ICT National Integrated Services Framework Update

(Information Architecture)

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Dublin 16 October 2013

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Topics

- Introduction to ERS

- Information Architecture

- Project Approach

- Project Deliverables

- Project Roadmap & Timelines

- Stakeholders

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Founded in 2007

Business:

– Consultancy

– Software (CESIL™)

– Services

– Research (FP7)

Markets:

– National and Regional (e)Health body's

– Healthcare Provider (Organisations)

– Life Science Industry

– Health IT Systems Vendors

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We have taken part in various projects providing consultancy and IT-projects based on European/International standards such as:
- Masterplan NICTIZ
- large teaching Hospital (>800 beds)
- Roche
- iSoft
- Ministries: Spain, Slovakia, Sweden
- CIMI a project that is about modelling Archetypes based on an open International standard (ISO EN13606). Together with: VA, DoD, Mayo, Kaiser Permanente, InterMountain, NHS, Singapore, Canada, CEN, IHTSDO, EN13606 Association, …
- EU-USE eHealth co-operation project.

René Schippers, Director:
- – Master degree Public Health (Dentistry)
- – > 16 years in Health IT
- – Business Consultant eHealth/research domain
- – President EN13606 Association and ProRec-NL

Gerard Freriks, Director:
- – Trained in medicine and GP > 20 years and > 16 years in Health IT and standards development
- – Former Convenor of CEN/TC251 wg1
- – Co-founder of HL7 SGML/XML SIG (later CDA) and IHE-NL
- – Former vice-president EuroRec and Board Member of ProRec-NL

Both Directors participate in several EU FP7 projects

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SALUS; Post marketing Surveilance, Data dictionary, Ontologies

Board EN13606 Association / Consortium: actively involving members in EU-projects and develop tooling and Semantic Interoperability Artefacts, liaising with CEN/tc251, partner in EU-projects:

SemanticHealthNet: Improving Semantic Interoperability, preparing the European system for production and quality assuring semantic interoperability artefacts

ANTILOPE: How to quality assure semanic interoperability artefacts such as IHE Profiles in Europe

EXPAND: Together with various Ministries set up a European organisation for the production, testing, publishing of a collection of Semantic Interoperability artefacts, starting with the EU epSOS Patient Summary.

Any significant level of healthcare systems
integration requires the development and
use of a **standards based Information
Architecture**.

The HSE need a model that defines
the **structure** of a **complex data** environment
in an **unambiguous** and **meaningful** manner.

With a standards based Information Architecture (**IA**)
substantial healthcare systems **integration** can
occur.

The **IA Model enables** healthcare systems
integration not previously possible.

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Present Health IT-systems are designed to support healthcare providers for their part
of the health and care delivery, creating data SILO's.

Today IT-systems in health and care need:
-Semantic Interoperability
-AND better support Co-operability

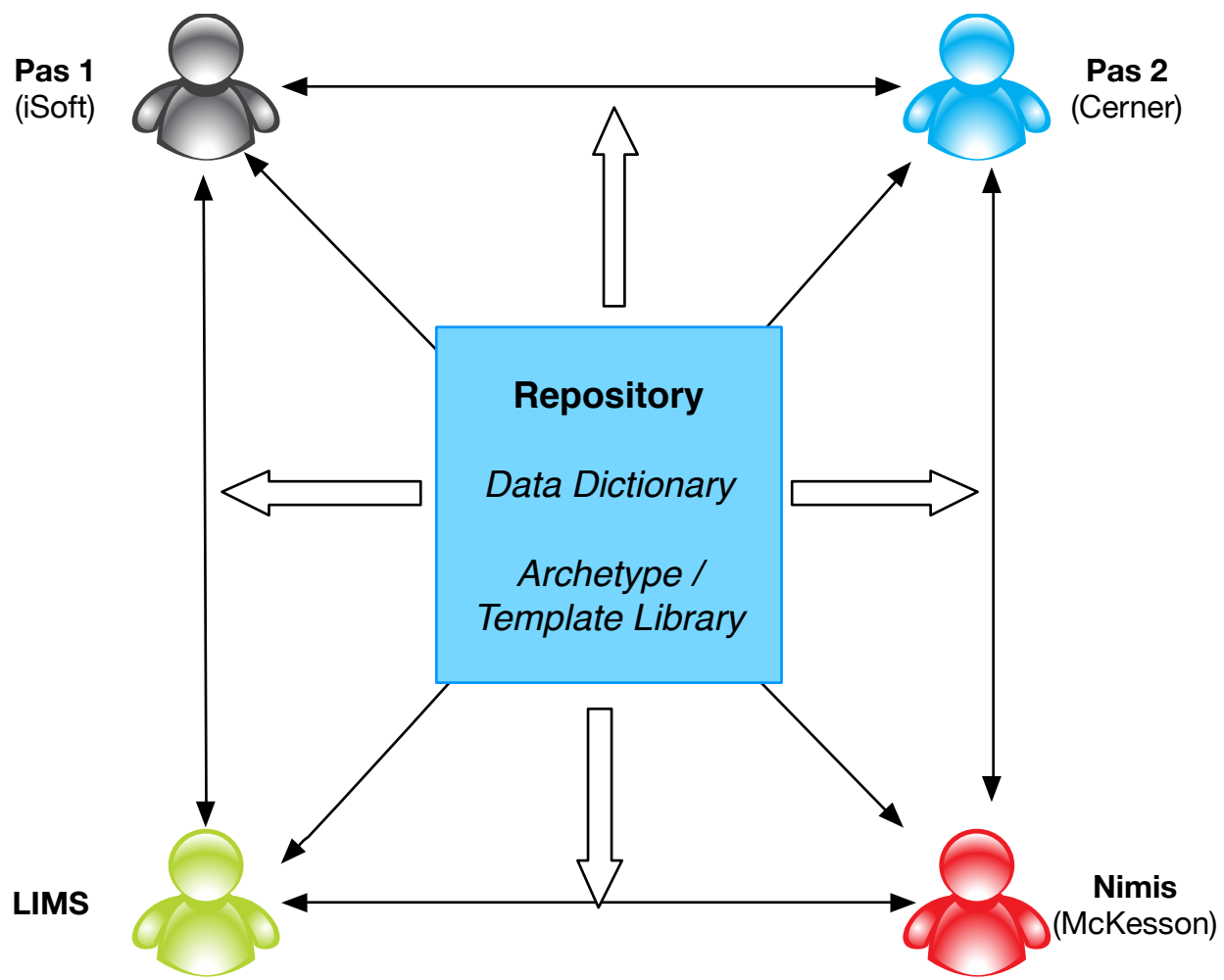Open International Standards, as foundation, are an essential ingredient.
Achieving the goal of Co-Operability is impossible without a firm foundation based on
open International standards.

So far IT-systems can hardly exchange: *name, birthdate, address* out of the box.
Each vendor created its own data silo using its own proprietary data and database
formats.

The moment HSE provides a Tooling Environment that produces, maintains, governs
and publishes common and shared Semantic Interoperability artefacts, there is a
foundation for data sharing and co-operability supporting systems

The Information Architecture Model will describe this Tooling Environment and common
and shared Artefacts needed for interoperability between different systems.

Pas 1
(iSoft)

Pas 2
(Cerner)

Repository

Data Dictionary

*Archetype /
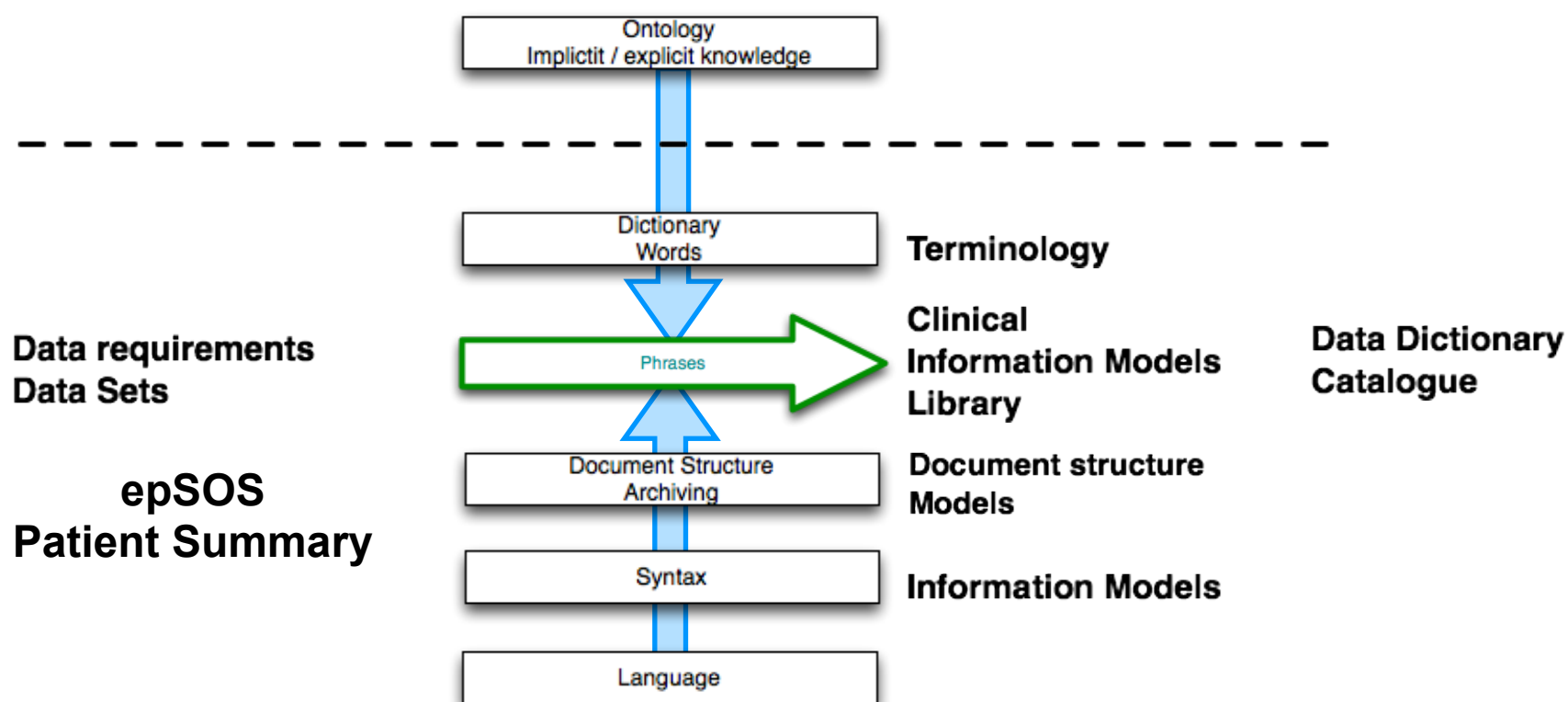Template Library*

LIMS

Nimis
(McKesson)

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The Information Architecture will enable all entities to exchange at will.

For exchange they will rely on the standardised components in the repository (Data Dictionary and Archetype/Template library) to construct the 'messages' they need.

Ontology
Implictit / explicit knowledge

Dictionary
Words — **Terminology**

Data requirements
Data Sets

Phrases — **Clinical Information Models Library**

Data Dictionary Catalogue

epSOS Patient Summary

Document Structure
Archiving — **Document structure Models**

Syntax — **Information Models**

Language

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For **human discourse** we need:
1. to know the Language
2. the language rules = syntaxe
3. a dictionary with defined words
4. to construct sentences/phrases
5. Behind the dictionary there is the encyclopedian body of common shared knowledge, the Ontology

Common Sense informs us that, for Semantic Interoperability between IT-systems, we need an analogous set-up of common facilities.
In the HSE project we will have to create artefacts as we humans use in our conversations.
These semantic interoperability Artefacts (SIA's) are collected in a library and express the data and information needs of the users. In order to secure consistency and a uniform description of the components they are published in a Data Dictionary, as a catalogue of specified data points as specified by the users.

In the present HSE project we will focus on 100 data points from the EU epSOS cross border Patient Summary.
Next exercises could be for Diabetes or other chronic or acute conditions.

Each level in the figure has its own Model that all together form the Semantic Interoperability Stack.
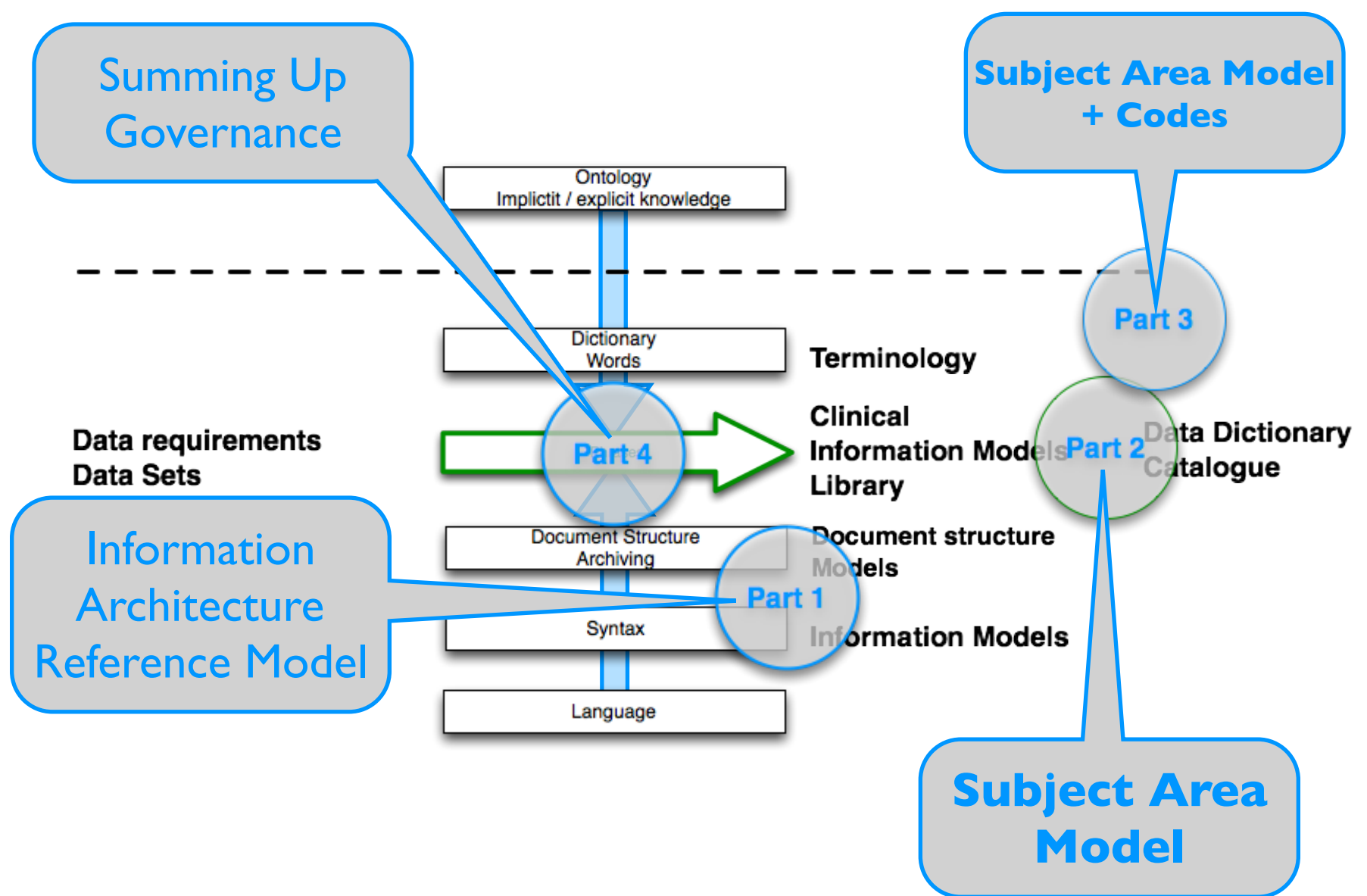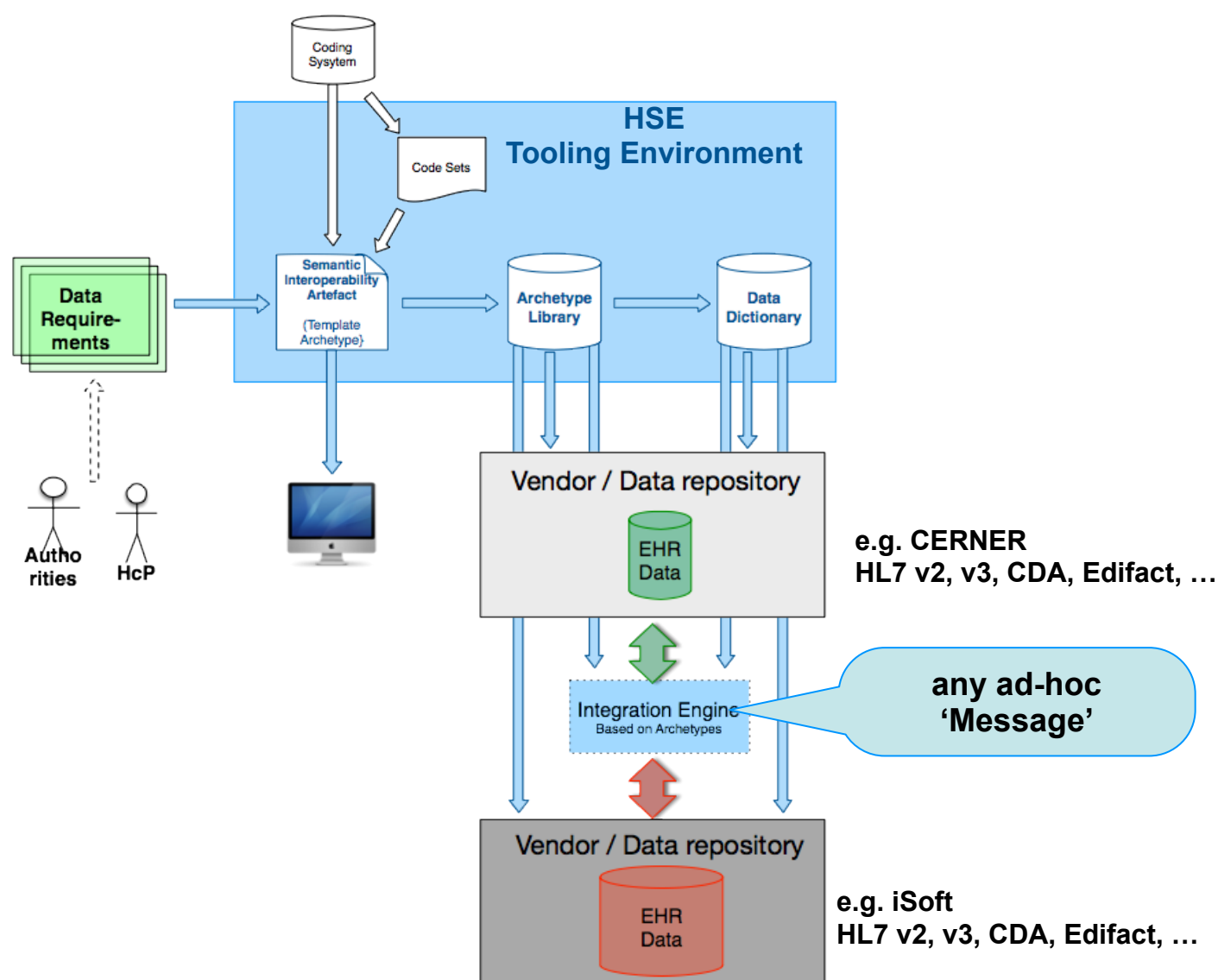
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1. The present HSE project has defined 4 parts.
2. Each part addressing one aspect:
   - Part 1: Information Architecture
   - Part 2: Demonstration of a Semantic Interoperability Artefacts LIbrary
   -     Demonstration of a Data Dictionary
   - Part 3: Codes attached to the (SIA's) Archetypes /Templates and the item in the Data Dictionary
   -     a Second Demonstration will be held,
   - Part 4: A summing up and focus on Governance
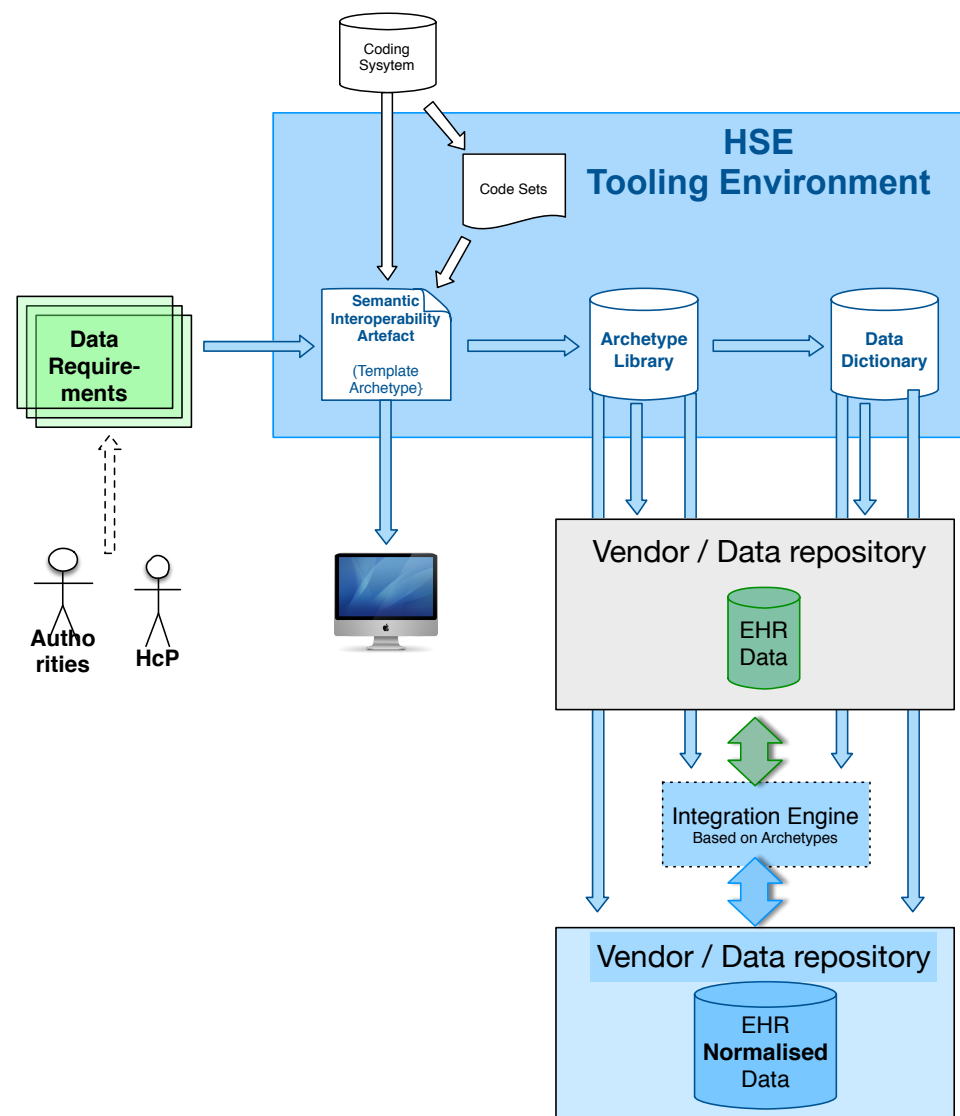
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The picture describes phase 1:
1. Data Requirements from authorities and Healthcare providers
2. Archetypes/Templates as Semantic Interoperability Artefacts
3. With inserted/attached relevant codes from coding systems (SNOMED, …)
4. With Codes and Value sets as defined by the data requirements
5. A Tooling environment to produce, manage and publish the semantic interoperability artefacts (SIA=archetypes and templates)
6. Including a Data Dictionary to maintain integrity of the SIA's
7. HCP and Authorities can see the SIA's and inspect and validate them
8. Vendors or National/regional registries know what data elements their system has to be able to store, retrieve and present or report because they can get access to computer processable SIA's and the definitions in the Data Dictionary.
9. When vendors want to transform their proprietary format to one based on SIA's. For instance an agile model driven Integration Engine can flexibly transform between EHR-systems using the common and shared SIA components.
10. Systems that have an SIA enabled interface can exchange without the need of an Interface Engine, but they need the SIA's.

In the example:
- The SIA's produced by the HSE/ERS Tooling Environment are used by the proprietary EHR-systems.
- The SIA's express the data/information needs by the Healthcare Providers and Authorities.
- Vendors with proprietary systems will use the SIA's to make it possible that their

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In the example:
Proprietary data is transformed to an EHR_systems that deals internally with normalised data.
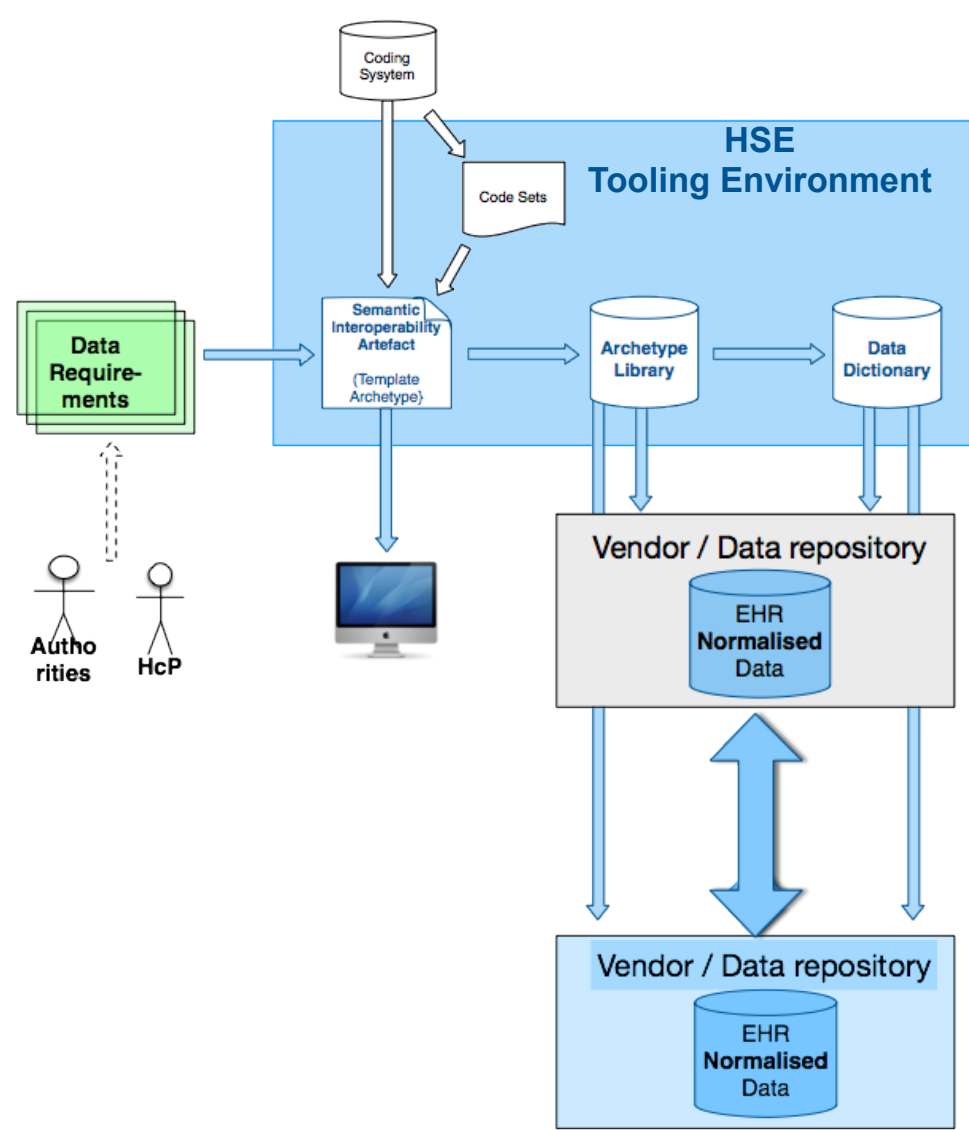
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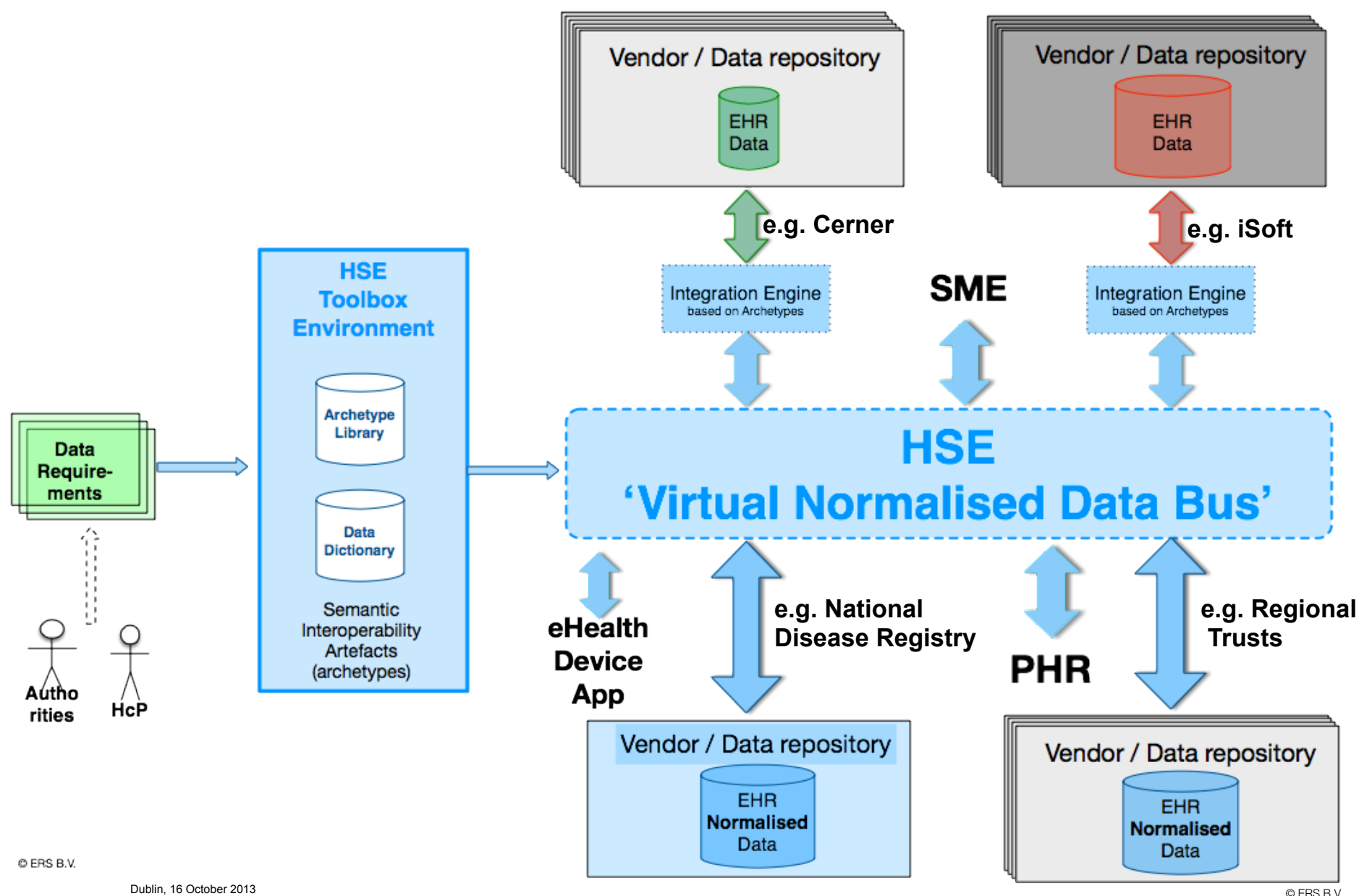
This picture describes the long term situation.

When systems are internally based on data standards or provide an standardised interface using the Semantic Interoperability Artefacts
NO Integration Engine is necessary.
Systems can be federated easily.

In short: a **level playing field** is created based on standards, SIA's, Tooling, and procured solutions that implement these SIA's.

HSE Toolbox Environment

Archetype Library

Data Dictionary

Semantic Interoperability Artefacts (archetypes)

Data Require-ments

Autho rities

HcP

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Vendor / Data repository — EHR Data

e.g. Cerner

Integration Engine based on Archetypes

SME

Vendor / Data repository — EHR Data

e.g. iSoft

Integration Engine based on Archetypes

HSE 'Virtual Normalised Data Bus'

eHealth Device App

e.g. National Disease Registry

PHR

e.g. Regional Trusts

Vendor / Data repository — EHR Normalised Data

Vendor / Data repository — EHR Normalised Data

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The COMMON SENSE solution.

Data elements, as shared, and common basic building blocks, as defined by SIA's, make possible a HSE 'Virtual Normalised Data Bus'.

It is an Open standardised framework creating a **level playing field** for big vendors, SME's, PHR's

Existing EHR–systems and Data repositories can extend their economic life span.
A managed evolutionary process can transform all EHR–systems and Repositories to one capable of processing normalised data.
These EHR–systems and Repositories can be federated: exchange any data ad–hoc.

Big vendors, SME's, PHR's, Devices, can exchange data with all other IT–systems.

New start–ups, SME's, can connect and start new innovative health and care services.

Project Approach

Embrace a broad stakeholder base

Eight (Small Group) Workshops (4x2)

Use an Interactive basis

Questionnaire type structure

Missed Stakeholders followed up by phone and email

Feedback opportunity

Reach both high level and technical audiences

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We have to **optimally engage** Stakeholders

ERS executea am HSE project leading to a description and demonstration of a possible 'HSE Virtual Data Bus; consisting of a standards based HSE Tooling Environment that produce, maintain, govern and publish Semantic Interoperability Artefacts that make the HSE Virtual Data Bus possible.

It is a path all stakeholders are invited to travel with us.
Their input will be indispensable for a successful journey.

Basic notion of any common and shared infrastructure is:
By all, for all.
Meaning that we all must benefit in the end, in order to create success.

28th October: Workshop 1 for Parts 1 and 2

29th October: Workshop 2 for Parts 1 and 2

11th November: Workshop 3 for Parts 1 and 2

12th November: Workshop 4 for Parts 1 and 2

2nd December: Workshop 1 for parts 3 and 4

(Including demo data dictionary)

3rd December: Workshop 2 for parts 3 and 4

(Including demo data dictionary)

16th December: Workshop 3 for parts 3 and 4

(Including demo data dictionary)

17th December: Workshop 4 for parts 3 and 4

(Including demo data dictionary)

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Part 1: Information Architecture

Part 2: Data Dictionary

Part 3: Terminology

Part 4: Operations (Governance)

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1. Establish suitable standards based Information Architecture Reference Model (IA-RM)

2. The provision of a standards based subject area model (SAM)

3. The determination of which technical systems should participate in the subject area model (SAM)

4. Recommendation of a Governance Framework and Tooling for Model maintenance and expansion

5. A catalogue with the Standards and associated sub-sections for the Model

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The initial SAM will be the epSOS data set as used in Europe for Cross border exchange for patient data.

Part 2 - Data Dictionary

1. The determination of a
   Standards Based Data Dictionary including the
   specification of meta data structure, data classes,
   entities and attributes

2. Validation (Proof-of-Concept) of the Data
   Dictionary

3. Recommendation of a Governance Framework
   and Tooling for Dictionary maintenance and
   expansion

4. A catalogue with the Standards and associated
   sub-sections for the Dictionary

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1. Provision of a blueprint for
   the deployment, management and maintenance of
   the terminology service

2. Validation of the proposed model thought the
   binding of SNOMED CT concepts to a specified
   clinical data set

3. A catalogue with the Standards and linkages
   associated with its operation and maintenance

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Part 4 - Support Process and Services

1. What standards based toolsets and support structure are required and available to manage the collective practical outputs and relationships of the information components listed above

2. A brief comparison of the products that best meet this need including commercial and open source toolsets

3. The recommendation of an established toolset and management approach to facilitate integrated governance of the data model, data dictionary and terminology service

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Stakeholders

WORKSHOP-1:

28th October 2pm-4:30pm

Data Model & Data Dictionary

STAKEHOLDER GROUP - BUSINESS & STRATEGY

1.	Reform Group	Leo Kerrins
2.	Corporate Planning & Corporate Performance	Jane Carolan
3.	Health Intelligence	Dougie Beaton
4.	Business Improvement	John McLoughlin
5	Strategic Programmes	Frank McGuinness
6.	HSE Procurement	John Swords
7.	DOHC	Kevin Conlon

WORKSHOP-2:

29th October: 10am-12:30pm

Data Model & Data Dictionary

STAKEHOLDER GROUP - CLINICAL, SAFETY & RESEARCH

1.	Clinical Programmes	Aine Carroll
2.	Public Health	Stephanie O' Keeffe
3.	Health & Safety	Philip Crowley
4.	Pharmacy	Jack Shanahan
5.	Irish Medicines Board	S. McDonald
6.	HIQA	Jane Grimson
7	HIQA	Kevin O' Carroll

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WORKSHOP-3:	STAKEHOLDER GROUP - TECHNICAL	
11th November: 10am-12:30pm	1. Healthlink	Gemma Garvan
Data Model & Data Dictionary	2. Health Identifier /Access Management	Roisin Doherty
	3. HSE Clinical System Delivery	Vincent Jordan
	4. ICGP	Brian O' Mahony
	5. RCSI	Gerard Kelliher
	6 DATHs Hospitals Rep	Deirdre Hyland
	7 Health Informatics	Pam Henry

WORKSHOP-4:	STAKEHOLDER GROUP - ALLIED AGENCIES	
12th November: 10am-12:30pm	1. Health Research Board (HRB)	Hamish Sinclair
Data Model & Data Dictionary	2. ESRI	Miriam Wylie
	3. PCRS	Paddy Bourke
	4. Patient Level Costing (PLC)	Brian O' Donovan
	5. RCPI	Gary Courtney
	6 Health Intelligence	Howard Johnson
	7. NSAI -HISC	Damon Berry

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OTHER STAKEHOLDER GROUPS / SUPPLIERS WHO MAY BE CONSULTED

Health Research Board (HRB)

Core Systems Suppliers iSOFT / McKesson / Cerner

IBM / Oracle / SAP

NSAI HISC Work Group

Academia

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