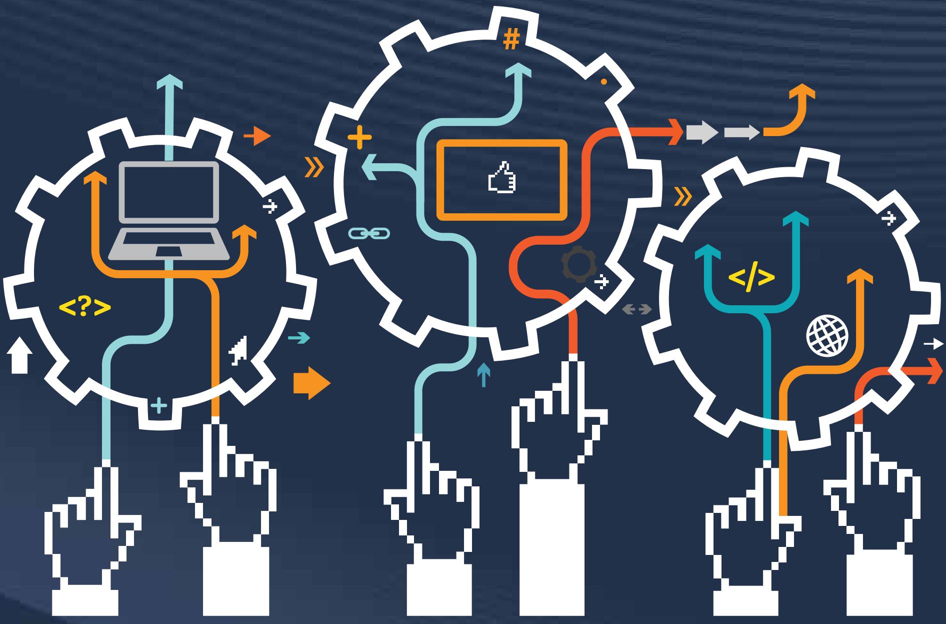
ELI

A technical implementation guide

Author, **ELI Task Force**



Publications Office

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

- ELI uniform resource identifier (URI) identifiers
- ELI ontology
- ELI metadata publishing
- ELI use-cases in annexes.

Target audiences are developers or project managers who need to implement the ELI model in their legal publishing system.

More information on the European Union is available on the internet (http://europa.eu).

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Contents

Foreword

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

The ELI Task Force 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.

At the time of publication, the task force was made up of Denmark, Ireland, France, Luxembourg (chair), the United Kingdom and the Publications Office of the European Union.

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

1 Introduction and scope of the document

1.1 Intended audience

The European legislation identifier (ELI) model is an initiative to improve access to European legislation and to the legislation of its Member States.

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

1.2 How to read this document

This document is written as frequently asked questions (FAQ). 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 ELI implementations in a few Member States.

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

- **European legislation identifier uniform resource identifier**
- **European legislation identifier ontology** (data model)
- **European legislation** identifier 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.

1.3 Uniform resource identifier abbreviations used in this document

Full uniform resource identifiers (URIs) are cited in the text of this document in monospace font, enclosed by angle brackets, e.g. `<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.

UNIFORM RESOURCE IDENTIFIER (URI)	ABBREVIATION
http://data.europa.eu/eli/ontology#	eli:
http://www.w3.org/1999/02/22-rdf-syntax-ns#	rdf:
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 European legislation identifier uniform resource identifiers

2.1 Understanding European legislation identifier uniform resource identifiers

2.1.1 What is a uniform resource identifier? What is the difference from a uniform resource locator?

A uniform resource identifier (URI) serves to **identify** things on the web: documents, people, concepts, areas, etc. Anything (from the real world) can be identified by a URI.

A uniform resource locator (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 URI 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 into the address bar of your browser, you may get an hypertext transport/transfer protocol (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 the European legislation identifier (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, URI are said to be constructed using components; a URI component is a piece of information used as part of the URI, such as {year}, {type_document}, {language}, etc. Components are usually separated by '/', e.g. http://exemple.eu/eli/{type_document}/{year}/{language}.

See also:

- What should I identify in the context of the European legislation identifier (ELI)? (Section 4.1.1.)
- Should I use a redirect or a forward to implement European legislation identifier (ELI) uniform resource identifier (URI) access? (Section 4.4.2)

2.1.2 How to forge European legislation identifiers?

There are some guidelines to follow when creating URIs in the context of the European legislation identifier (ELI).

- Create identifiers that are close to how your users cite legislation; do not use opaque or obscure identifiers that no one will understand; the identifier should be readable by end users.
- Create identifiers with components that are stable over time. A typical counter-example 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 work around or 'hack' the URI by removing components from it (typically by removing the last components).

See also:

- What are examples of European legislation identifier (ELI) uniform resource identifiers (URIs)? (Section 2.1.5.)
- Which components can I use to forge European legislation identifiers (ELI)? (Section 2.2.1.)

2.1.3 How can I use alias uniform resource identifiers? What is the benefit?

We can distinguish two types of ELIs as follows.

1. **Canonical uniform resource identifiers (URIs)**: the official URI to identify a resource. Typically this URI would be used as the subject of the resource description framework (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 exists.
2. **Alias URIs**: other URIs to refer to resources which 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: 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 who 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 is http://legifrance.gouv.fr/eli/loi/2014/10/13/AGRX1324417L/jo/texte and http://legifrance.gouv.fr/eli/loi/2014/10/13/2014-1170/jo/texte is the alias.

See also:

- What are examples of European legislation identifier (ELI) uniform resource identifiers (URIs)? (Section 2.1.5.)

2.1.4 What are incomplete European legislation identifiers? What should the associated behaviour be?

Full European legislation identifier (ELI) URIs (canonical or alias) serve as identifiers for legislation. Furthermore, it is desirable that these URI show 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 find their way in legislation more easily.

For example, the Publications Office of the European Union (Publications Office) 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 European legislation identifier uniform resource identifiers?

The European legislation identifier (ELI) patterns given below should not be regarded as a full documentation of the ELI of each institution but serve as an illustration of how ELIs can be defined. Special cases do apply for each of the given patterns.

Publications Office

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

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).

France

- `/eli/{type}/{year}/{month}/{day}/{natural identifier}/{version}/{level}/{point in time}/fr/{format}`: a canonical identifier for texts except codes.
- `/eli/{type}/{year}/{month}/{day}/{natural identifier}/{version}/texte/{point in time}`: a shortcut for the hypertext markup language (HTML) version of the text.

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

Luxembourg

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

2.1.6 Where will the European legislation identifier schemes be published?

The Publications Office will keep a registry of the Member State European legislation identifiers (ELI) identifier schemes that have been implemented.

2.2 European legislation identifier: building uniform resource identifiers

2.2.1 Which components can I use to forge European legislation identifiers?

The European legislation identifier (ELI) proposes to use the following components to create uniform resource identifiers (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.

EUROPEAN LEGISLATION IDENTIFIER 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}: 4 digit. {month} and {day}: 2 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 Section 2.2.3.	Reference to a subdivision, or smaller subdivision of legislation (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 European legislation identifier (ELI) only recommends 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 (International Organisation for Standardisation (ISO)-639-1).	To distinguish different linguistic variants of a legislation.
{format}	A file format such as portable document format (PDF) or hypertext markup language (HTML).	Note that the Council conclusions inviting the introduction of the European Legislation does not list this component explicitly, but it is always part of the European legislation identifiers (URIs) to identify the eli:Format level.

See also:

- What should I identify in the context of the European legislation identifier (ELI)? (Section 4.1.1.)

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

The European legislation identifier (ELI) explicitly recommends using three-letter codes for the {language} component when building ELI URIs (International Organisation for Standardisation (ISO)-639-2). See the code list ([1]) for the 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 be implemented from one to the other.

2.2.3 How should I create European legislation identifiers for subdivisions (articles and paragraphs)?

When crafting European legislation identifiers (ELIs) for subdivisions, one needs to combine a code which identifies the subdivision type (section, article, paragraphs, 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 (forward)slash, like the other components in the uniform resource identifier; e.g. /eli/law/2015/123/article/3/paragraph/2.
2. Concentrate the subdivision type and its number in a single component, using another separator, typically underscore '_'; e.g. /eli/law/2015/123/article_3/paragraph_2.

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

See also:

- What are incomplete European legislation identifiers (ELI)? What should the associated behaviour be? (Section 2.1.4.)

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

3 European legislation identifier ontology (data model)

3.1 European legislation identifier ontology overview

3.1.1 What is the European legislation identifier ontology?

The European legislation identifier (ELI) ontology defines a core model for describing legal resources which is aimed at supporting the linked data publishing of the legal resource metadata, specifically across the European Union. It is based on the functional requirements for bibliographic records (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 not the European legislation identifier ontology? (Section 3.1.4)

3.1.2 What is the European legislation identifier ontology namespace?

http://data.europa.eu/eli/ontology#, usually abbreviated by the prefix `eli:`.

3.1.3 What is the rationale behind the European legislation identifier ontology?

The European legislation identifier (ELI) ontology is a model for sharing legal resource metadata across the web. As such, it tries to be:

- **flexible** to accommodate the different point of view of the various European legal systems;
- **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, web ontology language (OWL)) and vocabularies (FRBR, simple knowledge organisation system (SKOS), Dublin core);

3.1.4 What is not the European legislation identifier ontology?

The European legislation identifier (ELI) ontology is not either of the following.

- The definitive model to describe legal resources; it is the result of compromises for the purpose of publishing metadata about legal resources on the web, and as such it makes simplifications to the attributes and relations used; other data models (those 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 European legislation identifier ontology based on English terms? Why is it not multilingual?

The European legislation identifier (ELI) URIs are technical identifiers. As such, they should be unique for 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 since other semantic web vocabularies already use English words as the basis for their identifiers, and it was a language shared by all the members of the ELI Task Force.

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

3.2 Other ontologies reused by the European legislation identifier

3.2.1 What are the functional requirements for bibliographic records and why is the European legislation identifier based on them?

Functional requirements for bibliographic records (FRBR) are a conceptual model created by library experts, and the model separates the information attached to a record in the following 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 in FRBR:

- item
- manifestation
- expression
- work.

FRBR is a conceptual model (i.e. on paper) and it is implemented in the resource description and access (RDA) vocabularies. RDA defines URIs for classes and properties of FRBR. The European legislation identifier (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 permits the following.

- To create links to or from a precise description level to an electronically-signed national official journal, a given consolidated version of a text, or the text in general.
- To factor some information and not repeat other information e.g. the type of the document (directive) for every single format of it (portable document format (PDF), print, HTML, extensible hypertext markup language (XHTML), etc.): the type of document is a property expressed at the work, and is not repeated for each manifestation.

See also:

- What is an eli:LegalResource? (Section 3.3.1.)
- What is an eli:LegalExpression? (Section 3.3.2.)
- What is an eli:Format? (Section 3.3.3.)
- My legal resources are all monolingual. Should I still use the functional requirements for bibliographic records (FRBR) distinction between a LegalResource and a LegalExpression? (Section 4.1.3.)

3.2.2 What is Dublin core and why is the European legislation identifier based on it?

The Dublin-core-metadata terms are a set of 55 metadata attributes that can be used to describe web resources (video, images, web pages, etc.), as well as physical resources such as books or CDs, and objects such as works of art. It covers generic notions such as creator, date, rights, etc.

The European legislation identifier (ELI) refines and extends the Dublin-core terms with its own, more precise, semantic terminology. For example, the Dublin-core metadata of alternative (title) is refined by the

ELI properties `eli:title_alternative` and `eli:title_short`, or the Dublin-core metadata relation is refined by the ELI properties `eli:transposes`/`eli:transposed_by`, `eli:cites`/`eli:cited_by` and all the other relations in ELI.

This refinement mechanism makes the model easier to understand and allows Dublin-core aware tools to understand ELI metadata at the Dublin-core level even if the tools do not understand the precise ELI semantic terminology.

See also:

- What are the important properties in the European legislation identifier ontology?

3.2.3 What is the simple knowledge organisation system and why is the European legislation identifier based on it?

Simple knowledge organisation system (SKOS) is a data model to structure controlled vocabularies, thesauri, authority tables, etc. Central in SKOS is the notion of concept, 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 the list of possible values open. 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? (Section 3.4.6.)
- What are the possible values for eli:legal_value? (Section 3.4.7.)
- What are the lists of values I need to define? (Section 4.2.1.)

3.3 European legislation identifier backbone classes

3.3.1 What is an eli:LegalResource?

A legal resource is a distinct intellectual creation (i.e. the 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, such as an article.

See also:

- What should I consider a LegalResource, and what should I consider a LegalExpression? (Section 4.1.2.)
- How can legal resources be grouped together? (Section 3.3.4.)

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, it can be any version of the legal resource whose content is specified and which is different from others for any reason: e.g. language, versions.

Legal expressions must be linked to the legal resource they express using the `eli:realises` property. A legal expression cannot exist without being linked to one and only one legal resource, and the `eli:realises` property is mandatory.

See also:

- What should I consider a LegalResource, and what should I consider a LegalExpression? (Section 4.1.2.)
- My legal resources are all monolingual. Should I still use the functional requirements for bibliographic records (FRBR) distinction between a LegalResource and a LegalExpression? (Section 4.1.3.)

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 (extensible hypertext markup language (XML), tagged image file format (TIFF), PDF, etc.); e.g. the 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? (Section 3.4.7.)

3.3.4 How can legal resources be grouped together?

The European legislation identifier (ELI) provides two generic properties `eli:has_part` and `eli:is_part_of` to include legal resources in other legal resources. This covers the use-cases of:

- structural relations, such as when a legal resource is included in a national official journal;
- temporal relations, such as when the consolidated version of an act is viewed as a legal resource and considered part of the generic act.

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

Future versions of the ELI ontology may refine this relation with two distinct properties.

See also:

- What should I consider a LegalResource, and what should I consider a LegalExpression? (Section 4.1.2.)

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 lifecycle. 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_part` and `eli:is_part_of` properties. The header under which the legal resources are grouped represents 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 European legislation identifier properties

3.4.1 What are the mandatory properties in European legislation identifier?

Only a few European legislation identifier (ELI) properties are actually mandatory. It is mandatory to assert at least:

- the `eli:type_document` on an `eli:LegalResource`;
- the `eli:realises` 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`.

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

3.4.2 What are the important properties in the European legislation identifier ontology?

Although only a few properties are (strictly speaking) mandatory in the European legislation identifier (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 European laws.
- `eli:is_about`: indicate the subjects of the legislation, preferably expressed using the Eurovoc thesaurus [2].
- `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 you should refer to the full documentation of the ELI ontology.

See also:

- I want to link to an EU directive with eli:transposes or eli:implements. Should I refer to the LegalResource of the EU directive, or to one language-specific LegalExpression? (Section 4.1.4.)

[2] Eurovoc thesaurus (http://eurovoc.europa.eu).

3.4.3 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, such as the 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://exemple.eu/{typedoc}/{year}/{number}`.

3.4.4 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:in_force`
- `eli:first_date_entry_in_force` and `eli:date_no_longer_in_force`
- `eli:related_to`
- `eli:changes` and `eli:changed_by`
- `eli:basis_for`
- `eli:cites`
- `eli:consolidates` and `eli:consolidated_by`
- `eli:transposes`
- `eli:description.`

This is done 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 in order 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.

3.4.5 Why is the range of some properties defined as (xsd:anyURI or xsd:string)?

The following properties can take as a value either a string (xsd:string) or a URI (xsd:anyURI):

- `eli:id_local`
- `eli:published_in`
- `eli:rights`
- `eli:rightsholder.`

This indicates that, for those properties, it is possible to indicate the URI of an existing resource as a value, if that URI is known. Typically, the **`eli:published_in`** property can reference the URI identifying a national official journal if there is one, or, if there is not, a string giving the title of that official journal.

Note that, even if a reference is made using a URI, the value should still be a literal value, in RDF/XML that is as shown below.

```
<rdf:Description rdf:about=»http://exemple.eu/eli/123456»>

<eli:published_in rdf:datatype=”http://www.w3.org/2001/XMLSchema#anyURI”>

          http://exemple.eu/oj/official_journal_uri

</eli:published_in>

</rdf:Description>
```

In terse RDF triple language (Turtle) that is as shown below.

```
<http://exemple.eu/eli/123456> eli:published_in
‘http://exemple.eu/oj/official_journal_uri”^^xsd:anyURI.
```

See also:

- What should I use as a value for eli:published_in? (Section 4.1.5.)

3.4.6 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 can be in force, partially in force and not in force. They are defined as SKOS concepts. They are summarised in the table below:

UNIFORM RESOURCE IDENTIFIER (URI)	LABEL
`eli:InForce-inForce`	in force
`eli:InForce-notInForce`	not in force
`eli:InForce-partiallyInForce`	authoritative

3.4.7 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.

UNIFORM RESOURCE IDENTIFIER (URI)	LABEL	DEFINITION	SIMPLE KNOWLEDGE ORGANISATION SYSTEM (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.	None
`eli:LegalValue-authoritative`	authoritative	The publisher gives some special status to the publication of the document.	`eli:LegalValue-official`
`eli:LegalValue-definitive`	definitive	Document for which the text is conclusively what the law says.	`eli:LegalValue-authoritative`

3.4.8 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 [3]. 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] Language authority table of the Publications Office (http://publications.europa.eu/mdr/authority/language).

3.5 Combining and extending European legislation identifier ontology

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

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

A typical example for that 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 friend of a friend (FOAF) ([4]) or the organisation ontology (ORG) ([5]) vocabularies to publish them, alongside the legal resource descriptions.

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

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

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

A typical example for that 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`.

3.5.3 What is likely to change/be added in European legislation identifier in the future?

Although there is no official commitment on the European legislation identifier (ELI) ontology evolution, possible improvements on the ontology may include (without being limited to) the following.

[4] FOAF (http://xmlns.com/foaf/spec/).

[5] ORG (http://www.w3.org/TR/vocab-org/).

- A refinement of `eli:is_part_of`/`eli:has_part` to distinguish a physical partition (a law included in a national official journal) from a logical partition (a consolidated version part of an abstract law).
- New relations between legislations, typically legislation making other legislation come into force.
- Possible modification of the range of properties having (xsd:anyURI or xsd:string) as their range.
- A link from an article of a consolidated version to the modifying act which created that article.
- A notion of quasi-modification.
- A link to the preceding or following article in a text, or a link to the previous or next temporal version of the same article.

These ideas were proposed in the context of workshops. As any evolution proposal requires the collective agreement of all the members of the task force, there is no commitment as to their implementation.

4 European legislation identifier publication

4.1 Implementing the European legislation identifier ontology in my context

4.1.1 What should I identify in the context of the European legislation identifier?

In order to implement the European legislation identifier (ELI), you should at a minimum give an identifier to the legislations that fall within the scope of ELI (it is OK to implement ELI for only part of the legislation). These legislations 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 of any of its temporal versions. As such this is an abstract notion and does not correspond to any real-world physical object.

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? (Section 3.3.4.)
- What is an abstract legal resource? (Section 3.3.5.)

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 represent 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.

1. Consider that the consolidated versions of a law represent the same intellectual content as the law itself, with different sequences of

signs. In this perspective consolidations would be LegalExpressions of the same LegalResource.

2. Consider that the consolidated versions of a law each have a distinct intellectual content from the law itself, and consider them a distinct LegalResource; in that perspective you can additionally link these LegalResources to an abstract LegalResource representing the document independent of its temporal version using `eli:has_part` and `eli:is_part_of`.

When the legislative system is multilingual, the scenario 1 described above is not applicable, since LegalExpression is, in this case, used to identify the various translations of a document, and cannot at the same time be used to identify the temporal version of a document.

See also:

- How can legal resources be grouped together? (Section 3.3.4.)

4.1.3 My legal resources are all monolingual. Should I still use the functional requirements for bibliographic records distinction between a LegalResource and a LegalExpression?

Yes. Even if they are non-official, 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 level is important for creating future links to the correct notion.

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

It is the directive itself that is transposed, not one of its language variants. So when using `eli:transposes` or `eli:implements` to assert that a legislation transposes or implements a directive, then the link must refer to the ELI identifying the LegalResource of the directive, not to an ELI identifying one language-specific LegalExpression.

4.1.5 What should I use as a value for eli:published_in?

The property `eli:published_in` is used to reference the publication in which a legal resource is published — typically an issue of the national official journal. That reference would typically be a reference to the URI identifying the national official journal issue. But since ELI does not want to impose that there are URIs for national official journal issues, it also allows using a simple string containing the title or number of the issue. This is why `eli:published_in` is one of the ELI properties that can take as a value either an xsd:String or an xsd:anyURI.

See also:

- Why is the range of some properties defined as (xsd:anyURI or xsd:string)? (Section3.4.5.)

4.1.6 European legislation identifier ontology defines inverse properties (eli:changes/eli:changed_by, eli:realises/eli:is_realized_by, etc.). Should I express the information both ways, or can I express it only in 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 are able to express the relation in only one way, this is still valid.

4.2 Defining my own controlled values for European legislation identifier properties

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

According to the European legislation identifier (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:relevant_for`; identifiers for possible geographic areas for which a regulation applies.
- `eli:passed_by`; identifiers for agents and organisations that pass or make 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, and a label. Additionally, each value can also have language translations, synonyms, or can be organised hierarchically with other values.

The easiest way to start these lists is to create a Microsoft Excel spreadsheet with two columns: URI and label, for each of the lists you need to define. Additionally, the workshop reports in the annexes give SKOS file templates that can be used as starting point for creating a list of values.

See also:

- What is the simple knowledge organisation system (SKOS) and why is the European legislation identifier based on it? (Section 3.2.3.)

4.2.3 How can I publish and advertise the lists of values I define?

Typically you can do the following.

- 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 value present.
- Propose a SKOS version of the list values for download.

As a source of inspiration, you can have a look at what the Publications Office is doing for its authority tables [6].

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

4.3 Using resource description framework in [extensible hypertext markup language] attributes to disseminate my metadata

4.3.1 What is the recommended way of disseminating European legislation identifier metadata?

The European legislation identifier (ELI) recommends publishing ELI-compatible metadata using the resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (RDFa) syntax within the existing HTML pages of the law-publishing portal. With RDFa 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 small impact on existing publishing systems since it can be implemented by updating the HTML generation templates without modifying the entire publishing workflow.

[6] Publications Office authority tables (http://publications.europa.eu/mdr/authority/).

See also:

- Besides resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (PDFa), are there other means of disseminating European legislation identifier metadata? (Section 4.4.3.)

4.3.2 Where can I learn more about resource description framework in [extensible hypertext markup language] attributes?

The recommended reading to start learning about resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (RDFa) in general is the RDFa primer published by the World Wide Web consortium (W3C) [7].

The RDFa core specification [8] 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 [9].

The rdfa.info portal [10] 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:

- Where can I search for tools and technologies on semantic web in general? (Section 4.4.5.)

4.3.3 Do I need 'resource description framework in [extensible hypertext markup language] attributes Lite' or 'resource description framework in [extensible hypertext markup language] attributes Core'?

Resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (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.

[7] RDFa primer (http://www.w3.org/TR/xhtml-rdfa-primer/).

[8] RDFa core specification (http://www.w3.org/TR/rdfa-core/).

[9] W3C translation database for RDFa (http://www.w3.org/2005/11/Translations/Query?titleMatch=rdfa&lang=any&search1=Submit).

[10] RDFa info portal (http://rdfa.info/).

4.3.4 Do you have a simple example of a hypertext markup language page with European legislation identifier metadata added as resource description framework in [extensible hypertext markup language] attributes?

We provide as annexes to this document two versions of the same page, illustrating two ways of adding ELI metadata markup in a legislation web page.

1. The first version adds all the RDFa markup right after the <body> tag, leaving the page content unmodified.
2. The second version tries as much as possible to mark the information where it is displayed in the page, thus avoiding repetitions.

4.3.5 How can I test if my resource description framework in [extensible hypertext markup language] attributes markup is correct?

The easiest option is to use the W3C RDFa validator [11], which will validate whether the markup is correct and produce a validation report.

You can also use the distiller service [12] to turn your RDFa markup into a set of RDF triples in order to see whether the content is correct according to the ELI ontology.

There is no straightforward ELI validator service that is capable of validating the metadata expressed in ELI against the ELI ontology.

See also:

- Which tools can I use to visualise the graph of resource description framework (RDF) triples encoded in a page? (Section 4.3.9.)
- Which resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (RDFa) programming library can I use to parse RDFa metadata? (Section 4.3.8)

4.3.6 The structure of my hypertext markup language pages is complex and does not allow easy resource description framework in [extensible hypertext markup language] attributes tagging. What are possible workarounds?

You can do either of the following.

1. Add all the resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (RDFa) markup right after the <body> tag, without impacting the hypertext markup lan-

[11] W3C RDFa validator (http://www.w3.org/2012/pyRdfa/Validator.html).
[12] W3C RDFa distiller service (http://www.w3.org/2012/pyRdfa/).

guage (HTML) page structure (see the first version of the page in the examples provided). This solution requires that, in the publishing process, you have access to all the metadata information which allows you to build this RDFa part (see section 4.3.5 and the provided page examples).

2. Use an alternative technology to disseminate your ELI metadata (see section 4.4.3.).

See also:

- Do you have a simple example of a hypertext markup language page with European legislation identifier (ELI) metadata added as resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (RDFa)? (Section 4.3.4.)
- Besides resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (PDFa), are there other means of disseminating European legislation identifier metadata (ELI)? (Section 4.4.3.)

4.3.7 Should the content of the text itself be tagged in resource description framework in [extensible hypertext markup language] attributes?

Resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (RDFa) tags are usually not required. Only the metadata part of the page is interesting in order to convey ELI metadata. The text of the legislation itself does not need to be tagged.

4.3.8 Which resource description framework in [extensible hypertext markup language] attributes programming library can I use to parse resource description framework in [extensible hypertext markup language] attributes metadata?

The rdfa.info portal lists some possible resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (RDFa) libraries to use.

- In Java, you can use Semargl [13].
- In PHP: hypertext pre-processor (PHP), you can use EasyRDF [14].
- In C, look at librdfa [15].
- In Python, look at PyRDFa [16] which is the library used by the W3C RDFa validator.

[13] Semargl (https://github.com/levkhomich/semargl).

[14] EasyRDF (http://www.easyrdf.org/).

[15] Librdfa (https://github.com/rdfa/librdfa/).

[16] PyRDFa (http://www.w3.org/2012/pyRdfa/Overview.html#distribution).

4.3.9 Which tools can I use to visualise the graph of resource description framework triples encoded in a page?

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

That being said, producing a visual graph from RDF triples can be useful in order to make 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 ([17]) of the Chrome browser.
- A tool with more features is Welkin ([18]). You can customise the graph a little. You should pass the RDF extracted from the RDFa markup using a parser such as the W3C distiller service.
- Probably the most comprehensive tool to design graph images is Gephi ([19]), enhanced with its semantic web import plugin ([20]) to read RDF files, but it has a steep learning curve.

4.4 Beyond resource description framework in [extensible hypertext markup language] attributes: the dissemination process

4.4.1 European legislation identifier is resource description framework . Do I need a resource description framework database (triplestore) to publish European legislation identifier metadata in resource description framework ?

No, adding resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (RDFa) that is, 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 pro-

[17] Green turtle Chrome browser plugin (https://chrome.google.com/webstore/detail/green-turtle-rdfa/loggcajcfkpdeoaeihclldihfefijjam).

[18] Welkin (http://simile.mit.edu/welkin/).

[19] Gephi (http://gephi.github.io/).

[20] Gephi semanticwebimport plugin (https://marketplace.gephi.org/plugin/semanticwebimport/).

tocol and RDF query language (SPARQL), that may require the 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.

4.4.2 Should I use a redirect or a forward to implement European legislation identifier uniform resource identifier access?

If possible, it is better to use URL forwarding so that the European legislation identifier (ELI) remains visible in the address bar of the user. Using a redirect from the ELI uniform resource identifier (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 pages code can be broken.

4.4.3 Besides resource description framework in [extensible hypertext markup language] attributes, are there other means of disseminating European legislation identifier metadata?

Yes. Javascript object notation for linked data (JSON-LD) [21] 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 (that is, RDF) data and content; as such, it may be more developer-friendly but might lack support in the various tools for the moment.

Beyond including structured data directly in the web page content in resource description framework (RDF) in [extensible hypertext markup language (XML)] attributes (RDFa) or JSON-LD, it is also possible to do the following.

- Bundle the European legislation identifier (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 a public access to this database using SPARQL [22], so that developers can directly query the metadata.
- Use the content negotiation mechanism to return alternatively an HTML page or an RDF document for the same URI, based on client preferences expressed in HTTP headers.

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

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

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

See also:

- What is content negotiation? (Section 4.4.4.)

4.4.4 What is content negotiation?

The content negotiation mechanism [23] 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 can be typically the client's preferred language (e.g. 'I prefer English first, 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 do not have then it is OK if you have RDF/XML').

The client expresses a preferences using HTTP headers in the request sent to the server. The request typically looks like the example given below.

- 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 that 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 browser), or a technical RDF file containing 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.

4.4.5 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 W3C as part of its semantic web activity [24].

Professional developers have set up linked data tools [25], to provide developers with tools and know-how in order to use the semantic web, with a set of tutorials for various aspects of semantic web development.

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

[24] Semantic web development tools (http://www.w3.org/2001/sw/wiki/Tools).

[25] Linked data tools (http://www.linkeddatatools.com/).

Validation of RDF data can be done using the RDF validator hosted at the W3C [26]. 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 [27] is an open source tool to clean, transform and link data. An extension to create RDF, RDF Refine [28], was created by and is available for download from the Digital Enterprise Research Institute.

[26] RDF validator (http://www.w3.org/RDF/Validator/).

[27] OpenRefine (http://openrefine.org/).

[28] RDF Refine (http://refine.deri.ie/).

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