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The European Legislation Identifier

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Abstract. The European Legislation Identifier initiative (ELI) aims at bringing legislation into the global Web of data, to facilitate the access, sharing and interconnection of legal information. It proposes the creation of URI identifiers for legislation based on common components and the description of their metadata based on an ontology relying on FRBRoo; the ELI ontology includes in particular the description of the FRBR levels of abstraction, the needed date properties to describe legislation and links to relate legislative acts. Legislation metadata is thus viewed as a global graph of interconnected entities. While ELI tries to lower the entry barrier for legal publishers to disseminate structured metadata and currently counts 13 implementations, it is also facing challenges to progress towards its full potential: data quality, description of ELI datasets, alignment of thematic vocabularies or granular description of the text subdivisions. ELI has the potential to facilitate access to legal information by enabling unambiguous legal citations mark-up, giving legislation more visibility in major web search engines, describing early legislation drafts or facilitating the exchange of data between legal information systems. ELI is tightly connected to novel legal information system architectures, based on legal knowledge graphs; this style of architecture encourages legal publishers to move from a document-centric perspective towards a data-centric perspective, as exemplified by the Casemates in Luxembourg and the Cellar at the Office of Publications of the European Union.

Keywords. ELI - European Legislation Identifier, web of data, ontology, FRBRoo, knowledge graphs, interoperability

1. The Web of Data, Legislation, and ELI

1.1. A Web of Data, but Where Is the Web of Legal Data?

The Web of data, or semantic Web, is a set of standards and principles that defines a new paradigm to make structured data interoperable on the World Wide Web. These principles are successfully applied to share, amongst others, libraries or open data portal catalogues, structured data for web search engines, medical databases, geographic atlases, and more.

However, legislation is not yet fully part of this Web of data, hence corresponding machine-readable descriptions cannot be reused or linked to, nor are they interoperable at web scale.

The conclusions of the Council of the European Union inviting the introduction of ELI state that "*... a European area of freedom, security and justice in which judicial cooperation can take place requires not only knowledge of European law, but also mutual*

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knowledge of the legal systems of other Member States, including national legislation"[2]. The exchange of legal information is key in this regard, and it is time that legislation becomes integrated into the Web of data, for higher interoperability.

1.2. ELI: Better Accessibility of Legislation Information through the Web of Data

From this rather technical perspective, the European Legislation Identifier initiative (ELI) aims at bringing legislation into this ocean of interconnected data. This means, from an end-user perspective, that ELI will *facilitate the access, sharing and interconnection of legal information* published through national, European and global legal information systems. This is done with the following benefits in mind:

- *Easier access* to legislation for end-users.
- Development of *new services* through the smart reuse of data.
- *Cost savings* for publishers.
- Higher *quality and reliability* of data, based on review and feedback from data reusers.
- Increased *transparency* for citizens and watchdog organisations.
- Improved *interoperability* of legislative information across legal information systems.

1.3. ELI: Motivations and Current Status

First established in the context of the European Forum of Official Gazettes[3] and with the impulse of Luxembourg, ELI has been further supported by the subgroup mandated by the Council of the European Union in the framework of the Working Party on E-law[4]. The first Council Conclusions on the European Legislation Identifier were published in 2012, and revised in 2017. The initial motivations were the ability to reuse automatically the structured description of EU Directives in national systems, as well as the need to have a shared interoperable model to link legislation on the Web; hence the use of semantic Web technologies was foreseen from the beginning.

As of March 2019, ELI has been implemented by Austria, Belgium, Denmark, Finland, France, Ireland, Italy, Luxembourg, Portugal, Spain, Norway, the United Kingdom and the EU Publications Office. The details of each implementation are available in the ELI registry[5].

2. The ELI Framework

2.1. The 3 Pillars of ELI

To have legislation dive into the data-driven world, the formal specifications[6] of ELI advocates the following:

[2]OJ C 441, 22.12.2017, p. 8-12, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52017XG1222(02), with the initial version of 2012 to be found in OJ C 325, 26.10.2012, p. 3-11, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012XG1026(01).

[3]https://publications.europa.eu/en/web/forum_official_gazettes/.

[4]http://www.consilium.europa.eu/en/council-eu/preparatory-bodies/working-party-e-law.

[5]https://eur-lex.europa.eu/eli.

[6]OJ C 441, 22.12.2017, p. 8-12, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52017XG1222(02), with the initial version of 2012 to be found in OJ C 325, 26.10.2012, p. 3-11, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012XG1026(01).

- Give stable web identifiers to legislation, using URIs; The URIs are formally described by templates, using semantic components from a legal and an end-user point of view, making them as close as possible to how users cite legislation and therefore user-readable. The use of web identifiers enables web-wide linking of legislation.
- Describe legislation metadata in a standardised way, using a common ontology.
- Make legislation metadata available for machines on the Web, by embedding structured data in web pages using RDFa[7] *or JSON-LD*[8].

The following Sections will provide a brief outline of the ELI components, focusing on what makes the added value of ELI.

2.2. ELI Identifiers

The ELI identifiers are made of formal components that ELI publishers can arrange in any order to specify their own URI patterns[9]. ELIs are crafted to be stable over time and serve as permalinks to legislation, to be transparent for a human reader and to be associated with a user behavior when a user links to it. As an example, http://data.europa.eu/eli/dir/1980/181 is the identifier of EU Directive 80/181/CEE, and returns the latest consolidated version of that directive.

2.3. ELI Ontology

While interested readers can refer to the detailed documentation of the ELI ontology[10] and the resources to implement ELI[11] for a detailed understanding of the ELI ontology, we describe 3 key features of the ontology here: its FRBR structure, specific legal dates and relations between entities. We emphasize that the ELI ontology is under constant improvement since its inception, currently in version 1.2, with a version 1.3 foreseen in late 2019.

2.3.1. FRBR: From the Resource Paradigm to the Graph Paradigm

The ELI ontology defines how legislation metadata must be structured in the context of the ELI framework. The ontology is based on the paradigm introduced by the Functional Requirements for Bibliographic Records conceptual model (FRBR)[12], and more specifically with its object-oriented derivative FRBRoo[13]. While legacy approaches, in bibliographic descriptions like Dublin Core Terms[14], were centered around the description of a 'flat' resource, FRBR splits the resource into layers of abstraction, organised hierarchically. Each layer is described with specific metadata, can refer to other entities and can be linked to, thus turning legislation information into a graph (it should be noted however that ELI has always retained a compatibility with Dublin Core by explicitly mapping its

[7]RDFa: https://www.w3.org/TR/rdfa-core/.

[8]JSON-LD: https://json-ld.org/.

[9]Reference ELI template components: http://publications.europa.eu/resource/cellar/c2f0e4f9-ed6f-11e8-b690-01aa75ed71a1.0001.03/DOC_2.

[10]https://publications.europa.eu/en/web/eu-vocabularies/eli.

[11]https://eur-lex.europa.eu/eli-register/resources.html.

[12]FRBR: https://www.ifla.org/publications/functional-requirements-for-bibliographic-records.

[13]FRBRoo: http://www.cidoc-crm.org/frbroo/.

[14]Dublin Core Terms: http://dublincore.org/documents/dcmi-terms/.

metadata fields to the corresponding Dublin Core properties, for informative purposes only).

The same paradigm influences other initiatives in the structuring of legal resources, such as Akoma Ntoso[15] or CEN Metalex [1].

In line with FRBRoo, ELI has specified the following levels of abstraction, from the more abstract to the more tangible:

- The Legal Resource covers 2 notions: a uniquely identified piece of legislation, independent of its version, language or file format; e.g. Directive 80/181/CEE (an FRBRoo Complex Work). And also a specific temporal version of a piece of legislation; e.g. version consolidated on the 27/05/2009 (a FRBRoo Individual Work).
- The Legal Expression: a linguistic variant of a version of the item of legislation; e.g. Hungarian translation.
- The Format (equivalent to FRBRoo Manifestation Product Type): a given file or set of files in a specific format, containing the written encoding of (a given version in a given language of) a piece of legislation; e.g. the body and annexes PDFs of the Hungarian translation of the consolidated version of the directive.

This graph data structure makes it possible to refer precisely to a given level, depending on the context: 'Article 1 of Regulation No 561/2006' (Abstract Legal Resource), 'Regulation (EC) No 561/2006 of the European Parliament and of the Council of 15 March 2006' (Legal Resource), 'Students will study the German translation of Regulation No 561/2006' (Legal Expression), 'I have downloaded the HTML file of German translation of Regulation No 561/2006' (Format). In particular, in a pure resource/document centric system, a reference to the 'Abstract Legal Resource' level is not possible.

2.3.2. Dates of a LegalResource

ELI also specifies, among many more metadata, the dates needed to describe a LegalResource 'lifecycle':

- Date of document: the date on which the text became a law, e.g. by the virtue of a signature by the head of state; this is different from the date on which the text was written.
- Date of publication: the date on which the text was published in an Official Journal (OJ), which may typically happen a few days after the text officially became law.
- Date range in which the legislation is in force: the time span during which the legislation is in force.
- Date of applicability: the date on which the legislation becomes applicable; this can differ from the date the legislation becomes in force (e.g. if an act in force states it will become applicable in 3 months).

2.4. Links to Create a Graph

The ELI ontology provides links to specify how legal entities can be connected together in a graph. A legal resource may simply *cite* another one. Some of these links are related to how legal provisions affect other pieces of legislation: a legal resource may *amend*, *repeal* or *commence* another one. A legal resource can also *correct* another legal resource,

[15] Vitali, F. (2007). *Akoma Ntoso Release Notes*, http://www.akomantoso.org.

like corrigenda in EU legislation, when it is only correcting spelling mistakes with no impact on the legal content. Secondary legislation is *based on* primary legislation. In a European context, a national legal resource may formally *transpose* an EU Directive. A legal resource may be *another publication* of the same resource already published elsewhere (typically in the context of national and regional OJs). And finally a legal resource may be *cited by* a case law.

2.5. The ELI Philosophy

As a complement to the description of the ELI framework, we think it is important to outline some of the key ideas that motivated its design.

Probably, the most fundamental of these ideas is to *lower the entry barrier for ELI implementations* as much as possible. Official Journals with limited resources and without in-depth technical knowledge of semantic Web principles should be able to implement ELI. The goal is to reach a critical mass of adoption and available data, so that ELI becomes a cornerstone for legal data interoperability. This is what guided the choice of RDFa as a dissemination technique for metadata, which is far less complicated than opening a SPARQL service.

In addition, ELI is *non-intrusive* with respect to existing legal publishing systems. Since ELI is a framework for the dissemination of metadata, it does not require any change of the publishing workflow.

However non-intrusive, the *progressive* nature of ELI is also an opportunity for an official legal publisher to improve the way its information is published. This can be in terms of quality, quantity or structure of information maintained, or in terms of the publishing system as a whole, by adopting a legal knowledge graph architecture (see below).

Another key aspect of ELI is its *adaptability to different legal systems*; in particular common law systems and civil law systems. This adaptability has a concrete consequence on the ontology: publishers may consider subsequent versions of a legislation either as FRBR LegalExpressions of the same LegalResource, or as independent LegalResources grouped under the same Abstract LegalResource. This last choice is adopted by most ELI implementers.

3. ELI Challenges

What are the challenges that ELI is currently facing to progress towards its full potential?

3.1. Data Quantity and Quality

Currently, 12 national legislation publishers, plus the Publications Office of the EU, have implemented ELI. However, not all implementations have the same level of precision; this is the other side of the coin for the low entry barrier principle described above: some populate a lot of metadata fields in their structured descriptions of legislation, while others provide very few, or sometimes only a subset of their legislation. This currently makes it hard to implement a 'cross-national' search on European legislation based on ELI metadata. Opening publicly these structured metadata may have a positive impact on their overall quality, if a feedback loop from data reusers is established.

3.2. Aggregation of ELI Datasets

While the inclusion of metadata inside webpages is the simplest path for a data provider with an existing web portal to disseminate reusable data on the Web, this does not make the life of data consumers easier. They need to crawl and fetch every webpage, analyse their HTML source in order to recreate a complete graph that can be queried and integrated into an application. While this is technically feasible, such a mechanism raises the entry barrier for data consumers and, more problematic, it may not give the guarantee to obtain the complete set of metadata from a given ELI publisher, depending on the crawling algorithm used. This is why ELI has proposed a methodology for ELI providers to describe and disseminate their ELI dataset[16], in order to facilitate the acquisition of ELI metadata by reusers. ELI should address this relation with data reusers in order for the initiative to be entirely fruitful.

3.3. Thematic Vocabularies Alignment

A key entry point for accessing legislation is the search on thematic/subject keywords. The ability to perform such a cross-national search requires first of all that legislation is indexed on a controlled set of concepts, and secondly that these sets of concepts are aligned with a pivot vocabulary allowing a higher degree of interoperability of the legal notions used to index legislation. A first step in this direction has been conducted to align the thematic vocabulary of Luxembourg with Eurovoc[17], the multilingual and multidisciplinary thesaurus covering the activities of the EU, based on either lexical proximity or on the analysis of how directives and their national transpositions are respectively indexed[18].

3.4. Granularity (Identification and Description of Subdivisions)

Linking a piece of national legislation with the EU Directive it transposes is good, but linking *articles* of that legislation with *articles* of the directive being transposed would be even better. This requires an identification of each text fragment, at EU and national level. This will be particularly useful for long directives (e.g. Directive 2009/138/CE[19] has 312 articles in 155 pages). While there is no foreseen difficulty in modelling the subdivision metadata, the challenge resides in adding complexity and scalability requirements to existing dissemination systems.

3.5. Disseminating ELI for Regulation Agencies

Use-cases have pointed out that ELI would be even more useful if it could be applied to the texts of regulation agencies [2]. The first application of ELI on *soft law* is the implementation at the French 'Autorité des Marchés Financiers'[20] (AMF): this has proven that ELI is applicable outside the scope of Official Journals. How can such agencies engage even more with ELI in order to produce machine-readable metadata and link it to legislation?

[16] https://eur-lex.europa.eu/content/eli-register/ELI_dataset_description-EN.pdf.

[17] Eurovoc, maintained in the EU vocabularies portal at http://eurovoc.europa.eu/.

[18] Dann, J. & Gerencsér, A. (2018). *EU Vocabularies – Facilitating the Linking of Legal Data*. Slides presentation at LVI 2018 Conference, https://bit.ly/2W3dFfx.

[19] http://data.europa.eu/eli/dir/2009/138/oj.

[20] https://www.amf-france.org/eli/fr/aai/amf/rg/20190209.

4. ELI Potentialities

ELI has the potential to change the legal world and facilitate access to legal information, not only for end-users but also between legal information systems.

4.1. Unambiguous Legal Citations Mark-up

As an ELI identifier is crafted to be as close as possible to how an end-user cites legislation, it provides an easy way to associate textual citations with the corresponding stable web identifier to navigate to this text. 'Article 2 of Directive 2009/138/CE' can be easily (and automatically) converted to http://data.europa.eu/eli/dir/2009/138/art_2 (the conversion needs to know that ELI identifiers for EU legislation all start with http://data.europa.eu/eli). This allows the automated mark-up of legal citations with a higher degree of reliability, as recently shown in an effort to generate legal mark-up – including citation mark-up – on 5 Luxemburgish codes[21].

4.2. Better Visibility of Legislation in Major Search Engines

Facilitating access to legislation for end-users is one of the goals of ELI. This includes, of course, accessing legislation from the Web in general. But how do users search for information on the Web: do they use the search bar of their browser, the search field of major search engines, or the chatbot of their own operating system? These major players consume structured data from the Web to improve their services, however they do not consume just *any* structured data, the data has to be expressed in a specific and commonly agreed vocabulary: schema.org[22]. In order to make structured legislation data available for these major players, the ELI Taskforce[23] proposed to introduce a description for legislation inside this vocabulary[24], as none was yet foreseen. The proposal derives from the ELI ontology[25]. This is done in the expectation that a webmaster can use it to disseminate more structured data about legislation and also in the hope that search engines will use such data for providing added value to their users. This *could* lead to improved search results as depicted in the mock-up in Figure 1, where metadata of a given act are directly shown in the search result: the title, the status, domain keywords and direct access to the original or latest consolidated version.

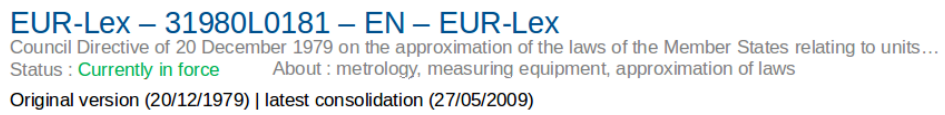

Figure 1. Mock up of improved search results

This schema.org legislation extension has already been implemented by Luxembourg and the Brazilian parliament[26].

[21] http://orbilu.uni.lu/handle/10993/31825.

[22] http://schema.org.

[23] ELI Taskforce mandate: https://eur-lex.europa.eu/content/eli-register/governance_rules.pdf.

[24] https://pending.schema.org/Legislation.

[25] Interested readers can follow the archive of the discussion in the introduction of this extension in schema.org at: https://github.com/schemaorg/schemaorg/issues/1156.

[26] https://github.com/schemaorg/schemaorg/issues/1743#issuecomment-438768067.

4.3. Analysis and Navigation in Legal Knowledge Graphs

The availability of interconnected legislation information will allow to search across the global data graph and provide answers to queries such as "how is this EU Directive implemented in different countries?", "where can I find a translation of French legislation into English?", or "what legislation exists about 'food inspection' and 'labelling' across EU Member States?". We can also envisage a fine-grained transposition analysis, with e.g. side-by-side display of directive articles and how they are transposed in a national corpus.

This will also improve navigation inside a legal act; a proof of concept for this functionality is the Lexparency prototype[27]. A related data visualization – not based on ELI – to navigate the GDPR was made at the CNIL - Commission National de l'Informatique et des Libertés[28].

The availability of reusable content formats and machine-readable links in a global legal knowledge graph on the World Wide Web can also serve as a basis for Artificial Intelligence algorithms to take legislation information into account.

4.4. Description of Early Legislation Drafts

As a legal watchman, how can I be notified that a legislative project has been issued, which could have a potential impact on the domain that I am monitoring? How can I access the impact studies or debate recordings of the legislative project that preceded a piece of legislation, and how can I reuse this information? As a civil servant in an EU Member State, how can I be informed at an early stage that a directive might potentially be amended, in order to allow me to start preparing for national transposition? These scenarios require not only machine-readable descriptions of legislation but also machine-readable descriptions of draft legislation at an early stage.

To address these use-cases, ELI has released ELI for Draft Legislation (ELI-DL)[29], an extension of the core ELI ontology to add structured metadata in the description pages of legislative projects. This extension emphasizes the description of *events* occurring during the legislative workflow, as a complement to the description of the sole *documents*. As of March 2019, this non-official draft ontology extension is open for comments.

4.5. Exchange of Data Between Legal Information Systems

A higher degree of interoperability between legal information systems is one of the central goals of ELI. This is particularly interesting in a European institutional context where data is exchanged between the European Commission and EU Member States in the frame of the transposition notification mechanism. ELI – and Web of data technologies in general – enables this data exchange in two ways: when starting a transposition project, EU Member States can fetch the ELI metadata of the Directive to be transposed from the EUR-Lex site managed by the Publications Office of the EU and integrate it in their own legal information system. Secondly, when a Member State wants to notify the Commission that the transposition is effective, it can point to the ELI reference(s) of the trans-

[27] https://lexparency.org/.

[28] https://www.cnil.fr/fr/reglement-europeen-protection-donnees/dataviz.

[29] https://joinup.ec.europa.eu/solution/eli-ontology-draft-legislation-eli-dl.

posing act(s), so that the Commission integrates the metadata of the transposed text in its own database. It is interesting to outline that this happens without any proprietary service or protocol, using only web standards.

4.6. Addressing Multilingual and decentralized Aspects

ELI allows to efficiently inter-link legislation in multilingual and/or federal legal environments. The FRBR hierarchy makes it possible to have a legal resource described only once associated to multiple translations. Links in the ontology allow to interrelate resources published in national and regional OJs, like in the Spanish implementation of ELI[30].

4.7. Linking with Case Law and Normative Requirements

Other potentialities of ELI lie in the ability to create links to and from other data sources, such as the European Case Law Identifier (ECLI)[31] or from the analysis of the normative requirements encoded in the legal provisions of the act [3].

5. ELI in the Context of Legal Knowledge Graphs

5.1. Building a 'Legal Knowledge Graph'

ELI, in line with the approach of the Web of data, with an FRBR-based data structure, encourages legal publishers to move from a document-centric perspective toward a *data-centric perspective*. In this approach, access to content (here, the legislation text) is enabled by a database containing the structured description of all the entities comprised in the knowledge domain. In the case of a legal publisher, such entities are the interrelated FRBR levels of the content notices, as well as the supporting concepts for the description of the notices: types of acts, thematic keywords, etc. Content files in multiple formats (XML, HTML, PDF) will also be stored in it. Such a database of highly interconnected entities plays a central role in the information system, as it can be reused across many applications. It is often referred to as 'knowledge graph', and in the case of legal publishers as 'legal knowledge graph'.

We describe in this Section the benefits we see in this style of architecture, exemplified in the information systems of Luxembourg and the Publications Office of the EU.

5.2. Characteristics of a Legal Knowledge Graph

The very nature of a graph data structure makes it easy to *aggregate data from heterogeneous data sources*, and such a legal knowledge graph links the data from multiple business applications: the Official Journal, the management of directive transpositions, consolidations, legislation projects, archives, international treaties, etc.; applications can navigate the links to operate transversally across data silos. The graph is controlled by an *ontology* and consolidates existing values in each application through *controlled vocabu-*

[30] http://administracionelectronica.gob.es/ctt/eli/descargas.
[31] https://e-justice.europa.eu/content_european_case_law_identifier_ecli-175-en.do.

laries shared across the whole system that serve as a 'pivot' to link the data. The graph is seen as a Data Warehouse and becomes the *single source of truth*[32] for the dissemination of data through all channels: web portals, ELI metadata, open data portals, APIs, RSS feeds, etc. As the system evolves, it tends to become also the single source of truth *inside* the information system, and not only for the dissemination to the outside world.

5.3. Legilux Casemates and the OP Cellar: Two Legal Knowledge Graphs in Action

The Publications Office of the EU has its legal knowledge graph stored in the Cellar[33], its semantic repository containing structured description of all EU legislation. The Cellar is the source of data for the EUR-Lex portal[34], including the embedded ELI metadata. The Cellar database can be freely queried from the outside[35].

Legilux[36], the web portal of the Official Journal of the Grand Duchy of Luxembourg, also relies on a legal knowledge graph, Casemates[37].

We describe here some examples of accessibility features permitted by such knowledge graph architectures.

An obvious feature is that they provide a *single web portal to access all the content*: the different OJ series, legislative projects, international agreements, treaties and more.

These portals provide classical *faceted search* features on their content, based on the metadata of each act and the associated controlled vocabularies. Legilux even provides a *semantic auto-complete* feature for its search input field (Figure 2): not a plain search field, not proposals based on frequent queries, but on entities of the knowledge domain; as users type words in the search field, they are prompted with names of ministries, keywords, places and titles of laws corresponding to the letters typed, thus enabling quicker access to content.

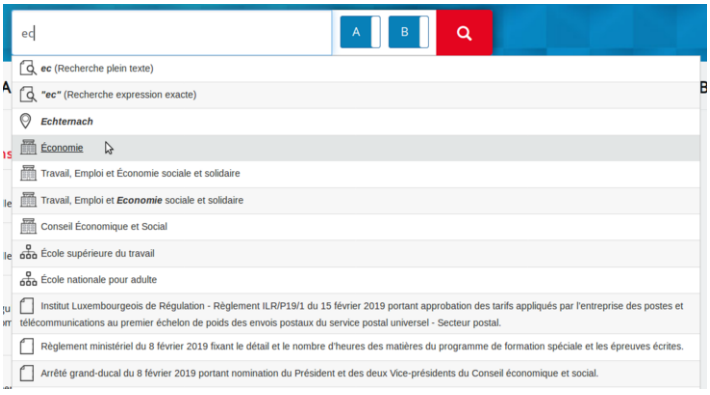

Figure 2. Legilux: Semantic auto-complete feature for search input

[32] https://en.wikipedia.org/wiki/Singlesourceof_truth.

[33] Cellar guide for data reusers: https://publications.europa.eu/en/publication-detail/-/publication/50ecce27-857e-11e8-ac6a-01aa75ed71a1/language-en/format-PDF/source-73059305.

[34] EUR-Lex: https://eur-lex.europa.eu/.

[35] Cellar SPARQL service: http://publications.europa.eu/webapi/rdf/sparql.

[36] Legilux: http://legilux.public.lu/.

[37] Casemates: http://data.legilux.public.lu/.

When users have accessed the notice of the legislation act they are interested in, the graph nature of the information enables to '*navigate anywhere*': not only can they click on any of the acts somehow linked from or linking to this one, but they can also search for legislation with similar characteristics, by listing acts with the same author or thematic keywords.

Time and versioning of legislation is an important aspect of how the legal knowledge graph can be exploited, particularly in two situations: to show and navigate through the successive versions of an act, or to display the timeline of events in a legislative project. These display types require the aggregation of a lot of information from different entities. EUR-Lex offers a good example of such a timeline, where each event in a procedure can be opened for details, giving access to the documents linked to this step (Figure 3).

Figure 3. EUR-Lex: timeline of events in a legislative project

The knowledge graph can be queried transversally, based on any of its links and as such serves as a basis for flexible *data visualizations*. Legilux provides, for example, a quick access to the current transposition projects by ministry, type of text, and organisation[38].

Such legal knowledge graphs with a sufficient level of precision can allow for *automated consolidations* of legislation. This requires an unambiguous identification of legislation subdivisions, a precise annotation of legal references, and the ability to express the semantic links between amendments and original texts.

[38]Legilux access to transpositions: http://legilux.public.lu/data-graphics/transpositions.

The legal knowledge graph, as the data source of every dissemination channel, also serves for the dissemination of legislation datasets on open data portals, including the source content files, content metadata and supporting vocabularies used to index legislation.

6. Conclusion

The description of the European Legislation Identifier and the legal knowledge graph architectures shows the added value of this innovative approach for the benefit of legal information distribution. We outlined its potentialities as well as the challenges it will be facing in the coming steps. ELI is sufficiently generic to be adopted outside Official Journals and EU Member States and with its 'benevolent' approach, encourages both its implementation by legal information providers and the creation of innovative legal services by data reusers.

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[2] Mathis, B. (2019). La normalisation des documents normatifs, une avancée européenne au service de l'innovation juridique. In Masson, A. & Bouthinon-Dumas, H. (Eds.). *L'innovation juridique et judiciaire*. Larcier, 147-152.

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