

# ERS

Electronic Record Services B.V.

## HSE DEMO

Introduction

2 and 3 December 2013

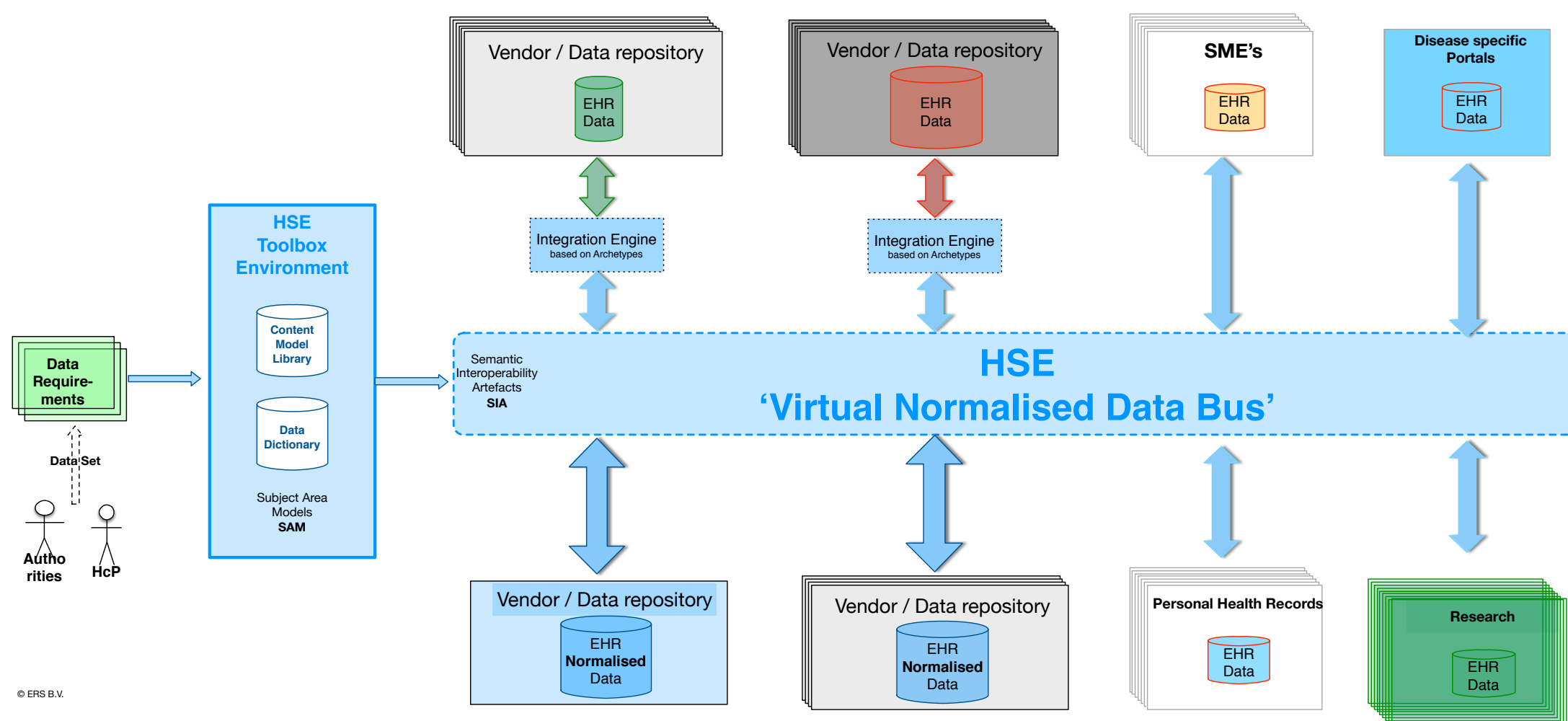
# HSE DEMO

## SAM editor

## SAM Environment

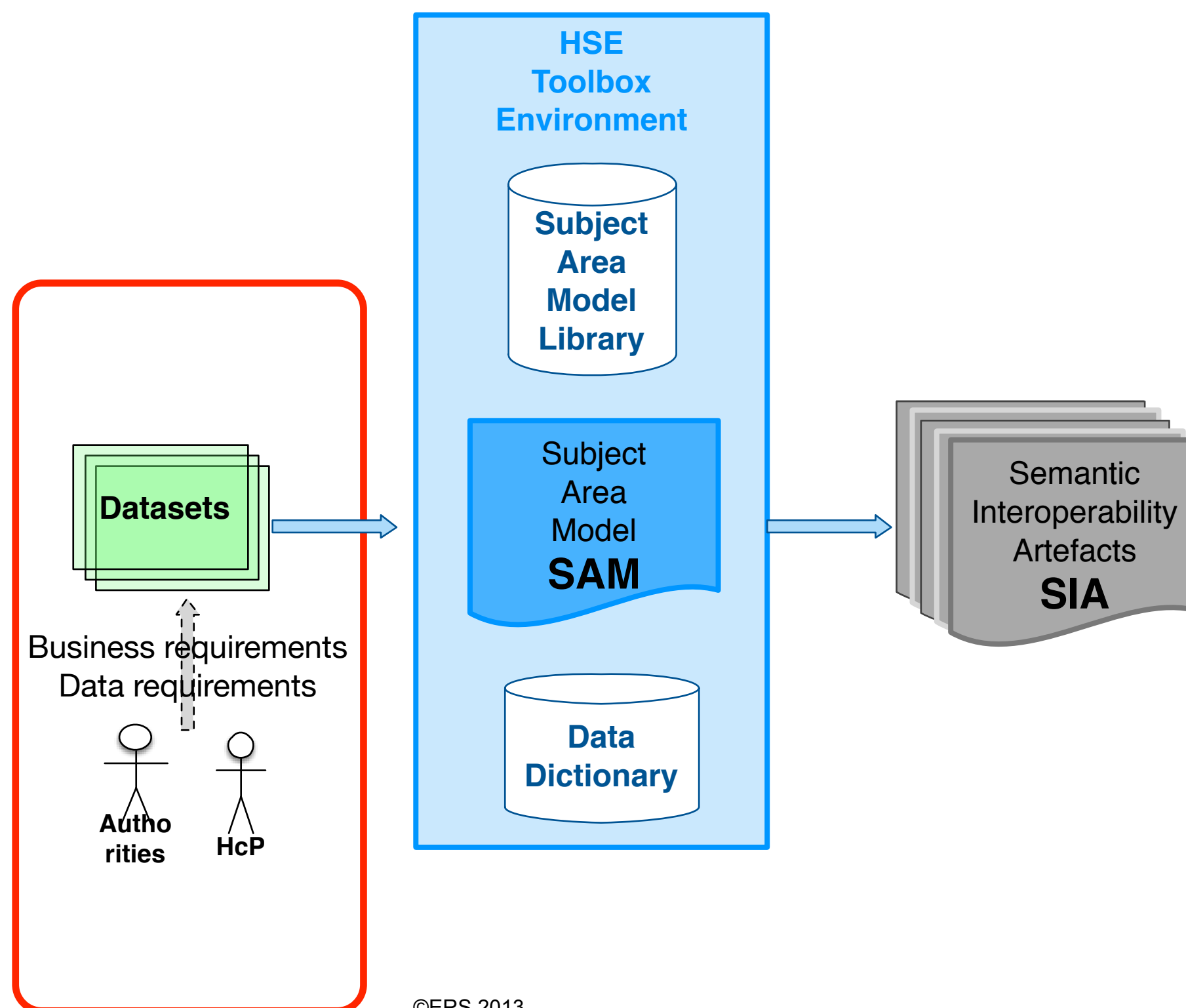
## SIA's

- 1- Business requirements and Dataset**
- 2- SAM editor introduction: constructing a dataset**
- 3- The SAM editor life demo**
- 4- Semantic Interoperability Artefacts (SIA's)**
- 5- SAM Environment (tbd)**



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# From 'Information' Requirements to Semantic Interoperability Artefacts



# Business needs

## Data needs

### **Stakeholders:**

- Healthcare providers
- Health organisations
- Payors
- Authorities
- Research

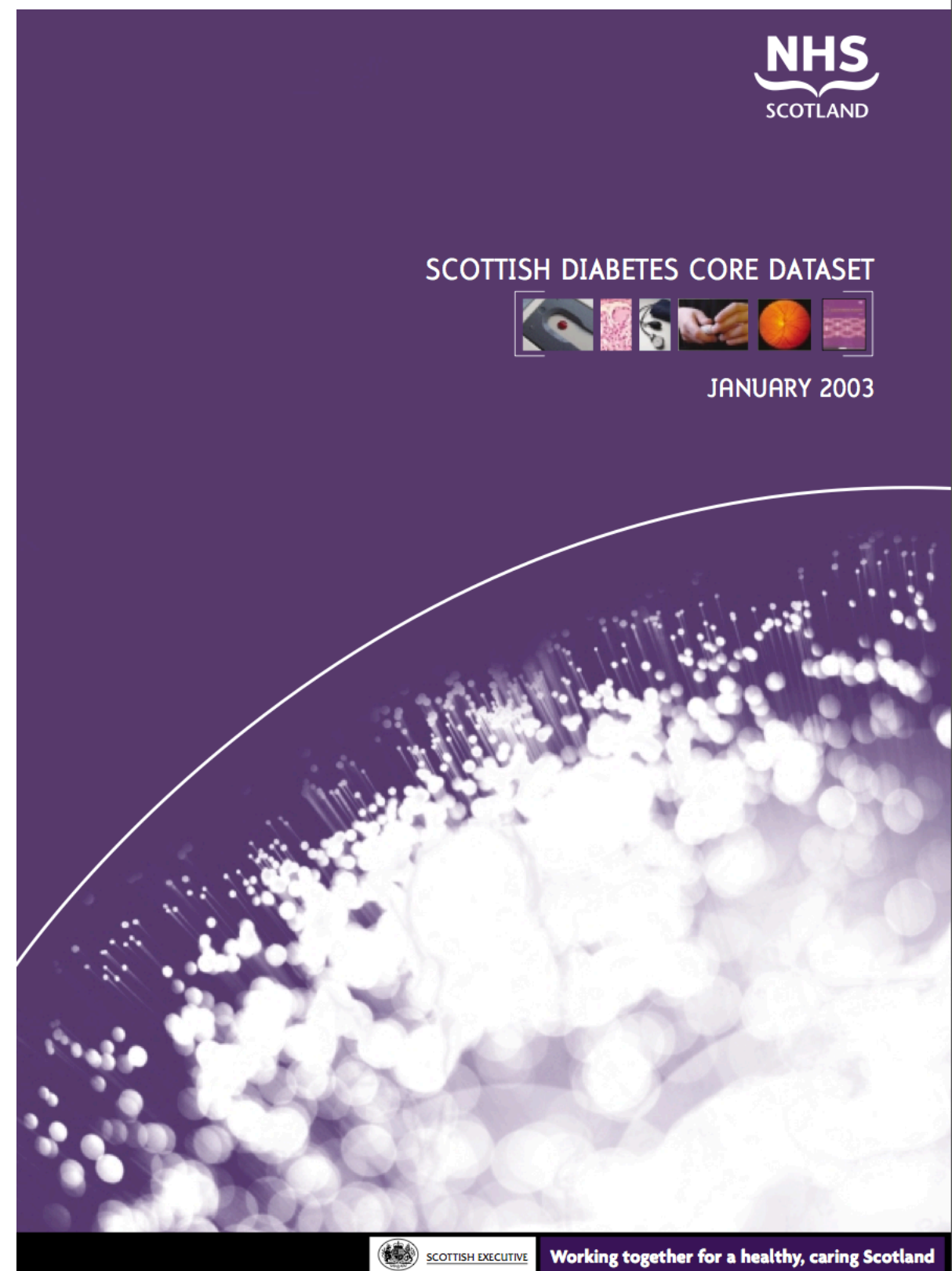
**Stakeholders have ‘information’ needs**

**Each for its own business needs**

# Datasets

**‘Information’ needs  
(Data needs)  
are expressed as:**

# Datasets



# Datasets

## Kinds of ...

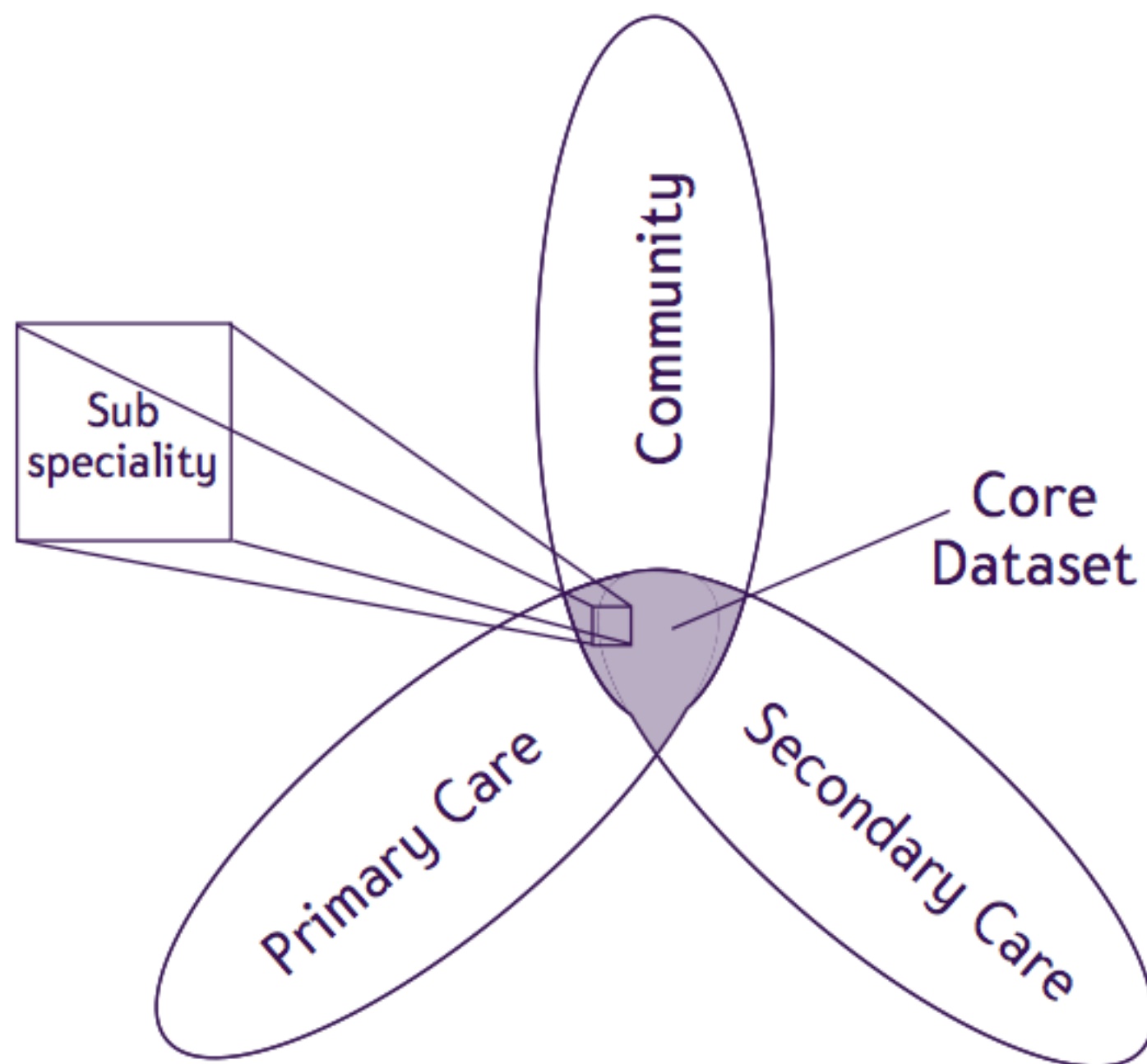


Figure 1: The Scottish Diabetes Core Dataset and the architecture of diabetes data

# Scottish Diabetes Core Dataset

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# Dataset example

Reference number	Field name	Description	Parameter	Read term	Read code
1	PT_NHS	Community Health Index (CHI) number for Scotland	10 digits	Patient CHI number	915B.
2	PT_ID	Principal treating hospital patient number	14 characters	Patient hospital number	915D.
3	HOSP_ID	Principal treating hospital identifier	6 characters	Hospital reference number	9R6..
4	PRACID	General practice identifier	6-digit practice code		
5	GP_CODE	Registered GP identifier (GMC Code)	7 digits (GMC No. format)	General Medical Practitioner	03DC.
6	GPC_CODE	GMC Code of GP to whom correspondence should be addressed	7 digits (GMC No. format)		
7	SURNAME	Present surname	20 characters	Patient surname	9152.

# Dataset example

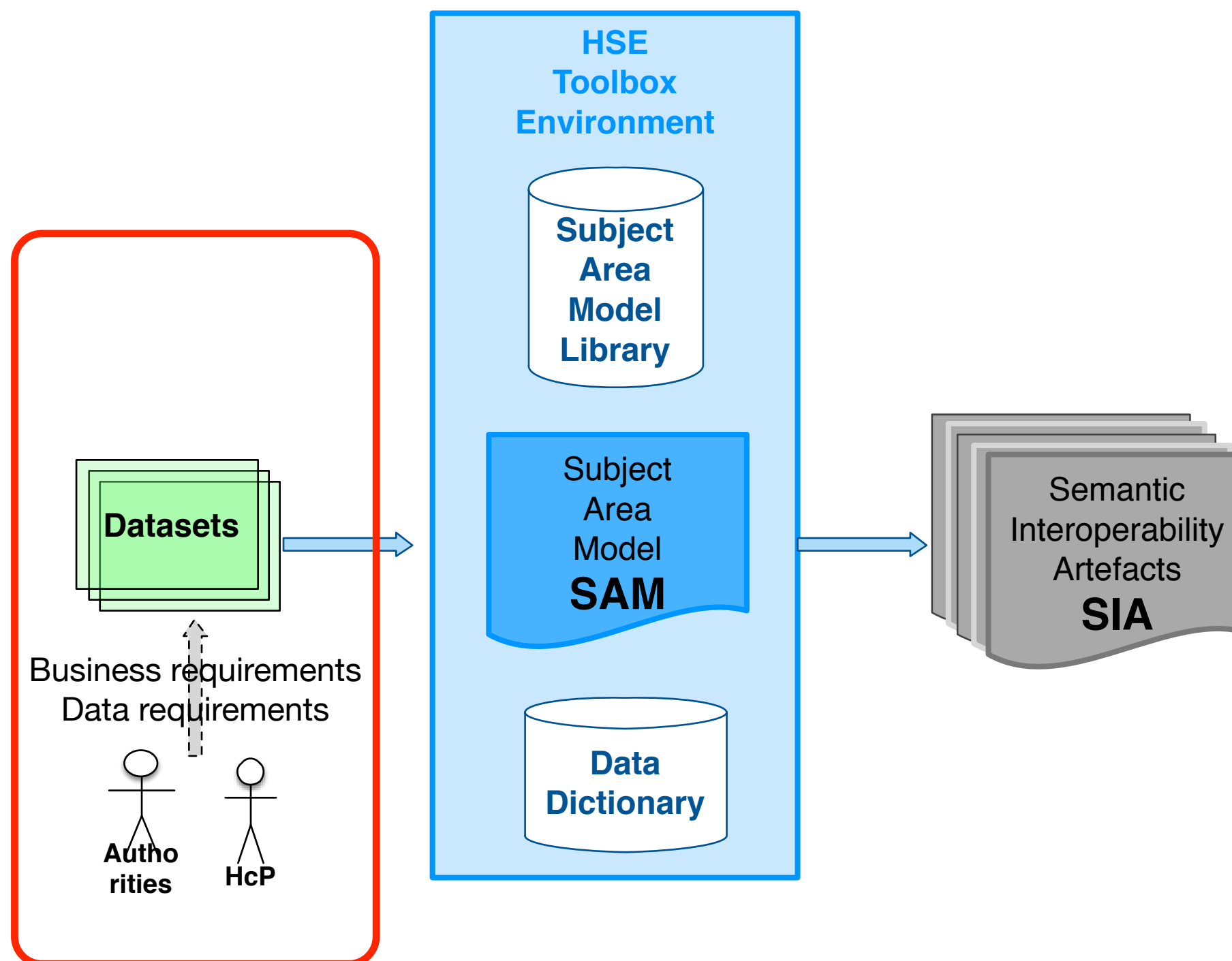
Reference number	Field name	Description	Parameter	Read term	Read code
31	WEIGHT	Patient weight	>0 – 300 kg (nnn.nn)	O/E – weight	22A..
32	HEIGHT	Patient height	>0 – 2.50 m (nnn.nnn)	O/E – height	229..
33	BMI	Patient body mass index	(nn.n) kg/m <sup>2</sup>	Body Mass Index	22K..
34	SBP	Systolic blood pressure	(nnn) mmHg	O/E – Systolic BP reading	2469.
35	DBP	Diastolic blood pressure	(nnn) mmHg	O/E – Diastolic BP reading	246A.
36	SMOKER	Smoking status at date of contact	heading	Tobacco consumption	137..
			1 = Current smoker	Current smoker	137R.
			2 = Ex smoker	Ex smoker	137S.
			3 = Never smoked	Never smoked tobacco	137I.
37	STOPSMOK	Year patient stopped smoking	yyyy	Date ceased smoking	137T.
38	ALCHOHOL	Alcohol intake per average week	(nn) units	Alcohol consumption	136..

# Dataset

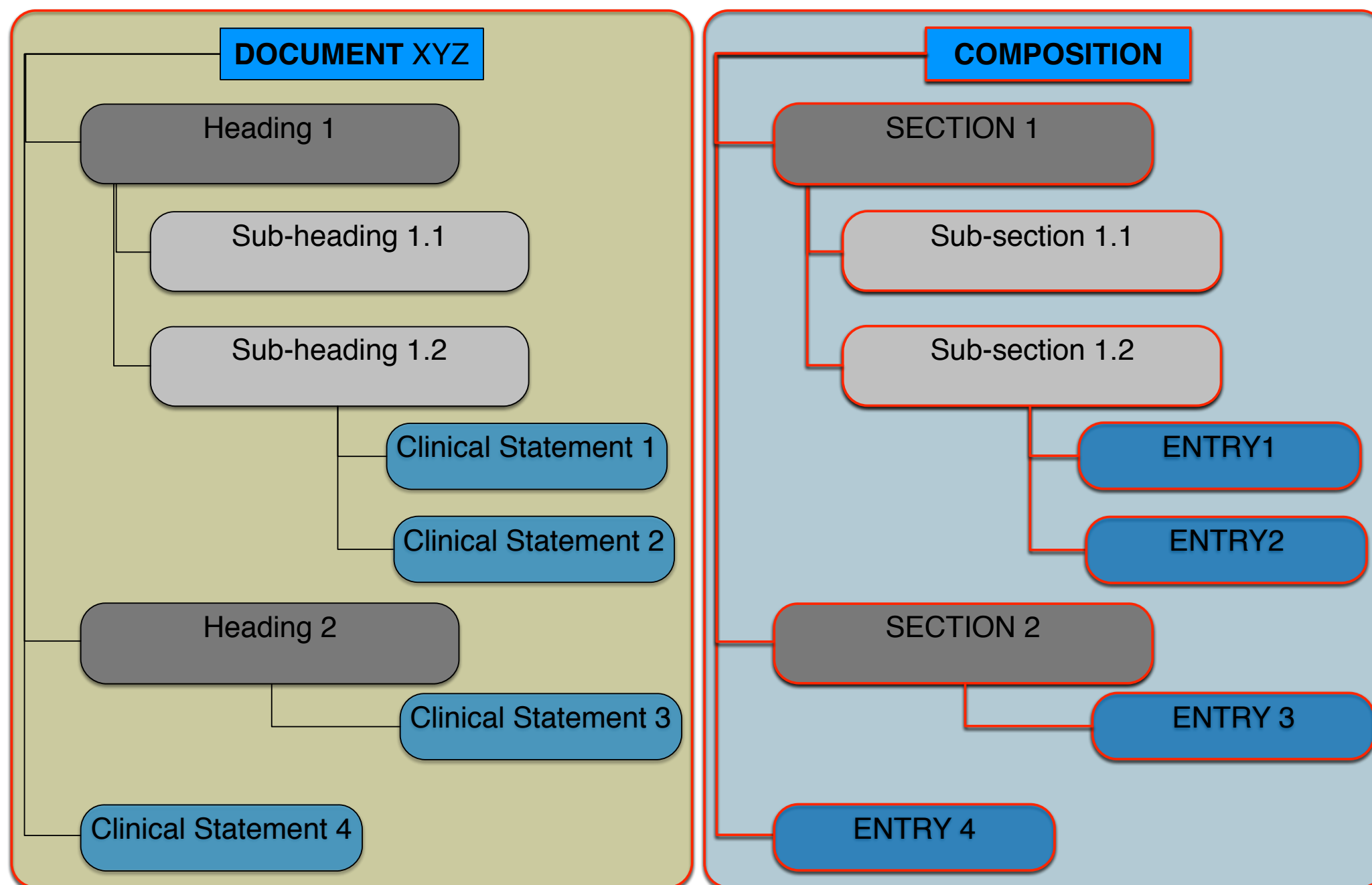
## Datasets:

- express the data needs of stakeholders
- can be used in procurement
- specify what IT-systems must be able to handle (store, retrieve, exchange)
- facilitate reporting, collaboration, and research

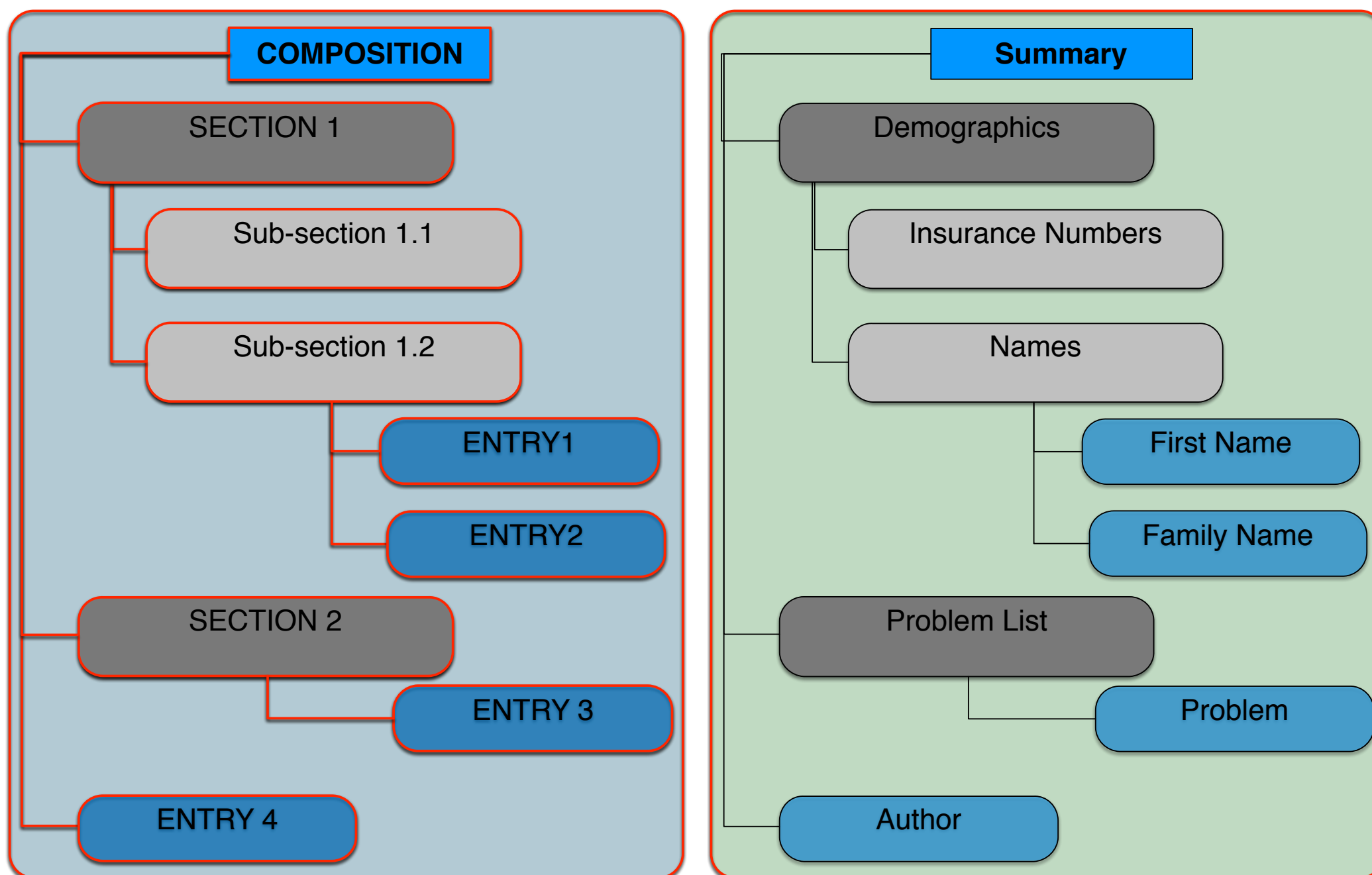
# From 'Information' Requirements to Semantic Interoperability Artefacts



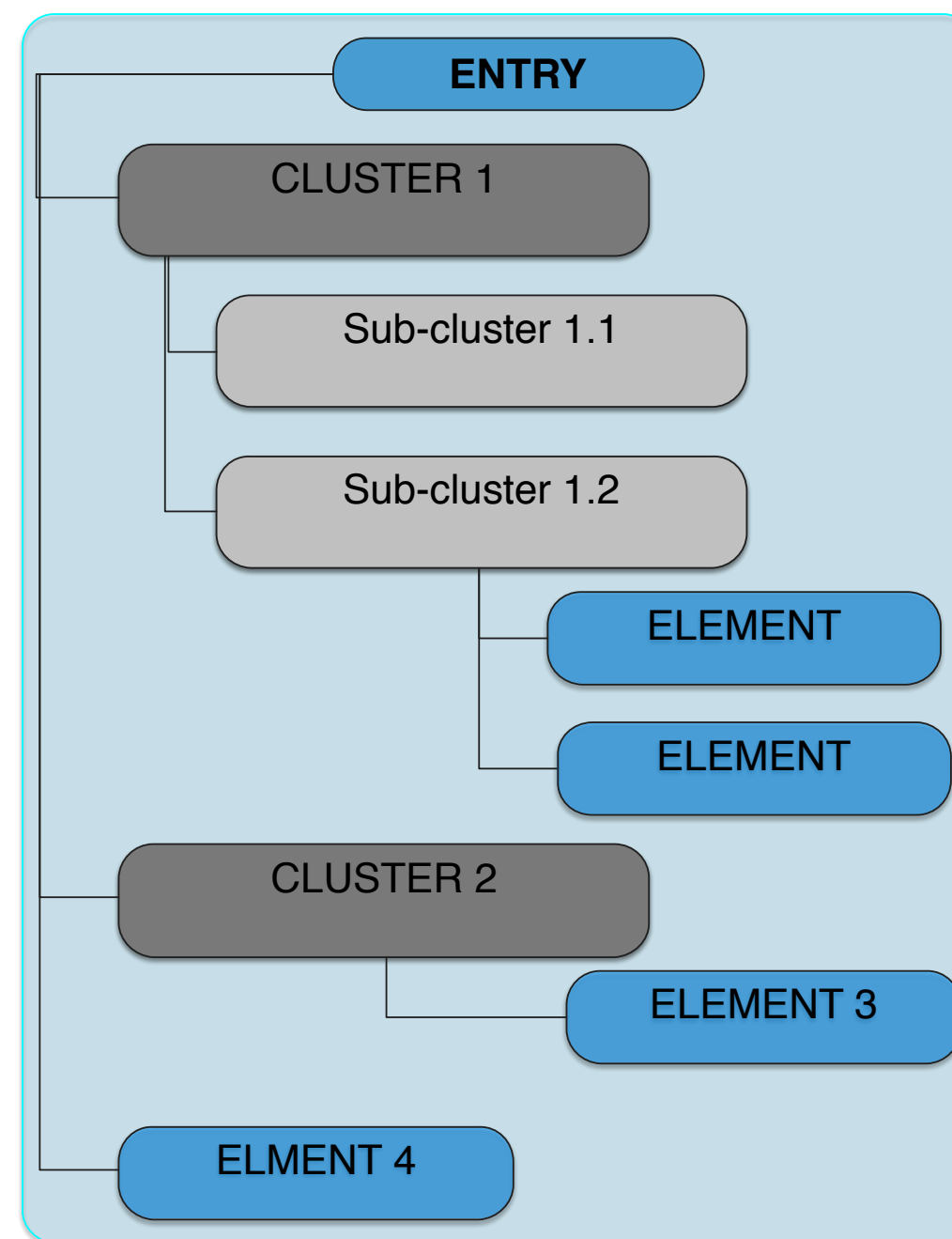
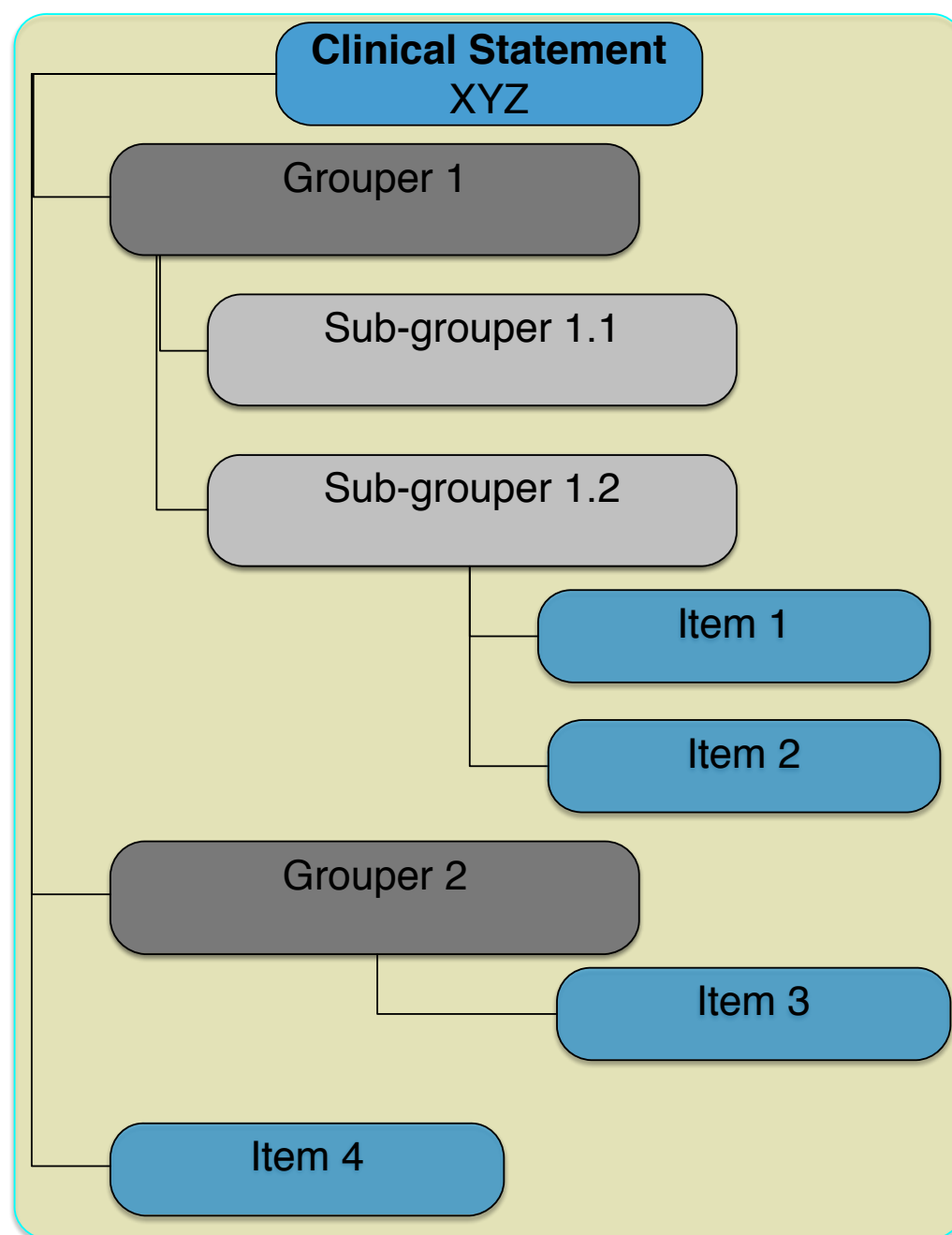
# From Data Set to Subject Area Model



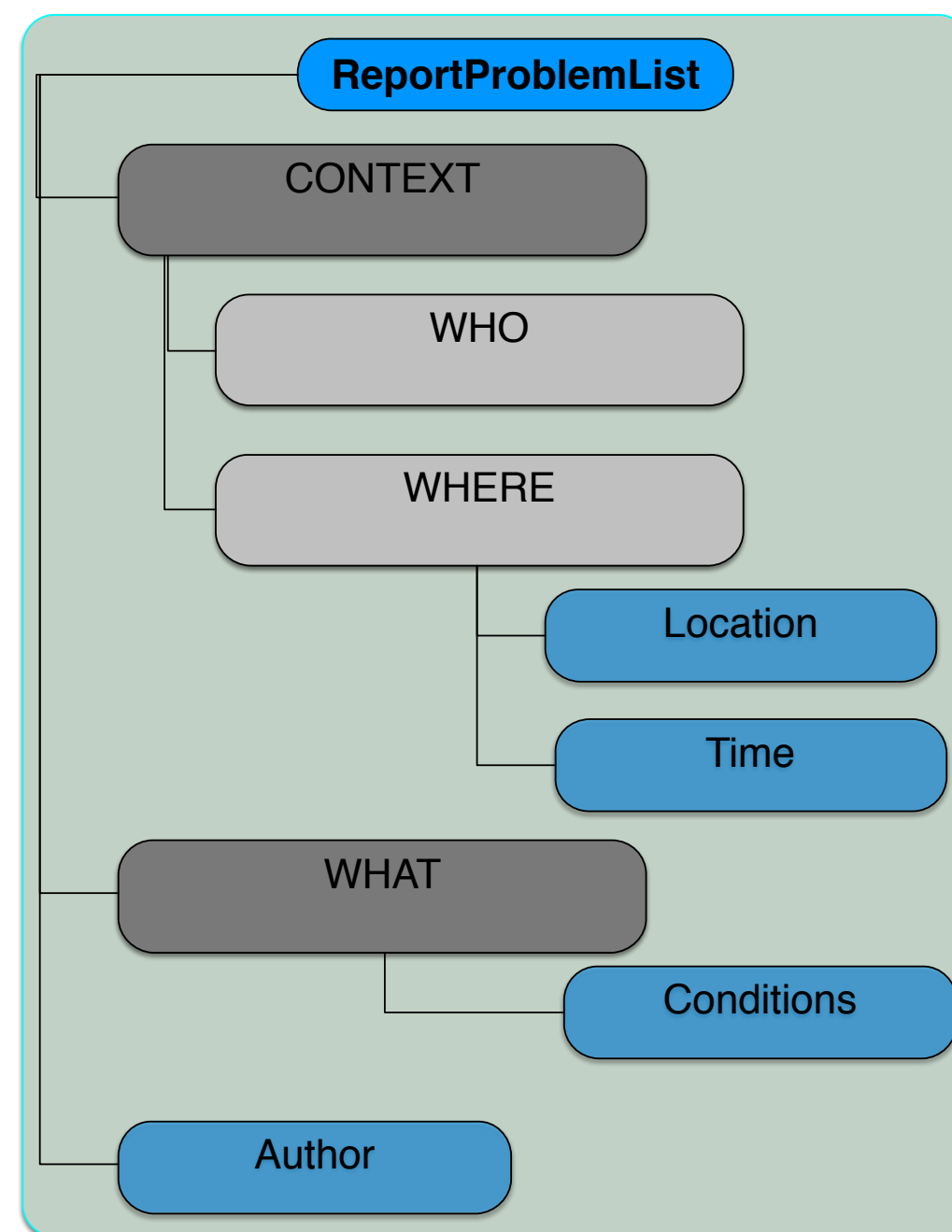
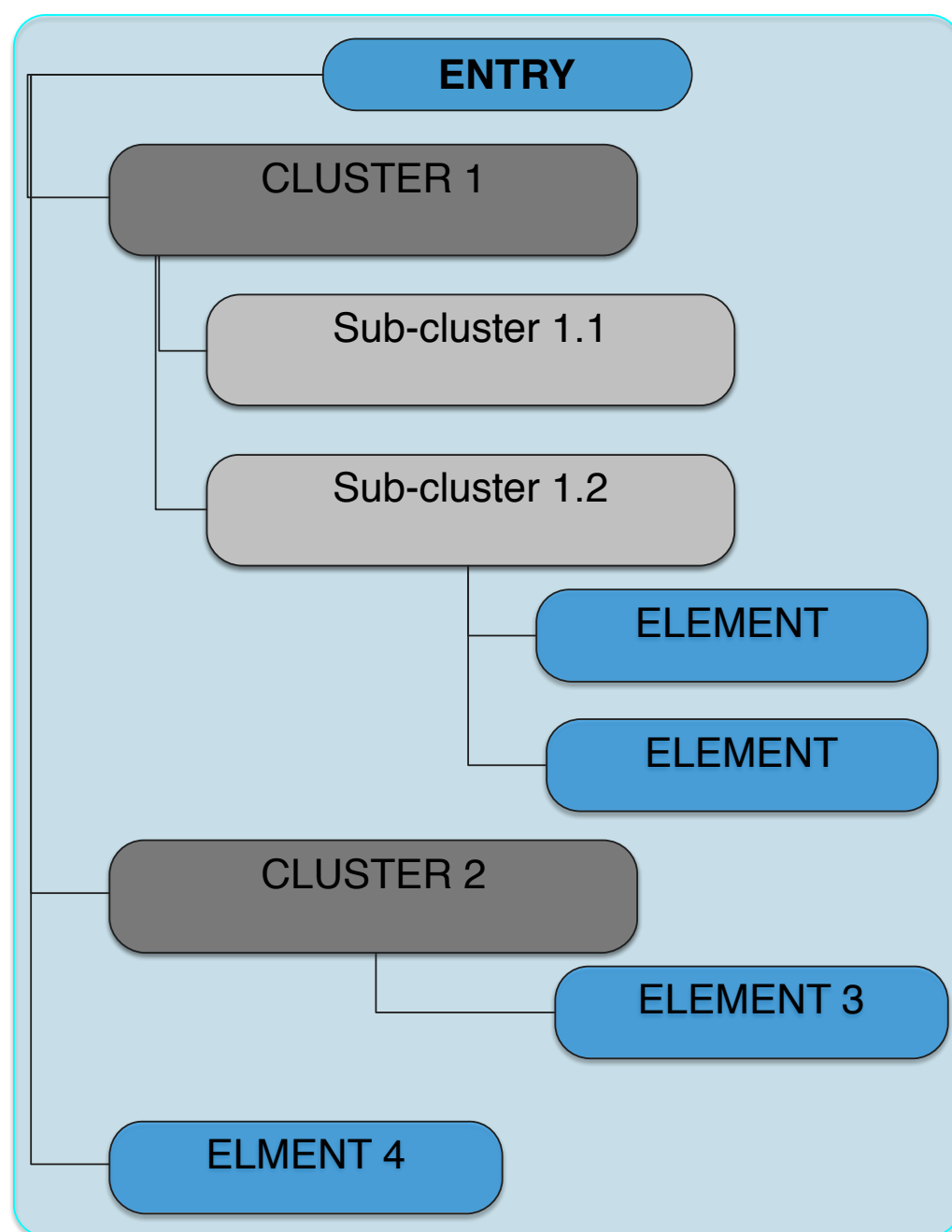
# From Data Set to Subject Area Model



# From Data Set to Subject Area Model



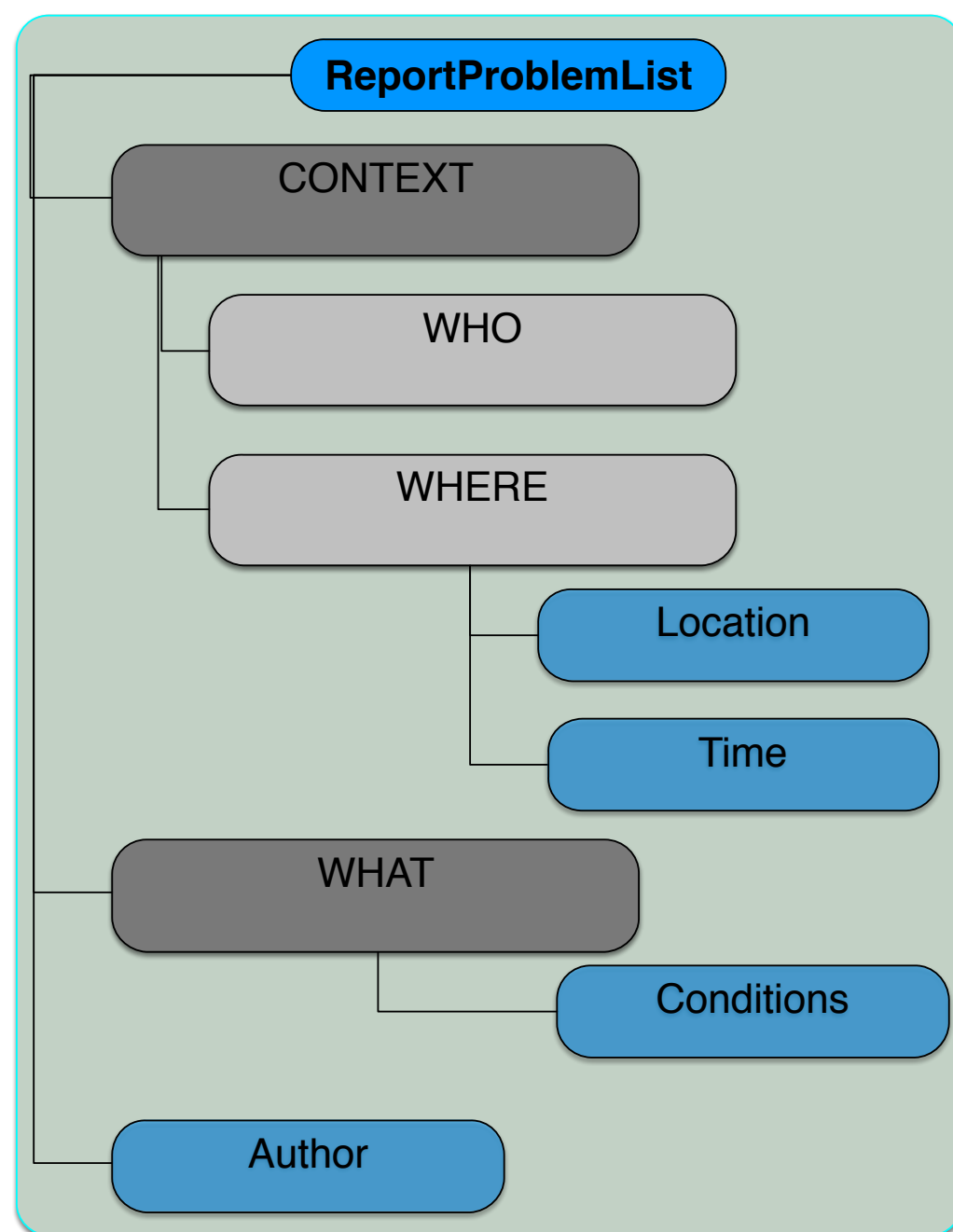
# From Data Set to Subject Area Model





# From Data Set to Subject Area Model

## Data Types

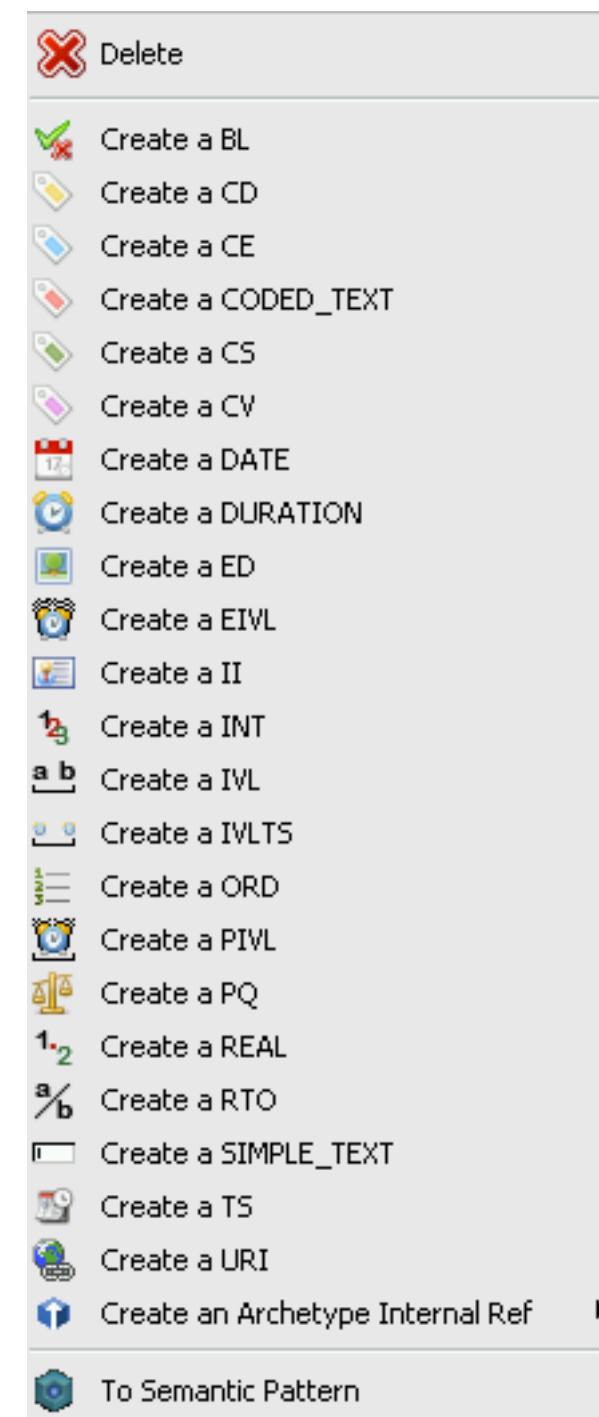


*Simple text*

TS

CD

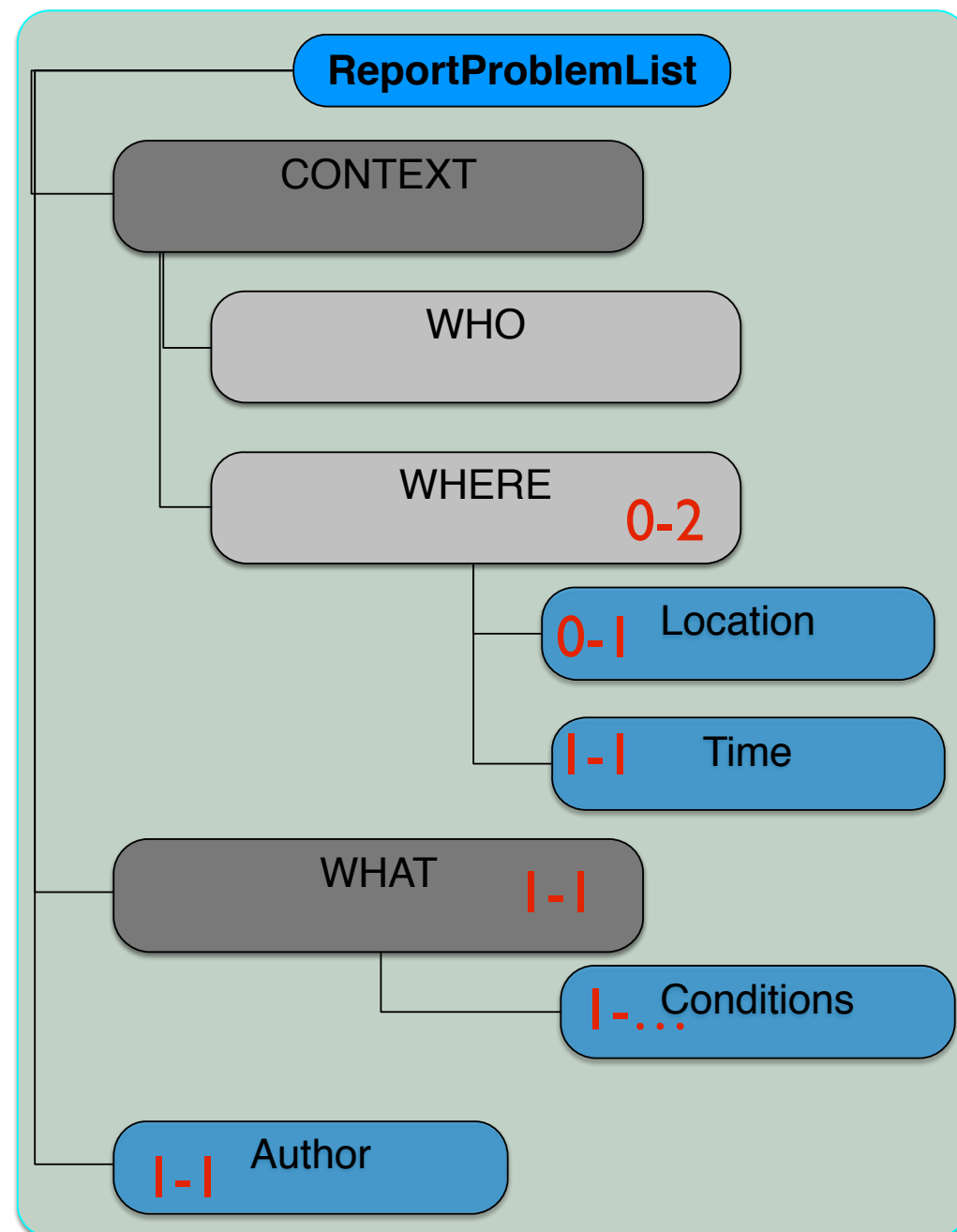
*Simple text*



# From Data Set to Subject Area Model

## Cardinalities Occurrences

## Codes Annotations



Loinc: I234  
ContSys: Problem Lst

SNOMED: I23.234  
Loinc: 4567  
ContSys: HealthCondition

*Any local or international code*

# HSE Toolset SAM Editor

The screenshot displays the HSE Toolset SAM Editor interface. On the left, a hierarchical tree structure is shown for the file 'CEN-EN13606-COMPOSITION.HSE\_DEmo.v1'. The tree includes a 'Definition' folder containing a 'COMPOSITION {1}' element, which has an 'ENTRY {0..\*}' child. This entry is further divided into three 'SECTION {0..\*}' elements. The bottom-most section contains two 'ENTRY {0..\*}' elements and another 'SECTION {0..\*}' element. The final section at the bottom is labeled 'Slot: ENTRY [at0010] {0..\*}' and is highlighted with a blue border. Below the tree are icons for 'Language' and 'Ontology'. On the right side, the 'ARCHETYPE SLOT' configuration panel is visible. It has two main sections: 'Occurrences' and 'Includes/Excludes'. The 'Occurrences' section shows 'Min.: 0' and 'Max.: 0' with up/down arrows, and a checked 'Unbounded' checkbox. The 'Includes/Excludes' section has an 'Includes' list containing three entries: 'archetype\_id/value matches {/.Diagnosis/}', 'archetype\_id/value matches {/.Complaints/}', and 'archetype\_id/value matches {/.Findings/}'.

**ARCHETYPE SLOT**

**Occurrences**

Min.: 0

Max.: 0 ☒ Unbounded

**Includes/Excludes**

Includes

- archetype\_id/value matches {/.Diagnosis/}
- archetype\_id/value matches {/.Complaints/}
- archetype\_id/value matches {/.Findings/}

# HSE Toolset SAM Editor

The screenshot displays the HSE Toolset SAM Editor interface, which is divided into two main panels: the Archetype Tree on the left and the Archetype Slot on the right.

**Archetype Tree Panel:**

- Tab: CEN EN13606 Editor
- Language: en
- Tree Structure:
  - CEN-EN13606-COMPOSITION.HSE\_DEmo.v1
    - Definition
      - Summary {1}
        - Author {0..\*}
        - Context {0..\*}
          - WHERE {0..\*}
            - Location {0..\*}
            - Time {0..\*}
            - WHO {0..\*}
        - WHAT:ProblemList {0..\*}
          - Slot: HealthConditions {0..\*} (highlighted)
  - Language
  - Ontology

**Archetype Slot Panel:**

- Tab: Archetype slot
- Section: ARCHETYPE SLOT
- Occurrences:
  - Min.: 0
  - Max.: 0 ☒ Unbounded
- Includes/Excludes:
  - Includes:
    - archetype\_id/value matches {/.Diagnosis/}
    - archetype\_id/value matches {/.Complaints/}
    - archetype\_id/value matches {/.Findings/}

# HSE Toolset SAM Editor

The screenshot displays the HSE Toolset SAM Editor interface, which is divided into two main panels: the Archetype Tree on the left and the Archetype Slot configuration on the right.

**Archetype Tree (Left Panel):**

- The tree is titled "CEN-EN13606-COMPOSITION.HSE\_DEmo.v1".
- Under "Definition", there is a "Summary {1}" element.
- Under "Summary {1}", there is an "Author {0..1}" element.
- Under "Author {0..1}", there is a "Context {0..1}" element.
- Under "Context {0..1}", there is a "WHERE {0..1}" element.
- Under "WHERE {0..1}", there are two elements: "Location {0..1}" and "Time {0..1}".
- Under "WHERE {0..1}", there is a "WHO {0..\*}" element.
- Under "WHO {0..\*}", there is a "WHAT:ProblemList {0..\*}" element.
- Under "WHAT:ProblemList {0..\*}", there is a "Slot: HealthConditions {0..\*}" element, which is currently selected and highlighted with a blue border.
- At the bottom of the tree, there are two icons: "Language" and "Ontology".

**Archetype Slot (Right Panel):**

The right panel is titled "ARCHETYPE SLOT" and contains two sections:

- Occurrences:** This section contains two spinners for "Min.:" and "Max.:". Both are set to "0". There is a checkbox labeled "Unbounded" which is checked.
- Includes/Excludes:** This section contains a list of includes. The list is titled "Includes" and contains three entries:
  - archetype\_id/value matches {/.Diagnosis/}
  - archetype\_id/value matches {/.Complaints/}
  - archetype\_id/value matches {/.Findings/}

# HSE Toolset SAM Editor

The screenshot displays the HSE Toolset SAM Editor interface. The left pane, titled 'Archetype Tree', shows a hierarchical structure for 'CEN-EN13606-COMPOSITION.HSE\_DEmo.v1'. The tree includes a 'Definition' node with a 'Summary {1}' node, which contains 'Author {1}', 'Context {0..1}', 'WHERE {0..1}', 'WHO {0..\*}', and 'WHAT:ProblemList {0..1}'. The 'WHERE {0..1}' node has sub-nodes for 'Location {0..1}' and 'Time {0..1}'. The 'WHAT:ProblemList {0..1}' node has a sub-node 'Slot: HealthConditions {0..\*}'. The right pane, titled 'SECTION', shows the configuration for the 'SECTION' archetype. It includes a 'Documentation' section with an 'ANY ALLOWED' checkbox. The 'Occurrences' section has 'Min.: 0' and 'Max.: 1' with 'Unbounded' checked. The 'Members' section has 'Obligatory', 'Ordered', and 'Unique' checkboxes, with 'Min.: 0' and 'Max.: 1' and 'Unbounded' checked. The 'Ontology' section has a 'Text' field containing 'WHAT:ProblemList' and a 'Description' field. The 'Binding' section has a field containing '[CONTSYS::HealthProblemList]' and 'Search' and 'Del' buttons.

Archetype Tree CEN EN13606 Editor en

CEN-EN13606-COMPOSITION.HSE\_DEmo.v1

- Definition
  - Summary {1}
    - Author {1}
    - Context {0..1}
      - WHERE {0..1}
        - Location {0..1}
        - Time {0..1}
      - WHO {0..\*}
    - WHAT:ProblemList {0..1}
      - Slot: HealthConditions {0..\*}
- Language
- Ontology

SECTION

SECTION

+ Documentation

☐ ANY ALLOWED

Occurrences

Min.: 0

Max.: 1 ☐ Unbounded

Members

☐ Obligatory ☐ Ordered ☐ Unique

Min.: 0

Max.: 1 ☒ Unbounded

Ontology

Text: WHAT:ProblemList

Description:

Binding: [CONTSYS::HealthProblemList] Search Del

# HSE Toolset SAM Editor

The screenshot displays the HSE Toolset SAM Editor interface. The main window is titled "CEN-EN13606 Editor" and shows a tree view of the archetype structure. The tree is organized as follows:

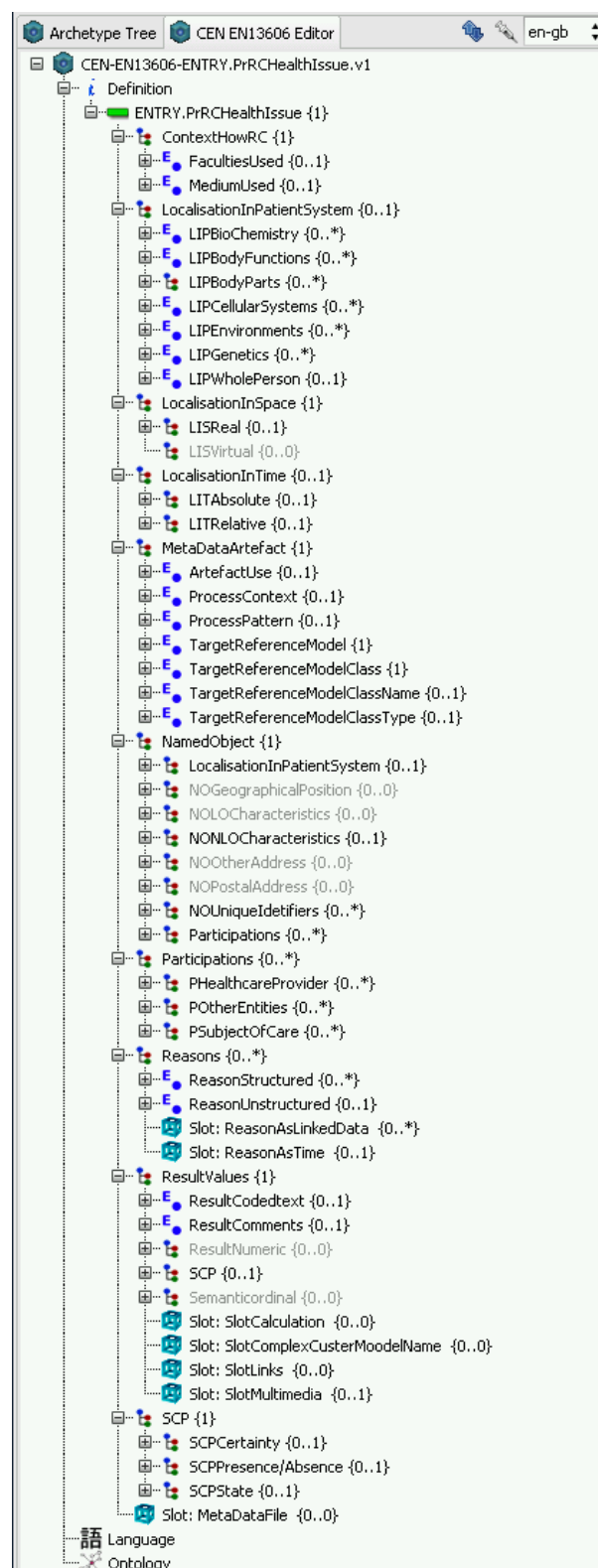
- CEN-EN13606-COMPOSITION.HSE\_DEMO.v1
  - Definition
    - Summary {1}
      - Author {0..1}
      - Context {0..1}
        - WHERE {0..1}
          - Location {0..1}
          - Time {0..1}
          - WHO {0..\*}
        - WHAT:ProblemList {0..\*}
          - Slot: HealthConditions {0..\*}
  - Language
  - Ontology

The right-hand panel, titled "ARCHETYPE SLOT", contains the following sections:

- Occurrences**
  - Min.: 0
  - Max.: 0 ☒ Unbounded
- Includes/Excludes**
  - Includes**
    - archetype\_id/value matches {/.Diagnosis/}
    - archetype\_id/value matches {/.Complaints/}
    - archetype\_id/value matches {/.Findings/}
  - Excludes**
- Ontology**
  - Text: HealthConditions
  - Description:
  - Binding: [CONTSYS::HealthProblem]  
[epSOS::1.1.2.3.4.5.6.1112]

# HSE Toolset

## SAM Editor





# HSE Toolset

## SAM Editor

The screenshot displays the HSE Toolset SAM Editor interface. The left pane shows the 'Archetype Tree' for 'CEN-EN13606-ENTRY.PrRHealthIssue.v1'. The tree structure includes a 'Definition' node, followed by 'ENTRY.PrRHealthIssue {1}', which contains several sub-elements like 'ContextHowRC {1}', 'FacultiesUsed {0..1}', 'MediumUsed {0..1}', 'LocalisationInPatientSystem {0..1}', 'LocalisationInSpace {1}', 'LocalisationInTime {0..1}', and 'MetaDataArtefact {1}'. The right pane shows the 'SIMPLE\_TEXT' configuration panel. It includes a 'Documentation' section with an 'ANY ALLOWED' checkbox. The 'Occurrences' section has 'Min.: 0' and 'Max.: 1' with 'Unbounded' checkbox. The 'Value' section has tabs for 'Default', 'List', 'Pattern', and 'Constraint ref'. The 'List' tab is active, showing a list of values: 'Seeing', 'Hearing', 'Touching', 'Smelling', 'Tasting', and 'Digitally'. The 'Assumed value' is set to 'Seeing'.

Archetype Tree CEN EN13606 Editor en-gb

CEN-EN13606-ENTRY.PrRHealthIssue.v1

- Definition
  - ENTRY.PrRHealthIssue {1}
    - ContextHowRC {1}
      - FacultiesUsed {0..1}
      - MediumUsed {0..1}
    - LocalisationInPatientSystem {0..1}
      - LIPBioChemistry {0..\*}
      - LIPBodyFunctions {0..\*}
      - LIPBodyParts {0..\*}
      - LIPCellularSystems {0..\*}
      - LIPEnvironments {0..\*}
      - LIPGenetics {0..\*}
      - LIPWholePerson {0..1}
    - LocalisationInSpace {1}
      - LISReal {0..1}
      - LISVirtual {0..0}
    - LocalisationInTime {0..1}
      - LITAbsolute {0..1}
      - LITRelative {0..1}
    - MetaDataArtefact {1}
      - ArtefactUse {0..1}
      - ProcessContext {0..1}
      - ProcessPattern {0..1}

SIMPLE\_TEXT

SIMPLE\_TEXT

+ Documentation

ANY ALLOWED

Occurrences

Min.: 0

Max.: 1 Unbounded

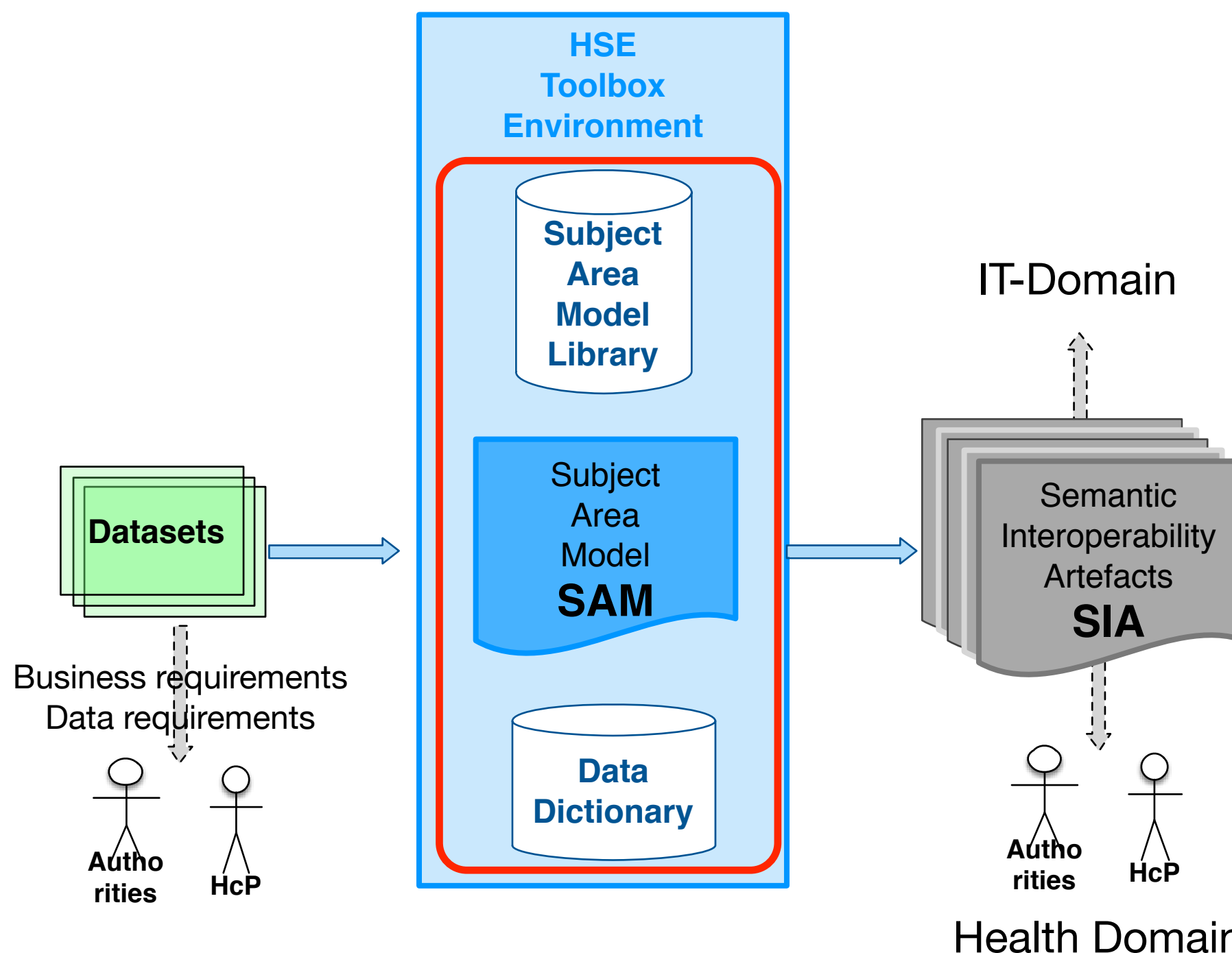
Value

Default List Pattern Constraint ref

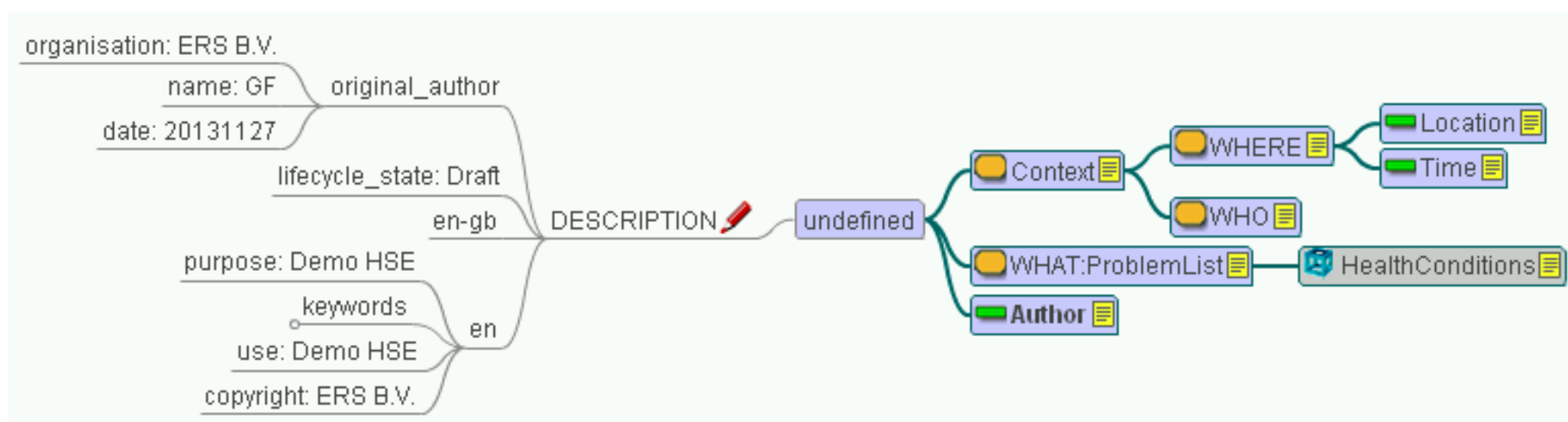
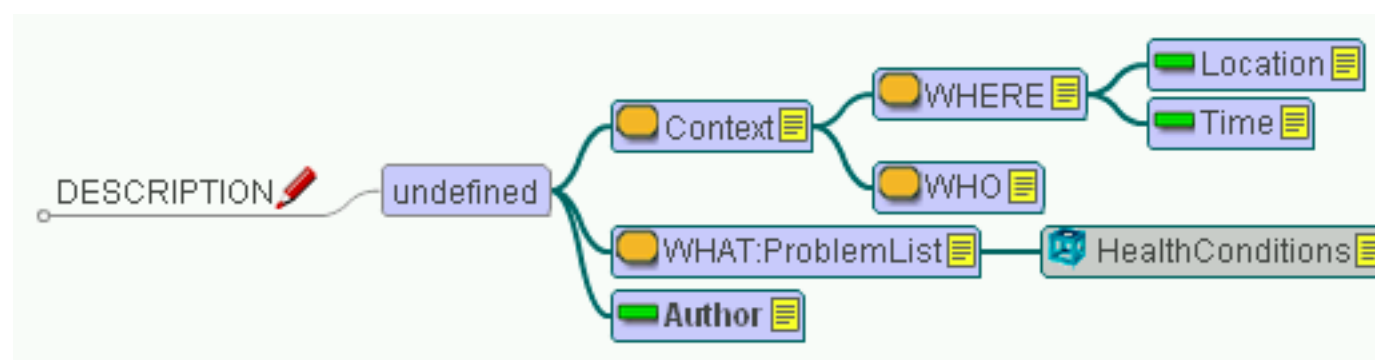
Seeing  
Hearing  
Touching  
Smelling  
Tasting  
Digitally

Assumed value: Seeing

# From 'Information' Requirements to Semantic Interoperability Artefacts



# Mind Map



## ADL

```
CEN-EN13606-COMPOSITION.HSE_DEmo 2.adl
1 archetype (adl_version=1.4)
2   CEN-EN13606-COMPOSITION.HSE_DEmo.v1
3
4 concept
5   [at0000]
6
7 language
8   original_language = <[ISO_639-1::en]>
9
10 description
11   original_author = <
12     ["name"] = <"GF">
13     ["organisation"] = <"ERS B.V.">
14     ["date"] = <"20131127">
15   >
16   lifecycle_state = <"Draft">
17   details = <
18     ["en-gb"] = <
19       language = <[ISO_639-1::en-gb]>
20     >
21     ["en"] = <
22       language = <[ISO_639-1::en]>
23     >
24   >
25
26 definition
27   COMPOSITION[at0000] occurrences matches (1..1) matches { -- Summary
28     content existence matches (0..1) cardinality matches (0..3; unordered; unique) matches {
29       SECTION[at0001] occurrences matches (0..1) matches { -- Context
30         members existence matches (0..1) cardinality matches (0..*; unordered) matches {
31           SECTION[at0002] occurrences matches (0..1) matches { -- WHERE
32             members existence matches (0..1) cardinality matches (0..*; unordered; unique) matches {
33               ENTRY[at0003] occurrences matches (0..1) matches { -- Location
34                 items existence matches (0..1) cardinality matches (0..1; unordered) matches (*)
35               }
36               ENTRY[at0008] occurrences matches (0..1) matches { -- Time
37                 items existence matches (0..1) cardinality matches (0..*; unordered; unique) matches (*)
38               }
39             }
40           }
41         }
42       }
43     }
44   }
```

# Conclusion

- A Data Set can be converted in a precise standards based Semantic Interoperability artefact
- The artefacts can be inspected by:
  - Stakeholders in the Health knowledge domain (SAM Editor, Mind Map, HTML) and
  - Stakeholders in the IT knowledge domain (ADL, XML instantiation)

## DEMO

# **Subject Area Model Editor**

## SAM Environment

**[tbd]**