
ELi technical guide
Author, ELI Taskforce
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ELi technical guide

Author, **ELI Taskforce**

SECOND EDITION

This document is a technical guide written in the form of a FAQ (frequently asked questions) on the implementation of the European Legislation Identifier (ELI) by Member States. It covers the following aspects:

- ELI URI identifiers;
- ELI ontology;
- ELI metadata publishing.

Its target audiences are developers or project managers that need to implement ELI in their legal publishing system.

Contents

Foreword

The present guide was created by the ELI Taskforce and is aimed at developers or project managers who want to implement ELI in their legal publishing systems.

The ELI Taskforce was set up in December 2012, under the auspices of the Council of the European Union Working Party on E-law, to study the future development of the ELI standard.

The task force aims to help Member States wishing to adopt ELI by sharing knowledge and expertise.

More information is available on the website:
http://eurlex.europa.eu/eli.

1. Introduction and scope of the document

1.1. Intended audience

ELI (European Legislation Identifier) is an initiative to improve access to European Union legislation and to the legislation of the EU Member States.

This document is written with a **technical audience** in mind and is made to help developers and project managers implement ELI in their country.

1.2. ELI ontology version

This guide refers to version **1.1** of the ELI ontology.

1.3. How to read this document

This document is written as a **FAQ** (frequently asked questions). It tries to be as close as possible to the real questions that the implementation of ELI can raise from a technical point of view. It builds on the questions and the feedback gathered from the first implementations of ELI in a few Member States.

This document is divided into three main parts, corresponding to the three pillars of ELI.

- **ELI URI identifiers.**
- **ELI ontology (data model).**
- **ELI metadata** publication.

Each section title in this document corresponds to a question, with the answer given in the text of the section. After each answer, **references to other questions** in the document about related topics are also included.

1.4. URI abbreviations used in this document

Full URIs are cited in the text of this document in monospace font, enclosed by angle brackets, for example <http://example.org/ns/example>.

URIs are also cited in the text of this document in an abbreviated form. Abbreviated URIs are cited in monospace font without angle

brackets, and should be expanded using the table of abbreviations below.

URI	Abbreviation
http://data.europa.eu/eli/ontology#	eli:
http://www.w3.org/1999/02/22-rdf-syntax-ns#	rdf:
http://www.w3.org/2000/01/rdf-schema#	rdfs:
http://www.w3.org/2004/02/skos/core#	skos:
http://purl.org/dc/terms/	dct:

So, for example, eli:LegalResource is an abbreviation of <http://data.europa.eu/eli/ontology#LegalResource>.

2. ELI URI identifiers

2.1. Understanding ELI URI identifiers

2.1.1. What is a URI? What is the difference between it and a URL?

URI stands for Uniform Resource Identifier. As such, a URI serves to **identify** things on the web: documents, people, concepts, areas, etc. Anything (from the real world) can be identified by a URI.

URL stands for Uniform Resource Locator. As such, a URL serves to **locate** a document on the web: a page, an image, a video, etc. Every document has (at least) one URL on the web.

As URIs are unique identifiers for real-world things, they do not **necessarily** correspond to the URL of a document. In other words, if you copy-paste a URI in the address bar of your browser, you may get an HTTP 404 'Document not found' error. This is OK though, and does not mean that this URI is wrong or that the system is broken. That being said, a lot of URIs are also URLs, and will indeed return to a page when dereferenced.

In the context of ELI, URIs are used to identify legal resources, their expressions in specific languages and formats, agents that passed or made the law, geographic areas, languages and other concepts. Anything needed to express ELI metadata is identified by a URI.

In the context of ELI, URIs are said to be constructed using 'components'. A URI component is a piece of information used as part the URI, like {year}, {type_document}, {language}, etc. Components are usually separated by '/', for example http://example.eu/eli/{type_document}/{year}/{language}.

See also:

- What should I identify in the context of ELI?
- Should I use a redirect or a forward to implement ELI URI access?

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2.1.2. How can I create ELI identifiers?

There are some guidelines to follow when creating URIs in the context of ELI.

- Create identifiers that are close to how your users cite legislation. Do not use opaque or obscure identifiers that no one would understand. The identifier should be 'readable' by end users.
- Create identifiers with components that are stable over time. A typical counterexample is the names of ministries: they change quite often, and identifiers should not be based on them.
- Create identifiers using a sensible and 'hackable' hierarchical structure of components: your users should be able to 'hack' the URI by removing components from it (typically by removing the last components).

See also:

- What are examples of ELI URI identifiers?
- What components can I use to create ELI identifiers?

2.1.3. How can I use 'alias URIs'? What is the benefit?

We can distinguish two types of ELI identifier.

1. **Canonical URIs**. The official URI to identify a resource. Typically this URI would be used as the subject of the RDF triples used to encode the data, and would be the one stored as the primary key in a metadata database, if such a database existed.
2. **Alias URIs**. Other URIs referring to resources that are identified by a canonical URI. These alias URIs can serve as alternative ways for users to identify or access the corresponding resource, but are typically not used when expressing metadata internally.

France, for example, already uses an identifier for legislation called 'NOR'. This technical identifier, although unique, is unknown to most users. This is why two ELIs are defined, one using the NOR and one using the natural number. This allows users that do not know the NOR to still create a link or process the metadata associated with the legislation. As an example, the ELI using the NOR http://legifrance.gouv.fr/eli/loi/2014/10/13/AGRX1324417L/jo/texte has the alias http://legifrance.gouv.fr/eli/loi/2014/10/13/2014-1170/jo/texte

See also:

- What are examples of ELI URI identifiers?

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2.1.4. What are 'incomplete ELIs'? What should be the associated behaviour?

Full ELI URIs (canonical or alias) serve as identifiers for legislation. Furthermore, it is desirable that these URIs have a sensible behaviour when a user is creating a link to the **beginning** of the URI only, with only the first URI components. This allows users to more easily find their way in legislation.

For example, the Publications Office of the European Union defines the canonical ELI for directives and regulations as /eli/{typedoc}/{year}/{natural_number}/oj. Consequently, the following URI patterns are also defined with their associated behaviour:

- /eli/{typedoc} should return a (paginated) list of all the documents of the given type;
- /eli/{typedoc}/{year} should return a (paginated) list of all the documents of the given type published in the given year;
- /eli/{typedoc}/{year}/{natural_number} should redirect to the latest consolidated version or base act of the document with the given document type, year and number.

Although 'incomplete ELIs' are strictly speaking not 'identifiers', in the sense that they do not identify a resource in the system, they ease resource discovery and make the system more consistent.

2.1.5. What are examples of ELI URI identifiers?

The ELI patterns given below should not be regarded as full documentation of the ELI of each institution but are here to serve as an illustration of how ELIs can be defined. Special cases apply for each of the given patterns.

Publications Office:

- http://data.europa.eu/eli/{typedoc}/{year}/{natural_number}/oj: canonical ELI to identify a directive or regulation;
- http://data.europa.eu/eli/{typedoc}/{year}/{natural_number}/corrigendum/{publication_date}/oj: canonical ELI to identify a corrigendum;
- http://data.europa.eu/eli/{typedoc}/{year}/{natural_number}/{point-in-time}: canonical ELI to identify a corrigendum;
- etc.

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France:

- /eli/{type}/{year}/{month}/{day}/{natural identifier}/{version}/{level}/{point-in-time}/fr/{format}: canonical identifier for texts except codes;
- /eli/{type}/{year}/{month}/{day}/{natural identifier}/{version}/texte/{point-in-time}: shortcut for the HTML version of the text;
- etc.

The {natural identifier} component can be the NOR (unique text identifier) or an identifier based on the year and law number.

Ireland:

- http://www.irishstatutebook.ie/eli/{year}/{type}/{natural identifier}: identifies an act as enacted and published on the electronic Irish Statute Book (eISB);
- http://www.irishstatutebook.ie/eli/cons/{point in time}/{language}: the version of the constitution in the given language as published on the eISB at a particular point in time (publication date);
- etc.

Luxembourg:

- http://eli.legilux.public.lu/eli/etat/leg/{type}/{year}/{month}/{day}/{id}: identifies a law published in the *Mémorial*;
- etc.

Other URI patterns are described in the ELI registry on EUR-Lex.

2.1.6. Where are the ELI identifier schemes published?

The Publications Office keeps a registry of the ELI identifier schemes used by the Member States that have implemented ELI ([1]).

2.2. Building URI identifiers

2.2.1. What components can I use to create ELI identifiers?

ELI proposes using the following components to create URIs. They are all optional, and can be used in any order, depending on how the law is cited. The recommended format provides a guideline for the value, but is not an absolute requirement.

([1]) ELI registry on EUR-Lex: http://eur-lex.europa.eu/eli-register/about.html

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ELI Component	Recommended format	Additional remarks
{jurisdiction}	Two-letter country codes	
{agent} and {sub-agent}	No recommended format	Codes for administrative hierarchical structures and substructures. Member States need to define their own values.
{year}, {month} and {day}	{year}: four digits {month} and {day}: two digits	The components do not have to be used together (e.g. {year} can be used without {month} or {day})
{type} and {subtype}	No recommended format	Nature of the act (law, decree, draft bill, etc.). Member States need to define their own values.
{natural identifier}	No recommended format	
{domain}		Thematic classification. Member States need to define their own values.
{level 1} {level 2} and {level N}	No recommended format but see also 2.2.3	Reference to a subdivision or to a smaller legislation subdivision (e.g. articles and paragraphs).
{point in time}	YYYYMMDD or YYYY-MM-DD	To retrieve the version of the legislation valid at a given date. Note that the Council conclusions inviting the introduction of the ELI only recommend YYYYMMDD, but implementations using YYYY-MM-DD would still be valid.
{version}	No recommended format	To distinguish between a base act and a consolidated version.
{language}	Three-letter language codes (ISO-639-1)	To distinguish different linguistic variants of a piece of legislation.
{format}	A file format, like 'PDF' or 'HTML'	Note that the Council conclusions inviting the introduction of the ELI does not list this component explicitly, but it is always part of the URIs to identify the eli:Format level.

See also:

- What should I identify in the context of ELI?

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2.2.2. Should I use two-letter codes or three-letter codes for the {language} component in ELI identifiers?

ELI explicitly recommends using three-letter codes for the {language} component when building ELI URIs (ISO-639-2). See the code-list page (7) for the list of language codes.

That being said, implementations using two-letter language codes would still be valid. It is expected in that case that an alias mechanism would be implemented from one to the other.

2.2.3. How do I create ELIs for subdivisions (articles and paragraphs)?

When crafting ELIs for subdivisions, the user needs to combine a code to identify the subdivision type (section, article, paragraph, etc.) and the number or identifier of the subdivision (1, A, 1.5.9, etc.). There are two ways to make this combination.

1. Separate the subdivision type and number with a slash, like other components in the URI, for example /eli/law/2015/123/article/3/paragraph/2.
2. Concatenate the subdivision type and its number into a single component, using another separator, typically underscore '_', for example /eli/law/2015/123/article_3/paragraph_2.

Solution 2 above is preferred, since solution 1 would imply incomplete ELIs that do not make sense, like /eli/law/2015/123/article/3/paragraph and /eli/law/2015/123/article.

See also:

- What are 'incomplete ELIs'? What should be the associated behaviour?
- What is the recommended way to describe a subdivision of a legal act in ELI, like a section or article?

(7) ISO-639-3 codes list: http://www-01.sil.org/iso639-3/codes.asp

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3. ELI ontology (data model)

3.1. ELI ontology overview

3.1.1. What is the ELI ontology?

The ELI ontology defines a core model for describing legal resources, aimed at supporting linked data publishing of these legal resources' metadata, specifically across the European Union. It is based on the FRBR model and accommodates the differences in national legal systems to build a semantic web of legal gazettes and official journals.

See also:

- What is the ELI ontology *not*?
- What is FRBR and why is ELI based on it?

3.1.2. What is the ELI ontology namespace?

http://data.europa.eu/eli/ontology#, usually abbreviated using the prefix eli:. This URI resolves to the OWL file of the ontology.

3.1.3. What is the rationale behind the ELI ontology?

The ELI ontology is a model for sharing legal resources metadata across the web. As such, it tries to be:

- **flexible**, to accommodate the different point of view of the various legal systems in the EU;
- **generic**, to foster interoperability between the legal metadata published;
- **easy to use** and well documented, to allow for simple deployment by Member States;
- **open**, by building on standard semantic web technologies (RDF, OWL) and vocabularies (FRBR, SKOS, Dublin Core).

3.1.4. What is the ELI ontology *not*?

The ELI ontology is not the following.

- The definitive model to describe legal resources. It is the result of compromises for publishing metadata about legal resources

on the web, and as such makes simplifications on the attributes and relations used. Other data models, used internally in editorial systems for example, are much more detailed.

- A document model to describe the structure of the legal documents themselves. ELI captures only the metadata of the documents.

3.1.5. Why is the ELI ontology based on English terms? Why is it not multilingual?

ELI URIs are technical identifiers. As such, they should be unique to the notion they represent. They could have been based on totally opaque strings of characters (e.g. eli:ab09j5), but building identifiers based on words makes the model and the data more readable. English was chosen because other vocabularies already use English words as the basis for their identifiers, and it was a language shared by all the members of the ELI Taskforce.

In the future, multilingual labels could be associated with each technical identifier. Member States are encouraged to provide their translations of the ELI ontology.

3.1.6. What's new in version 1.1 of the ontology?

In mid 2016, the ELI Taskforce upgraded the ELI ontology from 1.0 to 1.1, integrating the comments received during the first round of workshops and the experience gained during the first implementations.

ELI 1.1 contains the following enhancements over 1.0.

- The following properties were added:
  - eli:is_member_of/eli:has_member
  - eli:number
  - eli:jurisdiction
  - eli:date_applicability
  - eli:applies/eli:applied_by
  - eli:commences/eli:commenced_by
  - eli:repeals/eli:repealed_by
  - eli:corrects/eli:corrected_by
  - eli:amends/eli: amended_by
  - eli:is_another_publication_of/eli:has_another_publication.

- Additional properties were also added to accommodate situations in which a property value can be either a literal or a URI:
  - eli:responsibility_of_agent vs eli:responsibility_of
  - eli:published_in_format vs eli:published_in
  - eli:publisher_agent vs eli:publisher
  - eli:rightsholder_agent vs eli:rightsholder.
- The relationship with Dublin Core properties is now declared using a custom annotation property eli:isSpecificPropertyOf instead of rdfs:subPropertyOf to be able to relate both eli:publisher/eli:publisher_agent to dcterms:publisher and eli:rightsholder/eli:rightsholder_agent to dcterms:rightsholder.
- The class eli:LegalResourceSubdivision was added.
- The property eli:implements/eli:implemented_by was deprecated in favour of eli:applies/eli:applied_by.
- Numerous definitions were improved and clarified.
- All ontology items are now documented with:
  - their version of creation;
  - their version of latest modification;
  - a history note documenting the changes on the item.

See also:

- Why does ELI use a custom annotation property to map to Dublin Core rather than rdfs:subPropertyOf?
- Why are some properties duplicated as object and datatype properties (e.g. eli:publisher vs eli:publisher_agent?)
- What are the possible values for eli:relevant_for and eli:jurisdiction?
- How do I transition from ELI 1.0 to ELI 1.1?

3.1.7. How do I transition from ELI 1.0 to ELI 1.1?

ELI 1.1 is backwards-compatible, with the exception indicated below in the 'MUST' clause. To transition from ELI 1.0 to ELI 1.1, data publishers:

- **MUST** use eli:is_member_of/eli:has_member instead of eli:is_part_of/eli:has_part for conceptual inclusions. eli:has_part/eli:is_part_of should be used only for physical inclusions;

- are **STRONGLY ENCOURAGED** to:
  - use eli:publisher_agent, eli:rightsholder_agent, eli:responsibility_of_agent, eli:published_in_format whenever a URI is available to identify the property value, instead of the corresponding datatype property (kept only for situations in which a URI is not available),
  - use an identifier from the Administrative Territorial Unit table published by the Publications Office as value for the property eli:relevant_for, instead of a custom URI,
  - use eli:applies/eli:applied_by instead of eli:implements/eli:implemented_by — note however that eli:implements/eli:implemented_by currently remain in the ontology so publishers can take the time to transition smoothly;
- **SHOULD** use new items in ELI 1.1 in the following situations:
  - use eli:LegalResourceSubdivision instead of eli:LegalResource to type the subcomponents of an act (articles, paragraphs, sections, etc.),
  - use eli:number instead of eli:id_local to indicate the number of a resource or article,
  - use eli:jurisdiction instead of eli:relevant_area to indicate the jurisdiction of a legal resource,
  - whenever applicable, use specific types of links instead of the generic property eli:changes/eli:changed_by:
    - eli:commences/eli:commenced_by,
    - eli:repeals/eli:repealed_by,
    - eli:corrects/eli:corrected_by,
    - eli:amends/eli:amended_by.

See also:

- What's new in version 1.1 of the ontology?
- What are the possible values for eli:relevant_for and eli:jurisdiction?

3.2. Other ontologies reused by ELI

3.2.1. What is FRBR and why is ELI based on it?

FRBR stands for Functional Requirements for Bibliographic Records. It is a conceptual model created by library experts, and it separates the information attached to a record into four categories:

- properties describing the individual exemplar (e.g. author's dedication on the first page);
- properties of the edition to which the exemplar belongs (e.g. the publisher);
- properties of its intellectual content (e.g. the language of the text);
- properties of the artistic creation (e.g. keywords);

These four categories are named as follows in FRBR:

- Item;
- Manifestation;
- Expression;
- Work.

FRBR is a conceptual model (i.e. on paper) and it is implemented in the RDA (Resource Description and Access) vocabularies. RDA defines URI identifiers for classes and properties of FRBR. ELI extends the RDA vocabulary to refine the notions of Work (eli:LegalResource), Expression (eli:LegalExpression) and Manifestation (eli:Format). The Item level is not part of ELI.

The separation into multiple conceptual levels allows users to:

- create links to or from a precise description level — to an electronically-signed OJ, a given consolidated version of a text or the text in general;
- factor some information and not repeat, for example, the type of the document ('Directive') for every single format ('PDF', 'Print', 'HTML', 'XHTML', etc.): the type of document is a property expressed in the Work category, and is not repeated for each Manifestation.

See also:

- What is an 'eli:LegalResource'?
- What is an 'eli:LegalExpression'?
- What is an 'eli:Format'?
- My legal resources are all monolingual. Should I still use the FRBR distinction between a LegalResource and a LegalExpression?

3.2.2. What is Dublin Core and why is ELI based on it?

Dublin Core Metadata Terms is a set of 55 metadata attributes that can be used to describe web resources (video, images, web pages, etc.), along with physical resources such as books or CDs and objects like artworks. It covers generic notions like 'creator', 'date', 'rights', etc.

ELI properties are mapped to the corresponding Dublin Core metadata. For example, the ELI properties eli:title_alternative and eli:title_short are mapped to the Dublin Core metadata 'alternative (title)', and the ELI properties eli:transposes/eli:transposed_by, eli:cites/eli:cited_by and all the other relations in ELI are mapped to the Dublin Core metadata 'relation'.

This mapping declaration makes the model easier to understand.

In ELI 1.1, the mapping is not declared using 'rdfs:subPropertyOf', but rather using a custom annotation property 'eli:isSpecificPropertyOf'.

See also:

- What are the important properties in the ELI ontology?
- Why does ELI use a custom annotation property to map to Dublin Core rather than rdfs:subPropertyOf?

3.2.3. What is SKOS and why is ELI based on it?

SKOS stands for Simple Knowledge Organization System. It is a data model to structure controlled vocabularies, thesauri, authority tables, etc. The notion of a 'Concept' is central to SKOS, and these Concepts can be:

- labelled with preferred or alternative labels;
- organised with semantic relations, hierarchical or transversal;
- documented by definitions, notes, examples, etc.;
- mapped to Concepts of other vocabularies.

ELI uses SKOS to declare the list of possible values for the properties eli:in_force and eli:legal_value.

ELI also uses SKOS to state that some other properties need to have a value in a controlled value set, but leaves open the list of possible values. This is the case for eli:type_document, eli:version, eli:passed_by and eli:relevant_for.

See also:

- What are the possible values for eli:in_force?
- What are the possible values for eli:legal_value?
- What are the lists of values I need to define?

3.3. ELI 'backbone' classes

3.3.1. What is an 'eli:LegalResource'?

A legal resource is a distinct intellectual creation (i.e. intellectual content). For example, the notion of 'Act 3 of 2005', without specifying in which language (if in a multilingual context) and without specifying in which format, would be considered a legal resource.

Legal resources can be described and linked together using properties defined in the model. A legal resource can represent a legal act or any component of a legal act, like an article. A specific subclass of LegalResource, LegalResourceSubdivision, has been introduced in ELI 1.1 and can be used to give the type of components of legal acts.

See also:

- What should I consider a LegalResource and what should I consider a LegalExpression?
- How can legal resources be grouped together (physically or logically)?
- What is the recommended way to describe a subdivision of a legal act in ELI, like a section or article?

3.3.2. What is an 'eli:LegalExpression'?

A legal expression is the intellectual realisation of a legal resource in the form of a 'sequence of signs' (typically alphanumeric characters).

For example, any version of the legal resource with content that is specified and different from others for any reason: language, versions, etc.;

Legal expressions must be linked to the legal resource they express using the eli:realizes property. A legal expression cannot exist without being linked to a single legal resource, and the eli:realizes property is mandatory.

See also:

- What should I consider a LegalResource and what should I consider a LegalExpression?
- My legal resources are all monolingual. Should I still use the FRBR distinction between a LegalResource and a LegalExpression?

3.3.3. What is an 'eli:Format'?

A format is the physical embodiment of a legal expression, either on paper or in any electronic format.

For example, any electronic or physical format of the legal expression (XML, TIFF, PDF, etc.), for example a PDF version of Act 3 of 2005, would be considered a format.

Formats must be linked to the legal expression they embody, using an eli:embodies property.

Formats refer to the actual file URL of the corresponding document with the eli:is_exemplified_by property.

See also:

- What are the possible values for eli:legal_value?

3.3.4. How can legal resources be grouped together (physically or logically)?

Legal resources can be grouped together using either eli:has_part and eli:is_part_of, for physical/structural inclusion, or eli:has_member and eli:is_member_of, for logical/temporal inclusion.

When you need to declare that a legal resource is included in an official journal, this is a physical relationship, so you use eli:is_part_of. When you need to declare that the consolidated version of an act 'belongs to' the same abstract act as the base act, this is a temporal relation, so you use eli:is_member_of.

There are no restrictions in ELI on the levels of partitions that can be asserted: eli:has_part/eli:is_part_of or eli:has_member/eli:is_member_of can be used to construct a complete hierarchy of legal resources.

See also:

- What should I consider a LegalResource and what should I consider a LegalExpression?
- What is an 'abstract legal resource'?

3.3.5. What is an 'abstract legal resource'?

It is often desirable to group under the same 'header' different legal resources that represent the same act at different stages of its 'life cycle'. For example, the base act and all of its consolidated versions

can be grouped together; or, in common law, the enacted and revised versions of an act can be grouped together.

This grouping is done using the eli:has_member and eli:is_member_of properties. The 'header' under which the legal resources are grouped represent the legislation independently of one of its temporal versions. It allows users to refer to it when they cannot know, or do not need to know, to which specific version of the legislation they refer.

In that case, this 'header' legal resource is often referred to as an 'abstract legal resource'. It does not correspond to a specific class in the ELI ontology, and is declared using the eli:LegalResource class.

3.4. ELI properties

3.4.1. What are the mandatory properties in ELI?

Only a few ELI properties are actually mandatory. It is mandatory to assert at least:

- the eli:type_document on an eli:LegalResource;
- the eli:realizes property of an eli:LegalExpression (to link it to an eli:LegalResource);
- the eli:title of an eli:LegalExpression;
- the eli:language of an eli:LegalExpression;
- the eli:format of an eli:Format;
- the eli:embodies of an eli:Format (to link it to an eli:LegalExpression).

Each Member State can define a stricter ELI ontology for their use (as long as it remains a subset of the current ontology)

3.4.2. What are the important properties in the ELI ontology?

Although only a few properties are strictly speaking mandatory in the ELI ontology, some descriptive metadata are important to achieve a good level of interoperability.

- eli:transposes: link to the ELI of a directive transposed by an act or an article. This is key for achieving interoperability and linking EU laws.
- eli:is_about: indicate the subjects of the legislation, preferably expressed using the Eurovoc Thesaurus ([3]).

([3]) Eurovoc Thesaurus: http://eurovoc.europa.eu

- eli:date_document and eli:date_publication: to indicate respectively the date or adoption or signature and the date of publication of the official version of the legislation.

For more information, see the full documentation of the ELI ontology.

See also:

- I want to link to an EU directive with eli:transposes or eli:applies. Should I refer to the LegalResource of the EU directive or to one of its language-specific LegalExpressions?

3.4.3. What kinds of link between LegalResource and LegalExpression can be asserted using ELI?

ELI defines a number of properties to relate LegalResource or LegalExpression to each other. These links are organised in the following property hierarchy (inverse properties are not listed for clarity).

- eli:applies
  - eli:transposes
- eli:based_on
- eli:changes
  - eli:amends
  - eli:commences
  - eli:repeals
- eli:corrects
- eli:cites
- eli:consolidates
- eli:is_another_publication_of
- eli:related_to

Note that the semantic of eli:changes covers the notions of legal change, hence eli:corrects, used to describe the corrections of typos in the text, is not a subproperty of eli:changes.

If an assertion cannot be precisely expressed with one of the properties above you should use the generic link eli:related_to or eli:changes if it is a legal change, and contact the ELI Taskforce to describe your use case.

For more details, see the full documentation of the ELI ontology.

3.4.4. What are the properties common to the three levels eli:LegalResource, eli:LegalExpression and eli:Format?

Two properties are global in the ELI ontology and can be asserted on eli:LegalResource, eli:LegalExpression and eli:Format.

- eli:id_local indicates a corresponding identifier in an existing system (for example an existing identifier of a law, like NOR in France).
- eli:uri_schema indicates the URI template used to build the URI of the legal resource, legal expression or format. This is expressed using the URI template syntax, with components between '{' and '}', for example: http://example.eu/{typedoc}/{year}/{number}.

3.4.5. Why is the domain/range of some properties defined as (eli:LegalResource or eli:LegalExpression)?

The following properties can describe either an eli:LegalResource or an eli:LegalExpression.

- eli:relevant_for
- eli:jurisdiction
- eli:in_force
- eli:first_date_entry_in_force, eli:date_no_longer_in_force and eli:in_force
- eli:date_applicability
- eli:description
- eli:version and eli:version_date
- The following links:
  - eli:related_to
  - eli:changes and eli:changed_by
  - eli:basis_for
  - eli:cites
  - eli:consolidates and eli:consolidated_by
  - eli:commences and eli:commenced_by
  - eli:repeals and eli:repealed_by
  - eli:corrects and eli:corrected_by
  - eli:amends and eli:amended_by
  - eli:transposes and eli:applies

This is on purpose, since it allows the ELI model to accommodate different points of view on what should be considered a legal resource or a legal expression.

For example, a consolidated version can be viewed as new legal expression of the same legal resource representing the act. In that case, the consolidated version will be an instance of the class eli:LegalExpression, and an eli:consolidates property will be asserted on it to link to the modifiers or corrigenda being consolidated. But, depending on modelling choices, a consolidated version can be considered as a separate legal resource, distinct from the one representing the act. In that case, the consolidated version will be an instance of the class eli:LegalResource, and the eli:consolidates property will be asserted at this level.

3.4.6. Why are some properties duplicated as object and datatype properties (e.g. eli:publisher vs eli:publisher_agent?)

To allow data publishers to use a URI value when there is one available, or otherwise use a string value, while keeping the ELI ontology an OWL-friendly ontology.

This is the case for the following pairs or properties.

Datatype property	Object property
eli:publisher	eli:publisher_agent
eli:rightsholder	eli:rightsholder_agent
eli:published_in	eli:published_in_format
eli:responsibility_of	eli:responsibility_of_agent

Note that eli:passed_by has no datatype equivalent and thus requires a URI value. This is on purpose.

See also:

- Why does ELI use a custom annotation property to map to Dublin Core rather than rdfs:subPropertyOf?

3.4.7. What are the possible values for eli:in_force?

The ELI ontology defines a set of values for the property eli:in_force. These values are 'in force', 'partially in force' and 'not in force'. They are defined as SKOS concepts. They are summarised in the table below.

URI	Label
eli:InForce-inForce	in force
eli:InForce-notInForce	not in force
eli:InForce-partiallyInForce	authoritative

3.4.8. What are the possible values for eli:legal_value?

The ELI ontology defines a set of values for the property eli:legal_value. This property is asserted on eli:Format since the legal value depends on the (electronic) format of the document (a signed PDF does not have the same legal value as the HTML version of the same legislation). Possible values are 'unofficial', 'official', 'authoritative' and 'definitive'. They are defined as SKOS concepts, and organised hierarchically: the notion of being 'definitive' is more precise than the notion of being 'authoritative', which is itself a special case of being 'official'. They are summarised in the table below.

URI	Label	DEFINITION	SKOS:BROADER
eli:LegalValue-unofficial	Unofficial	Document has no particular or special standing.	*None*
eli:LegalValue-official	Official	Document is published by an organisation with the public task of making the information available (a consolidated version of an EU directive published by the Publications Office).	*None*
eli:LegalValue-authoritative	Authoritative	The publisher gives special status to the publication of the document. ('The Queen's Printer' version of a UK act of Parliament). This status is specific to the United Kingdom, where no text can be considered 'definitive'.	eli:LegalValue-official
eli:LegalValue-definitive	Definitive	Document for which the text is conclusively what the law says. (The digitally signed version of an Official Journal.)	eli:LegalValue-authoritative

3.4.9. What are the possible values for eli:language?

The eli:language property can use the values defined in the language authority table published by the Publications Office ([4]). ELI does not define a set of identifiers for languages. There is no need for Member States to declare their own identifiers for languages.

3.4.10. What are the possible values for eli:relevant_for and eli:jurisdiction?

The eli:relevant_for and eli:jurisdiction properties can use the values defined in the Administrative Territorial Unit table published by the Publications Office ([5]). Member States do not have to recreate their own list of values.

3.4.11. Why does ELI use a custom annotation property to map to Dublin Core rather than rdfs:subPropertyOf?

To allow object properties and datatype properties to be mapped to the same Dublin Core metadata.

ELI 1.0 used rdfs:subPropertyOf to map to Dublin Core. This has the following disadvantages.

- Since Dublin Core is not available as an OWL file it cannot be imported from the ELI ontology, thus the Dublin Core metadata needed to be redeclared within the ELI ontology.
- By doing so, ELI forces the Dublin Core metadata to be either datatype or object properties (because in OWL the two sets of properties are disjoint).
- A lot of inferences are automatically generated by reasoners, which are not necessarily useful in all situations.

In ELI 1.1 the rdfs:subPropertyOf links to Dublin Core have been replaced with a custom annotation property eli:isSpecificPropertyOf. Using this:

- ELI property pairs eli:rightsholder/eli:rightsholder_agent and eli:publisher/eli:publisher_agent can be mapped to their respective Dublin Core counterparts dct:rightsholder and dct:publisher;
- the Dublin Core metadata do not need to be redeclared within the ELI ontology, and ELI does not force a Dublin Core metadata to be interpreted as a datatype or an object property;

([4]) Language authority table of the Publications Office: http://publications.europa.eu/mdr/authority/language

([5]) Administrative Territorial Unit authority table of the Publications Office: http://publications.europa.eu/mdr/authority/atu

- reasoners cannot automatically infer the Dublin Core metadata from ELI, but it can be easily done with a single query by applications that need to do so.

3.5. Combining and extending the ELI ontology

3.5.1. I cannot find the property/class I need in ELI, but I know it exists in some other ontology. Can I use it in combination with ELI?

Yes. If the data you publish is not just about legal resources, but about other things that are outside of the scope of the ELI model, you can publish them using your own ontology(-ies) or well-known existing ontologies.

A typical example is if you want to publish the descriptions of the agents (persons or organisations) that passed or made the laws. ELI does not provide classes and properties for this, but you can use the FOAF ([6]) or ORG ([7]) vocabularies to publish them, alongside the legal resources descriptions.

Another typical use case of combining ELI with another ontology is to use properties from other vocabularies (e.g. Dublin Core) to assert, on legal resources, legal expressions or formats, additional information that are not covered by ELI.

3.5.2. I cannot find the property/class I need in ELI, or anywhere else. Can I extend ELI with my own property/class?

ELI is not a one-size-fits-all model for describing legal resources. It is perfectly fine to refine it with your own, more precise, semantic (although this is an advanced use case).

A typical example is to refine the eli:related_to generic property and create your own types of link between legal resources. You do that by first creating your own OWL ontology and importing the ELI ontology into it. You can then create your own property and declare it as a subproperty of eli:related_to. By doing so you will not lose the precise semantic of your data, and ELI-compatible systems will still be able to understand these links as eli:related_to.

([6]) FOAF: http://xmlns.com/foaf/spec/
([7]) ORG: http://www.w3.org/TR/vocab-org/

3.5.3. What is likely to change in/be added to ELI in the future?

Although there is no official commitment on the ELI ontology evolution, possible improvements on the ontology may include, without being limited to:

- new relationships between pieces of legislation;
- better handling of the eli:format property with respect to printed/paper versions of a piece of legislation;
- extension of ELI to draft legislation;
- extension of ELI to documents related to legislation (opinions, preparatory documents, etc.).
- in addition, some range constraints on datatype properties may change.

As any evolution proposal requires the collective agreement of all the members of the ELI Taskforce, there is no commitment as to their implementation.

4. ELI metadata publication

4.1. Implementing the ELI ontology in my context

4.1.1. What should I identify in the context of ELI?

In order to implement ELI, you should as a minimum give an identifier to the pieces of legislation that fall within the scope of ELI (it is OK to implement ELI for only part of the legislation). These pieces of legislation will actually be decomposed into three identifiers corresponding to the three levels of the ELI ontology skeleton.

- An identifier for the LegalResource corresponding to the intellectual content of the document.
- One or more identifiers for the LegalExpression(s) of the document.
- One or more identifiers for the Format(s) of each expression of the document.

Additionally, you can also choose to identify 'abstract' LegalResources. Such resources would represent a single piece of legislation, but independently from any of its temporal versions. As such this is an abstract notion and does not correspond to any real-world physical objects.

Additionally, in a more advanced ELI deployment, you can also identify the subparts of the documents, such as articles and paragraphs.

See also:

- How can legal resources be grouped together (physically or logically)?
- What is an 'abstract legal resource'?
- What is the recommended way to describe a subdivision of a legal act in ELI, like a section or article?

4.1.2. What should I consider a LegalResource and what should I consider a LegalExpression?

It depends. The question arises principally regarding the consolidation of laws. A 'LegalResource' represents the intellectual content of a document, and a 'LegalExpression' represents the realisation of that intellectual content in the form of a sequence of signs. Given these definitions, you can choose to do either of the following things.

1. Consider that the consolidated versions of a law represent the same intellectual content, with different sequences of signs. In this case consolidations would be LegalExpressions of the same LegalResource.
2. Consider that the consolidated versions of a law each have a distinct intellectual content, and consider them as distinct LegalResource. In this case you can also link these LegalResources to an 'abstract' LegalResource representing the document independent of its temporal version using eli:has_member and eli:is_member_of.

When the legislative system is multilingual, scenario 1 above needs to be considered with care, since LegalExpressions are in this case used to identify the various translations of a document, and will at the same time be used to identify the temporal version of a document.

See also:

- How can legal resources be grouped together (physically or logically)?

4.1.3. My legal resources are all monolingual. Should I still use the FRBR distinction between a LegalResource and a LegalExpression?

Yes. Even if they are unofficial, you may have translations of some of your laws in other languages. Others may also provide translations of your laws, thus creating a new LegalExpression of your LegalResource. The distinction between the Legal Resource and Legal Expression levels is important to create future links to the correct notion.

4.1.4. I want to link to an EU directive with eli:transposes or eli:applies. Should I refer to the LegalResource of the EU directive or to one of its language-specific LegalExpressions?

It is the directive itself that is transposed, not one of its language variants. So, when using eli:transposes or eli:applies to assert that a piece of legislation transposes or implements a directive, the link must re-

fer to the ELI identifying the LegalResource of the directive, not to an ELI identifying one of its language-specific LegalExpressions.

4.1.5. ELI ontology defines inverse properties (eli:changes/eli:changed_by, eli:realizes/eli:is_realized_by, etc.). Should I express the information both ways, or can I express it in only one way?

If it is technically easy to do, try to add the information both ways: you will make the work of data consumers a little easier. But this should not be an absolute requirement, and if for any reason you can express the relationship in only one way this is still valid.

4.1.6. What is the recommended way to describe a subdivision of a legal act in ELI, like a section or article?

- Give an ELI URI to each of the subdivision you need to identify.
- Use the class eli:LegalResourceSubdivision as the type of resource.
- Optionally, use eli:number to describe the number of the section or the article.
- Use eli:is_part_of to link the subdivision to the whole act URI and/or to its parent subdivision in the text.
- Since eli:LegalResourceSubdivision is a subclass of eli:LegalResource, you can use any other ELI metadata to further refine the description of the subdivision (indicate relevant area, date of entry into force for the article, etc.).

See also:

- How do I create ELIs for subdivisions (articles and paragraphs)?

Firefox https://op.europa.eu/flexpaper/common/split_document.jsp?doc=8159b7...

4.2. Defining my own controlled values for ELI properties

4.2.1. What are the lists of values I need to define?

According to the ELI ontology, Member States need to provide their own identifiers for the values of the following properties.

- eli:type_document: identifiers for possible document types in the legislative system.
- eli:passed_by: identifiers for agents and organisations that pass or made the laws (typically ministries).
- eli:version: identifiers for specific states of the law in the legislative process, such as 'proposed', 'consolidated', 'signed', 'published', etc.

4.2.2. How can I define my own lists of values?

You can define your list of values using SKOS. Each value should have at least a URI identifier and a label. Additionally, each value can also have translations in other languages, synonyms or can be organised hierarchically with other values.

The easiest way to start with these lists is to create an Excel spreadsheet with two columns — URI and label — for each of the lists you need to define.

An ELI annotation tool has been developed to help you to create and publish these controlled lists. This annotation tool can be found on the ELI registry: http://eur-lex.europa.eu/eli-register/resources.html

See also:

- What is SKOS and why is ELI based on it?
- What is the ELI annotation tool?

4.2.3. How can I publish and advertise the lists of values I define? Which tool can I use?

Typically you can:

- create one HTML page for each list;
- give the values of that list in an HTML table in that page, with associated definitions or code for each values, if present;
- propose a SKOS version of the list values for download.

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As a source of inspiration, you can have a look at what the Publications Office is doing for its authority tables ([8]).

Page and SKOS file templates may be provided in the future to make the publication of these lists easier.

The ELI annotation tool also provides a feature to publish HTML pages from controlled vocabularies in SKOS.

See also:

- What is the ELI annotation tool?

4.3. Using RDFa to disseminate my metadata

4.3.1. What is the recommended way of disseminating ELI metadata?

ELI recommends publishing ELI-compatible metadata using the RDFa syntax within the existing HTML pages of the law-publishing portal. With RDFa (RDF in [XML] Attributes) you can add **semantic** markup to the HTML formatting markup. This solution:

- avoids duplicating the information (in the page header or in a separated file) if it is already presented in the page;
- has little impact on existing publishing systems since it can be implemented by updating the HTML generation templates without modifying the entire publishing workflow.

See also:

- Besides RDFa are there other means of disseminating ELI metadata?

4.3.2. Where can I learn more about RDFa?

The recommended reading to start learning about RDFa in general is the RDFa primer published by the W3C ([9]).

The RDFa Core specification ([10]) can be worth referring to when in doubt about the result of an RDFa markup.

You can search for translations of these documents in your language in the W3C translation database ([11]).

([8]) Publications Office authority tables: http://publications.europa.eu/mdr/authority/
([9]) RDFa Primer: http://www.w3.org/TR/xhtml-rdfa-primer/
([10]) RDFa Core specification: http://www.w3.org/TR/rdfa-core/
([11]) W3C translation database for RDFa: http://www.w3.org/2005/11/Translations/Query?titleMatch=rdfa&lang=any&search1=Submit

The rdfa.info portal ([12]) is also a good entry point, listing tools and distillers that can take RDFa input and convert it to other RDF formats and validators of RDFa markup.

See also:

- What is content negotiation?
- Where can I search for tools and technologies on semantic web in general?

4.3.3. Do I need RDFa Lite or RDFa Core?

RDFa comes in two flavours: RDFa Lite and RDFa Core. RDFa Lite is a small and simple subset of RDFa Core, using only five attributes and covering simple data-structuring use cases. Yet, marking up ELI metadata will very probably go beyond what is possible with RDFa Lite and require some features from RDFa core.

4.3.4. How can I test if my RDFa markup is correct?

The easiest option is to use the W3C RDFa validator ([13]), which will check whether the markup is correct and produce a validation report.

You can also use the 'distiller' service ([14]) to turn your RDFa markup into a set of RDF triples and see if the content is correct according to the ELI ontology.

These tools can validate the conformance of your RDF syntax in a generic way but cannot validate the actual content of the markup against the ELI ontology. To do so you should use the ELI validator service.

See also:

- Which tools can I use to visualise the graph of RDF triples encoded in a page?
- Which RDFa programming library can I use to parse RDFa metadata?
- Where can I search for tools and technologies on semantic web in general?
- Which tool can I use to check if my ELI metadata is correct?

([12]) RDFa info portal: http://rdfa.info/
([13]) W3C RDFa validator: http://www.w3.org/2012/pyRdfa/Validator.html
([14]) W3C RDFa distiller service: http://www.w3.org/2012/pyRdfa/

4.3.5. Which tool can I use to check if my ELI metadata is correct?

Use the ELI validator accessible at: http://eur-lex.europa.eu/eli-register/resources.html

See also:

- What is the ELI validator?

4.3.6. The structure of my HTML pages is complex and does not allow easy RDFa tagging. What are possible workarounds?

You can do either of the following things.

1. Add all the RDFa markup right after the <body> tag, without impacting the HTML page structure. This solution requires that, in the publishing process, you have access to all the metadata information allowing this RDFa part to be built (see Section 4.3.5 and the page examples provided).
2. Use an alternative technology to disseminate your ELI metadata (see Section 4.4.5).

See also:

- Besides RDFa are there other means of disseminating ELI metadata?

4.3.7. Should the content of the text itself be tagged in RDFa?

Not usually. Only the metadata part of the page is interesting for conveying ELI metadata. The text of the legislation itself does not need to be tagged.

4.3.8. Which RDFa programming library can I use to parse RDFa metadata?

The rdfa.info portal lists some possible libraries to use.

- In Java you can use Semargl ([15]).
- In PHP you can use EasyRDF ([16]).
- In C look at librdfa ([17]).
- In Python look at PyRDFa ([18]), which is the library used by the W3C RDFa validator.

([15]) Semargl: https://github.com/levkhomich/semargl
([16]) EasyRDF: http://www.easyrdf.org/
([17]) Librdfa: https://github.com/rdfa/librdfa/
([18]) PyRDFa: http://www.w3.org/2012/pyRdfa/Overview.html#distribution

4.3.9. Which tools can I use to visualise the graph of RDF triples encoded in a page?

Viewing a raw RDF graph 'as is', with each triple represented as an arrow, usually does not produce a satisfying result (in the same way as viewing a relational database content by showing directly the tables and columns is not the best way to display it).

That being said, producing a visual graph from RDF triples can be useful to help others understand the underlying information structure contained inside the web page.

- A straightforward way to show a simple, non-customisable graph of the RDFA-encoded triples within a page is to use the 'Green Turtle' plugin ([19]) for the Chrome browser.
- A tool with more features is Welkin ([20]). You can customise the graph a little. You should pass the RDF extracted from the RDFa markup using a parser like the W3C distiller service.
- Probably the most comprehensive tool to design graph images is Gephi ([21]), enhanced with its 'SemanticWebImport' plugin to read RDF files, but it has a steep learning curve.
- Note that the ELI validator is able to parse the RDFa markup of web pages, and offers the ability to download the parsed RDF triples so they can be integrated and displayed in another application.

See also:

- What is the ELI validator?

4.4. Beyond RDFa: the dissemination process

4.4.1. My publication process relies on XML. Can I embed ELI metadata inside XML documents?

Yes. The ELI/XML schema is provided for that purpose. Basically you can import the ELI XSD schema into your own XML structure and add the corresponding ELI metadata into your XML. XSLT stylesheets are then provided to generate ELI RDFa markup or RDF/XML files from the ELI XML metadata.

See also:

- What is ELI/XML?

([19]) Green Turtle Chrome browser plugin: https://chrome.google.com/webstore/detail/green-turtle-rdfa/loggcajcfkpdeoaeihcldihfefijjam
([20]) Welkin: http://simile.mit.edu/welkin/
([21]) Gephi: http://gephi.github.io/

4.4.2. We do not have structured metadata associated to our legislation files. Can we create ELI notices by hand?

Yes. The ELI annotation tool is provided to create ELI metadata notices by hand. The tool generates basic HTML notices pages with the proper ELI RDFa metadata embedded inside. See the corresponding section below.

See also:

- What is the ELI annotation tool?

4.4.3. ELI is RDF. Do I need an RDF database (triplestore) to publish ELI metadata in RDF?

No. Adding RDFa markup to encode structured metadata in web pages does not require an RDF database to be used in the publishing process. It is merely a question of modifying the page-generation templates to add the new markup.

There are other ways of disseminating RDF data, such as providing RDF files for download or giving access to the data using the SPARQL query language, that may require use of an RDF database. A detailed analysis of content publication and data dissemination scenarios is required to determine whether an RDF database can bring value to your publishing system.

4.4.4. Should I use a redirect or a forward to implement ELI URI access?

If possible, it is better to use URL forwarding so that the ELI remains visible in the address bar of the user. Using a redirect from the ELI URI to the original URL does not keep the ELI visible.

However, using URL forwarding may be more complicated with respect to relative links. Since ELI URIs have a hierarchical structure of components that will certainly be different from the original portal URLs, relative links included in the HTML page code can be broken.

4.4.5. Besides RDFa are there other means of disseminating ELI metadata?

Yes. JSON-LD ([22]) is a different syntax to encode structured data within web pages, in the form of JSON data structures inside '<script>' tags. This is the newest way of mixing structured (RDF) data and content. As such it may be more 'developer friendly', but might lack support in the various tools for the moment.

([22]) JSON-LD: http://www.w3.org/TR/json-ld/

Firefox https://op.europa.eu/flexpaper/common/split_document.jsp?doc=8159b7...

Beyond including structured data directly in the web page content in RDFa or JSON-LD, it is also possible to:

- bundle the ELI metadata for the entire legislation in one or a few RDF files, and provide these files for download;
- store the ELI metadata for the entire legislation in an RDF database, and provide public access to this database using the SPARQL query language ([23]) so developers can query the metadata directly;
- use the content negotiation mechanism to return either an HTML page or an RDF document for the same URI, based on client preferences expressed in HTTP headers.

Note that these ways of disseminating ELI metadata are not officially recommended by the ELI Taskforce. RDFa remains the recommended way of disseminating ELI metadata.

See also:

- What is content negotiation?
- What is schema.org and what is the legal.schema.org extension? How can I use them? What are the benefits?

4.4.6. What is content negotiation?

The content negotiation mechanism ([24]) is a way for a single URI to return different 'representations' of that URI (i.e. different result pages) depending on client preferences. These preferences could typically be the client's preferred language (e.g. 'I prefer English, but I can just about get by in French'), or the client's preferred file format (e.g. 'I would like HTML, but if you don't have then it is OK if you have RDF/XML').

The client expresses its preferences using HTTP headers in the request it sends to the server. The request typically looks like the following:

```
GET  /eli/dir/2015/1234 HTTP/1.1
Accept: application/xml; q=0.8, text/html;q=0.9,*/*
Accept-Language: en,fr;q=0.8,fr-FR;q=0.5,en-US;q=0.3
```

In practice, for ELI, this means a single ELI URI could return either an HTML page marked up with RDFa if the client accepts HTML (which is the case for all web browsers) or a technical RDF file containing

([23]) SPARQL query language: http://www.w3.org/TR/sparql11-query/

([24]) Content Negociation mechanism: http://www.w3.org/TR/ld-glossary/#content-negotiation

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only the ELI metadata expressed in RDF if the client has expressed a preference for RDF files.

Implementing content negotiation is not required in ELI; it is an alternative way of disseminating ELI metadata.

4.4.7. Where can I search for tools and technologies on semantic web in general?

A collection of general semantic web development tools is maintained by the World Wide Web Consortium as part of its semantic web activity ([25]).

Professional developers from Cambridge have set up Linked Data Tools ([26]) to provide developers with tools and know-how to use the semantic web, with a set of tutorials for various aspects of semantic web development.

Validation of RDF data can be done using the RDF validator hosted by the World Wide Web Consortium ([27]). The data can be submitted either by providing a URI that points to RDF data or by pasting RDF data into a text box.

Originally initiated by Google under the name of Google Refine, OpenRefine ([28]) is an open-source tool used to clean, transform and link data. An extension to create RDF, RDF Refine is available for download.

4.4.8. What is schema.org and what is the legal.schema.org extension? How can I use them? What are the benefits?

Schema.org ([29]) is a vocabulary (a 'lightweight ontology') used to publish structured metadata in web pages that will be understood by search engines. It is the vocabulary to use if you want to ensure that major web search engines will 'understand' the data inside a web page. Structured data expressed using the schema.org vocabulary is typically what enables search engines to display 'rich snippets' in a search result page, for example to give the rating of a blog post or the cooking time of a recipe.

Schema.org is a collaborative effort: anyone can propose enhancements to the vocabulary.

([25]) Semantic web development tools: http://www.w3.org/2001/sw/wiki/Tools
([26]) Linked Data Tools: http://www.linkeddatatools.com/
([27]) RDF validator: http://www.w3.org/RDF/Validator/
([28]) OpenRefine: http://openrefine.org/
([29]) Schema.org: http://schema.org

Firefox https://op.europa.eu/flexpaper/common/split_document.jsp?doc=8159b7...

Previously, nothing existed in the schema.org vocabulary to describe a legal act. In accordance with its objective of making legislation more visible on the web as a whole, the ELI Taskforce decided to propose an extension to the schema.org vocabulary ([30]) to describe a legislation document. The ELI ontology was compared to the schema.org vocabulary, and properties that did not exist in schema.org were proposed in the extension. The extension is now publicly available ([31]).

If you want to make your legislation metadata understandable by both ELI partners and major web engines you need to embed structured metadata expressed both in the ELI ontology in RDFa and in schema.org (using the extension), in either RDFa, JSON-LD or Microdata. See the markup examples included in the extension.

Note that you will not see any immediate benefit in search-engine rankings, or in the display of the search engine results on your web pages. How the web search engines use the schema.org metadata remains opaque, and they are free to read/interpret/use only a small percentage of what is described using the schema.org vocabulary.

See also:

- What is the ELI annotation tool?

4.5. ELI tools

4.5.1. What is the ELI validator?

The Eli validator ([32]) is an online service that can be used to parse the RDFa markup of an HTML web page (either available online or by entering its HTML code) and validate its conformance against the ELI ontology.

The validator produces a report that allows the validity of an RDFa markup to be assessed against the ELI ontology. Validation rules are broken down into the following three levels.

- 'Info': informative messages give hints to improve the quality of the ELI metadata, while not being hard constraints from the ELI ontology, strictly speaking. Typically, eli:is_about can use Eurovoc URIs as values, but this is indicative only.
- 'Warning': warning messages are constraints derived from the ELI ontology that would not prevent a data consumer from 'un-

([30]) Proposed Legislation extension to schema.org: https://github.com/schemaorg/schemaorg/issues/1156

([31]) Public Legislation extension: http://pending.schema.org/Legislation

([32]) ELI validator: http://eur-lex.europa.eu/eli-register/resources.html

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derstanding' the data. Typically, constraints on the datatypes of some values are encoded as warnings.

- 'Violations': violations are constraints derived from the ELI ontology that would prevent a data consumer from correctly 'understanding' the data. Typically, domain and ranges constraints are violations.

See the ELI validator online documentation for more details.

4.5.2. What is the ELI annotation tool?

The ELI annotation tool ([33]) is an application allowing organisations in charge of the official publication of legal resources to identify and describe those legal resources conforming to the ELI standard and to make this description available on the web using structured data embedded in HTML pages.

The application answers the needs of official journals and other organisations publishing legal resources that have no, or scarce, metadata management for their contents.

ELI annotation tool has the following two main functional components.

- Administration of the data model and controlled vocabularies.
- Editing and publishing of legal resources metadata.

The administration of the data model and controlled vocabularies is mainly used to customise the application for local needs, both by customising the ELI URI naming convention — the ELI model — and by managing some local controlled vocabularies.

The editing and publishing component helps the user to describe a legal resource with ELI metadata and to publish an HTML page with metadata for human users, RDFa metadata for harvesting by third parties and JSON-LD metadata that conform to schema.org to help referencing of the legal resources by web search engines and local search engines.

See the application documentation for more details.

See also:

- What is schema.org and what is the legal.schema.org extension? How can I use them? What are the benefits?

([33]) ELI annotation tool: http://eur-lex.europa.eu/eli-register/resources.html

4.5.3. What is ELI/XML?

ELI/XML ([34]) is an XSD schema for expressing ELI metadata in XML documents. It is not part of the 'official' ELI specification, like the ELI ontology, and is provided only as a 'helper' for generating and publishing ELI metadata that conform to the ontology. It helps integrate ELI metadata into XML-based production systems, and is not intended for publishing ELI metadata on the web.

The ELI/XML format hides the (relative) complexity of the RDF fundamentals. The following points should be noted.

- In ELI/XML the order of the ELI metadata in the XML is mandatory: they must be listed in alphabetical order (e.g. from eli:amended_by to eli:version_date);
- XML elements corresponding to LegalResource, LegalExpression and Format are embedded in an XML hierarchy, thus making it unnecessary to state FRBR structure metadata (e.g. eli:realized_by, eli:embodied_in, etc.).
- Controlled values are provided for eli:in_force and eli:legal_value.

([34]) ELI/XML schema: http://eur-lex.europa.eu/eli-register/resources.html

Below is a short example of an ELI/XML document.

```
<eli:LegalResource eli:URI='http://data.europa.eu/eli/dir/1980/181/oj'
     eli:in_force='InForce-inForce'
     xsi:schemaLocation='http://data.europa.eu/eli/ontology# elixml-v1.xsd'
     xmlns:xsi='http://www.w3.org/2001/XMLSchema-instance'
     xmlns:eli='http://data.europa.eu/eli/ontology#'>
 <eli:based_on eli:URI='http://publications.europa.eu/resource/authority/
treaty/TEEC_1957'/>
 <eli:date_document>1979-12-20</eli:date_document>
 <eli:date_publication>1980-02-15</eli:date_publication>
 <eli:first_date_entry_in_force>1979-12-21</eli:first_date_entry_in_force>
 <eli:id_local>31980L0181</eli:id_local>
 <eli:is_about eli:URI='http://eurovoc.europa.eu/1896'/>
 <eli:is_about eli:URI='http://eurovoc.europa.eu/2159'/>
 <eli:is_about eli:URI='http://eurovoc.europa.eu/2897'/>
 <eli:passed_by eli:URI='http://publications.europa.eu/resource/authority/
corporate-body/CONSIL'/>
 <eli:type_document eli:URI='http://publications.europa.eu/
resource/authority/resource-type/DIR'/>
 <eli:LegalExpression eli:URI='http://data.europa.eu/eli/dir/1980/181/
oj/ell'
      eli:in_force='InForce-inForce'
      eli:language='ELL'>
 <eli:title>Οδηγία 80/181/ΕΟΚ του Συμβουλίου της 20ής Δεκεμβρίου 1979
περί προσεγγίσεως των νομοθεσιών των κρατών μελών των αναφερομένων στις
μονάδες μετρήσεως και καταργήσεως της οδηγίας 71/354/ΕΟΚ</eli:title>
 <eli:Format eli:URI='http://data.europa.eu/eli/dir/1980/181/oj/ell/html'
    eli:format='text/html'>
  <eli:is_exemplified_by eli:URI='http://publications.europa.eu/resource/
celex/31980L0181.ELL.html.31980L0181el.html'/>
  <eli:publisher>http://publications.europa.eu/resource/authority/corporate-
body/PUBL</eli:publisher>
 </eli:Format>
 </eli:LegalExpression>

</eli:LegalResource>
```

See the ELI/XML XSD schema for more details.

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