ONTOLOGY MECHANISMS

STICS

Governance mechanisms in STICS

Governance mechanisms are the structured instruments that support and regulate the decision-making process within ontology governance. They establish what should be achieved, what must be fulfilled, and how it can be implemented. These elements are organized in a hierarchical structure that connects abstract governance goals with concrete operational actions:

Principles. (*what should be achieved)* Represent the highest level of the hierarchy. They are the foundational ideas that establish the values and intentions of the governance. They define the desired outcomes and states to be achieved.

> **Requirements.** (*what must be fulfilled*) Derived from each Principle, the requirements are statements that express needs, obligations and conditions that must be fulfilled to comply with the principles.
>
> > **Guidelines.** (*how it can be implemented*) Set of recommendations and methodological instructions on how to implement the Requirements.

Through this hierarchy, each Principle is supported by one or more Requirements, and each Requirement is implemented through one or more Guidelines.

Within the STICS project, there have been defined 10 foundational principles that guide the whole lifecycle of the ontologies developed, used and managed in the project.

Principle 1. Availability

All the ontologies and its related components (e.g. code, documentation, etc.) are openly available for access and consumption by the data space users, including both humans and machines.

Requirement 1.1. Localization of the resources

Guideline 1.1.1. Hosting ontologies in the STICS data space

Guideline 1.1.2. Publication of ontologies in the STICS data space

Guideline 1.1.3. Make the ontologies accessible through their IRI

Requirement 1.2. Licensing conditions

For every ontology developed and used within the data space, it must be explicitly stated what terms and conditions apply to access and use of the ontologies and their associated resources.

Guideline 1.2.1. Choosing a license

Guideline 1.2.2. Declaring the licensing conditions

Principle 2. Scope

Ontologies are expected to have a clearly defined scope, ensuring alignment between their content and purpose. A well-scoped ontology facilitates its discovery and reuse. It should be specific enough to represent its intended domain while remaining flexible enough to support its extension.

Requirement 2.1. Scope statement

Guideline 2.1.1 Scope in the ontology's title and description

Guideline 2.1.2 Where to declare the scope of the ontology

Principle 3. Documentation

Human and machine readable documentation contributes to promote the transparency, traceability, and understandability of ontologies. This documentation enables diverse users to understand the ontology's content, context and its evolution across its lifecycle.

Requirement 3.1. Embedded documentation

Guideline 3.1.1 Ontology-level metadata documentation

Guideline 3.1.2 Describing the ontology terms

Requirement 3.2. External documentation

Guideline 3.2.1. Publishing external ontology documentation

Principle 4. Metadata

The ontology is made findable and traceable through its metadata, which helps users identify and interpret its context.

Requirement 4.1. Metadata at ontology level

Guideline 4.1.1. Recommended metadata for describing the ontology

Requirement 4.2. Metadata at term level

Guideline 4.2.1. Recommended metadata for describing the terms

Principle 5. Identifiers

Ontologies in STICS follow a clear designing policy for the creation and management of identifiers. This policy addresses identifiers at three levels: Ontology and Term IRI, Version identifiers, and Naming Convention.

Requirement 5.1. Ontology and Terms IRI

Guideline 5.1.1. Designing and managing the ontology IRI

Guideline 5.1.2. Designing the Terms IRIs

Requirement 5.2. Ontology versions

G5.2.1. Defining IRIs for the ontology's versions

Requirement 5.3. Naming convention

Guideline 5.3.1. STICS naming convention policy

Principle 6. Reuse

To ensure interoperability and avoid duplication of efforts, ontologies within STICS should commit, whenever possible, to the reuse and integration of existing, well-established ontologies and vocabularies.

Requirement 6.1. Reuse of existing ontologies

Guideline 6.1.1. How to select ontologies for reuse

Guideline 6.1.2. How to reuse ontologies in practice

Principle 7. Modularity

To facilitate maintenance and reusability, ontologies are modularized whenever possible. A single reference ontology is developed to cover a specific domain of knowledge. This

ontology functions as an independent module, while also being able to integrate with other modules that, together, form a coherent network of ontologies.

Requirement 7.1. Scope and coverage

Guideline 7.1.1. How to define the scope and the coverage of ontology modules

Principle 8. Format

All ontologies in STICS are available in OWL, to ensure its interpretability and interoperability by tools, systems, and users.

Requirement 8.1. Ontology implementation language

Guideline 8.1.1. How to implement the ontologies in the right format

P9. Adoption

To ensure the impact and relevance of the ontology, its adoption by the intended users is actively promoted and monitored.

Requirement 9.1. Dissemination

Guideline 9.1.1. Dissemination activities and materials

Principle 10. Maintenance

To ensure the long-term relevance, accuracy, and usability of the ontologies within STICS, their resources are regularly reviewed and updated to incorporate new requirements, corrections, and improvements. This is done following the maintenance policy defined, which covers these four elements: Ontology Evolution, Users Communication, Versioning, and Contribution Guidelines.

Requirement 10.1. Ontology evolution

Guideline 10.1.1. STICS Ontology Evolution Strategy

Requirement 10.2. Versioning protocol

Guideline 10.2. Guidelines for Versioning in STICS

Requirement 10.3. Users communication

Guideline 10.3. Users communication mechanisms in STICS

3.2.3. Resources:

3.2.3.1. Methodology

3.2.3.2. STICS Infrastructure

3.2.3.3. Tools