernment cross-border digital infrastructure.

**Trillium Bridge:** Bridging Patient Summaries across the Atlantic. Trillium Bridge is an EU support action which started on July 1st, 2013. It aims to bridge patient summary specifications in the EU and US. Trillium Bridge leverages epSOS patient access and Meaningful Use/Transitions of Care use cases to compare patient summary specifications and associated policies including eldentification, privacy & security to select pilot use cases and complete a gap analysis. Moreover, it aims to assemble interoperability assets to align structure and terminology (semantic mapping services for value sets published by the National Library of Medicine & epSOS, clinical document structures, testing and validation tools) and develop testing tools and validation reports from committed US providers and epSOS sites.

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11 [http://www.esens.eu](http://www.esens.eu)
12 [www.trilliumbridge.eu](http://www.trilliumbridge.eu)
**ANTILOPE** Thematic Network\(^{13}\) (“Adoption and take up of Standards and Profiles for eHealth Interoperability”) has kicked off in February 2013. Building upon several eHealth interoperability initiatives (epSOS, Calliope, Mandate M403, EHR-Q and HITCH), the Thematic Network ANTILOPE is set to support the dissemination and adoption of such an Interoperability Framework and concretely to build on these recommendations, roadmaps, National/Regional and local Interoperability projects. In particular it will (i) drive the adoption of recognised sets of profiles and underlying standards for eHealth interoperability, and improve the impact of the EU and International eHealth standards development process; (ii) define and validate testing guidelines and common approaches on Interoperability Labelling and Certification processes at European and at National/Regional level.

**EXPAND** is a new Thematic Network starting in February 2014. The aim of EXPAND is to address the challenge of moving from a set of point-solution pilots to a large-scale deployment of cross-border facilities that support Member States in delivering their local eHealth plans and providing cross-border care. In particular, the objective of the Network is to launch a process through which it will be possible to harness the available resources and to act as a catalyst for their operational use on a large scale. While this process shall cater to cross border eHealth services in general, the initial focus of EXPAND shall be to secure the sustainability and expandability of the epSOS pilot services including the proper handover, up to the launch of the Connecting Europe Facility (CEF) which is planned to be operational in 2014. EXPAND will ensure that its work, in particular the assessment framework for semantic assets, takes due account of the experience coming from the large scale pilots such as STORK, epSOS, eSENS as well as the developments in the SHN and ANTILOPE projects.

**Connecting Europe Facility\(^{14}\)** (CEF): The CEF is envisaged as both an EU governance framework and a targeted infrastructure investment at European level. It will support the roll-out of high-performing, sustainable and joined-up trans-European networks in the fields of transport, energy, and broadband & digital services including for health. The EU eHealth co-operation and the further development, deployment and sustainability of cross border eHealth services are to be also supported by the CEF.

The CEF will be publicly funded, but with a limited budget. This underlines the necessity to establishing the right conditions under which cross-border eHealth services are sustained in the long term. It calls for development and sharing of generic and re-usable interoperability solutions, investment in growing clinical content standards, in aligning multiple standards so that they work together well, and of course in embedding them in systems, training clinical and non-clinical users, implementation guidance, good practice identification and dissemination, etc.

In response to these needs, SHN is engaging with the multi-stakeholder eHealth community and is composing a multi-level market for semantic interoperability. One solution could lie in bundling revenue streams from insurers, healthcare providers, EHR vendors, data users such as Pharma, public health budgets etc. Which all contribute directly or indirectly towards the design, adoption and promotion of interoperability solutions. The issue is not only of funding, but of value creation from interoperability and of winning hearts and minds across all stakeholder groups.

\(^{13}\) [http://www.antilope-project.eu/](http://www.antilope-project.eu/)
Figure 7 in section 7.1 illustrates the above described wider picture of European activities and the context in which the SHN business modelling activities take place. Sections 5-7 (in particular subsections 7.1 and 7.2) outline the need for the establishment of two SemanticHEALTH organizations to jointly drive and ensure the sustainability of semantic interoperability solutions in the long term.

Another recent initiative is the First European eHealth Standards Summit. To respond to acute needs of three main stakeholders - the European Commission, the Member States and the (global) Health IT industry, CEN took the initiative to organize a first European eHealth Standards Summit in September 2013. Two concrete actions were put on the agenda: active discussion with member states through the eHealth Governance Initiative and eHealth Network to arrive at a simplified structure and follow-on discussions with National eHealth Competence Centres.

4.2.2 Relevant global standardisation initiatives

4.2.2.1 Joint Interoperability Council (JIC)

The JIC, which functions as a liaison group of ISO TC/215, comprises representatives from several international SDOs in order to help coordinate their future standards development so as to minimise overlap or conflict between emerging standards, and where appropriate to enable cross consultation, and even cross balloting, of jointly branded standards. The strength of the Council is its potential to examine areas in which two SDOs are developing standards in a similar area, and to facilitate cooperation between the development teams so that the standards are as well harmonised as possible. However, JIC does not have capacity to review the work programs of every SDO in detail, and its membership comprises the SDOs themselves without introducing any other stakeholder groups.

SHN has identified the need for many other stakeholders to play a stronger role in the way in which semantic interoperability assets are defined, inter-related, and adopted. SHN therefore perceives the need for an organisation that is complementary to JIC, and indeed includes representation from JIC, but which brings together the participants who are traditionally involved in developing standards with the other stakeholders involved in the interoperability ecosystem. The organisations proposed this deliverable fulfil that wider complementary role.

4.2.2.2 Clinical Information Modeling Initiative (CIMI)

CIMI is a voluntary ad hoc international organisation which brings together several SDOs, ministries of health, health care provider organisations and EHR system vendors in order to define a common representation for detailed clinical models, and to publish a library of such models for International use. CIMI's mission is to develop a large corpus of clinical models and terminology bindings that can support the semantic interoperability of electronic health records and clinical decision support, to augment clinical care management and improve patient safety. Its main activities have to date been to choose or develop modelling formalisms, to define a core reference model, to develop clinical patterns and to define style guidelines. CIMI is creating an open repository for shared models, and a process for defining and for validating them. SHN is working with CIMI, in order to align clinical pattern specifications and to share learning about good practice in the design of clinical models and their bindings to terminology.
5 An innovative business modelling approach to establishing sustainable semantic interoperability

This section summarises how an innovative business modelling approach is being deployed to help the project in defining the stakeholders and customers of the SIOP solutions, including the optimization of a multi-stakeholder value chain and the definition of customized and evidence-based value propositions.

5.1 What are current expectations regarding the future of semantic interoperability?

The “Semantic Interoperability for Better Health and Safer Healthcare - R&D Roadmap for Europe” study of 2008, presented a comprehensive review, assessment and synthesis of challenges around semantic interoperability and how to proceed to tackle them. This was the project starting point when considering expectations of future semantic interoperability.

Following on from this a previous SemanticHealthNet deliverable, “Deliverable 7.1 Relevant Sets of Stakeholders”, highlighted the progress being made in Europe towards semantic interoperability by projects such as epSOS and the plans of the CEF (Connecting Europe Facility) programme. Both initiatives are considered as paving the way for planning and investing in European (central) services for eHealth and subsequently for semantic interoperability. Given this influence it was therefore advisable to consider the progress made by these instances and the expectations they shape.

Such an exercise was carried out at the SemanticHealthNet Business Modelling Workshop on 22nd June 2012 in Brussels with the establishment of the SSI-TF, composed of relevant stakeholders, experts and other communities involved across the workpackages that comprise the SemanticHealthNet consortium. The conclusion was that dedicated European organisations (SHI and SHA) would be best placed to govern a European “infostructure”, maintain registers of semantic assets, and act as a co-ordination and reference centre for further efforts to enrich European capability for semantic interoperability.

The workshop also defined:

1. Perceived key drivers for achieving and sustaining interoperability in Europe (relevant to epSOS scenarios)
   - The many potential tools, assets & services confirmed the need for prioritization and for providing validated/dependable services aligned with specific business needs;
   - The identification of multiple stakeholders validated the need to conduct customer segmentation/prioritization and to develop customized value propositions;
   - Achieving optimal EU/national integration through consensus building appeared of interest, in addition to building further synergies with standards development organizations and expert groups. These findings also confirmed the relevance of establishing well-defined European organizations for semantic interoperability that would involve key stakeholders;
   - Establishing an integrated governance model (combining a bottom up/top down approach) and an implementation roadmap also appeared relevant;
The identification of different potential funding sources confirmed the interest of assessing different revenue streams and to potentially conduct specific business model simulations according to the business model scope and needs.

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

- Again, having multiple potential scenarios highlighted a need for prioritization amongst them
- Market forces were identified, including economic pressures, patients/consumer rights, need for convergence and opportunity to optimise service offerings (e.g. Apps)
- Emerging trends identified included complexity of care and decision making, opportunity to leverage social media as interoperable tools and smart apps, and interest in using EHRs for research purposes
- Industry developments emphasised the need to offer integrated/efficient services, the emergence of personal health records and “cloud”
- Macro-economic aspects highlighted global economic pressures and cost containment measures, mutualisation of investments and commoditization of IT infrastructure (“cloud”)

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

- Relevant to different scenarios, multiple stakeholders and their respective perceived benefits were identified. Again, this confirmed the interest of focusing on specific services and of aligning/customizing value propositions by customer segment, based on their respective needs and incentives.
- Amongst the perceived benefits of interoperability that would add value, enabling better and safer health care, building efficiencies and generating potential cost savings appeared most relevant.
- Regarding the type of evidence needed to demonstrate the added value of interoperability, the need to generate qualitative and quantitative benefits was identified, 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

Success criteria were considered from the perspective of situations in which SIOP succeeds, which can only be measured in concrete terms through what it enables. 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 included:

- % of cross-border cases where doctors accessed patient summary data
- % of health providers perceiving patient summaries as useful
- Number of patients having given epSOS consent

Customer demand for new services/apps was also proposed as a success criterion,
which further supports the relevance of ensuring business model innovation in the long term.

5.2 How does the business modelling approach support the long term sustainability of semantically interoperable assets developed in Europe?

Business model framework

The objective of a business model is to define how an organization creates value, how it delivers value to its customers, and how it captures further value in the long term (Osterwalder & Pigneur 2010). For that purpose, business modelling best practices are deployed, including the use of a business model template (Business Model Canvas©), providing a useful framework for customization. The business model template includes 9 building blocks, as shown in Figure 1:

![Figure 1: The business model framework](Image)

In order to guide the business model design for SHN purposes, a multidisciplinary sustainable semantic interoperability task force (SSI-TF) was established. It is composed of European key stakeholders who are involved in developing and using SIOp assets and solutions in the long term. The strategic objectives of establishing a SSI-TF included:

- Build awareness and momentum and engage the SIOp stakeholder community;
- Gather strategic input for the development of the SIOp business model framework and of customized value propositions;
- Define business model assets and sustainability strategies, and
- Establish a solid advocacy base to further support the deployment and adoption of SIOp solutions at project completion.
SemanticHealthNet

By engaging a multidisciplinary expert task force in the design of the SemanticHEALTH organisations (SHI and SHA), in the definition of their strategic vision, mission and core value statements and key activities, as well as in innovative business model strategies and customized value propositions, the project has ensured a robust step-by-step validation process with end users. This constitutes a key success factor to achieving customer satisfaction at project completion and long term sustainability.

As illustrated in Figure 2, in the proposed organizational framework, the primary focus of the SHI will be to exploit the business model (using a customer centric approach). The sustainability of the business model will be enhanced by the SHA, which primary focus will be to optimize the value across the chain of interdependent stakeholders involved in the business model framework (using an ecosystem oriented approach).

Figure 2: Shaping the landscape for a sustainable business model framework

<table>
<thead>
<tr>
<th>SemanticHEALTH Alliance</th>
<th>SemanticHEALTH Institute</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Multi-Stakeholder Network)</td>
<td>(Catalyst Organization)</td>
</tr>
<tr>
<td>‣ European multi-stakeholder network which advocates European priority use cases for eHealth, undertakes the development of corresponding semantic assets, and supports the implementation and adoption of high quality trusted semantic interoperability (SIOp) solutions for the delivery of safe and effective person centred care, for the promotion of health, public health and research.</td>
<td>‣ European institute that catalyses and coordinates the European prioritization, coordinated development, certified implementation, and successful adoption of high quality trusted SIOP assets by EU SIOP stakeholders to enable rich health information exchange for safe and effective person centred care, the promotion of care, public health, and research</td>
</tr>
<tr>
<td>‣ EU/National/regional/local focus</td>
<td>‣ European focus</td>
</tr>
</tbody>
</table>

Optimizing a Multi-Stakeholder Value Chain

Hence, the model design involves combining the efforts of the SHI and SHA in order to leverage the synergies and to optimize the generation of value from exploiting a diversified “multi-sided market”, thus ensuring long-term sustainability. This is because contrary to one-sided market platforms which serve different independent customers, a multi-sided market is a platform serving two or more distinct but interdependent groups of customers that provide each other with benefits so that:

- Each stakeholder group must value each other’s participation in the business model framework in order to make the model work and generate any economic value
- A multi-sided market grows in value to the extent that it attracts more users, also known as the “network effect”

Hence, semantic interoperability is an example of a multi-sided market. Accordingly, the SHI
will create, deliver and capture SIOp value from exploiting the SIOp business model using a customer centric approach. The business model will include customized value propositions relevant to top tier stakeholder segments identified in the SIOp landscape (Figure 2), towards establishing a pan-European semantic interoperability infostructure.

In parallel, using an ecosystem oriented approach, the SemanticHEALTH Alliance will optimize the value chain in order to leverage the synergies of this multi-sided market, and to unleash optimal SIOp value from and for the different stakeholders who will take part in the business model framework.

**Value chain optimisation**

Complementary to the design of a business model for the SHI, an end-to-end value chain is also being developed to identify and leverage the synergies and SIOp value across clusters of stakeholders (SIOp funders, providers, users and beneficiaries) who currently constitute the SIOp multi-sided landscape and who will actively contribute to shaping and firmly establishing the SemanticHEALTH Alliance. As also illustrated in Figure 2, the value chain will enable optimizing the creation, delivery and capture of of SIOp value, thus further contributing to achieving sustainability.
Figure 3: SIOP stakeholder segmentation and value chain optimisation

SemanticHEALTH Institute
Exploiting a Multi-Sided Market (Customer Focused)

SemanticHEALTH Alliance
Optimizing an End-to-End Value Chain (Ecosystem Focused)

Tier I
• National Decision Makers
• Public/private payers

Tier II
• Industry (Vendors)
• SDO

Tier III
• Prof Associations
• Care Givers
• Citizens

Tier IV
• Patients

Providers of SIOP Solutions
Tier II
• Industry/EHR Vendors
• SDOs

Users of SIOP Solutions
Tier III
• Professional Associations
• HCP/HPO
• Research Sector (public/private)

Beneficiaries of SIOP Solutions
Tier IV
• Patients
• Citizens
• Carers

Capturing Value
Creating Value
Delivering Value
This combined approach represents a key success factor to designing and delivering a relevant and sustainable business model, which will be supported by meaningful and customized SIOp value propositions. The multi-stakeholder value chain will ensure that SIOp value is created, delivered and captured jointly by the SemanticHEALTH Institute and Alliance, as it will be demonstrated by the CBA.

Given an evolving and rapidly changing business landscape, combining a top-down (public funding) and bottom-up (private funding) approaches will ensure that the SIOp value will be optimized across stakeholder groups. This innovative approach is described in Figure 4.

Figure 4: Optimising SIOp sustainability

An Evolving Business Model
Optimizing Value from Limited Top-Down to Value Chain Approach

In summary, as described in Figure 5, the SHI and SHA will jointly play complementary roles to enable value optimization across the SIOp landscape, for all stakeholder segments involved.
The SHI will thus operate a multi-sided business model where the SIOp demand and supply will be regulated jointly with the SH alliance, from leveraging best practices, partnerships and synergies, towards optimizing the SIOp multi-stakeholder value chain, and building a sustainable SIOp infostructure in Europe.
5.3 What has the project achieved so far with this business modelling approach?

Business model innovation best practices have deployed to date in the frame of three SSI-TF multidisciplinary workshops and interactive breakout sessions, followed by a small group working session and a CBA expert panel meeting, as follows:

- **Workshop 1: June 22\textsuperscript{nd} 2012 (Brussels)** - 1 day
  - Objectives:
    - Define the perceived key drivers for achieving and sustaining interoperability in Europe relevant to epSOS scenarios;
    - Determine the factors which may favourably influence the development and adoption of interoperable assets towards achieving sustainability;
    - Describe 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;
    - Establish the success criteria that should be used to define the achievement of sustainable interoperability in Europe

- **Workshop 2: May 30-31st 2013 (Brussels)** – 2 days
  - Objectives:
    - Summarise business modelling best practices
    - Categorize the SIOP stakeholder groups by segments
    - Align corresponding value propositions
    - Develop business model prototypes by stakeholder segment
    - Identify sustainability strategies and align next steps.

- **Workshop 3: Sept 12\textsuperscript{th} 2013 (Munich)** – 0.5 day
  - Objectives:
    - Define the SHN VO organizational structure
    - Provide input on its strategic vision, mission, core values and activities
    - Consolidate the business model framework
    - Discuss the interest of developing a multi-stakeholder value chain
    - Validate the need to establish an evidence-based strategy to support the SHN VO value propositions to optimize success.

- **Working session: Nov 18\textsuperscript{th} 2013 (Berlin)** – 0.5 day
  - Objectives:
    - Confirm the scope of the SH organizations
    - Refine the vision, mission and core values statements and related activities
    - Define the scope of the business model framework
    - Consolidate the multi-stakeholder value chain
    - Align next steps.
• **CBA expert panel: Nov 18th 2013 (Berlin) – 0.5 day**
  
  - Objectives:
    - Describe the BM & multi-stakeholder value chain approach
    - Consolidate the underlying assumptions of the SIOP CBA
    - Summarise published evidence and search strategy
    - Align next steps

A comprehensive meeting report has been produced after each workshop and shared with SSI-TF members for further input between workshops. These comprehensive workshop reports are provided in the Appendix of this report. The key findings are summarised in the next section.

At each step, 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 for the EHR). Further details of the first workshop can be found in “Deliverable 7.1 Relevant Sets of Stakeholders”.

The next section presents the results of the second workshop.
6 Results of the business modelling workshop in May 2013

6.1 Stakeholder segmentation and customised value proposition

The Sustainable Semantic Interoperability Task Force (SSI-TF) business modelling workshop examined the stakeholders who form part of the multi-sided "marketplace" for semantic interoperability, building on the results of the first business modelling workshop held in June 2012, which was reported in "Deliverable 7.1 Relevant Sets of Stakeholders" and summarised in the previous section. The list of identified stakeholders can be found in Figure 5 below.

The second workshop, held in May 2013, sought to cluster stakeholders, from the list below, based on their perceived level of influence/impact on the sustainability of the European SemanticHEALTH organizations (SHI/SHA) for SIOp, taking into account the current market landscape, perceived unmet needs and expected benefits. The perceived added value of the European organizations for the stakeholders and their potential role were also examined in order to create customized value propositions.

Using a value proposition template, customized value propositions - short statements ("elevator pitches") - describing the perceived added value of European SemanticHEALTH organizations for Tier I, II, III stakeholder segments were drafted. The need to generate specific supportive evidence to substantiate these statements was also emphasized.

Figure 6: Identified relevant sets of stakeholders

For business modelling purposes, the stakeholders connected to a future European institute for SIOp (which was later called the SemanticHEALTH Institute) were conventionally tiered in terms of their impact on the business, in particular in financial terms. Because healthcare is to some extent a business, but to some extent a societal good and a public service, there is a tension between tiering stakeholders in terms of their true business impact, and ranking their priority in relation to societal value. As an example, patients are absolutely central to the societal value of healthcare, and interoperable health records are clearly first and foremost
designed to centre around the delivery of care to individual patients. However, today, individual patients have almost no influence on the design, purchase or adoption practices of electronic health record systems in general practice or in hospitals. They are almost never involved in the development of standards, or of ICT products for clinicians. They can have a somewhat weak - indirect - influence through proxy stakeholders, such as clinicians and payers, who hopefully will present the patient perspective to some extent alongside their own perspectives. Patients could not therefore be considered for inclusion in Tier I. Nonetheless, the importance of addressing the patient’s perspective has been strongly emphasized by the SSI-TF and will be taken into account in the context of the multi-stakeholder value chain.

The focus of this second business modelling workshop was primarily to consider a traditional business ecosystem that could generate revenue to sustain the co-ordinated development and adoption of semantic interoperability assets. In other words, although we wish to ensure best value and maximal benefits to the social good of health care, the SSI-TF had primarily to focus on the economic forces that will generate added value and catalyse richer and more interoperable health records. As the European SemanticHEALTH organizations had yet to be defined, there was some healthy debate about how reasonable it was to rank stakeholders into Tier I, Tier II, Tier III segments. The meeting agreed to proceed with this clustering, but recognising that this reflected their direct influence on advancing semantic interoperability. The three tiers segments used in the rest of this report therefore need to be recognised in terms of their decision making and decision influencing roles in the business of semantic interoperability, as opposed to the value of semantic interoperability which is expected to benefit all stakeholders involved.

For business modeling purposes, using the perspective of the SHI, the proposed stakeholder segments will be further refined and re-prioritized as potential “customers”. In parallel, the
SemanticHealthNet

SIOp value chain optimization will include and leverage all stakeholder tiers and further categorize them into SIOp clusters (SIOp funders, providers, enables, users and beneficiaries), also including patients/citizens/carers, in order to enable SIOp value optimization across stakeholder segments.

Below are the stakeholder tiers and their relevant SIOp customised value proposition statements as drafted by the SSI-TF. These statements will be further consolidated by the SSI-TF in order to emphasize the SIOp value that can be optimized jointly by establishing the SemanticHEALTH organisations (SHI/SHA).

Further details on the process can be found in the Annex.
## Table 1: Stakeholder tiers and customised value statements

<table>
<thead>
<tr>
<th>Tier I</th>
<th>Customised value statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>National decision makers / policy makers</td>
<td>“The SHI will help to enable better integrated, more efficient and sustainable healthcare through richer sharing of health information and knowledge via innovative and cost-effective interoperability solutions, which facilitate the intelligent re-engineering of healthcare systems, and contribute to improved patient health outcomes, population health and life expectancy.”</td>
</tr>
<tr>
<td>Payers</td>
<td>“The SHI will help to enable better integrated, more efficient and sustainable healthcare, through richer sharing of health information and knowledge via standardised and cost-effective interoperability solutions, which facilitate the smart re-engineering of healthcare systems to improve population health, patient outcomes, life expectancy, and service efficiency.”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tier II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>“The SHI will help to grow the eHealth market, improve product development efficiency and enhance win-win collaborations across healthcare industries and associations by providing value-added standardised and cost-effective interoperability solutions that stimulate wider adoption of EHRs and PHRs, and accelerate the development of safe and effective innovative medicines and health technologies, to address unmet medical needs.”</td>
</tr>
<tr>
<td>Research</td>
<td>“The SHI will provide efficient, standardized interoperability solutions, enabling timely access to and wider sharing of evidence-based health data for research, aiming to improve healthcare and patient outcomes, whilst reducing research costs and optimizing healthcare efficiency”.</td>
</tr>
<tr>
<td>Standards development organisations (SDOs)</td>
<td>“The SHI will help to: better connect SDOs to stakeholders who need, will use, will benefit from and may fund interoperable eHealth solutions; facilitate better co-ordinated and well targeted standards development, and promote the adoption of standards by industry, healthcare services and clinical research.”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tier III</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare professional / clinical specialty associations</td>
<td>“The SHI will accelerate the adoption of clinical and professional health record standards and therapeutic guidelines, by enabling innovative, standardized, cost-effective, and sustainable interoperability solutions, which contribute to the adoption of best clinical practice, more efficient and better integrated healthcare, and the growth of richer clinical evidence.”</td>
</tr>
<tr>
<td>Health Professionals</td>
<td>“The SHI will provide innovative, standardized, cost-effective, and sustainable interoperability solutions that will enable timely access to health data, empowering healthcare professionals working in multidisciplinary teams to achieve efficient integrated healthcare, and the adoption of best clinical and disease management practices, towards optimizing patients’ health outcomes.</td>
</tr>
<tr>
<td>Healthcare Provider Organizations</td>
<td>“The SHI will provide innovative, standardized, cost-effective, and sustainable interoperability solutions that will enhance healthcare delivery and planning across the continuum of care, clinical governance and decision-making, supporting more efficient integrated healthcare to reduce errors, provide timely patient access to health interventions, enable promulgation of clinical standards, and ensure compliance and optimal resource allocations, towards improving patients’ health outcomes.”</td>
</tr>
</tbody>
</table>
6.2 Potential activities for the European Institute for SIOp

The SSI-TF business modelling workshop, May 30-31\textsuperscript{st} 2013, discussed examples of the activities that might be sustained by a future European institute for SIOp (now known as the SHI) such as: establishing a permanent collaboration network amongst standards and specification development organisations; developing guidance for, and supporting in concrete terms, communities of clinical practice in order to develop and validate (multi-professional) semantic assets; supporting industry with adoption and benefits realisation from interoperable products; performing or overseeing pan European certification of semantic assets; maintaining a dynamic and innovative multi-level business model that fuels future investments in interoperable capability and adoption of the relevant assets; delivering education and more specific training where needed; advising national eHealth programs and the European Commission on the business benefits and relevant strategic investments needed in this area; growing a funding stream to sponsor future research towards better interoperability approaches and solutions.

As indicated above, the SSI-TF workshop utilised a business model template (Osterwalder A, Pigneur Y. 2010 Business Model Canvas\textsuperscript{©} www.businessmodelgeneration.com) in order to better identify the roles, relationships, key activities and value propositions of the stakeholder tiers in the European institute for SIOp. Further details of this activity can be found in the Annex.

6.3 Designing a European institute for SIOp: sustainable business model framework

In order to design a sustainable business model framework for the European institute for SIOp the SSI-TF were asked to identify perceived key success factors and risks relevant to the European institute for SIOp’s business model by stakeholder segment. Additionally they were required to consider the likelihood; low, medium or high of the risks and success occurring and align strategies towards optimizing the assets and sustainability of the European institute for SIOp’s business model. For the detailed results of this activity please see the Annex.

This activity indicated that a number of strategies would have to be developed for mitigating the identified risks and ensuring success. Some of the strategies were:

- Create a European institute for SIOp Advisory Board to position the institute as part of EU governance for eHealth, to gain political support and to build strategic alignment with relevant national/regional platforms and timelines;
- Establish the value of the European institute for SIOp to deliver customized, robust and evidence-based value propositions;
- Develop a sustainable business model to bring meaningful value to the European institute for SIOp’s Tier I-III stakeholders;
- Build strategic alliances, win-win partnerships, and value chain brokering to optimise benefits;
- Promote the European institute for SIOp using a targeted approach and a marketing/communication/dissemination plan.
• Develop / communicate clear implementation roadmap based on the SemanticHEALTH organizations vision, mission, and core value statements;
• Optimise reach, through optimal customer / relationship management capabilities to address stakeholders’ perceived needs / incentives;
• Establish the European institute for SIOp as a platform to expand the market and to grow the industry and SDOs’ business;
• Demonstrate the European institute for SIOp’s value quick wins, including its impact on business growth;
• Develop educational program (e.g. Train the Trainer, webinars, business days etc.) and targeted promotional plan & tool kit;
• Establish clear and evidence-based value statements tailored to the European institute for SIOp’s stakeholder groups;
• Promote the European institute for SIOp’s developed assets and applications utilising the specialised skills that different stakeholders provide;
• Deploy an implementation strategy and roadmap for the institute, leveraging measurable successes to ensure progress is always visible and to maintain momentum;
• Promote the European institute for SIOp using a multi-stakeholders patient-centric approach involving HCPs, clinical specialty associations and HPOs;
• Build momentum and synergies to mutually engage Tier III stakeholder groups.

Using the perspective of the SHI, these strategies will be further prioritized by the SSI-TF and supported by an achievable plan of action to be deployed in 2014.

**Using a five year business simulation**

A business simulation could be used to forecast the potential expenses and revenues of the SHI. However, before the stage of simulation is reached the business approach needs to be detailed in more granularity, particularly the business model canvas which should be detailed block by block for what it means for the institute.
7 Workshop implications for upcoming work in WP7

It was clear from the discussions at the 2\textsuperscript{nd} SSI-TF business modelling workshop that in order to design a sustainable business model framework and value chain, it is essential that a clear vision, mission and value statements be defined for the European Semantic HEALTH Institute and Alliance. Activities on this were planned for the following SSI-TF workshop which was held on 12\textsuperscript{th} September 2013 in Munich, the results of which can be found in the Annex.

As the value proposition is central to the business model framework, it was emphasized by the SSI-TF that the SIOp qualitative value propositions will have to be substantiated by quantitative evidence regarding the estimated benefits of SIOp using a cost-benefit assessment (CBA) model. Efforts are currently underway to propose and implement an appropriate cost-benefit assessment methodology, including defining the scope, perspective and possible data sources. For this purpose, a CBA expert panel has been constituted to participate in this initiative and to validate the data and the underlying assumptions that will be used to populate the CBA model. Please see subsection 8 for further details on the CBA model.

At the last business modelling workshop, held on 18\textsuperscript{th} November 2013 in Berlin, it was agreed that in order to achieve optimal results, the business model framework will be developed further from a SHI perspective where as the value chain optimisation will continue from the broader perspective of the SHA.

7.1 Proposed mission, vision and core values statements for the European SemanticHEALTH Institute and Alliance

A draft vision, mission and core value statements relevant to the European SemanticHEALTH Institute and Alliance were presented to the SSI-TF 3\textsuperscript{rd} SSI-TF business modelling workshop which took place on 12\textsuperscript{th} September 2013 in Munich.

Clarification was made that the vision statement for each organization (SHI and SHA) should be bold and inspirational, representing what each organization projects to become in the future; that the mission should describe the present purpose or “raison d’être” of each organization in order to achieve its long term vision; and that the values should represent the organisational core values, the beliefs, and the unique assets that the organizations would jointly commit to promote and use as an internal “code of conduct” when performing their mission towards achieving their vision.

Importantly, the organisational core values represent a different concept than the SIOp “value propositions” by stakeholder groups which describe the perceived benefits of SIOp and of the organizations for external stakeholders.

Having started from the concepts of a Catalyst Organisation (CO) and larger Virtual Organisation (VO), potential SHN VO (CO) vision, mission and values were proposed alongside possible SHN VO/CO short and long term activities. Please see the Annex for more details.

Following the discussion and results of the 3\textsuperscript{rd} workshop there have been some further iterations. Most notably the formalisation of a SemanticHEALTH Alliance which represents
the whole ecosystem of stakeholders involved in SIOp, distinct from the SemanticHEALTH Institute which will act as an organising / facilitating core entity, both organizations acting in a complementary and synergistic manner towards optimizing SIOp developments and adoption in Europe, and beyond.

The SemanticHEALTH Alliance (SHA) is proposed as a network of stakeholder representatives who ideally all play a role in the progress towards richer semantic interoperability. The term Alliance has been used to underline the common interest and mutuality of benefit across these stakeholder groups. This network is deliberately wider than those who are usually involved in developing semantic interoperability assets. It includes stakeholders who require health information to be semantically interoperable (such as healthcare professionals, patients, payers, health ministries, and research organisations), acting as requirements holders and driving the prioritisation of efforts towards delivering that interoperability. It includes bodies that develop standards and specifications that will enable the necessary interoperability, and implementers of EHR systems and other ICT components such as monitoring devices that will utilise SIOp assets within their products and services. It also includes health informatics research communities who are tackling outstanding challenges in enriching our SIOp capability, and funders of such research such as the EC. It includes those who procure health ICT solutions, such as healthcare provider organisations, insurers and other commissioning bodies, those who create the data that needs to be interoperable (often overlapping with the requirements holders) and others who will use integrated data about individual patients (e.g. clinicians, patients) or at population level (such as public health bodies and clinical research organisations).

Many of these stakeholder groups are already organised through professional associations, in order to consolidate their voice, concerns and momentum. Some stakeholders within the proposed SHA network already inter-connect to some extent, at a national or European level, but experience to date shows that there is a lack of co-ordination across them, and an end to end value chain to grow interoperability investments that deliver clear benefits is not well established.

The proposed SemanticHEALTH Institute (SHI) will act as a co-ordinating body to the SHA and catalyse the relevant inter-stakeholder connections, helping to focus European investments and efforts and to nurture a high value marketplace of interoperable eHealth products. The SHI will also curate or develop specific resources that help accelerate the deployment of high quality solutions, acting as a concentrator of prioritised use cases that influence EU and national eHealth strategy, the maintainer of an infostructure that acts as a dissemination channel and guides standards adopters, a curator of criteria to assure the quality of interoperability implementations and possibly a certification body for SIOp products and services. It will also encourage good procurement and good adoption of SIOp solutions through guidelines, educational programmes and possibly an accreditation programme for relevant personnel. The SHI will also define and maintain business models that demonstrate the value of interoperability and investments to enrich it, and collate evidence of benefit (including patient outcomes and economic benefits, as these emerge).

The SHI will include key stakeholders from the SHA within its governance and steering structures in order to ensure that the Alliance thrives, and that value is provided to all members of the network. It will engage with higher level European infrastructures supporting interoperability, such as the CEF, and support relevant Alliance members with equivalent
national initiatives within their countries. Since many of the drivers to scale up SIOp are not limited to Europe, and indeed many of the Alliance members will be global organisations, the SHI will engage internationally to align the efforts and approaches to achieving interoperability internationally, thereby also opening up markets and enabling cross-border healthcare, cross-border effectiveness and safety comparisons, and global clinical research.

The current versions of the SHA and SHI mission statements, visions and value statements are presented on the following pages, although it should be noted that these are currently undergoing a process of consolidation by the SSI-TF. The suggested names for the institute and the alliance: SemanticHEALTH Alliance and SemanticHEALTH Institute are also subject to validation by the SSI-TF.

Based on the policy introduction in section 2 the Figure below illustrates the wider picture of European activities and the context in which the proposed SemanticHEALTH Alliance and Institute would operate.

**Figure 7: The SHA and SHI within the European eHealth landscape**
Table 2: SHA and SHI vision and missions statements, jointly held values

<table>
<thead>
<tr>
<th>Vision (Bold statement describing what the organization aspires to be in the future)</th>
<th>SemanticHEALTH Alliance (SHA)</th>
<th>SemanticHEALTH Institute (SHI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be the principal European multi-stakeholder network which • advocates European priority use cases for eHealth, • undertakes the development of corresponding semantic assets, and • supports the implementation and adoption of high quality trusted semantic interoperability solutions, for the delivery of safe and effective person-centred care, for the promotion of health, public health and research.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To be the European institute that catalyses and co-ordinates • the European prioritization, • co-ordinated development, • certified implementation and • successful adoption of high quality, trusted, semantic interoperability assets which enable rich health information exchange for safe and effective person centred care, the promotion of health, public health and research.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mission (Inspirational statement describing the current purpose of the organization to achieve its vision)</th>
<th>SemanticHEALTH Alliance (SHA)</th>
<th>SemanticHEALTH Institute (SHI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To enrich cross-stakeholder collaborations and initiatives that accelerate the semantic interoperability of health information systems throughout Europe, by • improving their co-ordination, • contributing to the development and maintenance of a pan-European eHealth infostructure and • to the promotion and successful use of health ICT, including electronic health record systems, to enhance healthcare, public health and biomedical research.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To promote and direct targeted collaborations amongst stakeholders • to define European eHealth priorities requiring semantic interoperability and steer investments to deliver this, • to foster co-ordination in the development of relevant semantic assets and a dissemination infostructure for them, • to accelerate and quality assure vendor adoption and multi-vendor collaboration, • to guide effective procurements of interoperable solutions, and • to champion the good use of interoperable information to enhance patient care, achieve better outcomes, population health, and more efficient research.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Jointly held values
(Short list of core values that will guide the organizational code of conduct and for which the organization will be known and valued for)

- Faithfully preserving clinical meaning when exchanging health information (between systems and countries);
- Developing semantic interoperability assets aligned with European and national priority use cases;
- Ensuring seamless information sharing between actors contributing to shared patient care;
- Optimizing care efficiency through better information and knowledge exchange;
- Empowering citizens to access and to richly use their health information;
- Enabling the discovery of new knowledge from consistently optimizing health data sharing;
- Ensuring timely information exchange and knowledge sharing between health care and life science research;
- Engaging all relevant stakeholders in optimizing the benefits from semantically interoperable resources;
- Ensuring that health information is consistently and securely captured, transferred, stored, organized, transformed and managed in compliance with applicable ethical, legal, regulatory and data privacy and personal information requirements.

7.2 Strategies for delivery: consolidating the objectives of the SemanticHEALTH Alliance and Institute

A further two business modelling workshops are planned for further validation of the business modelling framework, to agree on concrete activities of the SemanticHEALTH Institute and Alliance, and detailed steps for the setting up of both the SemanticHEALTH Institute and Alliance.

A table for suggestions on the tasks of the SemanticHEALH Institute and Alliance in both the long term and the short term is currently circulating among SSI-TF members, other experts and colleagues of other workpackages, please find the table on the following pages.
### Table 3: Objectives of the SemanticHEALTH Alliance and Institute

<table>
<thead>
<tr>
<th>Objective</th>
<th>SemanticHEALTH Alliance</th>
<th>SemanticHEALTH Institute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish an Organizational Framework and Governance Model</td>
<td>Establish an organizational framework and governance model that will enable the SHA to realize its vision, achieve its mission, and foster and promote its core values, for accelerating, facilitating and advancing the development of SIOp solutions, and their rapid adoption at the national/regional/local levels.</td>
<td>Establish a European structure and governance model that will enable SHI to realize its vision, achieve its mission, and foster and promote its core values, for accelerating, facilitating and advancing the development of SIOp solutions, and their rapid adoption in Europe, and beyond.</td>
</tr>
</tbody>
</table>
| Contribution to a European (e)Health Infostructure                       | - Work with national/regional/local professional bodies, patient associations, payers, ministries and vendors to identify needs, to facilitate the implementation of eHealth infrastructure strategies, and to prioritize and agree on interoperability scenarios for which initial standards bundles should be constructed and deployed.  
  - Work together with the different EHR Standards Development Organisations to review the scope and inter-relationship of standards that will support these scenarios, identify gaps and overlaps and strategies to handle these.  
  - Collaborate with European and international bodies to promote, prioritize and agree on eHealth infrastructure development strategies.  
  - Publish the scenarios, rationale for their prioritisation, and any early experience of standards adoption (e.g. from vendors).  
  - Co-ordinate the collation of relevant inventories of standards, develop guidance on their concurrent use and other resources supporting adoption.  
  - Propose with SDOs a short term work plan to remedy any identified issues. | - Identify and agree on the functional requirements for, and governance of, a common access point for standards and other resources supporting standards adoption, including the appropriate content of a physical repository and of links to SDO purchase sites.  
  - Agree and facilitate appropriate licensing arrangements for standards bundles that may contain assets from multiple SDOs, and on a maintenance process  
  - Establish and promote a European resource centre, including online services, that advises potential adopters about the semantic assets relevant to each scenario or use case, include or reference the source material such as standards, and offers guidance** on how the standards may be used concurrently.  
  - **This may include educational material about the standards and their use, possibly initially drawn from SHN deliverables. |
| Establish a distribution and maintenance infrastructure for semantic assets | - Identify and agree on the functional requirements for, and governance of, a common access point for standards and other resources supporting standards adoption, including the appropriate content of a physical repository and of links to SDO purchase sites.  
  - Agree and facilitate appropriate licensing arrangements for standards bundles that may contain assets from multiple SDOs, and on a maintenance process  
  - Establish and promote a European resource centre, including online services, that advises potential adopters about the semantic assets relevant to each scenario or use case, include or reference the source material such as standards, and offers guidance** on how the standards may be used concurrently.  
  - **This may include educational material about the standards and their use, possibly initially drawn from SHN deliverables. |
| Define quality criteria that assure the trustworthiness of semantic interoperability assets, and implement European quality labelling procedures | - Share existing quality assurance processes for semantic assets, and experiences of use.  
  - Agree on quality criteria for semantic interoperability assets, including criteria to appraise their ability to be concurrently used with other related assets. | - Establish and deliver an operational model (reflecting good development practices guidelines – see below) for the quality labelling of semantic interoperability assets deployed in Europe that is incorporated within the infrastructure where the assets may be labelled. |
<table>
<thead>
<tr>
<th>Objective</th>
<th>SemanticHEALTH Alliance</th>
<th>SemanticHEALTH Institute</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Development of semantic interoperability assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide a forum for European stakeholders to jointly agree on the priorities (use cases, scenarios) for the further development of semantic assets</td>
<td>• Work with professional bodies, patient associations, payers and ministries to agree on use cases for which interoperable capability is most needed at the national/regional/local levels. &lt;br&gt;• Develop from these the information flows and categories of standards required to support each use case.</td>
<td>• Establish a European resource centre and provide an online European forum to build a multi-stakeholder community that will grow libraries of use cases, criteria for prioritisation, and experiences of success in meeting them. &lt;br&gt;• Promote and publish the use cases and the evidence base behind each one, and collate any relevant national or European documentation about successful use of standards to meet them.</td>
</tr>
<tr>
<td>Define good design principles and guidance for multi-professional communities to develop semantic assets</td>
<td>• Share current methodologies and experiences at the national/regional/local levels, and agree good practice guidelines to develop semantic interoperability assets. &lt;br&gt;• Support the diverse stakeholder groups with the Alliance to understand how semantic assets are designed, what evidence inputs are needed, and how they should be evaluated before finalisation. &lt;br&gt;• Support SDOs, the JIC (and perhaps national standards bodies) in engaging a wider range of stakeholders during their development processes.</td>
<td>• Promote and publish and distribute good development practice guidelines for semantic interoperability assets in Europe. &lt;br&gt;• Develop educational strategies, programs and resources*** to foster good development practices and good adoption practices for semantic interoperability assets. &lt;br&gt;***This may include training support for future standards developers.</td>
</tr>
<tr>
<td>Establish a collaboration network amongst standards and specification development organisations, for coordinated asset development</td>
<td>• Work with the JIC and other bodies to facilitate the better harmonisation of future semantic interoperability assets at the national/regional/local levels. &lt;br&gt;• Work with non-SDO stakeholders to channel their inputs into the development processes of standards relevant to them.</td>
<td>• Contribute to the work of the JIC, and other standards harmonisation initiatives, representing the interests and viewpoints of other non-SDO stakeholders in Europe. &lt;br&gt;• Disseminate the activities and progress of standards development to wider audiences (including globally), and potentially gather feedback from them.</td>
</tr>
<tr>
<td>Advance SIOp research &amp; development</td>
<td>• Engage researchers and organizations at the national/regional/local levels in SIOp R&amp;D efforts and research programs to advance interoperability using SHI best practices.</td>
<td>• Establish and promote a SIOp European SIOp Innovation Think Tank that will contribute ideas to advancing the R&amp;D in SIOp assets in Europe, by promoting innovation and good practices.</td>
</tr>
<tr>
<td>Objective</td>
<td>SemanticHEALTH Alliance</td>
<td>SemanticHEALTH Institute</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Value demonstration of SIOp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collect examples of costs and benefits from around Europe that have been achieved from interoperability in healthcare</td>
<td>• Contribute known publications and information about current activities that are evaluating the benefits (or harms) from interoperability of health information, especially if through better semantic interoperability, at the national/regional/local levels.</td>
<td>• Collate and synthesise the evidence that supports investments and efforts in improving the semantic interoperability of health ICT components and services in Europe, including the timescales needed to succeed.</td>
</tr>
<tr>
<td>Evidencing the cost benefit and beneficial outcomes of semantic interoperability and the timescales needed to succeed</td>
<td>• Contribute expertise to collect and analyse evaluation methods used to assess semantic interoperability solutions and deployments at the national/regional/local levels.</td>
<td>• Provide a reference point for the consolidated available evidence to support strategic decisions and investments in semantic interoperability in Europe. • Collate evaluation methods, metrics and key indicators used to assess the cost, impact, benefit and harms from semantic interoperability. • Collate any assessments made on the validity of parameters and assumptions made when evaluating cost benefit and outcomes.</td>
</tr>
<tr>
<td>Conduct cost-benefit assessments of SIOP applications to establish their value for key stakeholders</td>
<td>• Collaborate in, or lead, evaluations of the cost, benefit or other impact of interoperability projects at the national/regional/local levels, with a focus where possible on eliciting the specific impact of semantic interoperability.</td>
<td>• Establish a panel of expertise to guide and conduct future cost-benefit analysis (CBA) studies on different use cases, standards bundles, deployment scenarios etc. in Europe. • Seek funding to undertake or to contract such evaluations, with the aim of advancing the European/international evidence base.</td>
</tr>
</tbody>
</table>

**Longer term objectives of the SHI** may include:

- Secure long term funding for the semantic interoperability infrastructure
- Expand the infrastructure to collate feedback from countries on the use of, and issues with, semantic assets in order to direct improvements
- Quality label (certify) the maturity of implementations of interoperability within EHR systems and services
- Deliver/promote education and more specific training in high quality shared health records & in creating/using semantic assets such as semantically enriched information models
- Strengthen patient and citizen engagement in co-creating interoperable resources
- Assist national eHealth programmes with the burden / effort of developing and maintaining interoperability assets
- Advise national eHealth programmes and the EC on the maturity of different semantic interoperability solutions and where investments at a national level and in vendor products might optimally be made
- Grow a funding stream so the SHI can itself sponsor necessary R&D and educational initiatives towards better interoperability
8 A cost-benefit model for SIOp: resulting actions from the CBA workshop

A cost-benefit analysis (CBA) model is under development for calculating the costs and benefits of SIOp. A CBA is necessary for persuading investors and other stakeholders of the need for SIOp within Europe through demonstrating the benefits of SIOp in relation to its costs. The CBA model which will be applied for SIOp is based on the eHealth Impact (eHI) model for assessing the economic impact of eHealth solutions. The model developed within the eHealth Impact study was also used for the EHRImpact (EHRI) study which undertook case studies on interoperable electronic health record (EHR) and ePrescribing systems where Substantial Semantic Interoperability (SSIOp) was in place. SSIOp is when semantic interoperability within the range of the SHN project’s definition of levels 2a to 2b is achieved with a new solution and builds on existing solutions. Full Semantic Interoperability (FSIOp) is at SHN level 3. Selected EHRI case studies can thus be used as evidence of the costs and benefits of SSIOp and FSIOp.

There are two eHI models, one for the FSIOp option, one for the SSIOp option. Preliminary results indicate that FSIOp’s long-term estimated net benefits are not viable. SSIOp is viable, indicating that it is the preferred option. Further evidence is required and is being collected. Some assumptions will have to be made where evidence is sparse due to the currently limited adoption of SSIOp. Where evidence is sparse, assumptions will need to be made and these assumptions need validating by the SSI-TF. This is being planned for February 2014. Both the extended evidence gathering and the validation of assumptions need to occur before the eHI models can be effectively applied to demonstrate the estimated costs, benefits and net benefits of SIOp over time.

The initial framework of the cost-benefit analysis model was presented at a short tester workshop with key representative experts on November 18th 2013 in Berlin. The experts were also able to directly provide their input to the above SemanticHEALTH Alliance and Institute vision and missions statements and jointly held values and as well as to offer some evidence on costs and benefits of SIOp. A summary of the workshop can be found in the Annex.

The presentation of the initial cost-benefit framework revealed that the methodology needs further clarification for all SSI-TF members to participate in its development and to validate the assumptions. It was also identified that further evidence is required in order for the framework to be more robust. Some participants were asked to provide further information from their own experience on certain costs and benefits in order to validate assumptions, however this action is taking time due to the need for further clarification on the cost benefit model’s methodology.

As has been identified in the workshop, further evidence is required for the cost benefit. Steps to achieving this include:

1. Development of a literature review framework
   a. An initial application of the framework will take place within the project’s lifetime with a view to the SHI then continuously applying it in order to collate all relevant evidence as it appears.

2. Development of a guide to the CBA and eHI methodology
3. A webinar question and answer session will then be held with SSI-TF members once the guide been circulated in order to clarify any remaining points.

4. A dedicated CBA and eHI workshop is to be held with the SSI-TF in order to gather further evidence and to validate assumptions that have been made

5. Finalisation of CBA and eHI and its application for SIOp

6. Results of CBA and eHI on SIOp to be presented in deliverable 7.3

Further to the work on CBA, the workshop identified actions needed required to stabilise the value chain:

- SemanticHEALTH Institute (SHI) to be better defined. The institute and Alliance are the driving forces.
- Approach to be taken towards the value chain to be defined
- Roles of each tier to be better defined
- Roles of each actor to be better defined. Once it has been decided where the actors will play their most decisive role from a SHI perspective.

Once these are complete the business model (BM) can really begin to come to life.

The workshop also discussed steps for setting up the SemanticHEALTH Institute. By the end of the project the SemanticHEALTH Institute should be launched. In order to achieve this precision is required on:

- What it will do in years 1,2,3
- What it will achieve in years 1,2,3

From these milestones and goals a picture can be built of what funding is required. To achieve this, the vision of the institute needs to be locked down with real numbers.
9 Proposed next steps and timelines

The 2014 plan of action for the SSI-TF includes the following next steps and timelines. This plan has been shared with the members of the SSI-TF during the 2014 kick-off Webinar on February 03, 2014. In order to ensure the completion of all business modelling activities in due course, the plan includes up to three (3) SSI-TF workshops (Q1, Q2, Q3), monthly Webinars, and a potential EU Summit for the community of SIOp stakeholders by year end, where the SHI and SHA would be officially launched.

**Figure 7: SSI-TF 2014 Webinars and Workshops: objectives and timelines**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Timelines (Target)</th>
<th>Launch (Target)</th>
<th>Monthly Webinars</th>
<th>SSI-TF Workshops</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Validate customized value propositions by stakeholder group to reflect stakeholder needs and incentives</td>
<td>Q1</td>
<td>Q2-Q4</td>
<td>X</td>
<td>X (Apr)</td>
</tr>
<tr>
<td>2. Consolidate the BM canvas for the SHI (including business model simulations &amp; business plan) and value chain optimization for the SHA</td>
<td>Q1-Q3</td>
<td>Q4</td>
<td>X</td>
<td>X (Apr-Sep)</td>
</tr>
<tr>
<td>3. Build the roadmap for establishing the SHI and SHA</td>
<td>Q1-Q2</td>
<td>Q3-Q4</td>
<td>X</td>
<td>X (Apr-Sep)</td>
</tr>
<tr>
<td>4. Establish the value of SIOp (cost-benefit assessment)</td>
<td>Q1-Q2</td>
<td>Q3-Q4</td>
<td>X (CBA)</td>
<td>X (Apr-Jun)</td>
</tr>
<tr>
<td>5. Develop a communication and stakeholder engagement plan for all stakeholder segments</td>
<td>Q1-Q2</td>
<td>Q3-Q4</td>
<td>X</td>
<td>X (Apr-Sep)</td>
</tr>
<tr>
<td>6. Identify quick business wins and develop SIOp promotional and educational material</td>
<td>Q1-Q2</td>
<td>Q3-Q4</td>
<td>X</td>
<td>X (Apr-Sep)</td>
</tr>
<tr>
<td>7. Plan an interactive multi-stakeholder SIOp “EU Summit” to build awareness and momentum, and to launch the SemanticHEALTH Institute and Alliance (e.g. Press release)</td>
<td>Q1-Q2</td>
<td>Q3-Q4</td>
<td>X</td>
<td>X (Dec)</td>
</tr>
</tbody>
</table>

**Figure 8: SSI-TF 2014 Webinars and Workshops: proposed dates**

SSI-TF 2014 Webinars & Workshops

Proposed Dates

**Monthly SSI-TF Webinars (60min) (or bi-monthly upon request)**

- 16h00-17h00 CET
  - Tue, February 11, 2014
  - Wed, March 19, 2014
  - Wed, April 23, 2014
  - Wed, May 14, 2014
  - Wed, June 11, 2014
  - Wed, July 9, 2014
  - Wed, August 13, 2014
  - Wed, September 10, 2014
  - Wed, October 15, 2014
  - Wed, November 5, 2014
  - Wed, November 19, 2014
  - Wed, December 03, 2014

**SSI-TF Workshops**

- 1) First week of April (Brussels)
  - 2days (14h30-18h00/8h30-17h00)
  - Thursday 3 PM- Friday 4 April, 2014

- 2) Mid-June (Geneva)
  - 1day (11h00-17h00)
  - Wednesday June 18, 2014 (before the SHN annual meeting on June 19-20)

- 3) September (TBC)
  - 1.5 day meeting
  - Date/location TBC

- 4) December (TBC)
  - Multi-stakeholder SIOp “EU Summit”
In addition, as described below, a CBA expert panel has been constituted to guide the design of the cost-benefit assessment. It includes some members of the SSI-TF who will be meeting in parallel to the SSI-TF workshops and attend dedicated monthly teleconferences.

**Figure 9: Cost-Benefit Assessment Expert Panel**

**Cost-Benefit Assessment (CBA) Expert Panel**

**Meetings: Proposed Dates**

- Monthly teleconferences
  - Led by Tom Jones & empirica
  - 0.5 day CBA dedicated expert panel meetings in parallel to SSI-TF workshop *(Proposed Date: April 3rd 2014, 9h00-13h00 – Brussels)*

- Objectives
  - Inform the underlying eHealth assumptions for the CBA model (cardiovascular prevention)
  - Generate supportive evidence (effectiveness, costing data)
  - Review/comment results
  - Participate in potential scientific publication & support dissemination

- CBA expert panel members (further volunteers welcome):
  - Tom Jones (Lead)
  - Dipak Kalra
  - Veli Stroetmann
  - Jess Vogt
  - Charles McCay
  - Annika Sonne Hansen
  - Stephen Walker
  - Susanna Hardman
  - Jan Van Emelen
  - Zoi Kolitsi
  - Jeremy Thorp
Sustainable Semantic Interoperability Task Force (SSI-TF)
Workshop Summary
May 30-31st, 2013

Afternoon Session on Day 2, May 31st, Jointly Organised With eHealth Innovation

EU Commission Offices, 25 avenue de Beaulieu, Auderghem (Brussels), Belgium

Sustainable Semantic Interoperability: Defining the Virtual Organisation

SemanticHealthNet (SHN) is growing a multi stakeholder network of experts and organisations to tackle many different facets of the challenge of achieving the interoperability of health information on a European scale. Given the size and complexity of that challenge, this project will primarily develop methods, inter-organisational processes and governance measures along with some examples of assets that illustrate how semantic interoperability can be achieved.

It is an explicit part of the workplan for SHN to define and help establish a sustainability organisation to take forward the initiatives that we start, maintaining and growing the network and expanding knowledge and practice in the development and adoption of semantic interoperability assets and solutions. In work package 8 this is called a Virtual Organisation (VO), because, at the time of writing the proposal, it was not clear if one or more than one physical organisations would take forward the entire scope.

The SSI-TF May 30-31st workshop discussed examples of the activities that might be sustained such as: establishing a permanent collaboration network amongst standards and specification development organisations; developing guidance for, and supporting in concrete terms, communities of clinical practice in order to develop and validate (multi-professional) semantic assets; supporting industry with adoption and benefits realisation from interoperable products; performing or overseeing pan European certification of semantic assets; maintaining a dynamic and innovative multi-level business model that fuels future
investments in interoperable capability and adoption of the relevant assets; delivering education and more specific training where needed; advising national eHealth programs and the European Commission on the business benefits and relevant strategic investments needed in this area; growing a funding stream to sponsor future research towards better interoperability approaches and solutions.

The SSI-TF workshop also examined the stakeholders who form part of this multilevel “marketplace”, building on a workshop held in June 2012, which was summarised in SHN Deliverable 7.1.

This summary report presents the outcomes of the SSI-TF May 30-31st business modelling workshop, and the results of discussions among key stakeholders with regard to the activities mentioned above. A business modeling perspective was adopted to start thinking about the SHN Virtual Organisation (SHN VO) as if it is a single logical entity. This allowed for the identification of stakeholders who contribute to the landscape, whether they are users of semantic assets or enablers of further development or both. The value propositions that will drive their engagement and, for some of those stakeholders, their specific financial and non-financial business models in support of semantic interoperability were also discussed.

The results can now be used to develop a blueprint for the SHN VO, its mandate and governance mechanisms. Once this is achieved, it will be easier to determine whether its tasks can be meaningfully subdivided and mapped to one or more existing organisations.

**SSI-TF Strategic Objectives**

- Build awareness & momentum towards designing a sustainable SHN VO business model
- Prioritize SHN VO key stakeholder groups and align relevant value propositions
- Provide strategic input in the design of a sustainable SHN VO business model
- Recommend strategies for optimizing SHN VO business model assets & sustainability
- Align a SSI-TF 2013 plan of action

**SSI-TF Workshop Objectives**

- Summarize business modelling best practices
- Categorize SHN VO stakeholder groups by segments and their perceived unmet needs
- Develop SHN VO customized value propositions
- Define the SHN VO business model perspective, framework & sustainability strategies
- Achieve consensus and align next steps (Q2-Q4.2013)

**Multidisciplinary SSI-TF**

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Participants</th>
<th>Confirmed to Attend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>Michele Thonnet</td>
<td>YES</td>
</tr>
<tr>
<td>Health &amp; Social Care</td>
<td>Jeremy Thorp</td>
<td>YES</td>
</tr>
<tr>
<td>Clinicians</td>
<td>Suzanna Hardman</td>
<td>YES</td>
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<tr>
<td>Government</td>
<td>Falk Schubert</td>
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<tr>
<td>Public Health</td>
<td>Anni Buhr</td>
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<tr>
<td>Policy &amp; Legal</td>
<td>Zoi Kolitsi</td>
<td>YES</td>
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<tr>
<td>Government</td>
<td>Luc Nicolas</td>
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</tbody>
</table>
### Private Payers/Insurers
- Standards Development Organisation
- Standards Development Organisation Industry
- Industry and Standards

<table>
<thead>
<tr>
<th>Name</th>
<th>Attendance Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan Van Emelen</td>
<td>YES</td>
</tr>
<tr>
<td>Charles McCay</td>
<td>YES</td>
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<tr>
<td>Jan Eric Slot</td>
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</tr>
<tr>
<td>Jörg Kraenzlein</td>
<td>Excused</td>
</tr>
<tr>
<td>Maarten Festen/Annika</td>
<td>YES</td>
</tr>
<tr>
<td>Sonne Hansen</td>
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### Business Development
### Health Economics
### Legal, Privacy Protection
### Academic
### Academic
### Academic
### EC
### eHealth & Business Modelling
### eHealth ICT (epSOS)
### eHealth
### eHealth
### eHealth, Business Modelling
### eHealth
### eHealth
### eHealth
### eHealth

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Roger Wallhouse</td>
<td>YES (Day 2)</td>
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<tr>
<td>Tom Jones</td>
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<tr>
<td>Petra Wilson</td>
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<td>Matic Meglic</td>
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<tr>
<td>Ian Buchan</td>
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<tr>
<td>Dipak Kalra</td>
<td>YES</td>
</tr>
<tr>
<td>Benoit Abeloos</td>
<td>YES</td>
</tr>
<tr>
<td>Veli Stroetmann</td>
<td>YES</td>
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<tr>
<td>Marcello Melgara</td>
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<td>Jörg Artmann</td>
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<tr>
<td>Jess Vogt</td>
<td>YES</td>
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<tr>
<td>Danielle Dupont</td>
<td>YES</td>
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<tr>
<td>Anna Adelöf</td>
<td>YES (Day 1)</td>
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<td>Lisa Hagberg</td>
<td>YES (Day 1)</td>
</tr>
<tr>
<td>Mario Romao</td>
<td>YES (Day 2)</td>
</tr>
<tr>
<td>Geert Thienpont</td>
<td>YES</td>
</tr>
</tbody>
</table>

### Acronyms used in this document:
- B2B: Business2Business
- FTE: Full Time Equivalent
- EEC: European Economic Community
- EVO: European SHN-VO (EVO)
- GP: General Practitioner
- HC: Healthcare
- HPO: Healthcare Provider Organizations
- HCP: Healthcare Professionals
- SHN: SemanticHealthNet (project)
- SI: Semantic Interoperability
- SSI: Sustainable Semantic Interoperability
- VO: Virtual Organisation
For business modelling purposes, the stakeholders connected to an organization (in our case a virtual organization) are conventionally tiered in terms of their impact on the business, in particular in financial terms. Because healthcare is to some extent a business, but to some extent a societal good and a public service, there is a tension between tiering stakeholders in terms of their true business impact, and ranking their priority in relation to societal value. As an example, patients are absolutely central to the societal value of healthcare, and interoperable health records are clearly first and foremost designed to centre around the delivery of care to individual patients. However, individual patients have almost no influence on the design, purchase or adoption practices of electronic health record systems in general practice or in hospitals. They are almost never involved in the development of standards, or of ICT products for clinicians. They can have a somewhat weak - indirect - influence through proxy stakeholders, such as clinicians and payers, who hopefully will present the patient perspective to some extent alongside their own perspectives.

The focus of this Semantic Interoperability Sustainability Task Force (SSI-TF) is primarily to consider a traditional business ecosystem that could generate revenue to sustain the development and adoption of semantic interoperability assets. In other words, although we wish to ensure best value and maximal benefits to the social good of health care, the SSI-TF had primarily to focus on the economic forces that will generate added value and catalyse richer and more interoperable health records. During the workshop there was some healthy debate about how reasonable it was to rank stakeholders into Tier I, Tier II, Tier III clusters. The meeting agreed to proceed with this clustering, but recognising that this reflected only one of the perspectives on stakeholders and their influence on semantic interoperability. The three tiers and stakeholder clusters used in the rest of this report therefore need to be recognised in terms of their decision making and decision influencing roles in the business of semantic interoperability, as opposed to the benefits and value of semantic interoperability. The societal value dimension is more likely to be invisible through the prioritisation of the development of the semantic interoperability assets, rather than the structuring of the business relationships around the VO.

**Objective:** Considering the SHN VO market landscape, perceived unmet needs and expected benefits, identify three (3) top tier clusters of stakeholders from the list below, based on their perceived level of influence/impact on the sustainability of the SHN VO business model.
SHN VO Perceived Stakeholders

Tier I

- **Policy Makers (5)**
  - Policy makers’ interest in a SHN VO is driven by the need to ensure sustainable healthcare. While the VO itself cannot deliver improved health outcomes, it can facilitate the development of tools that will eventually improve the way healthcare is delivered leading to better health outcomes, improve trust in shared information, avoid duplication, improve audit assessments and evidence based care, coping with increased demand (achieving more for less). Policy-makers also need a concrete implementation roadmap to build trust and to establish the credibility of the VO.

- **Payers (6)**
  - Payers are interested in cost-effective solutions and robust value propositions. An SHN VO could provide the quality metrics to assess which health IT solutions are cost-effective.

Tier II

- **Industry (7)**
  - For industry, the SHN VO could provide a repository of standard specifications, QA and certification processes. This would increase the product uptake by customers, leading to better cash flow and more reliable products that will reduce risk. With reference standards available, new products would have lower development costs. The wider adoption of clinical standards leads to better value to customers.
- **Research** (9)
  - The research community is interested in better quality and lower cost information, as well as more consistent information governance. If provided by an SHN VO, this would lead to better healthcare due to better research (faster trials, better observational data, pharma and devices), more evidence based healthcare (3R goal): Reusable Research Results.

- **Standards Development Organizations** (8)
  - For SDOs, the SHN VO could be a tool to define a clear focus of development work, as well as being the forum for widespread clinical standards adoption. It would help to define the scope for more investment in relevant standards, better transfer of developed standards to care, and better risk management. SDOs could use the VO to drive adoption and engagement with members.

- **Tier III**

  - **Health Professional Associations/Clinical Specialty Associations** (2)
    - For health professional associations, the key value of a VO could be its role in harmonizing inflexible and incompatible information systems through wider adoption of health IT standards. Knowledge embedded in clinical guidelines could then be rolled out faster and enable wide adoption of best practices, at lower implementation costs, leading to better quality of care and better evidence cycle. As a precondition for this work to succeed, existing clinical standards need to be adopted faster.

  - **Healthcare Professionals** (3)
    - Healthcare professionals need better access to data (new patients, transfer of care across all professionals) as an enabler for multi-disciplinary care.
    - For them, the perceived benefits of a SHN VO are better implementation of clinical rules and guidelines, improved clinical audits, multi-professional care plans, earlier interventions through risk stratification/ monitoring, empowering professional clinical practice, faster adoption of guidelines.

  - **Healthcare Provider Organizations (HPOs)** (4)
    - HPOs are eager to attract patients, improve efficiency of the service delivery process, provide reimbursement and achieve better clinical governance resulting in better outcomes. This can only be achieved through the use of health IT standards which allow for more rapid decisions, faster and more efficient care, and collaborative care models which focus on the patients.
    - Growth potential from providing high quality care, efficient use of resources and reduced clinical errors.
Breakout Session II: “Defining What’s in it for Them: Talk about customized value propositions!” (ref. Slides 23-32)

**Objective:** Using a value proposition template, develop customized short statements (“elevator pitch”) describing the perceived added value of SHN VO for Tier I, II, III stakeholder segments towards achieving interoperability, and describe the supportive evidence to be generated to substantiate these statements.

### Tier I

**National Decision Makers/Policy Makers (5)**

**Value Statement**

“The SHN VO will enable achieving sustainable and integrated healthcare through intelligent re-engineering of healthcare systems, aiming at improving patient outcomes, population health, life expectancy, and efficiency, by enabling the sharing of health information and knowledge through innovative, sustainable and cost-effective interoperable solutions.”

**Supportive Evidence**

- Exams and wastage avoided
- Improved health outcomes
- Better healthcare audits
- Achieving personalized healthcare delivery to the patient
- Better understanding between GPs/patients and other healthcare providers (eg. survey) and therefore more efficient care provision

**Payers (6)**

**Value Statement**

“The SHN VO will enable achieving sustainable integrated healthcare, through health data sharing, knowledge transfer, and a smart re-engineering of healthcare systems, for improving population health, patient outcomes, life expectancy, and efficiency, by providing standardized, and cost-effective interoperable solutions.”

**Supportive Evidence**

- Robust cost-benefit analyses
- Improved patient outcomes

### Tier II

**Industry (7)**

**Value Statement**

“The SHN VO will enhance the collaboration across health care industries and associations...
by providing value-added interoperable standardized solutions that will improve efficiency, grow the market, and accelerate the development of safe and effective innovative medicines and health technologies, to address unmet medical needs.”

Supportive Evidence

- Profitable use by clients in industry
- Market share growth

Research (9)

Value Statement

“The SHN VO will provide efficient interoperable standardized solutions enabling timely access to and wider sharing of evidence-based health data for research, aiming to improve healthcare and patient outcomes”.

Supportive Evidence

- Evidence of adoption of SHN VO solutions
- Reuse of results in research

Standards Development Organizations (8)

Value Statement

“The SHN VO will drive standards development and wider adoption by an engaged community, for the implementation of innovative and standardized interoperable solutions of high quality, enabling market growth”.

Supportive Evidence

- Clear roadmap based on commitment to adopt at scale

<table>
<thead>
<tr>
<th>Tier III</th>
</tr>
</thead>
</table>

Health Professional/Clinical Specialty Associations (2)

Value Statement

“The SHN VO will accelerate the adoption of clinical and professional standards, including therapeutic guidelines, by enabling standardized interoperable solutions, contributing to achieving integrated healthcare, to establishing evidence-based clinical development, and to implementing best practices to improve health outcomes”.

Supportive Evidence

- Case studies of best practice adoption
- Audits
Healthcare Professionals/Clinicians (3)

**Value Statement**

“The SHN VO will provide standardized interoperable solutions that will enable timely access to health data, empowering healthcare professionals working in multidisciplinary teams, and patients, to achieve integrated healthcare, and the adoption of best clinical and disease management practices for improving health outcomes”.

**Supportive Evidence**

- Established benefits through optimizing access to health data
- Observed implementation of clinical guidelines through clinical audits

Healthcare Provider Organizations (4)

**Value Statement**

“The SHN VO will provide standardized interoperable solutions that will enhance healthcare delivery and planning, the continuum of care, clinical governance and decision-making through a harmonized approach that will foster integrated healthcare models, reduce errors, provide timely patient access to health interventions, and ensure optimal resource allocation for improving patient health outcomes.”

**Supportive Evidence**

1. Case study
2. Improved health outcome results

**Breakout Session III: “Designing a SH VO sustainable business model framework”**
(Slides 35-37)

**Objective:** To design a SHN VO business model framework for Tier I-III stakeholder segments using a prototype of 9 building blocks.

**Tier I**

1) SHN VO Stakeholder Segment
   - National Decision Makers/Payers

2) SHN VO Value Proposition
   - Achieve more with less (value for money) through integrated healthcare solutions connecting people, organizations & data
   - Mobilize/unleash unused resources from re-engineering/optimizing HC systems
   - Avoid duplication of data entry/tests
   - Reduce administrative burden
   - Enable optimal use of health data for clinical practice
   - Enable resource allocation to optimize clinical, humanistic and economic benefits
• Provide more efficient HC solutions
• Enable patient empowerment for better health outcomes
• Provide certified SH assets

3) SHN VO Relationships
• Create SHN VO EU governance (public-private partnership)
• Establish as non-profit organization (e.g. EU reference centre of convergence/reference/excellence in SI towards establishing best practices)
• Develop contractual relationships or strategic alliances with key partners
• Consider potential role of SHN VO as a “broker” or “integrator” between different stakeholder groups (SI service offering/demand)

4) SHN VO Channels
• Provide open access to national/regional assets
• Establish a SHN VO portal
• Position SHN VO as a network of networks in SI
• Designate 1 “integrated” contact point at national/regional level
• Use/leverage existing/targeted communication channels to optimize visibility and to reduce costs

5) SHN VO Key Activities
• Deliver neutral/open terminologies & interfaces
• Design/assess methodologies
• Provide advisory/consultancy services
• Organize a F2F annual event/conference
• Support workflow systems for functional care
• Establish consensus on standardized protocols
• Ensure maintenance of resources/assets (licensing models)
• Assess semantic assets (certified assets based on pre-established priorities)
• Enable semantic assets & tools
• Conduct SHN VO promotional activities (e.g. SHN VO vision, mission, values, products & services)

6) SHN VO Key Resources
• Portal with assets & available resources (methods, tools, datasets)
• Governance & scientific board
• Management staff
• Legal experts
• Marketing/Promotional resources
• Offices to provide space and opportunity for key partners to collaborate

7) SHN VO Key Partners
• Health Professional Associations/Clinical Specialty Associations (2)
• Healthcare professionals (3)
• Healthcare Provider Organizations (4)
8) SHN VO Cost Structure (if set up as a new entity)

- Fixed and variable costs related to VO structure & governance model
- Costs related to maintenance of standards, assets, tools
- HR (small multi-skilled team)

9) SHN VO Revenue Streams

- Accreditation, certification, quality labelling, audits
- Assessment of industry issues to provide solutions (consultancy)
- Sell specific datasets, linkages between terminologies
- Personalized value-added fee for services for member states, stakeholder groups

Tier II

1) SHN VO Stakeholder Segment

- Industry
- Standards Development Organizations
- National organizations
- EU policy organizations
- Trade + Healthcare associations

2) SHN VO Value Proposition

- Support key partners in addressing the customers’ SI needs
- Promote added value of SI
- Establish/promote good practices
- Educate stakeholders
- Promote/leverage SDO standards/industry solutions
- Establish quality branding
- Gain HC market intelligence
- Grow the business/market size

3) SHN VO Relationships

- Establish a promotion-like agency (e.g. touristic promotional agency for a region)
- Not a trade association
- Establish Advisory Board
- Meeting portal for the SI community

4) SHN VO Channels

- Educational apps
- Trade associations
SemanticHealthNet

- Social media
- Advertising/licensing ramifications

5) SHN VO Key Activities
- SI booths
- Conferences/events
- Strategies to increase market uptake of SI solutions
- Semantic “connect-a-thon”
- Develop SI module in university curriculum
- Develop educational apps
- Meet ups (eg. B2B Speed dating)
- Branding (logo/symbol)
- Post epSos roadmap: standardize cross-border health (turn interoperability specifications to normative)
- Certification of Standards/Products

6) SHN VO Key Resources
- VO Staff
- Community Managers
- Internet/IT specialized resources
- Legal services
- Accounting
- Marketers & communications (“marcom”)
- Events/conference planners
- SI volunteers (mentorship programs)

7) SHN VO Key Partners
- Key stakeholders 2,3,5,6,9 (on education)
  - HC Professional Associations/Clinical Specialty Associations
  - HC Professionals
  - National Decision Makers
  - Payers
  - Research
- In the future, other industries (energy, engineering)
- EEC B2B meeting (organizing committee)

8) SHN VO Cost Structure
- Cost related to staffing a VO like this (activities/resources)
- Estimated 2 full time equivalent (FTE)
- Office
- Overheads

9) SHN VO Revenue Streams
- Public financing
- Member fee-dependent
- Event registrations
- Sponsorship
• Click fee (e.g. 0.1€ per booking/transaction)

Tier III

1) SHN VO Stakeholder Segment
• HP associations
• Healthcare Professionals
• Healthcare provider organizations
• Patients & citizens

2) SHN VO Value Proposition
• Help to improve clinical/health outcomes (benefits to HCPs & patients)
• Help to underpin HC with better quality data (more reliable, complete)
• Provide faster access to health records to support patient care
• Generate better data to support audits/clinical governance, research
• Improve public health knowledge & management (benefits to patients & citizens)
• Achieve better performance and more cost-effective care & services (leading to release of resources = benefits to HPOs)

3) SHN VO Relationships
• Enable business relationships across the whole value chain
• Education and dissemination of guidance
• Facilitation/cohesion at the national level (EU dimension? Individual?)

4) SHN VO Channels
• Leverage existing channels
• Aim for consistency with other groups

5) SHN VO Key Activities
• Support procurement, certification, guidance
• Stimulate demand for SI + supply = market optimization
• Semantic asset development for HCP, patients (maybe act as catalyst, broker or one stop shop)
• Data management
• Collect/share evidence of benefits/failures (one stop shop)

6) SHN VO Key Resources
• Research findings
• Cases
• Data management resources
• Change management resources
• SI business case development
• Resources to facilitate cohesion amongst professional bodies to better influence SDOs, industries
• Implementation skills (adoption of guidelines)
SemanticHealthNet

7) SHN VO Key Partners

- Payers
- Suppliers
- Patient associations

8) SHN VO Cost Structure

- Use flexible costs only to allow the VO to grow and change according to demand / requirements (e.g. Outsourcing, not employing staff)

9) SHN VO Revenue Streams

- HPOs business case (for eHealth/interoperability) developed first, then the case for skills development would come into play
- Learn from various SDO models (may be able to mirror their approach)
- Assess who might pay for SHN VO services (payers, EC HPOs, industry if better data; exclude MoH)

Breakout Session IV: “Defining Key Success Factors, Risks & Strategies for Optimizing the Sustainability of the SHN VO Business Model” (ref. Slides 38-45)

**Objective**: Identify 3-5 perceived key success factors, risks and their likelihood (L,M,H) relevant to the SHN VO business model by stakeholder segment, and align strategies towards optimizing the assets and sustainability of the SHN VO business model.

**Tier I: National Decision Makers/Policy Makers & Payers**

<table>
<thead>
<tr>
<th>Stakeholder Segment</th>
<th>Success Factors</th>
<th>Likelihood (L,M,H)</th>
<th>Strategy to Optimize SHN VO Business Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Decision Makers/Policy Makers/MoH/Health Authorities (5)</td>
<td>Convince stakeholders (HC providers involvement)</td>
<td>M</td>
<td>Establish an Advisory Board, Scientific Board; Identify appropriate incentives for each stakeholder group</td>
</tr>
<tr>
<td>Payers (6)</td>
<td>Position as part of the EU governance for eHealth (on the map)</td>
<td>H</td>
<td>Align with political timelines; Generate convincing evidence and value propositions; Match value proposition to expressed needs</td>
</tr>
<tr>
<td></td>
<td>Establish as part of EU eHN priorities (strategic alliance)</td>
<td>M</td>
<td>Gain political support; Establish governance with existing strategies at regional/national levels; Identify and dedicate specific resources</td>
</tr>
<tr>
<td></td>
<td>Step by step start + effectiveness = efficiency as 1st service</td>
<td>M</td>
<td>Win-win demonstration; Agility, timeliness &amp; use of appropriate channels (web portal,..)</td>
</tr>
<tr>
<td></td>
<td>Added value in terms of improving efficiency (cost-effective)</td>
<td>H</td>
<td>Establish partnerships &amp; value chains brokering; Promote SHN VO in the media</td>
</tr>
<tr>
<td>Stakeholder Segment</td>
<td>Risks</td>
<td>Likelihood (L,M,H)</td>
<td>Strategy to Mitigate Risks &amp; To Optimize SHN VO Business Model</td>
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<tr>
<td>------------------------------</td>
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</tr>
<tr>
<td>National Decision Makers/Health Policy Makers/ MOH/ Health Authorities (5)</td>
<td>Respect of PPP contractual agreement vs risk of monopoly</td>
<td>H</td>
<td>• Multidisciplinary governance model/statute to prevent risk&lt;br&gt;• Business model to address different stakeholders incentives</td>
</tr>
<tr>
<td></td>
<td>Risk of establishing big costly structure (monopoly) during economic crisis</td>
<td></td>
<td>• Develop lean SHN VO structure &amp; strategic alliances that foster integration into EU/national strategies to avoid duplicating costs&lt;br&gt;• Develop sustainable business model&lt;br&gt;• Establish pricing strategies based on willingness to pay and affordability&lt;br&gt;• Ensure transparency</td>
</tr>
<tr>
<td>Payers (6)</td>
<td>Short term gains more valued than long term goal</td>
<td>M/H</td>
<td>• Establish short/mid/long-term objectives &amp; corresponding plans of action&lt;br&gt;• Identify key drivers&lt;br&gt;• Build on quick “wins” to achieve long term mission</td>
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<tr>
<td></td>
<td>Added value not well understood (compelling value propositions needed)</td>
<td>H</td>
<td>• Develop compelling value propositions by stakeholder groups&lt;br&gt;• Build awareness&lt;br&gt;• Change paradigm: “Investing in health rather than paying for health care” (evidence-based cost benefit assessments by disease area)</td>
</tr>
<tr>
<td></td>
<td>Sub-optimal communication strategy/marketing</td>
<td>L–M</td>
<td>• Run awareness campaign&lt;br&gt;• Disseminate value propositions in strategic forums and major health care platforms&lt;br&gt;• Publish, publish, publish…</td>
</tr>
</tbody>
</table>

**Priority**

Develop the SHN VO strategy and structure

**Key Strategies**

1. Create a SHN VO Advisory Board to position SHN VO as part of EU governance for eHealth, to gain political support and to build strategic alignment with relevant national/regional platforms & timelines
2. Establish the value of SHN VO to deliver customized, robust and evidence-based value propositions
3. Develop a sustainable business model to bring meaningful value to SHN VO Tier I-III stakeholders
4. Build strategic alliances, win-win partnerships, and value chain brokering to optimize benefits
5. Promote SHN VO using a targeted approach and a marketing/communication/dissemination plan
### Stakeholder Segmentation and Value Propositions

#### Tier II: Industry, SDOs

<table>
<thead>
<tr>
<th>Stakeholder Segment</th>
<th>Success Factors</th>
<th>Likelihood (L, M, H)</th>
<th>Strategy to Optimize</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industry (7)</strong></td>
<td>Gaining more customers</td>
<td>M</td>
<td>•Targeted marketing&lt;br&gt;•Package products&lt;br&gt;•Reduced customer risks</td>
</tr>
<tr>
<td></td>
<td>More efficient marketing</td>
<td>H</td>
<td>•Effected outreach&lt;br&gt;•Relationship management</td>
</tr>
<tr>
<td></td>
<td>Increase adoption</td>
<td>H</td>
<td>•Clear roadmap&lt;br&gt;•Visibility</td>
</tr>
<tr>
<td></td>
<td>Increasing the number of members</td>
<td>L/M</td>
<td>•Clear roadmap&lt;br&gt;•Visibility</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stakeholder Segment</th>
<th>Risks</th>
<th>Likelihood (L, M, H)</th>
<th>Strategy to Optimize</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industry (7)</strong></td>
<td>Distorting the market</td>
<td>M</td>
<td>•Clear scope&lt;br&gt;•Prove market growth potential, including reduced costs &amp; risks</td>
</tr>
<tr>
<td></td>
<td>Conflicting with the industry’s marketing message</td>
<td>L</td>
<td>•Develop promotional/educational tool kit (case studies, communication, marketing strategy)&lt;br&gt;•Clear scope</td>
</tr>
<tr>
<td></td>
<td>Confusing the market (another “do”)</td>
<td>H</td>
<td>•Focus on promotion&lt;br&gt;•Relationship management</td>
</tr>
<tr>
<td></td>
<td>Spread resources too thin</td>
<td>H</td>
<td>•Establish quick wins&lt;br&gt;•Focused efforts</td>
</tr>
<tr>
<td><strong>Industry + SDO</strong></td>
<td>Quality of key staff</td>
<td>M</td>
<td>•Recruitment supervised by Advisory Board&lt;br&gt;•Clear metrics</td>
</tr>
</tbody>
</table>

### Key Strategies

1. Develop/communicate clear implementation roadmap based on SHN vision, mission, values
2. Optimize reach through optimal customer/relationship management capabilities to address stakeholders’ perceived needs/incentives
3. Establish SHN VO as a platform to expand the market and to grow the industry and SDOs' business
4. Demonstrate the SHN VO value quick wins, including its impact on business growth
5. Develop educational program (eg. Train the Trainer, webinars, business days etc.) and targeted promotional plan & tool kit

**Tier III: Health Professional/Clinical Specialty Associations, HC Professionals, HC Provider Organizations and (Patients)**

<table>
<thead>
<tr>
<th>Stakeholder Segment</th>
<th>Success Factor</th>
<th>Likelihood (L,M,H)</th>
<th>Strategy to Optimize SHN VO Business Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Professional/Clinical Specialty Associations (2)</td>
<td>Aligned statements of requirements (VALUES)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthcare Professionals (5)</td>
<td>Application of skills by stakeholder groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthcare Provider Organizations (4)</td>
<td>Application Tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients/Patient associations (1)</td>
<td>Leverage developed assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Response iterative (adaptive + additive)</td>
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<table>
<thead>
<tr>
<th>Stakeholder Segment</th>
<th>Risks</th>
<th>Likelihood (L,M,H)</th>
<th>Strategy to Optimize SHN VO Business Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Professional/Clinical Specialty Associations (2)</td>
<td>•Unusable deliverables</td>
<td></td>
<td>Ensure that all stakeholders work together on development</td>
</tr>
<tr>
<td>Healthcare Professionals (3)</td>
<td>•Unthinking implementation</td>
<td></td>
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<tr>
<td>Healthcare Provider Organizations (4)</td>
<td>•Unintended consequences</td>
<td></td>
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<tr>
<td>Patients/Patient associations (1)</td>
<td>•Unable to sell the concept of European VO</td>
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**Key Strategies**

1. Establish clear and evidence-based SHN VO value statements tailored to stakeholder groups
2. Promote SHN VO developed assets and applications utilising the specialised skills that different stakeholders provide
3. Deploy a SHN VO step-by-step/iterative implementation strategy leveraging measurable successes to ensure progress is always visible and to maintain momentum
4. Promote SHN VO using a multi-stakeholders patient-centric approach involving HCPs, clinical specialty associations and HPOs
5. Build momentum and synergies to mutually engage Tier III stakeholder groups

Plenary Session: “eHealth Innovation Reflections”

- Clearly define the SHN VO structure and its role/activities for enabling SI (including its vision, mission & values)
- The SHN VO won’t replace national level SDOs. The European SHN-VO (EVO) should instead play the enabler for better adoption. The EVO would offer a kind of round table to SDOs and act as an enabler rather than a competitor.
- For business modelling purposes, consensus was achieved on SHN VO top stakeholder tiers, as above.
- How to use business models for semantic interoperability where the patient is the focus? It is important that the patient is considered as the stakeholder ultimately benefitting from changes.
- Patient-centric approaches should be embedded in the SHN VO mission
- Need to build incentives and to demonstrate value for all stakeholders not just the patient. It is likely that many parties will benefit.
- Define who is the customer (payer) of SHN VO services
- The patient is currently not an influential “decision-maker”, but will become increasingly empowered and thus will want to play a bigger role in the decision making process in the future.
- Does being a customer really need to involve money? Distinction to make between customer (financial transaction involved) and stakeholders (e.g. customers are stakeholders but not all stakeholders are customers).
- Cannot the transaction between the VO and the customer take place without involving money? Conceptually interesting but financial aspects are key to ensure “built-in” sustainability.
- Need to establish clear business model focus (for whom are the SHN VO products/services, what is the added value, etc.). This needs to be clear before defining the full scope of the business model. The VO should consider/address all stakeholders into a coherent whole.
- The brokerage role suggested for the VO is a classic business model but this relates best for businesses such as insurance companies etc where the business model is much simpler. Using such a model for the VO, which is a complex entity, might not be feasible.
- How to get to the stage where summaries are available across Europe and understandable: who will make all the elements happen? The value chain amongst key stakeholders is where to focus our efforts to achieve sustainability.
- The set of artefacts (set of specifications / training solutions / legal frameworks etc) which will be produced and held by the VO will need to be sustained for Europe.
- When interoperability will happen, VO will enable optimal working of work flow
systems in healthcare.

- Need to be concrete on how to provide patients with better quality of life. The evidence/incentives should not only focus on financial aspects
- Patients are also stakeholders and beneficiaries but it is suggested to postpone their inclusion for now to first focus on SI key decision-makers
- An EU approach might reduce system costs: so what makes the benefits European rather than national: What is the added EU dimension?
- Discussion of a wider framework for the assessment of outcomes/benefits from semantically interoperable EHRs – all the drivers are to save money, but SHN VO needs to deliver high quality services/products, and demonstrate impact on improved quality of life, health outcomes and value.

**Establishing a sustainable SHN VO**

It was proposed that a number of sustainability activities could be carried out along the example of the following:

- Establish a collaboration network amongst SDOs
- Provide guidance and support for communities of practice to develop semantic assets
- Support industry with adoption and benefits realisation
- Oversee pan European certification of semantic assets
- Maintain a dynamic multi-level business model for future investments in interoperable capability and adoption
- Deliver/ promote education and more specific training
- Advise decision makers on the business benefits and relevant strategic investments needed
- Grow a funding stream to sponsor future research towards better interoperability

### Plenary Session: “Next Steps & Plan of Action” (ref. Slide 47)

<table>
<thead>
<tr>
<th>Strategic Imperative</th>
<th>Timing (Q2–Q4)</th>
<th>Who</th>
<th>What/Communication</th>
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</table>
| 1. Develop SHN VO strategy to propose VO structure (1 page executive summary) | Target: End of June/Mid July | VS/DK/DMI | • Gather input from SSI-TF  
• Share at Sept meeting (Munich)  
• Standing committee alignment |
| 2. Produce SSI-TF workshop summary slide deck (flip charts), including short value proposition statements | Target: End of June | DMI & Empirica/DK (review) | • Send email to SHN consortium to inform them of 1st SSI-TF workshop, upcoming workshop report & next steps |
| 3. Produce SSI-TF workshop short report (executive summary format) | Target: Mid–July | DMI & Empirica/DK (review) | • Invite AT Clements Auer to the next SSI-TF workshop  
• Expand proposal – PT Enrique to join the SSI-TF |
| 4. Review SSI-TF workshop slide deck/report and provide final comments on value proposition statements | Target: Mid–July to Mid August | SSI-TF members to review & provide final input | • Finalize in time for September 11–12 meeting - eHGI (Sept 11 AM)  
• Consider informal validation of VP statements within SSI-TF members organizations |
| 5. Consolidate SSI-TF value proposition short statements and align broader communication strategy | Target: Mid–Aug–End August | DMI/Empirica | • Leverage at multi-stakeholder platform (coordinate with Benoit for next meeting – CEN-TF)  
• Liaise with DG SANCO |
| 6. Start compiling existing supportive evidence of SHN added value (clinical, economic, humanistic, societal) to strengthen value propositions | Target: Q3–Q4 2013 | SST–TF members | • Develop framework for classification of evidence  
• CV use case care pathway  
• Health economic value of SH  
• Heart failure CBA example  
• … |
## SSI-TF Meeting Agenda

September 12th, 2013, 13h00-17h00

Munich Workstyle, Landwehrstrasse 61, 80336 Munich

http://www.munich-workstyle.de/en/

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Facilitator</th>
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<tbody>
<tr>
<td>12h00-13h00</td>
<td>Networking Lunch</td>
<td>All</td>
</tr>
<tr>
<td>13h00-13h05</td>
<td>“Welcome Remarks”</td>
<td>D. Kalra</td>
</tr>
<tr>
<td>(10 min)</td>
<td><strong>Objective:</strong> Introduce participants, workshop objectives&amp; agenda</td>
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<tr>
<td>13h05-13h15</td>
<td>“Back to the future!”</td>
<td>D. Dupont</td>
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<tr>
<td>(10 min)</td>
<td><strong>Objective:</strong> Summarize the main outcomes from the May 30-31st SSI-TF</td>
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<td>workshop</td>
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<tr>
<td>13h15-14h15</td>
<td>“SHN VO Organization Structure: An Overview”</td>
<td>D. Kalra</td>
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<tr>
<td>(60 min)</td>
<td><strong>Objective:</strong> Define the SHN VO organizational structure including its</td>
<td>V. Stroetmann</td>
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<td>vision, mission and values</td>
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<tr>
<td>14h15-15h15</td>
<td>“Optimizing the value chain for Tier I, II, III stakeholder segments”</td>
<td>D. Dupont</td>
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<tr>
<td>(60 min)</td>
<td><strong>Objective:</strong> Consolidate SHN VO business model framework to optimize</td>
<td>V. Stroetmann</td>
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<td></td>
<td>the multi-stakeholder value chain</td>
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<tr>
<td>15h15-15h30</td>
<td>Break</td>
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<tr>
<td>15h30-16h00</td>
<td>“What is the evidence behind the SHN VO value propositions?”</td>
<td>V. Stroetmann</td>
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<tr>
<td>(30 min)</td>
<td><strong>Objective:</strong> Considering existing supportive evidence, establish a</td>
<td>T. Jones</td>
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<td></td>
<td>strategy to support the SHN VO value proposition by stakeholder segment</td>
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<tr>
<td>16h00-17h00</td>
<td>“Strategies for delivering a SHN VO sustainable business model”</td>
<td>D. Dupont</td>
</tr>
<tr>
<td>(60 min)</td>
<td><strong>Objective:</strong> Prioritize the success optimization strategies defined</td>
<td>J. Artmann</td>
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<td>in May and align a plan of action by stakeholder segment</td>
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<td>17h00</td>
<td>Adjourn</td>
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</table>
**Back to the future!**

**Objective:** Summarize the main outcomes from the May 30-31st SSI-TF workshop

The main outcomes of the May workshop were summarized, namely:

- Review of Tier I, II, III stakeholder segments for the broad SHN VO
- Alignment of SHN VO short value proposition statements per stakeholder group
- Development of a business model prototype by stakeholder segment (Tier I, II, III)
- Identification of key success factors and risks per stakeholder segments (Tier I, II, III)
  - Recommendation to clearly define the sustainable organizational structures (SHN Virtual Organization and Catalyst Organization) that would coordinate all the efforts towards SIOP (please refer to the SSI-TF comments at the end of this document)
  - Recommendation to refine/shorten/further differentiate/validate the customized value propositions wording by stakeholder segment, and to substantiate with robust evidence

**Next Steps**

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<th>What</th>
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| Clearly establish the structure, scope, specific roles, interactions and nomenclature for the wider SHN Virtual Organization (VO) and for the core SHN Catalyst Organization (CO), and how they integrate in the wider sphere of influence of the SIOP network and broad eHealth ecosystem.  
  - SHN VO (wide stakeholder group)  
  - SHN CO (core organization acting as catalyst for the SHN VO)  
  - SIOP network community  
  - eHealth Ecosystem | DK, Empirica, DMI | Oct 18 |
| Distribute the revised SHN VO/CO organizational structure to SSI-TF for feedback | Empirica | Oct 21-Oct 31 |
| Using a guide, refine/shorten/further differentiate/validate the customized SHN VO value proposition short statements from the SSI-TF May Workshop; emphasize both the perceived value of SIOP as well as the relevance and added value of a dedicated SHN VO/CO to act as its driving force | SSI-TF | Oct 21-Oct 31 |
A proposal for the SHN VO/CO vision, mission and values statements was submitted and discussed.

- Clarification was made that the **vision** should be bold & inspirational and that it should express what the SHN VO/CO will be or become in the future; that the **mission** should describe the **present** SHN VO/CO purpose or *raison d'être* in order to achieve the long term vision; and that the **values** represent the SHN VO/CO organizational core values, the beliefs, and the unique assets that the SHN VO/CO would commit to use as an internal “code of conduct” when performing its mission to achieve its vision.

- Importantly, the SHN VO/CO organizational core values represent a different concept than the SHN VO/CO “value propositions” developed in May and which describe the perceived benefits of SIOP and SHN VO/CO for external stakeholders.

### Proposed SHN VO (CO) Vision, Mission & Values

- **Vision** *(Bold statement describing what the SHN VO/CO should be or become in the future)*
  - To be the authoritative European organisation that promotes and co-ordinates the development and adoption of high quality, trusted, semantic interoperability resources, to facilitate the promotion of health and the delivery of safe and effective person centred care

- **Mission** *(Inspirational statement describing the current purpose of the SHN VO/CO to achieve the vision of the future)*
  - To drive, align and quality assure cross-stakeholder initiatives that accelerate the semantic interoperability of health information systems* throughout Europe

  *This includes electronic health record systems and also aspects like public health and biomedical research, e.g. disease registries, documentation for clinical trials, interoperability with basic research resources in the omics field*

- **Values** *(Short list of organizational core values that the SHN VO/CO will establish and use as its code of conduct, and for which it will be renowned and valued for)*
  - Faithfully preserving clinical meaning when health information is exchanged between systems and countries;
  - Ensuring that the development of semantic interoperability assets aligns with European and national priority use cases for the improvement of health and health care services;
  - Enabling all actors contributing to shared patient care to be fully informed by each other;
  - Optimising the effectiveness and efficiency of care through better information and knowledge exchange;
  - Empowering citizens to access and to richly use their health information;
  - Accelerating the discovery of new knowledge from consistently combined health data on populations;
  - Enriching the bidirectional flow of information and knowledge between health care and life science research;
  - Engaging all relevant stakeholders in maximising the benefits from semantically interoperable

### SHN VO/CO Potential Short Term Activities

- **Infostructure**
Provide a single point of access to the currently available semantic assets for healthcare in Europe**, organised as well-tailored “bundles” that enable particular interoperability scenarios

**This includes information models, clinical models, ontologies and multilingual vocabularies, guideline rules as well as vocabulary subsets and extensions such as value sets also language translations etc.

- Establish a distribution and maintenance infrastructure for semantic assets
- Define, jointly with all stakeholders, good development practice and quality criteria that assure the trustworthiness of semantic interoperability assets, and implementing European quality labelling procedures

### Development of semantic interoperability assets
- Provide a forum for European stakeholders to jointly agree on the priorities (use cases, scenarios) for the further development of semantic assets
- Develop guidance for multi-professional communities of practice to develop semantic assets
- Establish a permanent collaboration network amongst standards and specification development organisations, for co-ordinated asset development

### Evidence of value
- Define methods and metrics for evidencing the cost benefit and beneficial outcomes of semantic interoperability and the timescales needed to succeed
- Collect examples of costs and benefits from around Europe that have been achieved from interoperability in healthcare

## SHN VO/CO Potential Long Term Activities

- Secure long term funding for the semantic interoperability infrastructure
- Expand the infrastructure to collate feedback from countries on the use of, and issues with, semantic assets in order to direct improvements
- Quality label (certify) the maturity of implementation of interoperability within EHR systems and services
- Collate the evidence base of cost benefit and clinical outcomes from interoperable EHRs
- Deliver / promote education and more specific training in high quality shared health records, and in creating / using semantic assets such as semantically enriched information models
- Strengthen patient and citizen engagement in co-creating interoperable resources
- Assist national eHealth programmes with the burden / effort of developing and maintaining interoperability assets
- Advise national eHealth programmes and the EC on the maturity of different semantic interoperability solutions and where investments at a national level and in vendor products might optimally be made
- Grow a funding stream so the VO can itself sponsor necessary initiatives towards better interoperability

### Next Steps

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<thead>
<tr>
<th>What</th>
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<tbody>
<tr>
<td>Consolidate the SHN VO/CO Vision, Mission &amp; Values statements, also refer to the SSI-TF May workshop report.</td>
<td>DK/Empirica/ DMI</td>
<td>Oct 18</td>
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</table>
Review the list of short/long term objectives (activities) according to the scope/role of SHN VO/CO organizational structure and establish a roadmap, including timelines. Refer to the BM building blocks developed for Tier I, II, III stakeholder segments at the SSI-TF May workshop.

Circulate the SHN VO/CO revised vision, mission & values statement to SSI-TF for feedback (provide examples from other companies/industries)

Produce final SHN VO/CO vision, mission & values statements

<table>
<thead>
<tr>
<th>14h15-15h15 (60 min)</th>
<th>“Optimizing the value chain for Tier I, II, III stakeholder segments”</th>
<th>D.Dupont, V.Stroetmann</th>
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</thead>
<tbody>
<tr>
<td>Objective: Consolidate SHN VO business model framework to optimize the multi-stakeholder value chain</td>
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- Based on above SHN VO & SHN CO organizational structure & scope, map SIOP stakeholders in a value chain
- Identify providers, payers & users of SIOP solutions, and potential funders of the SHN VO/CO, as defined above
- Include patients in the value chain model

Next Steps

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<tr>
<td>Map the SHN VO/CO stakeholder segments (including patients) to build a cohesive multi-stakeholder value chain that will optimize the sustainability of the SHN VO/CO business model, and leverage the SIOP network convergence &amp; assets. Refer to the SSI-TF May workshop summary report.</td>
<td>Empirica, DMI, TJ</td>
<td>Oct 21</td>
</tr>
<tr>
<td>In the value chain, identify the “providers, payers &amp; users” of SIOP solutions and the potential “funders” of the SHN VO/CO that will enable creating, delivering and capturing optimal value across the chain (including patients)</td>
<td>Empirica, DMI, TJ</td>
<td>Oct 31</td>
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<tr>
<th>15h30-16h00 (30 min)</th>
<th>“What is the evidence behind the SHN VO value propositions?”</th>
<th>V. Stroetmann, T.Jones</th>
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<tbody>
<tr>
<td>Objective: Considering existing supportive evidence, establish a strategy to support the SHN VO value proposition by stakeholder segment</td>
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</table>
Need to substantiate SHN VO/CO value propositions to key stakeholders/payers

Opportunity to demonstrate the socio-economic eHealth Impact (eHI) and socio-economic return (SER) for research using a Cost Benefit Analysis (CBA) model to show the net positions for key stakeholders over time (data is from 33 of tinTree International eHealth’s eHI database entries, see also www.ehr-impact.eu, http://ehealth-impact.org/, EC funded studies conducted by empirica and TanJent)

- Need to develop a conservative/realistic CBA (need rigorous testing and validation of underlying assumptions & data sources from SSI-TF as huge benefits are often perceived as “unrealistic”)

Need to demonstrate the long-term benefits of “value added” SIOP services (good eHealth vs bad eHealth) and the socio-economic impact of SHN VO/CO in leveraging the deployment of good eHealth services

Need to capture the rapidly changing landscape and the emerging trend of mHealth (mobile Health) which is empowering patients and citizens “From eHealth to mHealth: Society becomes the driver of its health activities” http://www.epractice.eu/en/node/5419087

Interest from SSI-TF members to join a SHN VO CBA expert panel is welcome. Please contact Jess.Voigt@empirica.com if you are interested to support this activity.

Next Steps

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<tr>
<td>Develop a CBA model framework and its underlying assumptions to establish the long-term socio-economic impact of “value added” SIOP and SHN VO/CO</td>
<td>TJ, Empirica</td>
<td>Oct 31</td>
</tr>
<tr>
<td>Validate assumptions with SSI-TF (or sub-group with particular interest in CBA who could act as CBA expert panel)</td>
<td>TJ/Empirica</td>
<td>Nov 18</td>
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<tr>
<td>Explore possibilities to conduct CBA analysis and generate preliminary results</td>
<td>TJ</td>
<td>Nov 30</td>
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<tr>
<td>Identify published evidence of SIOP added value</td>
<td>SSI-TF</td>
<td>Nov 30</td>
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**16h00-17h00 (60 min)**

**“Strategies for delivering a SHN VO sustainable business model”**

**Objective:** Prioritize the success optimization strategies defined in May and align a plan of action by stakeholder segment

D.Dupont

J.Artmann

- Considering the SHN project time table, develop a 15 months success optimization/risk mitigation plan

Next Steps

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<tr>
<td>Align strategies &amp; plan of action by Tier to leverage SIOP/SHN VO/CO success factors and to mitigate the risks identified at the May workshop (until project completion)</td>
<td>DMI/Empirica</td>
<td>Oct 31</td>
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</table>
**SHN SSI-TF BM Meeting Comments**

**Concept of “European Virtual Organisation”**

- Participants agreed that the concept “European Virtual Organisation” (VO) should comprise a catalytic organisation (CO) which has a business structure with governance initiatives etc. that is not virtual.
- The scope and purpose of this catalytic organisation still need to be defined.
- The VO could be seen as a representative of the whole ecosystem with an advisory board which makes it functional.

**What kind of service or product would the VO deliver?**

- There is a demand for specification and certification work with customers who are willing to pay for this as an alternative to seeking individual assets in the large current ecosystem of developers.
- The Virtual Organisation might be paid to deliver these services in which case it competes with the network (ecosystem). Or it stimulates and assists to ensure that the ecosystem can deliver this.
  1. Promote, catalyse, focus: SHN Virtual Organisation VO/CO
  2. Collaborate/network - series of organisations which are actors in the SI space - e.g. SDOs
  3. Ecosystem - actors who are impacted by and benefit from but are not directly engaged in delivering interoperability. The first two work as a team to make the ecosystem flourish.

Today we need to figure out what the organisation in the middle will do.

---

**SHN VO Vision, Mission & Values Statements**

Clarification is made that the **vision** should be bold & inspirational and that it should express what the SHN VO/CO will be in the **future**; that the **mission** should describe the **present** SHN VO/CO purpose or “raison d’être” in order to achieve the long term vision; and that the **values** represent the SHN VO/CO organizational core values, the beliefs, and the unique assets that the SHN VO/CO would
commit to drive its an “internal code of conduct” when performing its mission to achieve its vision.

Importantly, the SHN VO/CO organizational core values represent a totally distinct concept than the SHN VO/CO “value propositions” developed in May and which describe the perceived benefits of SIOP and SHN VO/CO for external stakeholders.

**SHN VO Vision Statement**

- Charlie: It could be that the VO may be made up of existing organisations.
- Susanna: put “effective person centred care” at the start of the vision statement.
- Marcello Melgara: What is not included is what is needed for SI.
- Dipak: This is because there are already a number of organisations that develop SI resources. What we need to focus on with the VO is how to promote these resources and their use.

**SHN VO Mission Statement**

- A focus on “framing, focusing and facilitating” was proposed to remove the control element in the tabled version of the mission statement. The quality assurance role should remain.
- Self-certification cascade route may be one means of delivering VO. VO can offer services to organisations that have to develop their own archetypes due to lack of trust.

**SHN VO Values**

- Values are the unique core values that the organisation brings to the world. These are the philosophies that the organisation will use to do business and that will drive its code of conduct.
- Participants discussed the proposed value wording, pointing to their proximity to goals and objectives.
- The inclusion of risk management as a specific value was suggested.
- It was also agreed that patient empowerment should not just be about providing citizens with access to information but also providing them with the ability to add to information - co-creating information.
- Finally, the VO’s contribution to social values should also be listed.

**SHN VO Key Activities-Short Term**

- The suggested activity list includes both short term and possibly long term activities.
- It was noted that an agreement should be found which of these are in the scope of the SHN project and which reach beyond the project duration.
- A timeline should be developed for these activities, clearly specifying the level at which they are expected to be carried out: EU or national.
- This roadmap should also interface with activities in the upcoming Expand thematic network.
- It was underlined once more that the SHN VO might not itself undertake much development work towards semantic interoperability assets (SI assets). Instead, it would primarily play a promoting and facilitating role.
  - For example, the VO could help in bundling existing assets into meaningful solutions to specific semantic interoperability challenges. Participants involved in the upcoming EXPAND thematic network underlined that certain activities might also be taken onboard by the EXPAND consortium.
- Infostructure: Problem orientated solutions to SI.
- Jan: App Swap: Is this something the VO should be doing?
- Dipak: The VO could take a facilitating role in the exchange & dissemination of relevant apps
- Steve: This could help avoid vendor lock-in. Also tackles legacy.
- Danielle: Once the SHN VO/CO scope is better defined, one key deliverable would be to
develop a 5-year strategic plan to go with the business model.

- William. Could the VO actually be 3 organisations?
- Dipak: It could be that the VO is made up of a few existing organisations.
- William: It's important that the VO coordinates to avoid duplication. The VO needs to have focus. It could have multiple roles but it should be focused and not overlap with what already exists.

**SHN VO Tier I-III Stakeholder Segments**

- Participants proposed to include representatives of health professional associations in the provider category of stakeholders.
- In addition, citizens/patients should also be included within the tiers as they are providing the income for the whole process through tax.
- A participant suggested that patients could even become future vendors of their health information to interested third parties, and/or potential funders of the SIOP services. In that sense, they would become a key player. With an average health insurance contribution of 1 cent per European citizen, a future SHN VO could potentially leverage 5 million €.
- The emergence of mHealth is also playing a key factor.
- An SDO representative underlined the importance of achieving development convergence through the SHN VO. Short term initiatives are not helpful. A permanent, long term approach is needed.
- Participants expect that the EU might provide funding for the operational costs of the VO.
- A proposal was made to develop segments of stakeholders along the following lines: the core circle (see also figure above) is made up of a Catalytic Organisation (CO). The surrounding network (2) of standardisation organisations and other immediate asset providers/developers could be called the Virtual Organisation (VO). The wider ecosystem includes stakeholders such as patient organisations, health insurance companies etc. (E.g., ESIP - European Social Insurance Platform, IAHP - International Association of Health Policy, AIM - International Association of Mutual Benefit Societies)
10.3 Business modelling workshop results, November 18th 2013, Berlin

Minutes from SHN CBA Meeting 18/11/2013, Berlin

CBA Meeting and Consultation with SSI-TF Experts

Interview with Jan Van Emelen

Evidence

There are many internal documents on cost effectiveness of mobile health. There is also evidence on the EU market of the cost effectiveness of introducing mobile health.

Hurdles

- Clear evidence that is also accepted, particularly accepted by doctors
- Huge amounts of apps without structural involvement of healthcare institutes.
  - The involvement healthcare institutes, particularly patients is essential
- Need strategic consensus on implementation process
  - This is currently taking place in Belgium. They are identifying the required conditions and what needs to change at all levels and whether doctors can accept it.
    - There is a white paper currently being written on this that will be released in February / March of 2014. Jan will share the content structure of this document.

Chronic heart disease (CHD) continuity of care

There are many projects in Belgium focusing on this, including mobile health focused ones, but they have not yet been implemented in the healthcare system. This lack of implementation is currently being resolved through the introduction of a new care environment in which mobile health plays an important role for overall health. In order to achieve this SIOp is a requirement. However to achieve SIOp new legislation and the involvement of doctors is required. To support this action in Belgium an EU level task force needs to be put in place.

Jan will share a list of proposed changes to achieve this.

Population health in Belgium

Definition of Population Health: Population health is a classifier of need which groups customers/recipients of a service. It is a group of people for whom a particular payer is responsible. It also involves forward planning of services for future use.

- There have been experiments in the last 5-6 years
- Private companies are now delivering integrated care
- To achieve integrated care services in Belgium these factors were required:
  - Internal classifications
  - General Practitioners (GPs) completing intake
  - Fixed targets
Citizens paying 1€ a day to receive coordinated care

Coordinated care= social care, comfort care and medical care combined
- Citizens are only prepared to pay this for combined care, they are unwilling to pay for medical care on its own. Social care acted as a lead in when targeting the consumer directly then medical care followed.
- Consumer base was created by first inviting people for free trials and then integrating progressively more services and asking consumers to pay.
- Coordinated care is delivered via a TV channel.
- Coordinated care started as part of a community initiative.
- A new project in the community with local social care providers has been launched and offers concrete services for integrated care. Data will be collected within this project including quantitative and qualitative indicators of population health.

Stephen Walker observed that Belgium has cleverly shifted the demand for interoperability by offering integrated care.

Dipak Kalra observed that we have historically matured Health ICT in its setting where clinical functionality has a business setting. Helping improve efficiency of care was not the principal aim of Health ICT, so now there is the need to re-architect health ICT for IOP. Procurement will have to be re-imagined away from individual hospital settings towards clusters of hospitals by area. The population health benefits will be delivered only if this re-architecture of eHealth systems is deliver.

In the Netherlands, they treat people by specific disease rather than integrated care. This means that GPs are therefore searching for small IT companies to deliver very specific solutions. However, the disadvantage is that people with more than one disease are not treated for all of their conditions harmoniously, rather they are treated for each disease separately. Therefore the business case for SIOp should aim to counter such an approach and manage patients with numerous conditions.

Post-interview discussion

We can use the example of projects in Belgium which are focusing on integrated care as evidence for the SHN institute. However, patients paying for social care as part of integrated care only works where they would normally be paying for social care. We can however, always assume that patients within caring families are going to be interested in improving the delivery of care and integrating information.

The example of the cases in Belgium gives us examples of willingness to pay and what type of services populations are willing to pay for. This could be used as a scalable approach.

Afternoon Session

Role of SHN institute

Charlie McCay commented: Nothing will be driven by SIOp, the best the institute can do is oil / lubricate the process and facilitate access to EHRs. A better term would be “enable change”
instead of “drive change”. The institute should be about reducing risks and making the process easier.

Dipak’s response was: The institute will enable the alliance partners to deliver / facilitate good SIOp. Simultaneously the institute will be pulling in those alliance partners who should be involved in SIOp to ensure that they are involved. However, it should be remembered that the customers for the institute will be those people who will provide funding.

The institute needs to act as a single contact point for potential inventors of new products that need to / should be semantically interoperable in order to guide them through the process of bringing the product to market at the best standard of SIOp. The institute should function by bringing all stakeholders together in order to solve the current roadblocks such as legacy systems which are preventing the introduction of semantically interoperable new products.

**Value chains**

It should be recognised that eHealth is involved in parallel value chains. If we use the innovator’s dilemma as an illustrative example: the innovator produces an innovative product, they then sell it and continue selling it with the number of sales improving year upon year until another innovative product is produced by and destroys their market. The same situation is also true for the Health market and which makes it difficult when attempting to achieve SIOp as it isn’t possible to know what possible products / solutions will enter the market in the future. Even with information from inside industry it will not be possible to envisage the market of the future as it is not known which future products will be a success. This means that we are unable to predict how SIOp will work and exactly how it will deliver value. However, what can be predicted is how SIOp will be used.

There are different types of value chains in the health market such as a hospital focused chain, and a family centred chain. It is impossible to say which is more important or more dominant. However, for the purposes of optimizing the value from SIOp for all stakeholders, some concrete use cases / scenarios need to be selected and their value chains identified. A particular perspective needs to be adopted and retained for the BM which is the one of the institute (SIOp infostructure/catalyst role), while the value chain will be developed using the broader perspective of the SI Alliance (SIOp infostructure/community role).

Then once this institute is in existence and delivering SIOp one of its tasks would be to delve into the details of the various service channels; this would be necessary anyway when searching for potential institute customers and alliance stakeholders.

**Creating, Delivering and Capturing Value**

The objective of the business model is to define how the SH institute will create value, deliver it to its varied customers (funding parties), and capture it in the business model innovation cycle. In order to engage the SIOp stakeholder community, the SH Institute will need to customize distinct value propositions highlighting the qualitative and quantitative benefits of SIOp for key stakeholders, and promote them with the SH Alliance. The scenarios in D2.1 would be a good starting point. Tom Jones could then explore and take these scenarios from the descriptive into the quantitative aspects.
There needs to be a focus on a small number of interaction points where value is achieved and a focus on gathering evidence and examples of this value rather than getting too caught up in the value chain as a whole and whether it fits. What is important is identifying what the institute can deliver that is unique, new and different as this is what can be sold to the stakeholder community.

**Points for consideration in the business model**

- Quality, access and efficiency are the factors which provide social-economic return (SER) for healthcare.
- Risk analysis with risk mitigation will make success more likely.
- The location of the stresses and strains in the market should be identified as these could affect the institute’s economic case.
- Apply an emergent strategy; a responsive strategy where the institute is flexibly managed.
- Potential is not always achieved so the probability of predictions coming true should also be explored.

**Points for consideration in cost benefit analysis (CBA)**

**Assumptions used for 3EHRI:**

- 20 year time-scale
- Sensitivity, optimism etc bias taken into consideration
- **SIOP costs:** to be detailed and explained
- **SIOP benefits:** to be detailed and explained
- The current CBA model is generic and does not seem to be particularly about SIOP. It is desirable to have something that is very narrow / specific as this is something that could be taken to governments or the EC and sold as a solution that can be shared / reused.

**Actions**

- Annika Sonne Hansen to provide figures for timescales and amounts of money detailing how long it will take and how much it will cost an ICT supplier to produce a high level of SIOP for EHRs.
- Charlie McCay to provide information on costs / timescales for standards development organisations (SDOs).

All participants are requested to send further information / input to empirica and Jess Vogt will coordinate with Tom Jones.

- Tom Jones to explore the scenarios from D2.1 and transform them into concrete figures.

**Next TF Meeting in 2014:**

- April 8-10 in Brussels? (would be favoured by DMI)
- Early May in Athens?