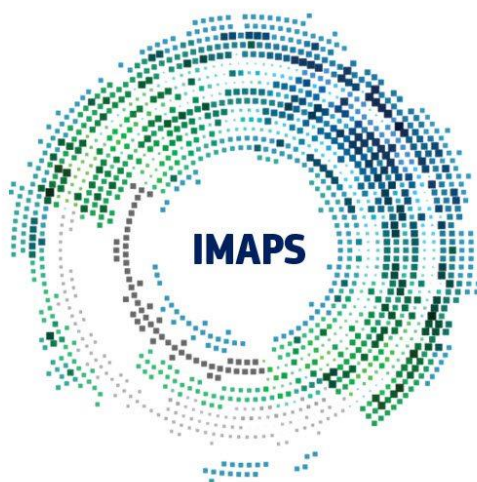# SIMAPS HL SAT v1.1.0

Semantic Interoperability Maturity Assessment of a Public Service (SIMAPS)
High Level Interoperability Solution Architecture Template (HL SAT)

Accompanying material

LIMAPS Legal Interoperability

OIMAPS Organisational Interoperability

SIMAPS Semantic Interoperability

TIMAPS Technical Interoperability

Interoperability Maturity Assessment of Your Digital Public Service

Change Control

Modification	Details
Version 1.1.0	
Version 1.0.0	

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TABLE OF CONTENTS

1   INTRODUCTION

This document contains the description for a High Level Solution Architecture Document (HL SAT) for Semantic Interoperability Maturity Assessment of Public Services (SIMAPS).

This HL SAT is based on EIRA v4.1.0

The ArchiMate source are embedded in this document in the "Archi format" as well as in "The Open Group ArchiMate Model Exchange File Format".

SIMAPS HL SAT
v1.1.0.archimate

SIMAPS HL SAT
v1.1.0.xml
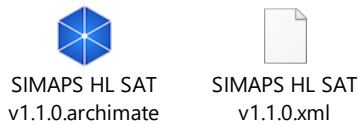
1.1   Purpose of this document

Enterprise and Solution architects can use this document to design solution architectures in the domain of Semantic Interoperability.

1.2   List of acronyms used in this document

Table 1: Acronyms in this document

Acronym	Description
ABB	Architectural Building Block
CarTool	Cartography Tool
EC	European Commission
EIF	European Interoperability Framework
EIRA ® (EIRA)	European Interoperability Reference Architecture
EU	European Union
IMAPS	Interoperability Maturity Assessment for Public Services
SIMAPS	Semantic Interoperability Maturity Assessment for Public Services
HL SAT	High-Level Interoperability Requirements Solution Architecture Template

2 GOAL, DESCRIPTION AND TARGET AUDIENCE

This chapter gives the goals and a description on SIMAPS and indicates the target audience and their potential use of this High-Level Interoperability Requirements Solution Architecture Template (HL SAT).

2.1 Goal

The purpose of this HL SAT is to provide guidance by defining a minimal, semantic behavioural interoperability architecture to implement the semantic specialisation of IMAPS, the SIMAPS. The SIMAPS HL SAT should allow businesses and public administrations to have a common understanding of the most salient building blocks from the perspective of semantic interoperability.

2.2 What is SIMAPS

SIMAPS inception initiated from the fact that the IMAPS model is not granular enough to assess how the service delivery model of digital public services and the semantic aspects of the organisations that they belong to, affect the behavioural aspects of their interaction with their end-users (citizens, businesses, administrations) or other client services.

Therefore, SIMAPS inception applies to the assessment of the behavioural aspects of a digital public service, via an approach similar to this of IMAPS, but from the semantic behavioural interoperability viewpoint.

Semantic interoperability enables organisations to process information from external sources in a meaningful manner and ensures that the precise meaning of exchanged information is understood and preserved throughout exchanges between different parties such as different Public Administrations. In the context of the European Interoperability Framework (EIF), semantic interoperability also encompasses the syntactic interoperability in the sense of describing the exact format of the information to be exchanged in terms of grammar, format and schemas. Semantic interoperability provides also a common understanding of the data, by using common nomenclatures and data formats. It is crucial to agree on the use of common semantic standards, promote transparent and well-documented metadata policies and increase the visibility and reuse of existing semantic interoperability solutions.

The figure below illustrates the IMAPS and SIMAPS approaches and shows how their scopes differentiate:
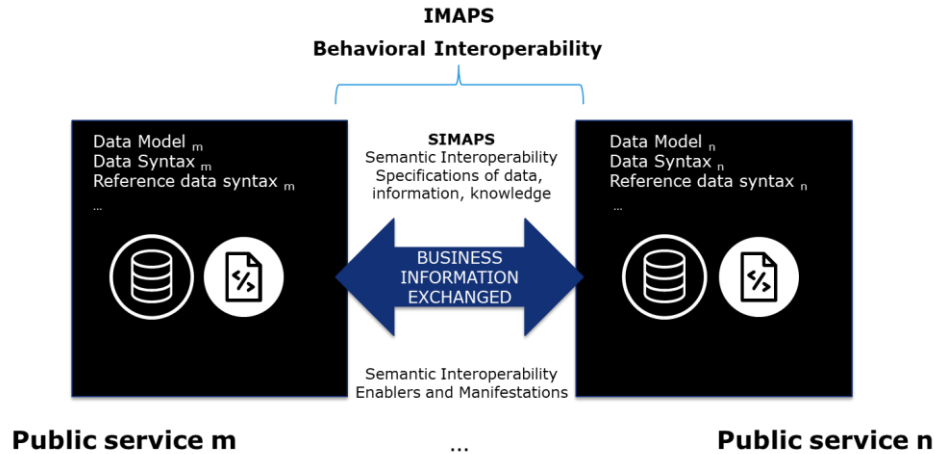
Figure 2: IMAPS vs SIMAPS level of assessment

SIMAPS assesses the behavioural aspects of a digital public service by limiting its focus on:

- the semantic behavioural interoperability specifications of data, information and knowledge delivered and consumed by the public service and its end-users or other client services;
- the semantic behavioural interoperability capabilities that enable either the delivery and consumption of data, information and knowledge by the digital public service and its end users or other client services or ii) the discoverability of the public service or other client services;
- the semantic behavioural interoperability manifestations of the public service delivering and consuming data, information and knowledge (manifestations can be performance, results, user experience).

2.3   What is a High Level interoperability requirements solution architecture template (HL SAT)

A Solution Architecture Template (SAT) is a specification extending the EIRA providing support to solution architects in a specific solution domain. A SAT contains a motivation (principles, requirements), a goal and a description of the supported functionalities, a sub-set of the EIRA core Architecture Building Blocks (ABBs) covering the four views, a set of specific ABBs extending EIRA's views enabling specific functionalities to be provided by implementations derived from the SAT and the interoperability specifications of selected ABBs and a narrative for each EIRA view.

In EIRA, a High-level (HL) requirement is a statement of a need that must be realized by a solution. This statement is a description of a to-be implemented functional aspect. They do not include any reference to technology specifics like standards. An interoperability requirement is defined as a statement of an interoperable need that must be realized by a system. In EIRA, this statement is a High-level description of a to-be implemented interoperability aspect. An interoperability requirement adds granularity to an interoperability aspect.

SIMAPS HL SAT v1.1.0 models the EIRA semantic view and in particular, the most salient behavioural ABBs that should be considered in order to support the semantic behavioural interoperability of information exchanges between administrations, businesses and citizens. The EIRA semantic

behavioural ABBs are source for the identification and documentation of the semantic behavioural interoperability requirements for SIMAPS (Semantic Interoperability Maturity Assessment of a Public Service).

The benefits of this HL SAT are the following:

- Provides architects with a common approach to cope with a specific interoperability challenge. It also places the focus on the key-points you need to consider.
- An architect can create a solution architecture by mapping existing Solution Building Blocks (SBBs) to an SAT, based on the interoperability specifications that are provided. This is done by providing SBBs for the ABBs identified in the SAT.
- When an architect creates a SAT, he/she can define the interoperability specifications for the SAT's ABBs and moreover recommend specific SBBs which produces faster and more interoperable results.
- A SAT can be created within and across the different views of the EIRA. A SAT can then support architects specialised in different interoperability levels.

2.4 Target audience

This document has the following target audience:

Table 2: Target audience

Audience	Description
IT System Architects and Developers	IT system architects and developers involved in the design and development of an interoperable IT architecture supporting a digital public service
Policy makers	Policy makers to identify the Public Services Implementation Orientation for the digitalisation of interoperable public services
Public service owners	Public service owners to diagnose the semantic behavioural interoperability maturity level of a digital public service
Public Procurement officers	Public procurement officers that need to identify standards and specifications for an interoperable digital public service

3   SIMAPS INTEROPERABILITY MAPPED TO EIRA

This chapter contains for the semantic EIRA view the corresponding ArchiMate model and narrative. Next to the SAT's EIRA architecture building blocks, the ArchiMate model includes, where applicable, the related specifications, principles and requirements.

In addition, this chapter describes the design and deployment process of the SIMAPS HL SAT.

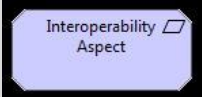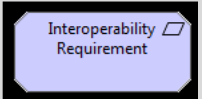### 3.1   ArchiMate motivation extension

The motivation extension is used to model specific goals, principles, requirements and/or constraints and optionally also the sources of those intentions; stakeholders, drivers and assessments. Motivational concepts are used to model the motivations, or reasons, that underlie the design or change of some enterprise architecture. These motivations influence, guide, and constrain the design.

It is essential to understand the factors, often referred to as drivers, which influence the motivational elements. They can originate from either inside or outside the enterprise. Internal drivers, also called concerns, are associated with stakeholders, which can be some individual human being or some group of human beings, such as a project team, enterprise, or society.

The actual motivations are represented by goals, principles, requirements, and constraints. Goals represent some desired result – or end – that a stakeholder wants to achieve; e.g., increasing customer satisfaction by 10%. Principles and requirements represent desired properties of solutions – or means – to realize the goals. Principles are normative guidelines that guide the design of all possible solutions in a given context.

In addition to the standard EIRA concepts, the diagrams use the following concepts coming from the ArchiMate motivation extension.

Table 3: ArchiMate motivation extension

EIRA concept	Description
Interoperability Aspect	An Interoperability aspect is an externally observable characteristic or a set of characteristics to be provided/supported by the solution that fulfills partially or internally a stakeholder interoperability need. (Source: PM2)
Interoperability Requirement	In EIRA, the requirement of concern is the interoperability requirement. An interoperability requirement is defined as a statement of an interoperable need that must be realized by a system. In EIRA, this statement is a High-level description of a to-be implemented interoperability aspect. An interoperability requirement adds granularity to an interoperability aspect

3.2   How to use this HL SAT

An architect that uses this HL SAT typically wants to perform a gap-analysis between an existing solution and this Solution Architecture Template, or he/she wants to model a solution in the domain of semantic interoperability and uses this document as guidance.

3.2.1 Gap Analysis

Using this HL SAT for gap analysis, the architect can map the building blocks of the solution to the ones in this SHL AT and identify which building blocks are missing. These building blocks can either indicate missing functionality or missing interoperability specifications.

3.2.2 Building a solution

When building a solution, the architect is expected to use the five different EIRA© views and provide a solution in the form of Solution Building Blocks (SBBs) for the Architecture Building Blocks (ABBs) that are indicated. This is done by replacing the Architecture Building Block (ABB) with an annotated Solution Building Block. The existing Solution Building Blocks (SBB) in this SAT should not be removed and replaced, however, the acknowledgement of reusing these building blocks can be done by removing the ABBs which they specialise.

Interoperability Specifications (IoP specs) are added as specialisation of an Interoperability ABB, implemented in the form of an SBB and attached to an ABB as interoperability requirements. The final solution should only contain the implementation (the SBB) of the IoP Spec

The result will be a solution architecture that will contain only SBBs, all ABBs should have been removed (in the case this SAT already provides SBBs for this ABB) or replaced by SBBs (solutions that implement that ABB).

> The SAT is a document describing the needed Architecture Building Blocks for a desired solution. This should not be taken as restrictive but as advisory. When an Architecture Building Block (ABB) is present for which there is no implementation foreseen in the form of a Solution Building Block (SBB), it is *strongly* recommended, but not mandatory, to take this ABB into consideration in the final solution.

3.3 Design and deployment process

The EIRA semantic view models the most salient ABBs that should be considered in order to support semantic interoperability of information exchanges between administrations, businesses and citizens.

The following EIRA v4.1.0 ABBs from the Semantic Interoperability view have been identified:

1. Data mapping
2. Representation
3. Semantic Interoperability Specification
4. Shared Knowledge Base

These different **Architecture Building Blocks (ABBs)** define the Semantic content and each of these can have any **Interoperability Specification** associated, of which the **Semantic Interoperability Specification** is a specialization.

Data mapping is an equivalence relationship between two data items with ontological value.

Representation: The description of the perceptible configuration of business information or a Legal act. Representations can be classified in various ways.

Semantic Interoperability Specification: Semantic interoperability enables organisations to process information from external sources in a meaningful manner.

A **shared knowledge base** is formed by usable data, information and knowledge resources, with convergence power, in relation to public policy goals attainment.

The following process has been followed in order to develop the SIMAPS HL SAT:

1. Create the requirements "normative statements" from the SIMAPS questionnaire's questions.

2. Check which behavioural ABBs are applicable e.g. in SIMAPS there are the Data Mapping, Representation, Semantic Interoperability Specification … etc.

3. Group the Interoperability Aspects/Requirements and map them into the Service Delivery, Service Consumption categories.

4. Create an aggregate view, in the "Legal View", including all the identified ABBs and the respective Interoperability Aspects and Requirements.

5. Create the SIMAPS HL SAT model in Archi.

3.4 Review and validation

This current version of SIMAPS HL SAT has been reviewed and received approval in its design and approval by EIRA team representatives. Its release notes include its current features, while it may evolve, following the evolution of SIMAPS survey and/or other updates in other related tools or policies in the interoperability domain.

On top of that, the SIMAPS 1.1.0 HL SAT has been successfully validated via the EIRA validator of the Interoperability TestBed (https://www.itb.ec.europa.eu/eira/upload) a conformance testing service offered by the European Commission's DG DIGIT for projects involved in the delivery of cross-border public services (https://joinup.ec.europa.eu/solution/interoperability-test-bed).

3.5 Relevant material

The SIMAPS v1.1.0 HL SAT along and the full documentation of the design and deployment of each one of the HL SAT requirements are available online at Joinup.